The Practice of Fisheries: Celebrating all who work toward sustainable fisheries in Alaska

American Fisheries Society — Alaska Chapter
40th Annual Meeting

8–11 October 2013
Fairbanks, AK

What is the American Fisheries Society?

The American Fisheries Society (AFS), founded in 1870, is the oldest and largest professional society representing fisheries scientists. AFS promotes scientific research and enlightened management of resources for optimum use and enjoyment by the public. It also encourages a comprehensive education for fisheries scientists and continuing on-the-job training.

The AFS publishes some of the world's leading fisheries research journals: the Transactions of the American Fisheries Society; North American Journal of Fisheries Management; North American Journal of Aquaculture, Journal of Aquatic Animal Health, and Fisheries.

The AFS organizes scientific meetings where new results are reported and discussed. In addition to these primary functions, the Society has many other programs in areas such as professional certification, international affairs, public affairs, and public information.

AFS Mission Statement

The mission of the American Fisheries Society is to improve the conservation and sustainability of fishery resources and aquatic ecosystems by advancing fisheries and aquatic science and promoting the development of fisheries professionals.

The Alaska Chapter of AFS

The Alaska Chapter is the local organization in Alaska for the American Fisheries Society. Major activities include our annual meeting, consisting of technical paper presentations, special guest lecturers, and continuing education courses for fisheries professionals. Through resolutions and letters to policy makers, the AK Chapter has supported continued conservation and stewardship of Alaska's fisheries.
Visit the Alaska Chapter AFS Website at: http://www.fisheries.org/afs-ak/

Guest Artist Biographies

Cover Art: Karen Olanna

Artist Biographical Sketch: Karen Olanna began her artistic career in high school, where she focused on training. After graduation, she expanded her artistic repertoire as an apprentice in wood carving with a Norwegian artist, and finally formalized her training at the University of Alaska Fairbanks.
Karen lives and works out of Nome, Alaska, where she finds inspiration in both the natural and spiritual world around her. Her art is influenced by the transformational themes of the spirit world found in traditional Alaska Native art, as well as by Greek mythology, and the psychology of Carl Jung.
More information about her work can be found on her website: http://www.karenolanna.com.

Welcome Reception Entertainment: Pavva Iñupiaq Dancers

The Pavva Iñupiaq Dancers are a group of residents of Fairbanks, Alaska formed to preserve the culture and traditions of the Iñupiaq peoples through song and dance. The group demonstrates this culture through performances of songs and dances to both Alaska Native and non-Native peoples. Fairbanks is in the interior of Alaska and the name "Pavva," which in Iñupiaq means 'away from shore, landwards, toward the mountain' was chosen. The group chose this name because they live away from the region where their parents and grandparents originally lived. Iñupiaq people from the Fairbanks community want to learn more about their ancestor's traditions and to continue the Iñupiaq way of life by passing their traditions and values onto their children. Although most of the Iñupiaq people in Fairbanks may have danced with family or other dance groups for years, they formed the Iñupiaq dance group in 1999 to create an environment in which to share dances, to learn from one another and to perform on a professional level. The group practices on a regular basis. As they have progressed in this effort other Iñupiaq persons have come to join the group.

More information about the group can be found at: https://sites.google.com/site/pavvadancers/history

Special Thanks

A special thanks to those individuals who offered their knowledge, time, and expertise in planning and organizing the 2013 Chapter meeting together

Chapter Executive Committee

Trent Sutton, Past President
Mark Wipfli, President
Philip Loring, President-elect
Jennifer Stahl, Vice-president
Nicky Szarzi, Secretary
Lee Ann Gardner, Treasurer
Kari Fenske, Student Unit President

Program Planning Committee

Philip Loring, University of Alaska Fairbanks
Anne Beaudreau, University of Alaska Fairbanks
Jeffrey Falke, University of Alaska Fairbanks
Kari Fenske, University of Alaska Fairbanks
Sue Mauger, Cook Inletkeeper
Emilie Springer, University of Alaska Fairbanks
Trent Sutton, University of Alaska Fairbanks

Meeting & Auction Sponsors

Special thanks to all those sponsors who directly and indirectly supported the meeting. For further information, please see the Sponsor and Venue Information pages at the back of this program.

Cover Art Donation

Karen Olanna

Audio/Visual Support

AK-AFS Student Subunits

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Keynote and Plenary Speakers

Carmel Finley, Oregon State University
Ratana Chuenpagdee, Memorial University of Newfoundland
Tom Garber, Third Wave Films
Jeremy Mathis, University of Alaska Fairbanks
Nicole Misarti, University of Alaska Fairbanks

Entertainment

Pavva Iñupiat Dancers
Tom Garber, Filmmaker

Session Chairs and Co-Chairs

Jeff Adams, US Fish and Wildlife Service
Milo Adkison, University of Alaska Fairbanks
Anne Beaudreau, University of Alaska Fairbanks
Bill Bechtol, Alaska Department of Fish and Game
Mac Campbell, University of Alaska Fairbanks
Hannah Harrison, University of Alaska Fairbanks
Jeffrey Falke, University of Alaska Fairbanks
Thomas Farrugia, University of Alaska Fairbanks
Karen Murphy, Western Alaska LCC
Julie Nelsen, University of Alaska Fairbanks
Tim Sands, University of Alaska Fairbanks
Andy Seitz, University of Alaska Fairbanks
Peter Westley, North Pacific Fisheries Management Center
Mark Wipfli, University of Alaska Fairbanks

Continuing Education Coordinator

Tammy Hoem Neher

Poster Session Coordinator

Kari Fenske

Student Presentation Judging Coordinator

Theresa Tanner, US Fish and Wildlife Service

Program Design

Alysa Loring

Table of Contents

Keynote & Plenary Speaker Biographies

Dr. Carmel Finley
Instructor, Oregon State University

Carmel Finley is a historian of science, who teaches world history. She is interested in the intersection of science and policy, especially in the oceans, and the interactions of fish, fishermen, scientists, and managers. Finley received her master's degree in interdisciplinary studies (History, Political Science, and Speech Communications) from Oregon State University in 2000 and her Ph.D. from the University of California, San Diego, in 2007 in the History of Science, with minors in Maritime History and Science Studies. The University of Chicago Press published All the Fish in the Sea: Maximum Sustained Yield and the Failure of Fisheries Management, in the fall of 2011. She is currently working on her next book, All the Boats on the Ocean: The Politics of Fishing Subsides. She is also working on a history of fishing in the Pacific Northwest. Her blog, *The Pacific Fishery History Project*, can be found at:
http://carmelfinley.wordpress.com/

Keynote & Plenary Speaker Biographies

Dr. Ratana Chuenpagdee
Canada Research Chair on Natural Resource Sustainability and Community Development and Professor at Department of Geography, Memorial University of Newfoundland

Dr. Chuenpagdee has a BSc in Marine Science from Chulalongkorn University, Thailand, MSc in Fisheries Management and Economics from Michigan State University, MSc in Fisheries from University of North Wales, and PhD in Resource Management and Environmental Studies from University of British Columbia. Dr. Chuenpagdee works on diverse topics, such as ocean and coastal governance, small-scale fisheries, and marine protected areas in various settings, including Cambodia, Canada, Malawi, Mexico, Namibia, South Africa, Spain, Thailand, and US. Before coming to Memorial University, she was Assistant Professor at Virginia Institute of Marine Science, in Virginia and a Senior Research Fellow at St. Francis Xavier University, and at International Ocean Institute, Dalhousie University. Currently, she is the project director of a six-year global partnership initiative on small-scale fisheries, Too Big to Ignore (http://www.toobigtoignore.net).

Dr. Chuenpagdee's visit is funded by the Frank and Marjorie Meek Endowment.

Keynote & Plenary Speaker Biographies

Mr. Tom Garber
Filmmaker & Producer, Third Wave Films

Tom Garber is a filmmaker and executive producer with Third Wave Films. Within the maritime documentary field Mr. Garber has conceived, written, produced, photographed, and edited eleven documentaries that have aired on PBS, The Discovery Channel, and Plum TV. His themes cover ordinary people achieving the extraordinary: surf-sailors in *North Shore Maui*, blind boat builders in *Of Boats and Brothers*, commercial fishermen in *The Salt of the Sea*, and tugboat captains in, *Tugging Through Time*.

From his studio in a 19th century carriage house in Hampton Bays, NY, Mr. Garber crafts documentaries with a depth of research, compelling visuals, and dramatic pacing that leaves the viewer informed and engaged. The awards Mr. Garber's films have received include an Emmy Nomination, a Bronze Telly, Silver and Platinum REMIs, Gold and Silver Medals from the Charleston and Houston International Film Festivals, and official selections at The Hamptons Take 2 Film Festival, Indy Fest, and Long Island Film Festival.

Mr. Garber's films have been underwritten by a variety of organizations, including: The United States Department of the Interior, New York State Office of Parks and Historic Preservation, The Marine Society of the City of New York, The Connecticut Maritime Association, and the New York City Office of Economic Development.

Keynote & Plenary Speaker Biographies

Dr. Jeremy Mathis
Director, Ocean Acidification Research Center, University of Alaska Fairbanks

My current research focuses on constraining CO2 fluxes and ocean acidification in coastal regions, particularly at high latitudes. I do this by using a variety of platforms including the collection of discrete DIC, TA, pH and pCO2 measurements from ships as well as data collected from moorings, gliders and floats. I am interested in the specific mechanisms that control the sources of anthropogenic CO2 in the ocean and how the intrusion of this CO2 affects biogeochemical cycles and marine ecosystems.

I am currently a member of the steering group for the North American Carbon Program and leading the NACP subgroup for the Arctic Ocean as well as serving on the Arctic Icebreaker Coordinating Committee (AICC). I am also serving a three-year term on The Ocean Carbon and Biogeochemistry (OCB) scientific steering committee as well as co-chairing the ocean acidification sub-committee.

Keynote & Plenary Speaker Biographies

Dr. Nicole Misarti
Water and Environmental Research Center, University of Alaska Fairbanks

Dr. Misarti's research focuses on long-term marine ecosystem and climate change coupled with an archaeological and anthropological component. She received her Ph.D. from UAF's School of Fisheries and Ocean Science in 2007. Until recently, she worked first as an NSF Postdoctoral Fellow at Idaho State University and then as an Institutional Postdoctoral Researcher at Oregon State University. Dr. Misarti is currently involved in a sea otter food web study on Kodiak Island that includes data from field collections in the intertidal as well as data from archaeological sites in the same locations. She is about to begin a project on the Bering Sea coast that involves archaeological excavations and recovery of faunal material to track ecosystem change during known periods of climatic fluctuations. She is also involved in an ongoing bio-complexity project with university researchers and local communities on the Pacific coast of the Alaska Peninsula as well as research along the coastlines of southern Chile and Argentina.

At A Glance Schedule

Day 0
Tuesday, 8 October 2013

Time	Event	Location
12–6PM	**Registration in Hotel Hallway**	Hotel Hallway
11:00AM	**Nature Walk**	Shuttle departs 10:45 from Princess
1:00PM	**Hatchery Tour 1**	Shuttle departs 12:45 from Princess
2:30PM	**Hatchery Tour 2**	Shuttle Departs 2:15 from Princess
6:30–9:00PM	**Welcome Reception**	UAF Museum of the North (Shuttles run 6:15-7:00 and 8:30-9:15)

Day 1
Wednesday, 9 October 2013

Time	Event	Location
8:00AM	**Exhibitor Setup**	Marble Room
8:30AM—5:00PM	**Silent Auction** **Exhibitions**	Marble Room
8:30AM	**Continental Breakfast**	Jade Room
8:00AM–5:00PM	**Registration**	Fireside
9:15AM	**Opening Remarks**	Edgewater Room
9:30AM	**Keynote 1**	Edgewater Room
10:45AM	**Plenary 1**	Edgewater Room
11:20AM	**Plenary 2**	Edgewater Room
12:00PM	**Lunch Buffet**	First Floor Hallway
12:20PM	**Keynote** 2	Edgewater Room
1:15PM	**(CS1) Salmon I** **(CS2) North Slope I**	Jade Room Edgewater Room
3:10PM	**(CS3) Salmon II** **(CS4) North Slope II**	Jade Room Edgewater Room
6:00–8:30PM	**Poster Session**	UAF Regent's Great Hall (Shuttles run from 5:45–6:45 and 8:15–8:45)
8:45PM	**Open Mic Night** **Fisher-poet Event**	UAF Pub

Day 2
Thursday, 10 October 2013

Time	Event	Location
8:00AM	**Continental Breakfast**	Fireside
8:30AM—5:00PM	**Silent Auction** **Exhibitions**	Marble Room
8:00AM–5:00PM	**Registration**	Fireside
8:30 AM	**(CS5) Freshwater Ecosystems** **(CS6) Foodwebs**	Copper Room Jade Room
10:25AM	**(CS7) Fish Movement & Dist.** **(CS8) Human Dimensions**	Copper Room Jade Room
12:00PM	**Past Presidents' Meeting**	Copper Room
12:00PM	**Lunch (on own)**	
12:45PM	**Learning Studio II**	Jade Room
1:30PM	**(CS9) Changing Climate** **(CS10) Estuaries/Coasts**	Copper Room Jade Room
3:30 PM	**Business Meeting**	Jade Room
4:00PM	**Screening of** **Frontline: Alaska Gold**	Copper Room
6:00–9:00PM	**Banquet**	Edgewater Room

Day 3
Friday, 11 October 2013

Time	Event	Location
8:00AM	**Continental Breakfast**	Fireside
8:00AM—12:00PM	**Registration**	Fireside
8:30AM	**(CS11) Evolution / Genetics** **(CS12) Advances**	Jade Room Edgewater Room
10:25AM	**(CS13) Stock Assessment**	Edgewater Room
12:05PM	**Lunch (on own)**	All
12:45PM	**Learning Studio III**	Edgewater Room
1:30PM	**Awards, Adjourn**	Edgewater Room
6:00PM	**Film Screening: Salt of the Sea**	Murie Auditorium (UAF)

Session List, With Titles

CS1: Salmon I - Biology, Ecology, Management

10/9 1:15-2:55PM

Chairs: Bill Bechtol, Tim Sands, and Peter Westley

Lisa Wirth	A Remote-Sensing, GIS-Based Approach to Identify Spawning Habitat for Fall Chum Salmon in a Sub-Arctic, Glacially Fed River
Stacy Vega	Reconstruction of Ocean-Entry Timing and Growth Rates of Juvenile Chum Salmon in Alaskan Waters of the Chukchi and Northern Bering Seas
Suresh Andrew Sethi	Detection Efficiency and Habitat use to Inform Inventory and Monitoring Efforts: Juvenile Coho Salmon in the Knik River Basin, Alaska
Stephanie Meggers	Factors influencing Chinook salmon spawning distribution in the Togiak River, Alaska
Megan McPhee	Declining Freshwater Growth and Escapement Quality in Western Alaskan Chinook Salmon: Are They Linked?

CS2: North Slope Fisheries

10/9: 1:15PM-2:35PM

Chairs: Jeff Adams and Matthew Whitman

Phaedra Budy	Understanding how lake populations of Arctic char are structured and function with special consideration of the potential effects of climate change.
Parker Bradley	Kuk and Kugrua River Fish and Aquatic Habitat Surveying
Erica Betts	Linking North Slope Climate, Hydrology, and Fish Migration
Trevor Haynes	Differences in Dispersal Ability and Tolerance to Winter Conditions Determine Occupancy Patterns of Arctic Fishes

CS3: Salmon II - Change and Uncertainty

10/9 3:10-4:50PM

Chairs: Bill Bechtol, Tim Sands, and Peter Westley

Ethan Ford	Commercial Salmon Fisheries Management: Terminal Harvest Strategies in Lower Cook Inlet
Tim Sands	Salmon Management on the West Side of Bristol Bay
Pete Rand	A model to simulate wild and hatchery pink salmon life history, hatchery straying and commercial fishing dynamics in Prince William Sound, Alaska
Sue Mauger	Landscape controls on stream temperature and thermal sensitivity: Assessing climate change impacts in Cook Inlet salmon streams
Peter Westley	Evidence for abiotic, biotic, and human influences on straying in an endangered Chinook salmon metapopulation

CS4: North Slope Fisheries II
10/9 3:10-4:30PM
Chairs: Jeff Adams and Matthew Whitman

Sarah Laske	Fish Distribution in a Warming Arctic: What Current Patterns May Tell Us About the Future
Michael Carey	Physiological and ecological effects of increasing temperature on fish production in lakes of the of the Arctic Coastal Plain
John Seigle	An Overview of the Colville River Delta Arctic Cisco Fall Fishery
Kurt Heim	Seasonal Movement Patterns of Arctic Grayling (Thymallus arcticus) in a Small Beaded Stream on the Arctic Coastal Plain, Alaska

CS5: Freshwater Ecosystems
10/10 8:30AM-9:50AM
Chair: Jeffrey Falke

David Roon	Overwintering Ecology of Juvenile Anadromous and Resident Fishes in the Susitna River
Dona Eidam	Trophic ecology of non-native Alaska blackfish (Dallia pectoralis) in Cook Inlet Basin, Alaska
Jason Neuswanger	3-D Territoriality and Shadow Competition within Schools of Juvenile Chinook Salmon
Rachel L. DeWilde	Overwintering habitat of Juvenile Fish in the Chena River: A student-run pilot project by UAF's AFS student subunit

CS6: Foodwebs
10/10 8:30-10:10 AM
Chairs: Mark Wipfli and Erik Schoen

Lauren Divine	Arctic snow crab diets: comparison of stomach content and δ13C and δ15N stable isotope analyses
Erik Schoen	Does deep-water refuge habitat weaken trophic interactions between introduced Mysis shrimp, lake trout, and kokanee?
Leah Vanden Busch	Seasonal Storage, Trophic Transport, and Uptake of Marine-derived Nutrients in the Hyporheic Zone of the Horsefly River Spawning Channel, British Columbia
Benjamin Gray	Fish diets across the Chukchi and Beaufort seas
Mark Wipfli	Freshwater Food Webs and Arctic Grayling Foraging Ecology on the Arctic Coastal Plain, Alaska

CS7: Fish Movement & Distribution

10/10 10:25-12:05 AM

Chairs: Julie Nielsen and Andy Seitz

Kevin Siwicke	The influence of host fishes on the distribution of anadromous lampreys in the eastern Bering Sea
Julie Nielsen	Halibut Detectives: Using Electronic Tags to Uncover the Mysteries of Halibut Migration
Michael Courtney	Dispersal patterns and summer oceanic distribution of adult Dolly Varden from the Wulik River, Alaska, evaluated using satellite telemetry
Heather Scannell	Using Archival Tags to Evaluate the Vertical Movements, Activity Level, and Thermal Habitat Selection of Burbot within Copper AND Tanada Lakes
John Scott	Does Pacific halibut behavior correspond to regular environmental cycles?

CS8: Human Dimensions of Fisheries

10/10 10:25-12:05PM

Chair: Hannah Harrison

Stian Stensland	The economic and social consequences of closures and changes in salmon sport fisheries
Lisa Strecker	Salmon Economics in Kamchatka: Fishing for Dog of Fishing for Snow Machines?
Dona Eidam	Alaska blackfish in the classroom
Jessica Glass	Strengths, Weaknesses, Opportunities and Threats: A SWOT analysis of the Alaskan weathervane scallop fishery
Hannah Harrison	Identifying sources of conflict in Cook Inlet and Kenai River salmon fisheries within the context of resource sustainability.

CS9: The Changing Climate of Resource Management: from Reach to Region

10/10 1:30PM-3:50PM

Chairs: Karen Murphy and Stephen Gray

Stephen Gray	Blending Climate Projections, Observations and Ecosystem Impact Models in Support of Natural Resource Management
Amanda Robertson	Introduction to the Landscape Conservation Cooperatives and the Alaska Climate Science Center
Philip Martin	Getting Past Perplexity: Climate Change Effects on Aquatic Resources
Karen A. Murphy	Flowing from reaches to regions through water temperature monitoring.
Joel Reynolds and Rebecca Anderson	Bringing Alaska's hydrography data into the 21st Century
David Koster and Davin Holen	New Searchable Map Interface for Subsistence Harvest Data
Panel Discussion	

CS10: Estuarine and Coastal Marine Ecosystems

10/10 1:30PM-3:10PM

Chair: Anne Beaudreau

Scott Pegau	Herring Research in Prince William Sound
Jessica Glass	Differences in community composition between Alaskan weathervane scallop beds within state fishery registration areas
Allyson Olds	Eulachon of the Chilkat and Chilkoot rivers: roles in local and indigenous cultures
Karson Coutre	Seasonal and ontogenetic patterns of resource use by juvenile sablefish, Anoplopoma fimbria, in Southeast Alaska
Angela Gastaldi	Salmon eggs increase the growth of coast range sculpin in Auke Creek, Alaska.

CS11: Evolutionary & Genetic Perspectives

10/11 08:30AM-10:10AM

Chair: Mac Campbell

Carol Ann Woody	Coho salmon biodiversity in a proposed mining district Bristol Bay, Alaska
Kyle Shedd	Competitive Release Leads to Novel Ontogenetic Resource Polymorphism in Kokanee (Oncorhynchus nerka)
Thaddaeus Buser	Under the Boardwalk: Exploring the Evolution of Reproductive Modes and Associated Morphological Specializations in Sculpins of the Subfamily Oligocottinae
Matthew A. Campbell	Monophyly of the Flatfish Revisited
Emily Lescak	Genomic Patterns of Rapid Evolution in 50 Year Old Alaskan Threespine Stickleback Populations on Uplift Islands

CS12: Advances in Fisheries Science & Technologies

10/11 8:30AM-10:10AM

Chair: Thomas Farrugia

Dona Eidam	Alaska blackfish husbandry - Techniques for keeping and culturing Dallia pectoralis in the lab
Cindy Hartmann Moore	ShoreZone Imaging and Mapping in Alaska
Thomas Farrugia	Nutritional and Contaminant Analyses of Skates in the Gulf of Alaska: Shaping Future Skate Demand
Lisa Wirth	Alaska Geospatial Data Resources
Trey Simmons	Using Next-Generation Sequencing of Environmental DNA to Assess Fish Assemblages in Alaskan National Parks

CS13: Stock Assessment & Management
10/11 10:25AM-12:05PM
Chair: Milo Adkison

Keith Cox	Declining Western Alaska Chinook salmon stocks- using impedance to look for answers.
Andrew Olson	Spatial Variability in Morphometric Size at Maturity and Reproductive Timing in Golden King Crab (Lithodes aequispinus)
Meghan Garrison	Variations in nutritional condition of Pacific cod (Gadus marcocephalus) in relation to depth in the Bering Sea.
Milo Adkison	The Effects of Salmon Abundance and Run Timing on the Performance of Management by Emergency Order
Adam St. Saviour	Development of a Late Season Escapement Monitoring Program on the Chignik River using DIDSON Sonar

Detailed Schedule

Tuesday, 08 October 2013	
11 AM	Creamer's Field Nature Walk *Shuttle departs from Fairbanks Princess Lodge at 10:45*
12-6 PM	Registration *Fireside (2nd floor), Fairbanks Princess Lodge*
1 PM	Ruth Burnett Hatchery Tour I *Shuttle departs from Fairbanks Princess Lodge at 12:45* *Meet at Lobby*
2:30	Ruth Burnett Hatchery Tour II *Shuttle departs from Fairbanks Princess Lodge at 2:15* *Meet at Lobby*
6:30-9 PM	Welcome Reception, UAF Museum *Shuttle runs from Fairbanks Princess Lodge, 6:15-7:00 and 8:30-9:15)* *(Carpooling encouraged) Meet at Lobby* *6:30 PM - Pizza, beer & wine* *7:30 PM - Pavva Iñupiat Dancers*
Wednesday, 09 October 2013	
8 AM – 5 PM	Registration *Fireside (2nd floor)*
8 – 9 AM	Exhibitor set-up *Marble Room*
8:30 AM	Continental Breakfast *Edgewater Room*
9:15 AM	Welcome & Opening Remarks *Dr. Philip Loring, University of Saskatchewan* *Edgewater Room*
9:30 - 10:30 AM	Keynote Address *Dr. Carmel Finley, Oregon State University* *"Icelandic Cod, Japanese Tuna, and the Destruction of American Fishing"* *Edgewater Room*
10:30 – 10:45 AM	Break

10:45 – 11:15 AM	Plenary 1 *Dr. Jeremy Mathis, University of Alaska Fairbanks* *"Ocean Acidification Risk Assessment for Alaska's Fishery Sector"* *Edgewater Room*
11:20-11:50 AM	Plenary 2 *Dr. Nicole Misarti, University of Alaska Fairbanks* *"Historical Ecology: tracking long-term trends in fisheries"* *Edgewater Room*
12:00 PM	Lunch Buffet *First Floor Hallway (2nd Floor)*
12:20 PM	Keynote II: "Sustainability according to whom? Dealing with wicked problems in fisheries governance" *Dr. Ratana Chuenpagdee, Memorial University of Newfoundland* *Edgewater Room*
1:15 – 2:55 PM	CS1: Salmon I: Biology, Ecology, and Management *Edgewater Room*

1:15	Lisa Wirth *A Remote-Sensing, GIS-Based Approach to Identify Spawning Habitat for Fall Chum Salmon in a Sub-Arctic, Glacially Fed River*
1:35	Stacy Vega *Reconstruction of Ocean-Entry Timing and Growth Rates of Juvenile Chum Salmon in Alaskan Waters of the Chukchi and Northern Bering Seas*
1:55	Suresh Andrew Sethi *Detection Efficiency and Habitat use to Inform Inventory and Monitoring Efforts: Juvenile Coho Salmon in the Knik River Basin, Alaska*
2:15	Stephanie Meggers Factors influencing Chinook salmon spawning distribution in the Togiak River, Alaska
2:35	Megan McPhee *Declining Freshwater Growth and Escapement Quality in Western Alaskan Chinook Salmon: Are They Linked?*

CS2: North Slope Fisheries I
Jade Room

1:15	Phaedra Budy *Understanding how lake populations of Arctic char are structured and function with special consideration of the potential effects of climate change.*
1:35	Parker Bradley *Kuk and Kugrua River Fish and Aquatic Habitat Surveying*
1:55	Erica Betts *Linking North Slope Climate, Hydrology, and Fish Migration*
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2:55 PM	Break

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Thursday, 10 October 2013

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8 AM	Continental Breakfast *Fireside (2nd Floor)*
8:30 – 10:10 AM	CS5: Freshwater Ecosystems *Copper Room*

8:30	David Roon *Overwintering Ecology of Juvenile Anadromous and Resident Fishes in the Susitna River*
8:50	Dona Eidam *Trophic ecology of non-native Alaska blackfish (*Dallia pectoralis*) in Cook Inlet Basin, Alaska*
9:10	Jason Neuswanger *3-D Territoriality and Shadow Competition within Schools of Juvenile Chinook Salmon*
9:30	Rachel L. DeWilde *Overwintering habitat of Juvenile Fish in the Chena River: A student-run pilot project by UAF's AFS student subunit*

CS6: Foodwebs
Jade Room

8:30	Lauren Divine *Arctic snow crab diets: comparison of stomach content and δ13C and δ15N stable isotope analyses*
8:50	Erik Schoen *Does deep-water refuge habitat weaken trophic interactions between introduced Mysis shrimp, lake trout, and kokanee?*
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10:10 - 10:25	Break

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Jade Room
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<tr><td>10:25</td><td>Stian Stensland
The economic and social consequences of closures and changes in salmon sport fisheries</td></tr>
<tr><td>10:45</td><td>Lisa Strecker
Salmon Economics in Kamchatka: Fishing for Dog of Fishing for Snow Machines?</td></tr>
<tr><td>11:05</td><td>Dona Eidam
Alaska blackfish in the classroom</td></tr>
<tr><td>11:25</td><td>Jessica Glass
Strengths, Weaknesses, Opportunities and Threats: A SWOT analysis of the Alaskan weathervane scallop fishery</td></tr>
<tr><td>11:45</td><td>Hannah Harrison
Identifying sources of conflict in Cook Inlet and Kenai River salmon fisheries within the context of resource sustainability.</td></tr>
</table></td></tr>
<tr><td>12:05 PM</td><td>Lunch (on own – see page X for nearby suggestions)</td></tr>
<tr><td>12:30 – 1:30 PM</td><td>Past Presidents' Meeting
Copper Room</td></tr>
<tr><td>12:45 PM</td><td>Learning Studio II: Environmental Justice
Dr. David Fazzino, University of Alaska
Jade Room</td></tr>
</table>

1:30 – 3:50 PM	CS9: The Changing Climate of Resource Management: from Reach to Region *Copper Room*

1:30	Stephen T. Gray and Jeremy S. Littell *Blending Climate Projections, Observations and Ecosystem Impact Models in Support of Natural Resource Management*
1:50	Amanda Robertson *Introduction to the Landscape Conservation Cooperatives and the Alaska Climate Science Center*
2:00	Philip Martin *Getting Past Perplexity: Climate Change Effects on Aquatic Resources*
2:25	Karen Murphy *Flowing from Reaches to Regions through Water Temperature Monitoring*
2:45	Joel Reynolds and Rebecca Anderson *Bringing Alaska's Hydrography Data into the 21st Century*
3:05	David Koster and Davin Holen *New Searchable Map Interface for Subsistence Harvest Data*
3:25	Panel Discussion

CS10: Estuaries and Coastal Marine Ecosystems
Jade Room

1:30	Scott Pegau *Herring Research in Prince William Sound*
1:50	Jessica Glass *Differences in community composition between Alaskan weathervane scallop beds within state fishery registration areas*
2:10	Allyson Olds *Eulachon of the Chilkat and Chilkoot rivers: roles in local and indigenous cultures*
2:30	Karson Coutre *Seasonal and ontogenetic patterns of resource use by juvenile sablefish, Anoplopoma fimbria, in Southeast Alaska*
2:50	Angela Gastaldi *Salmon eggs increase the growth of coast range sculpin in Auke Creek, Alaska.*

3:30 – 5:30 PM	Business Meeting *Jade Room*
4:15 PM	Screening of Frontline: Alaska Gold *Copper Room*
6:00 – 9:00 PM	Banquet *Edgewater Room*

Friday, 11 October 2013	
8 AM – 12 PM	Registration *Fireside (2nd floor)*
8 AM	Continental Breakfast *Fireside (2nd Floor)*
8:30 – 10:10 AM	CS11: Evolutionary and Genetic Perspectives *Jade Room*

8:30	Carol Ann Woody *Coho salmon biodiversity in a proposed mining district Bristol Bay, Alaska*
8:50	Kyle Shedd *Competitive Release Leads to Novel Ontogenetic Resource Polymorphism in Kokanee (Oncorhynchus nerka)*
9:10	Thaddaeus Buser *Under the Boardwalk: Exploring the Evolution of Reproductive Modes and Associated Morphological Specializations in Sculpins of the Subfamily Oligocottinae*
9:30	Matthew A. Campbell *Monophyly of the Flatfish Revisited*
9:50	Emily Lescak *Genomic Patterns of Rapid Evolution in 50 Year Old Alaskan Threespine Stickleback Populations on Uplift Islands*

CS12: Advances in Fisheries Science & Technology
Edgewater Room

8:30	Dona Eidam *Alaska blackfish husbandry - Techniques for keeping and culturing Dallia pectoralis in the lab*
8:50	Cindty Hartmann Moore *ShoreZone Imaging and Mapping in Alaska*
9:10	Thomas Farrugia *Nutritional and Contaminant Analyses of Skates in the Gulf of Alaska: Shaping Future Skate Demand*
9:30	Lisa Wirth *Alaska Geospatial Data Resources*
9:50	Trey Simmons *Using Next-Generation Sequencing of Environmental DNA to Assess Fish Assemblages in Alaskan National Parks*

10:10 - 10:25 AM	Break

<table>
<tr><td>10:25 – 11:45 AM</td><td>CS13: Stock Assessment & Management
Edgewater Room
<table>
<tr><td>10:25</td><td>Keith Cox
Declining Western Alaska Chinook salmon stocks- using impedance to look for answers.</td></tr>
<tr><td>10:45</td><td>Andrew Olson
Spatial Variability in Morphometric Size at Maturity and Reproductive Timing in Golden King Crab (Lithodes aequispinus)</td></tr>
<tr><td>11:05</td><td>Meghan Garrison
Variations in nutritional condition of Pacific cod (Gadus marcocephalus) in relation to depth in the Bering Sea</td></tr>
<tr><td>11:25</td><td>Milo Adkison
The Effects of Salmon Abundance and Run Timing on the Performance of Management by Emergency Order</td></tr>
<tr><td>11:45</td><td>Adam St. Saviour
Development of a Late Season Escapement Monitoring Program on the Chignik River using DIDSON Sonar</td></tr>
</table></td></tr>
<tr><td>12:05</td><td>Lunch (on own – see page X for nearby suggestions)</td></tr>
<tr><td>12:45 PM</td><td>Learning Studio III: The Center for Salmon and Society
John Sisk and Megan McPhee
Edgewater Room</td></tr>
<tr><td>1:30 PM</td><td>Best Student Talk & Poster Awards
Meeting Adjourns</td></tr>
<tr><td>6:00 PM</td><td>Film Screening: “Salt of the Sea”
Filmmaker Tom Garber will be on hands to answer questions after the film
UAF Murie Science Building Auditorium</td></tr>
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</table>

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Banquet Program

Thursday, 10 October 2013
Edgewater Room, Princess Lodge

Banquet — *6 PM*
Edgewater Room

Tom Garber — Presentation: "Filming The Salt of the Sea" — ***7:00 PM***

Awards — *8:15 PM*
Wally Noerenberg Award
Meritorious Service Award
Alaska Chapter Service Award
Cultural Diversity Travel Award
Molly Ahlgren Scholarship
Almost Darwin Award

Live Auction — *8:30 PM*

Congratulations to the following Alaska Chapter members who have been members of the Society at the national level for 25 years. Upon reaching this achievement, members are awarded with a commemorative pin:

Jennifer Nielsen, Duvall, WA, Joined 1988
Kenneth Morgan, Valdez, AK, Joined 1988
Christopher Habicht, Anchorage, AK, Joined 1988
David Erikson, Fritz Creek, AK, Joined 1988
David Daum, Fairbanks, AK, Joined 1988

The Effects of Salmon Abundance and Run Timing on the Performance of Management by Emergency Order

Adkison, Milo D.

Session: Stock Assessment and Management

Abstract
In Alaska, salmon are managed to achieve escapements within a particular range. The tactics employed are usually emergency order management, where managers open and close fisheries on short notice based on the information currently available. This in-season information is poor, so managers must make these quite consequential decisions while very uncertain about both the strength and the timing of the return. Several studies have noted that escapement goals are often not met, and that fish arriving early or late in the season can be harvested at quite different rates. This study uses simulation to look at how the abundance and timing of returns affect the performance of management by emergency order. It also examines how the particular characteristics of the fishery (fleet efficiency, lag in escapement counts, etc.) affect management performance.

Paper Abstracts

Linking North Slope Climate, Hydrology, and Fish Migration

Betts, Erica D. University of Alaska Fairbanks

Kane, Douglas L. University of Alaska Fairbanks

Session: North Slope Fisheries

Abstract
Arctic grayling are a species that have a life history strategy specifically adapted to the extreme climate of the North. They migrate to spawning grounds just after break up in the spring, migrate to feeding sites in early summer, and finally in the fall migrate back to their overwintering sites. The Kuparuk River is a perennial stream originating in the foothills of the Brooks Range on the North Slope of Alaska. Sections of the Kuparuk are intermittent in that during low flows in the system these reaches appear dry. Water reappears downstream of these dry reaches and it is believed that water continues to flow below the surface through an unfrozen thaw bulb beneath these reaches. These dry reaches create a barrier to fish migration. The impacts of a warming arctic may have implications for the flow of water through this unfrozen layer beneath the river and consequently the flow of water within the channel. A better understanding of this phenomenon is crucial to understanding the impacts of a changing climate on hydrology and ultimately fish populations in the Arctic.

Paper Abstracts

Kuk and Kugrua River Fish and Aquatic Habitat Surveying

Bradley, Parker T. ADFG Habitat Biologist

Morris, Bill A ADFG Habitat Division Regional Supervisor

Session: North Slope Fisheries

Abstract
The Kuk and Kugrua rivers are two of the largest rivers that flow into the Chukchi Sea (north of the Brooks Range), yet systematic sampling of these drainages has not been conducted to any level adequate to make fish or fish habitat management determinations or an evaluation as to the drainage's significance to fish. These rivers are likely to be crossed by pipelines connecting any Chukchi development to the Trans-Alaska Pipeline System (TAPS) and are in the area identified for placement of Chukchi Sea offshore development related onshore facilities. This project was designed to collect fish presence and population structure data as well as aquatic habitat data to begin to characterize fish use of the systems and their habitats. Fish sampling began in 2010 in the Ivisaruk River, a tributary to the Kuk River, followed by the Kungok River in 2011, the upper Kuk River in 2012 and the Kugrua River in 2013. Sampling involved using fyke nets, hoops traps, seines and gill nets from mid-June to late August. Basic fish data was collected including relative abundance by species, age/weight, age structure and age at maturity data for non-salmon species. Catches in the Kuk drainage were dominated by least cisco, Arctic flounder, Arctic grayling, ninespine stickleback, and fourhorn sculpin. Pink salmon, chum salmon, Chinook salmon, burbot and Arctic grayling were implanted with radio tags and tracked via fixed wing aircraft to determine important habitats. Preliminary results from the Kugrua River suggest the system is predominately used by ninespine and threespine stickleback, rainbow smelt, and Arctic flounder.

Paper Abstracts

Understanding how lake populations of Arctic char are structured and function with special consideration of the potential effects of climate change.

Budy, Phaedra. Utah State University, USGS - UCFWRU

Luecke, C. Utah State University

Thiede, G.P. Utah State University

Session: North Slope Fisheries

Abstract
We explored patterns among empirical vital rates, population structure, abundance and trend, built a population model to understand how arctic char (Salvelinus alpinus) populations are structured and function, modeled (bioenergetically) the effects of climate and climate change on growth, and then combined these components to predict the effects of climate change on population structure in two lakes. Despite differences in underlying geology, population and lake size, the density of adult char was extremely similar between lakes (0.002-0.003/m2). Both populations cycle between dominance by small (< 300 mm) and large (> 300 mm) char. Annual survival rates were relatively high (age 3 and older; 40-96%); growth rates were also relatively high (~ 0.1 g/day) and comparable to related species at lower latitudes. Climate change scenarios mimicked the pattern of warming observed in nature and resulted in temperatures closer to optimal for char growth, for a longer growing season. An increase in predicted consumption rates (28-34%) under climate change scenarios led to much greater growth rates (23-34%). Higher predicted growth rates resulted in an even greater predicted amplitude of cycles in population structure as well as an increase in Ro (reproductive output) and a decrease in Go (generation time). Collectively, these results indicate that arctic char populations are extremely sensitive to small changes in the number of ice-free days. We hypothesize that years of significantly longer growing season, which are predicted to occur more often under climate change, will produce elevated growth rates of small char and alter population structure and dynamics.

Paper Abstracts

Under the Boardwalk: Exploring the Evolution of Reproductive Modes and Associated Morphological Specializations in Sculpins of the Subfamily Oligocottinae

Buser, TJ

Lopez JA

Session: Evolutionary & Genetic Perspectives

Abstract
Sculpins of the subfamily Oligocottinae are important members of intertidal communities of the north Pacific. The group contains remarkable diversity of morphological, ecological, and behavioral adaptations, especially those associated with reproductive biology. Notable among these is a form of fertilization that combines insemination, gamete pairing and post-egg release fertilization. This bizarre trait (known as internal gamete association with delayed fertilization) is thought to occur in many, but not all oligocottin sculpins. To study the distribution and evolution of this and other reproductive traits, we developed a well-supported phylogenetic hypothesis of the group using evidence from DNA sequences from five nuclear protein-coding genes (EGR1, MLL ptchd1, Rhodopsin, and SVEP), one mitochondrial protein-coding gene (COI), and two nuclear introns (EPIC loci 1777E4 and 4174E20), for a total of 4,696 nucleotide sites. We generated a concatenated alignment from these sequences and used that concatenation to infer phylogeny under Bayesian and Maximum Likelihood analysis frameworks. We then mapped the presence of various morphological and behavioral traits within members of oligocottin sculpins (i.e., members of the genera, Clinocottus, Oligocottus, Artedius, Leiocottus, Orthonopias) as well as several outgroup taxa on the phylogeny to identify patterns of evolution in these traits. We found that many reproductive specializations are likely ancestral traits within the Oligocottinae, and have been secondarily lost in some of its constituent taxa.

Paper Abstracts

Monophyly of the Flatfish Revisited

Campbell, Matthew A. UAF Department of Biology and Wildlife

Chen, Wei-Jen Institute of Oceanography, National Taiwan University

Lopez, J. Andres UAF School of Fisheries and Ocean Sciences, University of Alaska Museum

Miya, Masaki Department of Zoology, Natural History Museum and Institute, Chiba

Session: Evolutionary & Genetic Perspectives

Abstract
Results of phylogenetic studies using morphological and genetic evidence suggest that living flatfish species (Pleuronectiformes) do not represent descendants from a single common ancestor. Past morphology-based hypotheses of relationships have indicated either the Bothidae, Samarinae, or Psettodidae as independent evolutions of the flatfish body form. However, the monophyly or common ancestry of all flatfishes has been accepted for twenty years based on three anatomical traits that serve as markers of shared ancestry. The three characteristics uniting flatfish are: (1) eyes are on the same side of the head, (2) dorsal fin overlaps the neurocranium, and (3) the recessus orbitalis, an organ to raise the eyes above the head. Critically, the presence of these traits in Psettodidae is not established. Evidence from DNA sequences challenges the monophyly of flatfishes. Hypotheses based on molecular traits have placed different flatfish lineages outside Pleuronectiformes depending on the analysis. Generally, these studies have found that the most basal lineage (Psettodidae) or lineages that show base composition bias are frequently excluded from the pleuronectiforms. Emerging consensus points to Psettodidae as an independent origin of the flatfish body shape. Currently, it is difficult to determine whether incomplete sampling, improper model choice, or some other issue are affecting recent hypotheses of flatfish relationships. We summarize the evidence relevant to the monophyly of flatfishes based on morphology and results of the most recent molecule-based flatfish phylogenies. To further investigate this problem, previously unpublished mitochondrial genome data is presented. The effects of modeling DNA evolution and taxonomic sample are explored.

Physiological and ecological effects of increasing temperature on fish production in lakes of the of the Arctic Coastal Plain

Carey, Michael P. USGS Alaska Science Center

Zimmerman, Christian E. USGS Alaska Science Center

Session: North Slope Fisheries

Abstract
Lake ecosystems in the Arctic are changing rapidly due to climate warming. Despite many studies on climate warming, there is a lack of understanding of how aquatic organisms, such as fish, will respond to changes in lake environments. Least Cisco (Coregonus sardinella) is a bellwether for lakes on the Arctic Coastal Plain as an important consumer and prey resource. To explore the consequences of climate warming, we used a bioenergetics model to simulate changes in Least Cisco production under future climate scenarios. First, we used current temperatures to fit Least Cisco consumption to observed annual growth. We then estimated growth, holding consumption constant, for future projections of temperature. Production of Least Cisco increased under all future scenarios with progressively more growth in warmer temperatures. Higher variability occurred with longer projections of time mirroring the expanding uncertainty in climate predictions further into the future. In addition to direct temperature effects on Least Cisco growth, we also considered changes in lake ice phenology and prey resources for Least Cisco. A shorter period of ice cover resulted in increased production similar to warmer temperatures. Altering prey quality had a larger effect on fish production in summer than winter and increased relative growth of younger rather than older age classes of Least Cisco. Overall, we predict increased production of Least Cisco due to climate warming in Arctic lakes. Understanding the implications of increased production of Least Cisco to the entire food web will be necessary to predict ecosystem response in lakes of the Arctic.

Paper Abstracts

Sustainability according to whom? Dealing with wicked problems in fisheries governance

Chuenpagdee, Ratana, Memorial University of Newfoundland, St. John's, NL, Canada.

Session: Keynote

Abstract
Fisheries are diverse, complex and dynamic ecological, social and political systems that pose major challenges for management and governance, especially when sustainability is a goal. Even if we assume that there exists a common understanding about what fisheries sustainability may mean, it is improbable that we will have an agreement about what it may look like, left alone how to achieve it. The presentation explores questions about sustainability and presents some perspectives from interactive governance theory that may help deal with this wicked problem.

Dispersal patterns and summer oceanic distribution of adult Dolly Varden from the Wulik River, Alaska, evaluated using satellite telemetry

Courtney, Michael B. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Seitz, Andrew C. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Scanlon, Brendan. Alaska Department of Fish and Game, Division of Sport Fish

Session: Fish Movement, Distribution

Abstract
Dolly Varden make up an important component of subsistence fisheries in northern Alaskan communities. While it is known that Dolly Varden may be broadly distributed throughout a wide range in the Pacific Ocean during the summer, their distribution in the Chukchi Sea is unknown. Therefore, in June of 2012 and 2013, we attached 52 Pop-up Satellite Archival Transmitting (PSAT) tags to Dolly Varden in the Wulik River, which flows into the Chukchi Sea, to examine their dispersal and behavior. PSAT tags measured and recorded temperature, depth and ambient light data at 2 minute intervals while externally attached to the fish. From 1 July– 1 October, in two week intervals, these tags released from the fish, floated to the surface of the sea and transmitted, via satellite, the pop-up position and archived data. To date, nine of the fish provided the first documented northwesterly offshore dispersal to the Russian Chukchi Sea. While at sea, they dispersed up to 60 km/day and frequently occupied (>90%) relatively shallow water (<15 m). Other dispersal types were demonstrated, including Wulik River residency, southerly alongshore dispersal, and movement to other rivers. Because many of the tagged fish appeared to occupy the outer continental shelf of the Chukchi Sea, this region may be an important summer feeding area for northwestern Dolly Varden. Furthermore, because of its ability rapidly transit broad areas of the Chukchi Sea and frequently occupy shallow water, this important subsistence species may be exposed to emerging human activities, such as hydrocarbon development and shipping.

Seasonal and ontogenetic patterns of resource use by juvenile sablefish, Anoplopoma fimbria, in Southeast Alaska

Coutre, Karson M. UAF SFOS Juneau

Malecha, Patrick W. NOAA Fisheries Auke Bay Laboratories

Beaudreau, Anne H. UAF SFOS Juneau

Session: Estuarine and Coastal Marine Ecosystems

Abstract
Sablefish (Anoplopoma fimbria) are long-lived demersal fish inhabiting the waters of the North Pacific Ocean and the Bering Sea and among the most valuable commercial groundfish in Alaska. Juvenile sablefish are commonly found in nearshore bays; however, the characteristics that make this habitat preferable are not well understood. The current study will investigate the diet composition of juvenile sablefish, quantify seasonal and ontogenetic shifts in diet, and assess sablefish habitat use of nearshore bays. To determine diet composition, juvenile sablefish will be caught during daytime angling trips and their stomach contents will be sampled using gastric lavage. Samples will be collected over multiple seasons (summer, fall, and spring) over a two year period (2012-2014) from St. John Baptist Bay, Baranof Island, Alaska, where juvenile sablefish have been found consistently. Prey items will be identified to the lowest possible taxonomic level and data will be analyzed using multivariate analyses. Habitat use and movement patterns of juvenile sablefish will be elucidated through the analysis of acoustic telemetry data from St. John Baptist Bay collected from 2003-2004. Generalized linear models will be used to identify relationships between environmental factors and sablefish movement within the bay. Information on diet and habitat use will contribute to an improved understanding of essential fish habitat (EFH) for juvenile sablefish.

Paper Abstracts

Declining Western Alaska Chinook salmon stocks- using impedance to look for answers.

Cox, Keith University of Alaska Southeast

Murphy, Jim NOAA

Session: Stock Assessment and Management

Abstract
Western Alaska Chinook salmon stocks are low and our research focus has been to determine processes leading up to their first winter at sea. Once smolted and at sea, we hypothesize juvenile salmon 1) utilize energy for growth during summer and lipid storage during fall to survive winter and 2) down regulate basal metabolic rates (BMR) during winter. Bioelectrical impedance was used to evaluate 1) food deprived juvenile Chinook salmon in laboratory experiments designed to simulate over-winter situations and 2) trawl caught juvenile salmon in the fall. Three size classes (~100, 160 and 200mm) of salmon were used to describe BMR during low food periods. Energy densities of Chinook salmon from early summer through mid-fall remained constant (~4.5 KJ/g fish) while growth as measured by length doubled (100 to 200mm) during this same period. Energy densities and lengths from mid-fall to mid-winter increased from 4.5 to 6.4 Kj/g fish and from 200 to 300mm, respectively. When comparing energy density at length, energy density did not increase until the fish had reached a length of 200mm. Over-winter simulations found evidence of salmon reducing BMR during low food periods. Life history strategies utilized by juvenile Chinook salmon to prepare for and survive their first winter include maintaining critical energy densities of 4.5 KJ/g prior to winter while concurrently reaching a critical size of 200mm. After the critical size of 200mm is reached, the fish then allocates energy into storage until an over-winter energy density level of 6.4 Kj/g is reached.

Paper Abstracts

Overwintering habitat of Juvenile Fish in the Chena River: A student-run pilot project by UAF's AFS student subunit

DeWilde, Rachel L. University of Alaska Fairbanks

UAF American Fisheries Society Student Subunit

Session: Freshwater Ecology

Abstract
In the fall of 2012 members of the UAF chapter of the AFS began developing a collaborative research project aimed at building research experience and contributing new information on the overwintering biology of fishes in interior Alaska. The primary research goal of the project was to characterize overwintering habitats of juvenile salmonids in the Chena River. In the spring of 2013, members of the group conducted exploratory sampling to establish a set of sampling sites to detect presence and winter movements of juvenile fish in the Chena River. Sampling took place in May and June; eight sampling locations surrounding the Fairbanks area were targeted, a total of four species were caught in minnow traps: Chinook salmon, longnose sucker, slimy sculpin, and round whitefish. Fork length and weight were taken of all seven Chinook salmon caught. Descriptions of project activities and status updates were presented via a dedicated website created by a member of the club. The website includes project background, a roster of key members, and a project blog which houses sampling photos and entries from participating members. Another important aim of the project was establishing mentorship channels between undergraduate and graduate students. Through these relationships, graduate students gain valuable experience in supervising and mentoring and undergraduate students have the opportunity to be involved in the design and execution of field research. With this in mind, the collaboration was developed with the specific goal of allowing members of all professional levels to partake in the process of project design, permitting, sampling, and analysis.

Arctic snow crab diets: comparison of stomach content and Δ13C and Δ15N stable isotope analyses

Divine, LM

Iken, K

Bluhn, BA Bluhm

Session: Foodwebs

Abstract
This ongoing study seeks to provide improved knowledge on snow crab trophic ecology on the Chukchi and Beaufort shelves using stable isotope and stomach content analyses. Stable isotope values provide a time-integrated view of the carbon sources used and the trophic position occupied by a consumer, while stomach content analysis provides detailed information on the exact prey items consumed. Muscle tissue was collected from snow crabs in different geographic regions (western and central Beaufort and northern and southern Chukchi) and at various depths for stable isotope analysis. Stomachs were removed from fresh or frozen crabs, preserved and later dissected under a microscope. Prey items were identified to lowest possible taxa, photographed, and recorded as frequency of occurrence. Preliminary results show snow crabs are predator/scavengers and generally occupy intermediate to high trophic levels. Prey items recovered from stomachs included bivalves, brittle stars, crustaceans (including smaller conspecifics), fishes and polychaete worms. Bivalves occurred more frequently in stomachs of western Beaufort and northern Chukchi crabs while polychaetes dominated crab stomachs in the central Beaufort and southern Chukchi Seas. Isotopic values of Chukchi and Beaufort Sea snow crabs ranged from -21.2 to -15.8‰ (δ13C) and 12.4 to 17.3‰ (δ15N) with Beaufort crabs occupying a more narrow range in δ13C. The present study will provide regionally explicit trophic information for C. opilio, which can ultimately assist in the development of better monitoring and management tools.

Paper Abstracts

Alaska blackfish in the classroom

Eidam, Dona M. University of Alaska Anchorage

Session: Human Dimensions

Abstract
"Come hold a live blackfish!" Science educators seeking hands-on activities with Alaska's native fishes will find an ideal specimen in this hardy little freshwater teleost found only in Alaska and Siberia. Due to its remarkable ability to breathe atmospheric air and survive in low-oxygenated swamps, blackfish can be held and examined out of water for brief periods by inquisitive young students without harm to the fish. I shared live blackfish from my research lab with a group of over 300 students and staff at an annual education day at Palmer Hayflats State Game Refuge. At the end of the day, after being scooped up and cradled repeatedly by hundreds of small hands, all blackfish were returned to the lab unharmed. Fourth-grade STEM (science, technology, engineering, and math) students in Palmer, Alaska, dissected euthanized specimens, removed and examined otoliths, and viewed stomach contents. Young campers at a week-long summer science camp made Gyutaku art prints with frozen-thawed blackfish while learning about ecosystem dynamics and problems caused by illegal introductions of Alaska blackfish to Cook Inlet Basin waters. Finally, students learned about historical and traditional uses of blackfish as an important subsistence species for rural residents.

Paper Abstracts

Trophic ecology of non-native Alaska blackfish (Dallia pectoralis) in Cook Inlet Basin, Alaska

Eidam, Dona M. University of Alaska Anchorage

von Hippel, Frank A. University of Alaska Anchorage

Lopez, J. Andres University of Alaska Fairbanks

Session: Freshwater Ecology

Abstract
The Alaska blackfish (Esocidae: Dallia pectoralis) is a small freshwater mudminnow endemic to Beringia. Alaska blackfish occur on the Chukotka Peninsula of Eastern Russia, across Western Alaska, Central Alaska in the Yukon River drainage, and on the North Slope. First introduced to Southcentral Alaska in the 1950s, Alaska blackfish are believed to inhabit most Cook Inlet Basin waters, partly due to illegal transplants by humans. Alaska blackfish ecology is poorly described, and fisheries managers express concern over possible predation of introduced blackfish on native and stocked salmonids as well as competition with native fishes for food and space. In this study, 500 Alaska blackfish were collected every month for a full year from a lake, stream, and wetlands in Cook Inlet Basin. Stomach contents were dissected (n=302) and quantified by percent frequency of occurrence, percent abundance of food items, and percent mass for calculation of the index of relative importance (IRI). Results show that Cook Inlet Alaska blackfish are opportunistic omnivores which consume 20 different prey types including Bryozoans and plant seeds. For all waterbodies combined, zooplankton (Ostracoda) ranked as primary prey (IRI 1364) in winter. Springtime prey consisted of three major groups: Ostracoda (IRI 4153), Diptera larvae (IRI 2904), and Gastropoda (IRI 2181.) Fishes ranked only 6th among minor prey categories (IRI 117.) Gastropoda comprised the highest-ranked prey group in both summer and autumn. Frequency of occurrence of piscivory ranged from 6 to 11% by season for combined waterbodies. Prey fish consisted of coho salmon, threespine stickleback, ninespine stickleback, and Alaska blackfish.

Paper Abstracts

Alaska blackfish husbandry - Techniques for keeping and culturing Dallia pectoralis in the lab

Eidam, Dona M., University of Alaska Anchorage

Session: Advances in Fisheries Science & Technology

Abstract
Alaska blackfish (Esocidae: Dallia pectoralis) are native to eastern Siberia and Western Alaska but were introduced into Cook Inlet Basin in the 1950s. They have successfully colonized most lakes, streams, and marshes in the region, and fisheries managers are concerned about ecological effects of these invaders on natural ecosystems. Physiologists have not yet determined how Alaska blackfish survive in freezing water, and blackfish reproductive ecology, including manner and location of egg deposition, is poorly understood. Streamlined husbandry techniques could benefit researchers needing to hold live blackfish in the laboratory for extended periods. Here I describe methods I used to keep wild-caught specimens for three years in recirculating, closed systems. Topics include tanks, substrate, water quality, feed, and filtration. I also describe a successful in vitro fertilization and rearing of those offspring.

Nutritional and Contaminant Analyses of Skates in the Gulf of Alaska: Shaping Future Skate Demand

Farrugia, Thomas J. School of Fisheries and Ocean Sciences, Fisheries Division, University of Alaska Fairbanks, Fairbanks, Alaska 99775 USA

Oliveira, Alexandra C.M. Kodiak Seafood and Marine Science Center, University of Alaska Fairbanks, Kodiak, Alaska 99615 USA

Seitz, Andrew, C. School of Fisheries and Ocean Sciences, Fisheries Division, University of Alaska Fairbanks, Fairbanks, Alaska 99775 USA

Session: Advances in Fisheries Science & Technology

Abstract
Skates are in growing demand worldwide, specifically in European and Asian markets and there is increasing economic pressure to develop directed fisheries for them in Alaska. Big skates (Raja binoculata) and longnose skates (Raja rhina) are the largest and most frequently landed skates in the Gulf of Alaska (GOA), yet there have been no studies done on their nutritional value or contaminant load. Currently, only the wings are retained from GOA skates and the livers are being discarded but could be an important source of high quality fish oil. Seafood is recognized as an important source of proteins, amino acids and long chain omega-3 fatty acids. However, one of the primary concerns is the level of heavy metals, particularly mercury, present in fish tissues, which may influence the demand of certain fishery products. Therefore, understanding the protein, lipid, moisture and omega-3 content of skate products, as well as the concentrations of contaminants, could be critical information to determine to long-term demand for skate products from GOA. To address this lack of knowledge, I collected 10 big and 10 longnose skates from Kodiak and Cordova, Alaska, sampled muscle and liver tissue from each individual and analyzed nutritional content (protein, moisture and lipid content, amino acid and fatty acid profiles) and heavy metal load (mercury, arsenic, selenium, cadmium, lead). These data will be shared with the fishing industry and will be integrated into a bioeconomic model developed to determine the most profitable and sustainable harvest strategy for skates in GOA.

Commercial Salmon Fisheries Management: Terminal Harvest Strategies in Lower Cook Inlet

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Session: Salmon II

Abstract
Biologically sustainable and valuable harvests of salmon populations can be effectively and responsibly prosecuted using a variety of management strategies. In the Lower Cook Inlet (LCI) management area, regulation directs the department to manage seine fisheries to target [only] LCI salmon stocks. The LCI management area is comprised of many relatively small systems producing relatively small runs. In order to ensure adequate escapement to all systems while providing harvest opportunity, managers must direct effort to specifically target harvestable surpluses in terminal locations. The early portion of each season is typically managed conservatively, based on preseason predictions of run strength, timing, fishing effort and processor support. As the season progresses managers use various tools to collect and process inseason information such as escapement data, saltwater staging, catch rates and fleet effort to determine if and when fishing in specific areas should be liberalized or restricted. Run timing curves are used to produce expected ranges of escapement in each system on any given date, enabling managers to spread harvest throughout the run while tracking toward escapement goals. In addition to natural runs, fisheries enhancement plays a significant role in LCI salmon production. Effective terminal harvest is equally important when targeting hatchery stocks to minimize catch of salmon bound to nearby natural systems while harvesting sometimes disproportionately large numbers of hatchery produced salmon. Managers work with local PNP hatcheries to establish appropriate release sites and Special Harvest Areas which maximize harvest of hatchery returns while minimizing harvest of adjacent wild stocks.

Variations in nutritional condition of Pacific cod (Gadus marcocephalus) in relation to depth in the Bering Sea.

Garrison, Meghan, University of Alaska Southeast and National Oceanic Atmospheric Administration

Session: Stock Assessment

Abstract
Pacific cod (*Gadus macrocephalus*) is the second largest fishery in the Bering Sea and the largest fishery in the Gulf of Alaska, but little is known about the nutritional condition of this species. Nutritional condition is important for stock assessment because it can help determine recruitment into adult populations. Walleye pollock (*Theragra chalcogramma*) is often substituted as a proxy because studies have shown that their recruitment processes track each other, but it is unknown whether nutritional conditions are also similar. Obviously species-specific measures of nutritional condition are better at predicting recruitment than a substituted species. This study will compare nutritional condition (dry mass and caloric content) of Pacific cod between depths and species. A new study design in 2012 permitted collections to be made at three depths (surface, midwater and bottom), rather than only the surface, allowing vertical migration patterns of Pacific cod to be monitored. Approximately 200 juvenile Pacific cod were analyzed for dry mass and caloric content. Results showed that Pacific cod at surface and midwater depths were found to have similar nutritional conditions. Pacific cod at the bottom appeared to be in the worst nutritional condition. More specifically, Pacific cod at the bottom were found to contain more water weight than surface and midwater fish and also have a lower caloric content than midwater fish. Comparisons of nutritional condition between Pacific cod and Walleye pollock do not appear to be similar (R^2 <0.4).

Salmon eggs increase the growth of coastrange sculpin in Auke Creek, Alaska.

Gastaldi, Angela, University of Alaska Southeast

Tallmon, David A. University of Alaska Southeast

Session: Estuarine and Coastal Marine Ecosystems

Abstract
Salmon carcasses and eggs provide many coastal freshwater ecosystems with valuable marine derived food resources, but the impact of these resources is seldom quantified. The freshwater coastrange sculpin (Cottus aleuticus) is a voracious salmon egg consumer. The importance of salmon eggs to coastrange sculpin body condition and growth was examined by manipulating the availability of salmon eggs to sculpins held in enclosures in Auke Creek, AK, during the summer of 2013. It was hypothesized that treatment sculpins fed salmon eggs would have increased growth compared to control sculpins that were not fed eggs. Growth was quantified by comparing initial and final body lengths, weights, and gape widths. Water temperatures in Auke Creek were much higher than historical temperatures during this study and may have caused the high mortality rates observed for both treatment and control sculpins. Treatment sculpins had greater weight gain, but not body length or gape width change, than control fish. These results are consistent with the idea that spawning salmon are an important marine derived food resource for freshwater sculpins.

Strengths, Weaknesses, Opportunities and Threats: A SWOT analysis of the Alaskan weathervane scallop fishery

Glass, Jessica R. University of Alaska Fairbanks School of Fisheries and Ocean Sciences

Kruse, Gordon H. University of Alaska Fairbanks School of Fisheries and Ocean Sciences

Miller, Scott A. National Marine Fisheries Service

Session: Human Dimensions

Abstract
This paper reports the findings of a socioeconomic assessment of the commercial weathervane scallop fishery off Alaska. The research was structured within the framework of a SWOT (strengths, weaknesses, opportunities, threats) analysis, a strategy commonly used to analyze the internal (strengths, weaknesses) and external (opportunities, threats) components of a business or industry. Within the SWOT framework, we focused on five categories: socio-cultural, technological, economic, environmental, and regulatory. Semi-structured interviews were conducted with 25 participants who had detailed knowledge of the fishery, including industry members, fishery managers, biologists, and members of coastal communities affected by the fishery. Participants were interviewed from communities including Juneau, Kodiak, Yakutat, Homer, Cordova, Anchorage and Seattle. We addressed topics such as attitudes of the Alaskan public towards scallop dredging, impacts of the scallop industry on Alaskan coastal communities, market influences of East Coast and imported scallops, changes in the management of the fishery, and a number of environmental considerations. Questions also addressed the risks and benefits of scallop industry participation in Community Supported Fisheries (CSFs) in Alaska. Several unifying opinions emerged from this study, including a lack of awareness of the fishery in many Alaskan communities and fears about rising fuel costs and diminishing harvest levels. The majority of participants consider the fishery to be managed sustainably, although the lack of data available on scallop recruitment and abundance is a large concern. This analysis provides relevant information to both fishery managers and the scallop industry to contribute to the environmental, economic, and social sustainability of the scallop fishery.

Differences in community composition between Alaskan weathervane scallop beds within state fishery registration areas

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Rosenkranz, Gregg E. Alaska Department of Fish and Game

Session: Estuarine and Coastal Marine Ecosystems

Abstract
We conducted an analysis of benthic communities in areas targeted by Alaska's commercial weathervane scallop (Patinopecten caurinus) fishery. Our objectives were to investigate differences in community composition among individual scallop beds within State of Alaska scallop fishery registration areas and to determine whether those differences could be explained by environmental variables. Fish and invertebrates are incidentally caught in the commercial scallop fishery and sampled by onboard observers, who have routinely collected bycatch data from scallop fishing vessels since 1993. Some species are commercially valuable, including walleye pollock (Theragra chalcogramma), Pacific cod (Gadus macrocephalus) and northern rock sole (Lepidopsetta polyxstra). Bycatch data provide a representation of species associated with scallops, but the structure of these communities throughout Alaska's continental shelf is poorly understood. Using observer bycatch data collected in 2009-2012, as well as CamSled image data from video surveys conducted in 2009 by the Alaska Department of Fish and Game, we estimated spatial patterns in community composition on weathervane scallop beds in four scallop registration areas in the Gulf of Alaska. Non-parametric tests, including nonmetric multidimensional scaling and analyses of similarity, revealed separation between management districts. Biological communities were significantly structured at the scale of individual beds, and community composition often varied among beds within a registration area. Some beds were clearly distinguished by sediment type and depth. Results from this study shed light on the scale at which benthic community composition differs and contribute to improved definitions of essential fish habitat for both weathervane scallops and their associated species.

Paper Abstracts

Fish diets across the Chukchi and Beaufort seas

Gray, Benjamin P. UAF

Norcross, Brenda L. UAF

Beaudreau, Anne H. UAF

Blanchard, Arny L. UAF

Seitz, Andy C. UAF

Session: Foodwebs

Abstract
Diet information for Arctic Cod (Boreogadus saida), Arctic Staghorn Sculpin (Gymnocanthus tricuspis), and Shorthorn Sculpin (Myoxocephalus scorpius) is limited, outdated, from distant regions, or nonexistent. We collected these species during ice-free months over three years in the Chukchi Sea (2010—2012) and one year in the Beaufort Sea (2011). Diets were compared by four factors: seas, regions, depths, and size classes. Diets of each of the three fish species differed between the Chukchi and Beaufort seas and small and large fish fed differently. In general, Arctic Cod and Shorthorn Sculpin fed more pelagically in the Beaufort Sea and more benthically in the Chukchi Sea. Arctic Staghorn Sculpin fed benthically in both seas. Smaller Arctic Cod consumed more calanoid copepods in both seas while larger fish ate a more varied diet. All sizes of both sculpin species ate more benthic amphipods in the Chukchi Sea. Smaller and larger Arctic Staghorn Sculpin in the Beaufort Sea ate other types of prey and polychaetes respectively. Smaller Shorthorn Sculpin in both seas ate hyperiid amphipods whereas larger Chukchi Sea fish ate fish prey and shrimps. Additional diet differences were indicated by regional analysis; however, the effect of depth appeared to be confounded by fish size. This is the first account of factors contributing to variability in diets of fishes across the Chukchi and Beaufort seas and of Shorthorn Sculpin diet across the Chukchi and Beaufort seas. As arctic conditions change, analyzing fish diets may help indicate shifts in arctic food web structure.

Paper Abstracts

Blending Climate Projections, Observations and Ecosystem Impact Models in Support of Natural Resource Management

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Littell, Jeremy S. U.S. Geological Survey and DOI Alaska Climate Science Center

Session: The Changing Climate of Resource Management: from Reach to Region

Abstract
Regional climate change will undoubtedly bring a host of impacts to Alaska's aquatic ecosystems. However, predicting the nature, intensity and extent of those impacts requires a complex blending of observations and future climate projections with models of key physical and ecological processes. In this talk we will discuss projected changes in regional temperatures and precipitation, along with potential consequences for regional hydrology. In particular we will focus on implications for water quantity, water temperature, changes in the seasonal timing of hydrologic events, and hydrologic extremes. Using water temperatures as a test case, we will also explore how both observations and models can be applied in the context of climate-impacts assessments, vulnerability analyses, adaptive management and planning. Related issues for consideration include ways to better leverage existing water temperature monitoring efforts, and strategies for improving the "real world" usefulness of future water temperature projections. In this way we hope to demonstrate more broadly how collaborative hydroclimatic monitoring networks, interdisciplinary modeling efforts, and improved climate projections can result in "actionable science" to address critical issues in natural resource management.

Paper Abstracts

Identifying sources of conflict in Cook Inlet and Kenai River salmon fisheries within the context of resource sustainability.

Harrison, Hannah L., Center for Cross-cultural Studies, University of Alaska Fairbanks

Loring, Philip A., School of Environment and Sustainability, University of Saskatchewan

Session: Human Dimensions

Abstract
Cook Inlet and Kenai River salmon fisheries are Alaska's most prolific shared salmon resource accessible by the road system. For many decades, sport, commercial, and personal use fishers have utilized salmon returning to the Kenai River as a means of supporting recreational pursuits, fishing livelihoods, access to local fish consumption, and the cultural impact of this resource on the small coastal communities of the Kenai Peninsula. Conflict has long been an underlying theme of this maximally allocated fishery as different user groups vie for catch allocation, access to fish, and engage in political maneuvering through advocacy groups and the Alaska Board of Fisheries process. This study uses an ethnographic approach to identifying points of conflict between user groups as described by resource users, and frames those conflicts within Redpath et. al.'s sustainability framework. Kenai River fisheries, though prolific, have begun to show signs of stress through a weakening of the King salmon (Oncorhynchus tshawytscha) run, prompting an intensification of conflict within the region. This study aims to understand this conflict and identify how it may impact the long term economic, biological, social, and cultural sustainability of this fishery for the Kenai Peninsula region.

Paper Abstracts

ShoreZone Imaging and Mapping in Alaska

Hartmann Moore, Cindy A. E. NOAA National Marine Fisheries Service, Alaska Region, Juneau, AK

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Session: Advances in Fisheries Science & Technology

Abstract

ShoreZone is a coastal marine habitat mapping system, in which spatially referenced aerial imagery is collected specifically for classification. The resulting dataset includes imagery with mapped geomorphic and biological attributes in a searchable geospatial dataset. The imagery provides a useful baseline and visual reference. The mapped features include: shoreline morphology, substrates, and biotic resources such as eelgrass, canopy kelps, salt marshes and other habitat descriptors. There are many applications for this data including: oil spill contingency planning, habitat research, and coastal resource evaluations. Approximately 104,200 km of ShoreZone imagery exists for the Pacific Northwest coastline including the entire shoreline of Oregon (1,795 km), Washington (4,933 km), British Columbia (37,619 km), and approximately 60,800 km of the Alaskan coastline (~80%). The Alaska ShoreZone imaging and mapping project is on-going with 75% of the coastal imagery mapped or with mapping in progress and ~20% (~15,000 km) of the coastline remaining to be imaged. ShoreZone imagery was collected in Kotzebue Sound in July 2012 from Point Hope to Wales (3,095 km) and in Bristol Bay in 2006. Mapping of the Kotzebue Sound and Bristol Bay imagery was recently completed and included a coastal vulnerability module. The Alaska imagery and mapping data can be viewed online at http://alaskafisheries.noaa.gov/shorezone/. The Alaska ShoreZone program is built on a foundation of multiple funding and contributing partners, including state and federal governmental agencies, nonprofit organizations, and private industry, as well as resource managers, scientists, and spatial data specialists. The multi-organization program provides a framework to build on and supports a contiguous, integrated coastal resource database that extends from Southeast Alaska through the Gulf of Alaska, the Alaska Peninsula, Bristol Bay, and northwards to Kotzebue Sound, and the Chukchi and Beaufort Seas. The program goal is to have all of the Alaskan shoreline imaged and mapped using the ShoreZone protocol and to make this data web accessible.

Differences in Dispersal Ability and Tolerance to Winter Conditions Determine Occupancy Patterns of Arctic Fishes

Haynes, Trevor B. University of Alaska, Fairbanks

Rosenberger, Amanda E. Univeristy of Missouri

Lindberg, Mark, S. University of Alaska, Fairbanks

Whitman, Matthew Bureau of Land Management, Fairbanks

Schmutz, Joel, A. US Geological Survey, Anchorage

Session: North Slope Fisheries

Abstract
Despite their potential importance to Arctic ecosystem dynamics, the ecology and distribution of freshwater fish in the Arctic region of Alaska remain poorly studied. We sampled fishes in 86 lakes on the Arctic Coastal Plain over a broad spatial scale (~ 8500 km2) and used an occupancy modeling framework to estimated occupancy for six fish species and how environmental factors influence occupancy probabilities. We constructed candidate model sets for each species to test whether species occupancy was driven by variables related to patch size, colonization potential (directional or dispersal), or overwinter habitat variables at the lake or regional (7 x 7 km) scale. All six fish species were more likely to be found in lakes with a local connection to a stream. The three large-bodied species, least cisco (Coregonus sardinella), broad whitefish (Coregonus nasus), and arctic grayling (Thymallus arcticus), were largely influenced by factors affecting colonization potential through migratory pathways. Least cisco had the highest occupancy of the three large-bodied species (52 ± 5 %) and their occupancy probability was also affected by lake size and overwintering habitat, indicating that some least cisco populations may be less migratory. Small-bodied fishes show multiple strategies, depending on the species. Ninespine stickleback (Pungitius pungitius) were found in almost every sample lake (occupancy = 97 ± 1 %) suggesting they are fast dispersers during spring break-up, disperse to lakes that likely do not support winter populations, and are likely tolerant to harsh winter conditions. Alaska blackfish (Dallia pectoralis) were less widely dispersed (occupancy = 76 ± 5%) with a distribution that suggests a resistant life-history strategy with some dispersal abilities. Slimy sculpin (Cottus cognatus) had an occupancy rate of 23 ± 6 %, with a distribution that was biogeographically limited by its marine origin suggesting comparatively limited dispersal capabilities. These fish communities likely impose both top-down and bottom-up controls on Arctic lake ecosystem dynamics. A rapidly warming climate in the Arctic could potentially change the hydrology and other landscape and lake features important for fish occupancy; therefore, occupancy dynamics, and ultimately Arctic lake ecosystem dynamics, will likely exhibit major changes in the near future.

Paper Abstracts

Seasonal Movement Patterns of Arctic Grayling (Thymallus arcticus) in a Small Beaded Stream on the Arctic Coastal Plain, Alaska

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Whitman, Matthew S., Bureau of Land Management, Arctic Field Office, 1150 University Avenue, Fairbanks, Alaska

Adams, Jeff, U.S. Fish and Wildlife Service, Fairbanks Fish and Wildlife Field Office, 101 12th Avenue, Room 110, Fairbanks, Alaska

Session: North Slope Fisheries

Abstract
Alaska's Arctic Coastal Plain (ACP) supports abundant populations of migratory Arctic grayling that use shallow productive habitats for spawning and foraging during the short ice-free period. On the ACP, beaded streams are the dominant stream type and provide habitat for several months during this critical period where grayling must feed to develop lipid reserves to endure the winter. Though ubiquitous on the ACP, there is a paucity of information on the timing of movements and habitat use by grayling in beaded streams, though their ecology should be understood in the face of climate change and petroleum development. The objective of this study-in-progress is to track Arctic grayling movements and seasonal habitat use within a small headwater beaded stream on the ACP. During the summers of 2012 and 2013 grayling were PIT tagged and monitored with an array of stream-width antennas within the 3-km Crea Creek drainage, a tributary of the Ublutuoch River. Preliminary analysis of the PIT tag data reveals upstream movements into the stream shortly after ice break-up in the spring and a strong peak in downstream movements out of the stream shortly before freeze-up in the fall. Downstream movements appear to be correlated to changing stream temperature, with fish departing for overwintering areas before ice formation restricts passage. There is also evidence of size-class specific trends in movements and habitat use. These results demonstrate that Arctic grayling require passage to a small, seemingly inconspicuous beaded tundra stream similar to thousands of others along the ACP, which affirms the importance of appropriate passage structures as development continues in tundra watersheds.

New Searchable Map Interface for Subsistence Harvest Data

Koster, David

Holen, Davin

Session: The Changing Climate of Resource Management: from Reach to Region

Abstract
The Community Subsistence Information System (CSIS) hosted by the Division of Subsistence, Alaska Department of Fish and Game (ADF&G) provides harvest data for over 270 communities. The Division of Subsistence has been collecting harvest data since 1981 for resources harvested by each community including large land mammals, marine mammals and migratory waterfowl. Data is organized by community and year of study with different levels of data available for each rural community. Through a partnership between ADF&G and Alaska's LCCs this data, depended upon by multiple land and resource managers, will be made publicly available online in 2014 as a searchable, map-based interface. By creating a spatial interface for the CSIS database, managers and stakeholders will be able to more easily compare trends in subsistence harvest not only through time, but across the landscape. The resulting spatially-explicit layers can be incorporated into GIS layers currently maintained by multiple partners including federal, state, and tribal entities to inform their management planning efforts. A spatial representation of subsistence data will inform multiple landscape conservation planning purposes including, but not limited to: demonstrating the value of essential ecosystem services, projecting food security and community resilience under climate-change scenarios, identifying potentially vulnerable or sensitive watersheds. The true cooperative nature of subsistence resource management in this region, as well as the regional importance of these resources on the health and viability of its people, has elevated this topic within the Alaska LCC partnership community.

Paper Abstracts

Fish Distribution in a Warming Arctic: What Current Patterns May Tell Us About the Future

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Session: North Slope Fisheries

bstract
The relationship that organisms have with one another and their environment is likely to change as global temperatures rise. The particular consequences of warming in the Arctic are unknown. However, it is likely that hydrologic regimes will be altered, impacting local and landscape distribution of freshwater fishes. The relationship between surface water hydrology and the movement or overwintering limitations of fish species may strongly influence fish landscape distribution patterns. As climate warms, and surface water hydrology changes, it is likely that fish distribution patterns will also change. To gain understanding of the effects of surface water connectivity on North Slope fish distributions we gathered fish from 32 ponds and lakes in the Chipp River Drainage, Alaska. Current conditions have allowed a suite of water body types to develop; ponds and lakes range from completely isolated to those with permanent stream connections. Deep (> 2 m), well-connected lakes contained up to eight fish species. By contrast, deep, isolated lakes typically contained one or two fish species. Ponds, which were shallow compared to lakes (< 1 m), either contained ninespine stickleback or were fishless. Ponds with fish were connected weakly, typically via wetlands, to other water bodies, while fishless ponds lacked permanent surface water connection. Uncertainty regarding future water budgets and hydrologic networks on the North Slope complicates prediction of future species distribution patterns. Furthering our understanding of current patterns and modeling for future climate scenarios will help aid decision making and planning for future fisheries resource management.

Paper Abstracts

Genomic Patterns of Rapid Evolution in 50 Year Old Alaskan Threespine Stickleback Populations on Uplift Islands

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Bassham, Susan University of Oregon, Institute of Ecology and Evolution

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von Hippel, Frank A. University of Alaska Anchorage, Department of Biological Sciences

Cresko, William A. University of Oregon, Institute of Ecology and Evolution

Session: Evolutionary & Genetic Perspectives

Abstract
How fast can natural populations evolve during adaptation to novel conditions? To help answer this longstanding evolutionary question, we identified a natural study system in Prince William Sound and the Gulf of Alaska that is only about 50 years old, consisting of oceanic threespine stickleback (Gasterosteus aculeatus) and their nearby conspecifics that inhabit freshwater ponds created by uplift during the 1964 Alaska earthquake. We used RAD-seq and the Stacks bioinformatics pipeline to characterize across thousands of SNPs the genetic variability underlying morphological change at early stages of population divergence. Freshwater and oceanic stickleback from these islands have phenotypically diverged in body size, armor, and trophic traits. Measures of genetic divergence, STRUCTURE analyses, PCA, and AMOVA all support recent independent colonization of freshwater habitats by oceanic ancestors and recurrent gene flow between ecotypes. Over the last few decades, freshwater populations have genetically diverged from oceanic ancestors to nearly the same extent as freshwater populations in Cook Inlet, Alaska – populations that were founded thousands of years ago - supporting the hypothesis that rapid genomic evolution underlies rapid phenotypic evolution.

Paper Abstracts

Ocean Acidification Risk Assessment for Alaska's Fishery Sector

Mathis, Jeremy T., Ocean Acidification Research Center, University of Alaska Fairbanks

Session: Plenary

Abstract
The coastal waters around Alaska support some of the most extensive and diverse fisheries of anywhere in the global ocean. They will also bear the brunt from the potential impacts of ocean acidification decades before more temperate regions. Unique biogeochemical processes, such as glacial and freshwater runoff, sea ice melt, coastal upwelling, organic matter respiration and the penetration of anthropogenic CO2 all combine with regional circulation patterns and cold water temperatures to create an environment that is both vulnerable and susceptible to future change. In particular, notable changes are expected in pH and carbonate mineral saturation state, which govern physiological responses of a number of marine organisms that are critical to the State's economy as well as Alaskan subsistence-based ways of life. Recent research has shown that extensive areas of the Gulf of Alaska, Bering Sea, Chukchi Sea and Beaufort Sea currently experience seasonal carbonate mineral undersaturations both in surface waters and near the bottom. These undersaturations can last for several days to several months with uncertain, but likely detrimental consequences to marine ecosystems. Here, we have applied a vulnerability assessment framework to quantify the vulnerability of 29 separate communities around Alaska to ocean acidification based on factor such as projected changes in regional ocean acidification, reliance on commercial and subsistence fisheries and economic diversity. The analysis showed that communities that are highly reliant on fishery harvests, especially in southeast and southwest Alaska are have the highest measured vulnerability index values, while the economic diversity in more metropolitan areas will likely allow those locations to better adapt to ocean acidification stressors. While more research is needed to better quantify direct species response and the economic consequences of the potential loss of some of Alaska's fisheries, our work suggests that residents, stakeholders and policy makers should begin to prepare for the consequences of ocean acidification, particularly in conjunction with other marine stressors such a climate change, over fishing and pollution.

Paper Abstracts

Seasonal Movement Patterns of Arctic Grayling (*Thymallus arcticus*) in a Small Beaded Stream on the Arctic Coastal Plain, Alaska

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Session: North Slope II

Abstract
Each fall, the residents of Nuiqsut, Alaska, a small village on the Colville River delta, deploy subsistence gill nets under the frozen river ice to harvest overwintering Arctic Cisco (*Coregonus autumnalis*). Known as *Qaaktaq* in Iñupiaq, these fish are a staple in the diet of Nuiqsut residents and are traded widely with other northern Alaska communities. Over the years, concerns have been raised that oil and gas exploration and development in the nearshore marine environment and on the Colville River delta could adversely affect local fish populations. To help address these concerns, ConocoPhillips Alaska, Inc., (CPAI) and its predecessors began funding annual harvest monitoring in the 1980s. One goal of the harvest monitoring program is to provide estimates of the total fishing effort and catch of Arctic Cisco and other species. This presentation will provide an historical overview of the Arctic Cisco fishery and monitoring program on the Colville River delta

Salmon Economics in Kamchatka: Fishing for Dog or Fishing for Snow Machines?

Strecker, Lisa University of Alaska-Fiarbanks, Deptartment of Anthropology

Session: Human Dimensions

Abstract
Alaska and the Kamchatka Peninsula in Russia are both neighboring regions of the Northern Pacific Ocean. Both share the fact that salmon is crucial to the lives of their inhabitants. In this study I will use the energy equivalent of salmon to investigate the cost of transportation for the indigenous inhabitants of Northern Kamchatka. As a theoretical starting point I will use Pelto's findings on the de-localization of energy sources (Pelto 1973). For the sedentary Koryak, the Nymylany of Northern Kamchatka, sled dogs played an important historical role, and continue to be part of the society. Until recently they have been the most important means of transportation. Sled dogs are incorporated into the spiritual world as well. In Northern Kamchatka, sled dogs can be sustained with locally available fish and meat. Even today, everything necessary for feeding and using sled dogs can be harvested or crafted in place without the need of money. In this regard, snow-machines are fundamentally different; they have to be purchased and maintained. Therefore, snow-machine owners need to earn extra money. In many cases, this money comes from selling salmon caviar. Sled dogs and snow-machines are well adapted means of transportation in the North, and both "eat" fish! However, I argue that the substitution of sled dogs by snow-machines has larger societal implications and environmental costs, than the harvesting and selling of caviar or the speed of locomotion.

Paper Abstracts

Getting Past Perplexity: Climate Change Effects on Aquatic Resources

Martin, Philip D. Arctic Landscape Conservation Cooperative

Session: The Changing Climate of Resource Management: from Reach to Region

Abstract
The potential effects of climate change on aquatic systems likely will include 1) changes in surface storage and stream flows and 2) changes in water temperature and chemistry. These changes will have myriad impacts on arctic fish populations, some positive, some negative. The Arctic LCC is working to reduce key uncertainties regarding future conditions through development of both a long-term monitoring program with a strong hydrological component and interdisciplinary research projects explicitly linking climate, hydrology, and organisms. The proposed Terrestrial Environmental Observation Network (TEON) uses select watersheds to provide long-term integrated data on weather and climate, hydrology, soils/permafrost, and vegetation. TEON uses the "nested watershed" approach to characterizing spatial variability in hydrology. While sustained monitoring is essential to better describe and predict ecosystem response to climate warming, we also need interdisciplinary studies to discern the underlying linkages between the physical and biological processes of aquatic systems. Three such projects will be briefly described: one examining the effects of climate change on stream and lake temperature, connectivity and availability of freshwater habitats in the Fish Creek drainage; one examining the biological responses to increasing water temperatures in arctic lakes, specifically fish growth, food web structure and bioaccumulation of mercury; and one examining the cascade of changing seasonality of snow melt, availability of aquatic invertebrate prey, and consequences for bird nest success and population status. By intentionally designing these as cross-disciplinary projects, the Arctic LCC is providing the synthetic results needed to better understand climate change effects to inform resource management.

Landscape controls on stream temperature and thermal sensitivity: Assessing climate change impacts in Cook Inlet salmon streams

Mauger, Sue Cook Inletkeeper

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Shaftel, Rebecca UAA Alaska Natural Heritage Program

Leppi, Jason The WIlderness Society

Session: Salmon II

Abstract
We implemented a Stream Temperature Monitoring Network for Cook Inlet salmon streams to characterize current water temperature profiles and identify watershed characteristics that make streams more sensitive to climate change impacts. We logged continuous water and air temperatures at 48 non-glacial salmon streams during open-water periods from 2008-2012. Maximum stream temperatures varied broadly among sites: 11.9 – 24.5oC, with average summer temperatures across all five years ranging from 6.9 – 16.2oC. The vast majority of streams consistently exceeded Alaska's water temperature criteria set for the protection of fish especially in 2009, the warmest year, when 47 sites exceeded the criteria of 13oC, 39 exceeded 15oC and 17 exceed 20oC. Our modeling efforts indicated that large watersheds with low slope and low elevation were inclined to have the warmest temperature profiles and were the most sensitive to increasing air temperature. Linking our models to climate change scenarios suggests that by 2099 salmon populations in 27% of the streams - characterized as warm systems (July average temperature >13oC) with high sensitivity (>0.75) - will experience increased thermal stress associated with greater incidence of disease and susceptibility to predation and pollution, populations in 23% of the streams will experience more moderate stress, and populations in 50% of the streams will see no significant impact. This regional network can be a template for coordination, data management and analysis to facilitate expanded water temperature monitoring throughout Alaska. We anticipate that this project will play an important role in helping resource managers prioritize streams for research, restoration and protection efforts to ensure Alaska wild salmon endure as thermal change continues.

Paper Abstracts

Declining Freshwater Growth and Escapement Quality in Western Alaskan Chinook Salmon: Are They Linked?

McPhee, Megan V. Fisheries Division, University of Alaska Fairbanks

Leon, Justin M. Fisheries Division, University of Alaska Fairbanks

Session: Salmon I

Abstract
Recent poor returns of Chinook salmon to rivers in western Alaska have been attributed to a number of potential causes, including climate change, overharvest, and by-catch in the Bering Sea. We recently completed a study designed to evaluate the potential correlation between freshwater growth and recruitment in two populations of Chinook salmon from the Yukon-Kuskokwim region. A straightforward relationship was not apparent; however we did observe significant declines in freshwater growth over time in both the Kogrukluk (Holitna) and Andreafsky rivers. Here, we explore potential explanations for these observed declines, including the hypothesis that they are linked to decreases in size and age of returning adults.

Paper Abstracts

Factors influencing Chinook salmon spawning distribution in the Togiak River, Alaska

Meggers, Stephanie. Alaska Cooperative Fish and Wildlife Research Unit

Seitz, Andrew. School of Fisheries and Ocean Sciences

Prakash, Anupma. Department of Geology and Geophysics, Geophysical Institute

Haselwimmer, Christian. Department of Geology and Geophysics, Geophysical Institute

Session: Salmon I

Abstract
Chinook salmon (Oncorhynchus tshawytscha) populations are declining in the Togiak River, Alaska, but remain a valuable resource for subsistence, sport, and commercial harvests. Traditional ecological knowledge indicates that the spawning distribution of Chinook salmon has shifted from tributaries to the main stem, with significantly more Chinook salmon spawning in the main stem than in tributaries. The goal of this project is to describe physical factors influencing Chinook salmon spawning habitat availability and distribution, which may influence overall abundance. The specific objectives of this project are to (1) use high resolution digital imagery to characterize river channel characteristics and (2) use high resolution thermal imagery to examine water temperatures. Locations of Chinook salmon radio-tagged in 2009 – 2012 were used to determine high and low density spawning areas in a GIS framework. Next, digital and forward-looking infrared (FLIR) imagery was collected over two main stem and one tributary area in the Togiak River watershed. This imagery is used to describe and compare the physical habitat characteristics and temperature differences in high and low density spawning areas. Information from this project will aid in understanding habitat characteristics important for Chinook salmon spawning that can be derived from remote sensing imagery.

Paper Abstracts

Historical Ecology: tracking long-term trends in fisheries.

Misart, Nicole. University of Alaska Fairbanks

Session: Plenary

Abstract
This presentation will examine the potential of using paleo- or proxy-data to help inform current fisheries studies. An in depth example using the remains of Pacific cod (Gadus macrocephalus) from archaeological sites on Sanak Island, AK will be discussed. Pacific cod were an important resource for the Aleut for thousands of years, and continue to be an important species in Alaska fisheries to this day. Changes in trophic dynamics and size of more than 420 individual Pacific cod were compared over the last few thousand years using carbon and nitrogen stable isotope analysis coupled with fish size. Fish size is based on allometric relationships of premaxillas to live fish length. SIAR mixing models were used to determine if changes in prey species are discernible over 4000 years. This research is a first step toward creating long term baseline data sets, which could be very useful to fisheries management and conservation.

Flowing from reaches to regions through water temperature monitoring.

Murphy, Karen A. Western Alaska Landscape Conservation Cooperative

Reynolds, Joel H. Western Alaska Landscape Conservation Cooperative

Session: The Changing Climate of Resource Management: from Reach to Region

Abstract
Regardless of whether you are interested in fish populations available for harvest, strong brown bear populations for harvest or viewing, clean water for drinking, or the overall ecological integrity of a watershed, you are likely to be interested in understanding the observed and predicted changes to freshwater systems in Alaska. It is only through understanding change that we can develop strategies to address the effects of change or adapt to changed systems. In November 2012, the LCCs and Alaska Climate Science Center hosted a small workshop on stream and lake temperature monitoring. Water temperature was selected as one of the most easily obtained water variables that many different entities are gathering throughout Alaska. Through the workshop sequential recommendations were made for what it would take to bring together temperature data collected by a wide range of partners for a wide variety of purposes in a manner that would enable conducting regional assessments and predictions of how stream and lake systems are changing with climate. The goals and objectives of establishing a voluntary participation water temperature monitoring network and the initial steps already underway will be discussed.

Paper Abstracts

3-D Territoriality and Shadow Competition within Schools of Juvenile Chinook Salmon

Neuswanger, Jason. Department of Biology and Wildlife, University of Alaska Fairbanks, Fairbanks, AK, USA.

Hughes, Nicholas F. Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, Alaska 99775 USA.

Wipfli, Mark S. U.S. Geological Survey, Alaska Cooperative Fish and Wildlife Research Unit, Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, AK, USA.

Rosenberger, Amanda E. U.S. Geological Survey, Missouri Cooperative Fish and Wildlife Research Unit, Department of Fisheries and Wildlife, University of Missouri, Columbia, MO, USA.

Session: Freshwater Ecology

Abstract
Riverine salmonid populations are often influenced by competition for food, which can affect population structure in many ways depending on the territorial behavior of individuals. This dependence has motivated many studies of salmonid territoriality, but most such work focused on adult fish in medium-sized rivers and juvenile fish in small streams, with large, sparsely distributed territories easily represented in 2 dimensions (2-D). Such knowledge may not transfer to small fish in large rivers, such as young-of-the-year Chinook salmon that inhabit the main stems of rivers in the Yukon River drainage. In the Chena River in interior Alaska, predation risk compels salmon to feed in 3-dimensional (3-D) schools, with some fish directly above or below others. We sought to understand competition within these schools, where the well-known salmonid propensity for territoriality conflicts with risk-induced schooling, juxtaposing two ostensibly opposite behaviors. We used 3-D video techniques to measure salmonid foraging attempts and conflicts in situ, and extended 2-D kernel home range analysis techniques into 3-D to represent potential feeding territories and their interactions. We found that juvenile Chinook salmon in the Chena River defend feeding territories within their 3-D schools, and that shadow competition from upstream competitors affects fish positions within the school.

Halibut Detectives: Using Electronic Tags to Uncover the Mysteries of Halibut Migration

Nielsen, Julie K. UAF

Seitz, Andrew C. UAF

Session: Fish Movement, Distribution

Abstract
Pacific halibut are known to conduct large-scale movements during winter spawning migrations, yet methods to determine migration characteristics such as timing, extent, and pathways are currently limited. Using clues from pop-up satellite archival tags (PSATs), we are attempting to uncover the secret movements of Pacific halibut in Glacier Bay National Park. PSATs that collect information on depth, light intensity, temperature, and the earth's magnetic field were deployed on 25 halibut > 105 cm during summer 2013 and are scheduled to transmit archived data to satellites in 2014. Acoustic tags were also implanted in 15 of the archival-tagged fish and short-term movements were recorded during bi-weekly tracking trips for two months following their release. We describe how the data collected by these tags may be used to reconstruct the large-scale movements of Pacific halibut and to determine whether tagged halibut leave Glacier Bay National Park during the winter, and if so, do they return?

Paper Abstracts

Eulachon of the Chilkat and Chilkoot rivers: roles in local and indigenous cultures

Olds, Allyson. University of Alaska Fairbanks

McPhee, Megan. University of Alaska Fairbanks

Beaudreau, Anne. University of Alaska Fairbanks

Carothers, Courtney. University of Alaska Fairbanks

Ryan, Brad. Takshanuk Watershed Council

Session: Estuarine and Coastal Marine Ecosystems

Abstract
Eulachon, Thaleichthys pacificus, is an anadromous smelt of the Pacific Northwest, ranging from northern California to southwest Alaska. In the southern portion of its geographic range, population declines have led to federal protection of eulachon for California, Oregon, Washington, and British Columbia. The cause and extent of the declines remain unidentified, as eulachon are poorly understood and data are limited. To coastal indigenous groups and local peoples, the eulachon serves as a cultural, economical, and nutritional source. In southeast Alaska, indigenous and local residents of the Haines-Klukwan area harvest eulachon from the Chilkat and Chilkoot rivers. Eulachon is also an important food source to many predators, including marine animals, birds, and terrestrial mammals. To understand past and present roles of eulachon of the Chilkat and Chilkoot rivers, I seek local and traditional knowledge from residents of Klukwan and Haines. Guided by an interview protocol, I am conducting semi-structured interviews in an ongoing study about trends in eulachon runs of the Chilkat and Chilkoot rivers. Interviews will be supplemented with scientific literature and other published sources to summarize the roles of eulachon of the Chilkat and Chilkoot rivers in the local and indigenous cultures of the area.

Spatial Variability in Morphometric Size at Maturity and Reproductive Timing in Golden King Crab (Lithodes aequispinus)

Olson, Andrew P

Session: Stock Assessment and Management

Abstract
Size at morphometric maturity (SAM) was established for golden king crab (GKC) (Lithodes aequispinus) in Southeast Alaska (SE AK) by comparing the relationship between the right chela height (CH) and carapace length (CL) in males and on the presence or absence of eggs in females. Spatial variability in SAM was analyzed in SE AK and compared with published information throughout the geographic range which includes: Russia, the Bering Sea, and British Columbia, Canada. Russian and Bering Sea GKC SAM decreased as latitude increased, while SE AK SAM increased as latitude increased. To coincide with SAM, spine morphometric measurements were taken to examine spine length variability and the establishment of legal size in SE AK. Reproductive timing will be investigated in SE AK by taking egg samples to determine potential hatching events.

Paper Abstracts

Herring Research in Prince William Sound

Pegau, W. Scott PWSSC

Herring Research Team, Various

Session: Estuarine and Coastal Marine Ecosystems

Abstract
Since 2009 the Exxon Valdez Oil Spill Trustee Council has been funding coordinated research programs to study herring. The programs have focused on the early life history of the herring and included a wide range of studies from the oceanographic conditions, overwintering condition, predation, and disease related issues. The current focus of research is to improve predictive models of herring stocks through observations and research. Several research projects focus on addressing assumptions and inputs to the age-structure-analysis model. This presentation provides an overview of the current and recent herring research programs in Prince William Sound.

A model to simulate wild and hatchery pink salmon life history, hatchery straying and commercial fishing dynamics in Prince William Sound, Alaska

Rand, Peter S. Wild Salmon Center

Lessard, Robert B. Independent Contractor

Session: Salmon II

Abstract
We developed a model to simulate life history dynamics of wild and hatchery pink salmon in Prince William Sound, Alaska. The model includes straying of hatchery pink salmon into natural spawning areas and commercial fishing dynamics. The objective of the model is to explore how different management approaches and certain assumptions influence the rate and potential impact of hatchery straying on wild pink salmon. Population dynamics of natural spawning populations are governed in the model by stock recruitment relationships representing density-dependence in freshwater and the ocean. We estimate straying by applying a stray probability to hatchery fish that escape the fishery, and estimate the number of fish that join the natural spawning population based on a negative exponential relationship with distance between the release location and the location of natural spawning habitat in each district. The model tracks key impact metrics, including the proportion of hatchery pink salmon in the natural spawning population and overall abundance of wild pink salmon, across a range of hatchery release levels and a variety of different assumptions regarding vulnerability of wild salmon to the fishery. To reach compliance with biological thresholds (e.g. 2% hatchery fish in natural spawning population) in a hypothetical effort to minimize risk, results from preliminary model runs suggest a combination of reduced releases and efforts to increase selectivity of the fishery for hatchery fish would be necessary. The model may be a useful tool to explore other ways of managing hatchery risks in this, and perhaps other, fisheries.

Paper Abstracts

Bringing Alaska's hydrography data into the 21st Century

Reynolds, Joel H. Western Alaska Landscape Conservation Cooperative

Anderson, Becci, US Geological Survey

Session: The Changing Climate of Resource Management: from Reach to Region

Abstract
We introduce the Alaska Hydro system, a recently expanded collaboration to improve the National Hydrography Dataset (NHD) in Alaska, and the newly formed Alaska Hydrography Technical Working Group (AHTWG). The NHD is the comprehensive reference set of digital surface water map data for lakes, streams, rivers, ice fields, coastlines, stream gages, dams, and flow-direction networks, with links to related databases covering discharge, water quality, and fish populations. NHD is critical to meeting science, regulatory, cartographic, and natural resource management requirements. Federal, state, and local agencies, as well as NGOs such as the National Fish Habitat Partnerships, need this data for mapping, modeling, flood estimation and other applications. While NHD is mapped at 1:24,000 in the Lower 48, Alaska is mapped at 1:63,360-scale, is based on 1950s-era topographic maps, and has many errors - streams outside of their current channels, misrepresented flow lines in braided streams, incorrectly disconnected streams, disconnected reaches, etc. Additionally, entities in Alaska maintain their own partially corrected hydrography datasets that, over time, diverge from the official NHD. AK Hydro provides a system for efficient and reliable data stewardship and lets all partners benefit from each other's hydrographic improvements, laying the groundwork for bringing the entire state's hydrography up to national standards. AHTWG, a newly formed coordination body, works in concert with AK Hydro to establish and communicate data model and editing standards to the AK Hydro user and editor base. Today's presentation emphasizes ways to engage with AK Hydro and AHTWG, including upcoming opportunities for learning more.

Paper Abstracts

Overwintering Ecology of Juvenile Anadromous and Resident Fishes in the Susitna River

Roon, David, R2 Resource Consultants

George, Jerry, R2 Resource Consultants

Weybright, Adam, R2 Resource Consultants

Ganger, Mike, R2 Resource Consultants

Keefe, MaryLou, R2 Resource Consultants

Reiser, Dudley, R2 Resource Consultants

Session: Freshwater Ecology

Abstract
Winter is a critical period for fish survival in large glacial rivers, yet little is known about the overwintering ecology of these fish populations. In attempt to understand anadromous and resident fish communities and their habitat use during winter conditions, a pilot study was initiated on the Susitna River in the winter of 2013. This study was conducted in conjunction with an Instream Flow Study that installed temperature loggers to monitor intragravel temperatures in known spawning locations. Multiple fish sampling techniques were tested during three different sampling periods February to April, 2013 in the Whiskers Slough (RM 104) and Slough 8A (RM 128) study sites on the Susitna River. Methods were tested in under-ice and open water conditions and included minnow traps, beach seines, backpack electrofishing, angling, trotlines, setlines, and underwater video. A diversity of habitat types were sampled including main channel, side channel, side slough, upland slough, slough mouth, tributary mouth, tributary, and other off-channel habitats. Preliminary results indicate that 268 fish comprising 10 species were collected during these efforts. Minnow traps collected the greatest numbers of fish when placed under ice and in open water habitats while backpack electrofishing captured the greatest number of species in open water habitats. Trotlines were also effective at catching adult burbot in main channel ice-covered habitats. Side channel and side slough habitats supported high numbers of juvenile and adult fish. The 2013 Winter Pilot Study will inform more intensive winter sampling efforts during the winters of 2013/2014 and 2014/2015.

Paper Abstracts

Salmon Management on the West Side of Bristol Bay

Sands, Tim M. ADF&G

Session: Salmon II

Abstract
Commercial salmon fishing began in the Nushagak District of Bristol Bay in 1884. Since then, management has continued to evolve in response to changes in fishing and management technology and a better understanding of the salmon resource. The Nushagak District, comprised of three major river systems and producing five species of salmon has produced single day harvests of over 900,000 sockeye salmon and daily escapements of over 500,000 sockeye salmon. Currently, the Nushagak District area biologist has escapement information collected from tower counts, aerial survey information, harvest information reported daily, historical catch and escapement curves, anecdotal reports from stakeholders, Port Moller test fish indices, and inseason genetics samples from the Port Moller test fishery. With these tools, and datasets, managers make decisions to manage the dynamic and relatively short commercial sockeye salmon fishery while abiding by the goals and restrictions of several management plans.

USING ARCHIVAL TAGS TO EVALUTE THE VERTICAL MOVEMENTS, ACTIVITY LEVEL, AND THERMAL HABITAT SELECTION OF BURBOT WITHIN COPPER AND TANADA LAKES

Scannell, Heather L. University of Alaska Fairbanks, School of Fisheries and Ocean Sciences

Wuttig, Klaus G. Alaska Dept. of Fish and Game

Sutton, Trent M. University of Alaska Fairbanks, School of Fisheries and Ocean Sciences

Session: Fish Movement, Distribution

Abstract
The Upper Copper River drainage supports one of the most popular sport fisheries for burbot Lota lota in Alaska. Fishing pressure in the mid-1980s led to the Alaska Department of Fish and Game (ADF&G) initiating a stock assessment program aimed at monitoring abundances and establishing catch restrictions. The current sampling protocol used by the ADF&G involves mark-recapture events in which burbot are captured during spring and fall with baited hoop traps. To avoid decompression, the sampling area is restricted to depths ≤15 m. The objectives of this study were to: 1) examine the thermal habitat selection of burbot and their annual, seasonal, and daily vertical movements within Copper and Tanada lakes; and 2) use those observations to evaluate the assumptions of a mark-recapture experiment. One hundred and forty burbot from Copper and Tanada lakes were implanted with archival tags to follow their vertical movements and thermal habitat selection for one year. Hoop traps targeted fish from the surface to 30 m in depth; traps set at depths > 15 m were given a 24-hr decompression stop at 13 m. Tagged fish remained at large for an entire year before efforts to recover implanted fish were conducted. Fifteen burbot were recaptured in Tanada Lake and nine fish were recaptured in Copper Lake. The thermal habitat occupied by recaptured burbot varied in both lakes. Activity (defined as vertical movements ≥ 1 m) showed seasonal differences, and these differences were consistent in both lakes. Burbot migrated to greater depths within spring and fall, and their daily activity was greatest in the fall. Their tendency to reside at depths ≤15 m during mark-recapture events may result in a significant proportion of the population being unavailable to capture by hoop traps given the 15-m depth restriction.

Does deep-water refuge habitat weaken trophic interactions between introduced Mysis shrimp, lake trout, and kokanee?

Schoen, Erik R. University of Washington / UAF

Beauchamp, David A. USGS / University of Washington

Session: Foodwebs

Abstract
Introductions of the opossum shrimp Mysis diluviana have altered hundreds of lake and reservoir ecosystems, having generally positive effects on lake trout Salvelinus namaycush and negative effects on kokanee Oncorhynchus nerka and other plantivores. However, the strengths of these interactions vary widely among lakes, and this variability is largely unexplained. Lake trout are known to consume Mysis during daylight hours when the shrimp migrate downwards and aggregate on the lake bottom. We hypothesized that 1) extremely deep habitats provide Mysis with a refuge from lake trout predation and 2) Mysis subsidizes lake trout populations more strongly in shallower lakes with less refuge space, and 3) these subsidized lake trout populations cause stronger negative predation impact on kokanee in shallower lakes. We quantified deep-water refuge space using a model of Mysis diel vertical migration, and found that lake trout consumed less Mysis in these refuges. Further, we examined the population trajectories of kokanee following Mysis introductions along a gradient of lake depth. Finally, we discuss the implications of our findings for the expected effectiveness of alternative kokanee enhancement strategies such as stocking, lake fertilization, and predator removal.

Does Pacific halibut behavior correspond to regular environmental cycles?

Scott, John D. UAF SFOS

Seitz, Andrew C. UAF SFOS

Session: Fish Movement, Distribution

Abstract
Pacific halibut (Hippoglossus stenolepis) is an important resource for subsistence, commercial, and recreational fishers throughout the Gulf of Alaska and the Bering Sea. Halibut biomass measurement (important for sustainable management) is completed indirectly from standardized longline surveys and catch reporting. This study provides insight into some predictable halibut behaviors that may make them unsusceptible to catch or surveying. Preliminary results have shown that Pacific halibut depth–specific behavior does follow periodic environmental cycles, including diel (24 hour) cycles. The degree to which halibut display periodic behavior and the periodic behavior patterns varies throughout the year. Knowledge of halibut behaviors elucidated by this tag data analysis, once quantified, may aid in improving stock assessments.

Paper Abstracts

Detection Efficiency and Habitat use to Inform Inventory and Monitoring Efforts: Juvenile Coho Salmon in the Knik River Basin, Alaska

Sethi, Suresh Andrew, USFWS

Benolkin, Elizabeth, USFWS

Session: Salmon I

Abstract
We examined occupancy dynamics and habitat use of juvenile coho salmon, Oncorhynchus kisutch, in shallow lakes in south central Alaska using models which control for and estimate sampling gear detection efficiency (occupancy and N-mixture models). In addition, we present statements for the probability that observed absences at a survey site are true absences given some amount of sampling effort and analysts' beliefs about site occupancy and sampling gear detection efficiency which can be used to guide inventory and monitoring efforts for juvenile salmon or other wildlife and plant species. Minnow traps were effective at sampling juvenile coho in shallow lake environments, with a mean probability of detection of 0.68 (i.e., probability of detecting the presence of juvenile coho given that they are present at a trap site; SE = 0.03). Juvenile coho salmon migrated into shallow water lakes in late summer and early fall, presumably to seek out overwinter habitat. Once in shallow lake environments, juvenile coho were widely distributed across a range of microhabitats, with some evidence for preference for shallower depths and warmer water temperatures.

Competitive Release Leads to Novel Ontogenetic Resource Polymorphism in Kokanee (Oncorhynchus nerka)

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Pavey, Scott A. Institut de Biologie Intégrative et des Systèmes, Département de Biologie, Université Laval, 1030 Avenue de la Médecine Québec, Québec, Canada G1V 0A6

Session: Evolutionary & Genetic Perspectives

Abstract
Competitive release and high levels of intra-specific competition have been thought to play a large role in understanding adaptive divergence related to resource polymorphism. Utilizing a suite of interdisciplinary techniques, this study seeks to better understand the evolutionary ecology of Jo-Jo Lake kokanee (Oncorhynchus nerka) and describe a novel ontogenetic diet shift that has been facilitated by competitive release from limnetic predators. Specifically we (1) further characterize the novel kokanee diets previously described using carbon (δ13C) and nitrogen (δ15N) stable isotope analysis (SIA) and stomach content analysis (SCA), and (2) describe morphological changes in gill raker morphology resulting from piscivory. Both SIA and SCA indicate a gradual dietary shift from benthic macroinvertebrates to piscivory. Piscivorous feeding in spite of phenotype-environment mismatch has resulted in high levels of gill raker damage and directional selection on gill raker morphology to reduce gill raker number. A reduction in gill raker number is convergent with what is seen in other piscivorous salmonids despite the lack of standing genetic variation for piscivory in the sockeye-kokanee species complex. As such, Jo-Jo Lake kokanee are a distinctive example of adaptation in salmonids in response to a unique aquatic ecosystem. This unusual population highlights the importance of competition in shaping the adaptive landscape and altering evolutionary trajectories.

Using Next-Generation Sequencing of Environmental DNA to Assess Fish Assemblages in Alaskan National Parks

Simmons, Trey. Central Alaska Network, National Park Service, Fairbanks, AK

Talbot, Sandra. Alaska Science Center, U.S. Geological Survey, Anchorage, AK

Sage, Kevin. Alaska Science Center, U.S. Geological Survey, Anchorage, AK

Flamme, Melanie. Gates of the Arctic National Park and Preserve, National Park Service, Fairbanks, AK

Session: Advances in Fisheries Science & Technology

Abstract
In Alaska, it is cost-prohibitive to conduct comprehensive fish sampling over large areas. As a result, data on fish species richness and distribution in small lakes and rivers in Alaskan National Parks are scant. We are developing field and laboratory methods for the simultaneous identification of multiple fish species in lakes and rivers in Alaskan National Parks, using environmental DNA (eDNA) extracted from water samples. Recent developments in the identification of species using eDNA recovered from environmental samples and classical genetic technologies, such as DNA barcoding, offer potentially powerful approaches for fish monitoring, or for any research requiring data regarding fish species richness or distribution. Nevertheless, eDNA approaches that apply a classical genetic approach generally target a single or few species, and the development of multiple-species detection methods is difficult and not cost-effective. Shotgun or amplicon-based next-generation (NG) sequencing approaches can overcome a number of obstacles inherent in applying classical genetic technologies to eDNA studies that target assemblages, rather than single or few species. Here we present an experimental amplicon approach, which targets subunits of both the 16S mitochondrial and 18S nuclear ribosomal genes, and discuss issues surrounding eDNA technologies in general. We also present results from our initial attempt to apply these NG-eDNA methods for detecting the presence of multiple fish species at a landscape scale, using water samples collected from both fish-bearing and fishless streams in Wrangell-St. Elias National Park and Preserve and Denali National Park and Preserve, and from lakes in the Bering Land Bridge National Preserve.

The influence of host fishes on the distribution of anadromous lampreys in the eastern Bering Sea

Siwicke, Kevin A.

Seitz, Andrew C.

Session: Fish Movement, Distribution

Abstract
Anadromous lampreys are an important subsistence and commercial resource to indigenous groups in Alaska and the Pacific Northwest, but recent declines in the number of adults observed during spawning runs is cause for concern. One hypothesis suggests that the availability of hosts during the marine feeding phase is the most important determinant of spawning run strength, but this period remains poorly understood. Using records of Pacific lamprey Entosphenus tridentatus and Arctic lamprey Lethenteron camtschaticum captured in surface and bottom trawl surveys, we investigated if fish assemblages (i.e., potential host fishes) may influence the distribution of lampreys in the eastern Bering Sea. Arctic lampreys were predominantly found in surface trawls on the midnorth and north middle and inner shelf, whereas Pacific lampreys were found in surface and bottom trawls along the entire shelf edge and northern outer shelf. These observed differences in distribution occur along a depth gradient, but fish assemblages in this region follow geographic gradients as well. Using CLUSTER (with SIMPER) analysis in conjunction with NMDS plots, we found that Arctic lamprey were associated with herring and juvenile salmonids, while Pacific lamprey were associated with groundfish and adult walleye pollock Theragra chalcograma. Our results suggest that Arctic lamprey may be more predatory on smaller fish in the surface waters while the larger Pacific lamprey may be more likely to parasitize larger marine vertebrates near the shelf edge. By elucidating these lamprey-host associations, we can better understand how changes in the Bering Sea will impact anadromous lampreys.

Paper Abstracts

Development of a Late Season Escapement Monitoring Program on the Chignik River using DIDSON Sonar

St. Saviour, Adam, B. FinFish Research, Commercial Fisheries Division, Alaska Department of Fish and Game

Session: Stock Assessment and Management

Abstract
The Chignik River system is the primary salmon producer in the southern Alaska Peninsula region where commercial and subsistence salmon are fundamental to both the local economy and cultural identity. The components of the runs that occur after the commercial season and weir removal are essential for subsistence users. In 2011, the Westward Region, Commercial Fisheries Division of the Alaska Department of Fish and Game (ADF&G), procured a DIDSON sonar system through an AKSSF grant (44611). It was deployed in the Chignik River in late August and run through September for the past three seasons to enumerate late-run sockeye and coho salmon. Species composition estimates and age, sex, and length (ASL) samples were acquired using primarily gillnet test fishing. The post-weir sockeye salmon time series estimate that has been historically used was compared with DIDSON counts. In 2011, the post-weir model predicted September sockeye salmon escapement of 6,585. This was in contrast with the unspeciated sonar count of 72,504. In 2012, the post-weir model estimate of 52,818 sockeye salmon was much closer to the DIDSON estimate of 63,832. DIDSON and weir salmon counts during overlapping periods were similar, within 7%. Results from this project have shown that Chignik River late-run sockeye and coho salmon runs are widely variable from year to year and cannot always be accurately assessed with a post-weir estimate model.

Paper Abstracts

The economic and social consequences of closures and changes in salmon sport fisheries

Stensland, Stian. The Resilience and Adaptation Program, University of Alaska Fairbanks, and Norwegian University of Life Sciences

Session: Human Dimensions

Abstract
Sport fishing for salmon is important culturally, economically and as a leisure activity. The annual run of salmon to rivers in Alaska or other parts of the world creates benefits and enjoyment for anglers, fishing tourism businesses and local communities. However, many countries and regions are experiencing low runs leading to closed fisheries, shortened seasons, and harvest limits. In Alaska there is great concern about the poor king salmon runs. Stakeholders somehow need to adapt to these changes. How do anglers behave and adapt to these changes when e.g. their local king salmon sport fishery closes or turns into catch & release only? What does it mean for local sportfishing businesses? Are they able to switch to a substitute species, site or fishing method? What are the financial and welfare losses to stakeholder groups? Such information is important to managers and policymakers. Results from a survey of anglers and fishing tourism businesses in Norway's Atlantic salmon fishery are presented. The parallel situation in Norway and Alaska are discussed and research needs for Alaska's salmon fisheries addressed.

Seasonal Storage, Trophic Transport, and Uptake of Marine-Derived Nutrients in the Hyporheic Zone of the Horsefly River Spawning Channel, British Columbia

Vanden Busch, Leah M., University of Northern British Columbia

Petticrew, Ellen L. (UNBC)

Rex, John F. (UNBC & Ministry of Forests, Lands and Natural Resource Operations)

Session: Foodwebs

Abstract
Coastal and inland riverine ecosystems receive an annual nutrient pulse that is delivered by millions of Pacific salmon (Oncorhynchus spp.) migrating to their natal spawning grounds. Salmon transfer marine-derived nutrients (MDN) to freshwater systems, which in some environments has been shown to enhance fish and aquatic productivity, as well as terrestrial wildlife and plant species. This study investigates the hyporheic zone (an area of mixing between groundwater and surface water) as an essential pathway for the transport and seasonal storage of MDN between the streambed and riparian zone. This pathway may provide crucial nutrient exchanges that help sustain healthy stream and riparian habitat for spawning salmon. The objective of this study is to determine if MDN from the 2011 sockeye salmon (O. nerka) run is stored in the hyporheic zone and made biologically-available to the riparian ecotone in the Horsefly River spawning channel, located approximately 800-km upstream from the mouth of the Fraser River. Nutrients can be removed from the water column quickly at multiple trophic levels. Therefore, nutrient storage is being quantified through three sources – hyporheic water, aquatic invertebrates, and riparian vegetation over a period of eight months. This presentation will focus on seasonal trends of MDN incorporation in vegetation and macroinvertebrates. The Fraser River contains Canada's most productive sockeye salmon fishery, which receives about a quarter of the returns that Bristol Bay averages. Gaining a more comprehensive understanding of this hyporheic nutrient exchange system will facilitate better restoration and stream management decisions that spans across watersheds and countries.

Reconstruction of Ocean-Entry Timing and Growth Rates of Juvenile Chum Salmon in Alaskan Waters of the Chukchi and Northern Bering Seas

Vega, Stacy L. UAF

Sutton, Trent M. UAF

Adkison, Milo D. UAF

Murphy, James M. NOAA

Session: Salmon I

Abstract
Recent climate change is most pronounced in the Arctic, with many implications for shifts in juvenile salmon distributions and life-history patterns. This may include expansion of sub-Arctic species poleward, altered timing of runs, and timing and success of key life-history stages. Although chum salmon Oncorhynchus keta are the most widely distributed Pacific salmon, few studies have examined their early marine life history. The objectives of this study were to determine the timing of ocean entry of chum salmon in the Chukchi and northern Bering seas and increase understanding of early life-history characteristics of this species, such as date of marine entry and first-year marine growth. Growth rates of chum salmon from the summers of 2012 and 2013 were determined using daily otolith increments and compared to data collected in 2007 (a year of minimal sea ice) to make temporal and regional comparisons. Inductively coupled plasma-mass spectrometry (ICP-MS) was used to detect changes in strontium concentrations along a cross section of sagittal otoliths to show entry to the marine environment. Preliminary results show that entry dates ranged from early June to mid-July in both regions, with the average entry timing occurring in the final week of June for both for northern Bering and Chukchi Sea in both 2007 and 2012. By understanding the full extent of chum salmon distribution, along with early life history and growth, managers will be better equipped for making predictions on the effects of climate change on future distribution and production.

Evidence for abiotic, biotic, and human influences on straying in an endangered Chinook salmon metapopulation

Westley, Peter A.H.

Quinn, Thomas P.

Dittman, Andrew H.

Ward, Eric J.

Session: Salmon II

Abstract
Dispersal from the natal area for reproduction (i.e. movement that may influence gene flow) has profound effects on the demography and evolution of metapopulations, yet the proximate climatic and environmental factors affecting dispersal are not well known. In this talk I discuss analyses of a 17-year mark recapture database of 20 Chinook salmon hatchery populations, representing over 186,000 recovered individuals in the Columbia River Basin to illuminate some of the causal factors related to dispersal. A multivariate Bayesian logistic regression model successfully explained 29% of the interannual variation in dispersal rate and detected an influence of a regional-scale climatic index (Pacific Decadal Oscillation) and local-scale stream flow during upstream migration and spawning. Results also indicated that dispersal rate was sensitive to practices in the hatcheries and exhibited inverse density dependence, suggesting a role of management, genetic origin, and collective migratory behavior. In contrast, drainage area and migratory distance experienced by populations did not affect dispersal. We detected an increasing temporal trend in dispersal rates that may relate to current climatic conditions, but may also reflect the artificial propagation of non-local individuals in hatcheries. These results combine to suggest that efforts to minimize the numbers of foreign hatchery-produced individuals on local spawning grounds must consider the interacting role of regional-scale climate, local weather conditions, practices in the hatcheries, and the abundance of salmon themselves.

Freshwater Food Webs and Arctic Grayling Foraging Ecology on the Arctic Coastal Plain, Alaska

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Whitmann, Matt, Bureau of Land Management, Arctic Field Office, 1150 University Avenue, Fairbanks, AK

Arp, Chris, Water and Environmental Research Center, Institute for Northern Engineering, University of Alaska Fairbanks, Fairbanks, AK

Adams, Jeff, U.S. Fish and Wildlife Service, Fairbanks Fish and Wildlife Field Office, Fairbanks, AK

Kock, Josh, U.S. Geological Survey, Alaska Science Center, 4210 University Dr., Anchorage, AK

Session: Foodwebs

Abstract
Often some of the least understood components of freshwater fish habitat are the lower trophic levels and food webs that support fishes within these habitats. Even less clear are the chemical and physical processes that ultimately drive food webs, and therefore regulate aquatic productivity and prey flow to fishes and other consumers. This is especially true for freshwater ecosystems on the Arctic Coastal Plain of Alaska. We've been involved in a series of studies that aim to discover what prey are important for Arctic grayling, and the controlling factors potentially responsible for regulating prey production and flow to fishes. In addition, we're investigating the seasonal movement patterns of grayling, and how they relate to seasonal hydrology and prey availability in associated freshwater habitats. We've learned that as ice melts in early summer, grayling move from deep overwintering areas to small streams, ponds, and lakes to feed on invertebrates and stickleback. In one study, older age class fish left the stream in mid-summer after just several weeks of use, while small fish remained in the stream until shortly before freeze up in fall. Movements of these young fish out of foraging habitats are timed with decreasing water temperature and stream discharge. We've also discovered that the composition and abundance of terrestrial insects available to grayling in summer are influenced by riparian vegetation cover, and that terrestrial prey originating from this streamside vegetation are important for early age classes of grayling. Aquatic invertebrates are important for young and to some extent older fish, and include primarily caddisfly, black fly, and midge larvae, and to some extent zooplankton. Most dramatic though is the dependence of older

age class grayling on ninespine stickleback. Up to 90% of their diet is comprised of stickleback. Surface water hydrology thus plays a key role in freshwater habitat connectivity, and regulates access by grayling to these summer foraging grounds. Climate change and petroleum development will certainly play a role in surface water connectivity and food web productivity, in ways we are just beginning to understand and predict, and will clearly affect fishes that inhabit these freshwater ecosystems.

Paper Abstracts

Alaska Geospatial Data Resources

Wirth, Lisa. Geographic Information Network of Alaska, International Arctic Research Center, University of Alaska Fairbanks, 111 West Ridge Research Building, Fairbanks, Alaska 99775, USA

Heinrichs, Tom. Geographic Information Network of Alaska, International Arctic Research Center, University of Alaska Fairbanks, 111 West Ridge Research Building, Fairbanks, Alaska 99775-7275

Broderson, Dayne. Geographic Information Network of Alaska, International Arctic Research Center, University of Alaska Fairbanks, 111 West Ridge Research Building, Fairbanks, Alaska 99775-7275

Session: Advances in Fisheries Science & Technology

Abstract
The University of Alaska's Geographic Information Network of Alaska (GINA) is a leading geospatial data service provider in Alaska, freely serving large volumes of data. Since 1993, GINA has operated a satellite ground receiving station on the University of Alaska Fairbanks (UAF) campus, processing in near-real-time. The data products are made immediately available for monitoring of wildfire hotspots, low cloud and fog distribution, and volcanic ash cloud tracking. GINA is the project manager for Alaska's statewide ortho-mosaic program, providing high-resolution imagery and elevation data used to provide a consistent imagery base layer for the state of Alaska. GINA also provides a geospatial training lab with 16 seats to train students and professionals in remote sensing and GIS techniques. Most recently, we are working towards providing historical imagery base layers as a tool for remote sensing change detection analysis. To provide a common platform for change detection and historical comparison UAF GINA and the UAF Alaska Satellite Facility are providing orthorectified historical imagery of three vintages: 1950s era USGS aerial imagery, 1980s Alaska High Altitude Photography (AHAP) color infrared aerial imagery, and 2010s Alaska SPOT5 Statewide Orthomosaic satellite imagery. This effort began with the EPSCoR Alaska Adapting to Changing Environments (ACE) project, which conducts biological, physical and social research into the adaptive capacity of Alaskan communities. Change detection is a key component of the EPSCoR-ACE research at three Test Case sites, in the North near Nuiqsut, Southcentral on the Kenai Peninsula, and in Southeast near Juneau.

A Remote-Sensing, GIS-Based Approach to Identify Spawning Habitat for Fall Chum Salmon in a Sub-Arctic, Glacially Fed River

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Session: Salmon I

Abstract
At northern limits of a species' distribution, fish habitat requirements are often linked to thermal preferences, and the presence of overwintering habitat. However, logistical challenges and hydrologic processes typical of glacial systems could compromise the identification of these habitats, particularly in large river environments. Our goal was to identify and characterize spawning habitat for fall-run chum salmon Oncorhynchus keta from spatial distributions of tagged individuals in the Tanana River, Alaska using an approach that combined ground surveys with remote sensing. Ice-free areas (indicating groundwater influence), and persistent ice-free water (i.e., consistent presence of ice-free water for a 12-year period according to satellite imagery) became the focus of the study. A combination of ground and remote surveys revealed spatial and temporal thermal characteristics of these habitats that could have strong biological implications. Persistent ice-free sites identified using synthetic aperture radar, appear to serve as core areas for spawning fall chum salmon. The importance of stability through time suggests a legacy of successful reproductive effort for this homing species, highlighting the utility of remote sensing for monitoring and identifying salmon habitat in remote areas. These features would not be captured with a one-visit traditional survey but rather required remote-sensing monitoring of the sites through time.

Coho salmon biodiversity in a proposed mining district Bristol Bay, Alaska

Woody, Carol A. Fisheries Research & Consulting

Session: Evolutionary & Genetic Perspectives

Abstract
Coho salmon (Oncorhynchus nerka) are a valuable component of Bristol Bay's prolific all-wild salmon runs. However, little is known regarding the species' local biodiversity. Here genotypic (eight microsatellite loci) and adaptive phenotypic (age and size at maturity) traits are reported for coho salmon originating in two rivers in a proposed Bristol Bay mining district. Genotypic analyses considered current survey data and three previously sampled Bristol Bay populations; all populations were significantly distinct (n=5; Fst 0.026; 95% CI:0.017-0.036). Surveyed populations also differed significantly in age and size at maturity, adaptive heritable traits influenced by natal environments. Because coho salmon populations are generally small, tend to be highly structured, and exhibit extended freshwater rearing in headwaters they can be more vulnerable to localized habitat elimination and alteration than other salmon species. Should mining proceed, habitat loss can increase the risk of coho salmon biodiversity declines, which is linked to fisheries sustainability.

Poster: Response of an Arctic Freshwater Ecosystem to Climate and Land-use Change: New, Interdisciplinary Research in the Fish Creek Watershed

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Abstract
The Fish Creek Watershed encompasses a diverse mosaic of aquatic habitats with elements representing much of the Arctic Coastal Plain of northern Alaska including deep dune trough lakes, shallow thermokarst lakes and beaded streams, sand and gravel bedded rivers, and deltaic habitats. Beyond observed and expected hydrologic and permafrost responses caused by changes in climate, this landscape is subject to potential land-use impacts related to petroleum development as it is entirely within the National Petroleum Reserve – Alaska. Multi-agency efforts to establish environmental baselines has led to a comprehensive monitoring infrastructure of fish populations, lakes, streams and rivers, permafrost, and climate spanning up to 15 years. This combination of drivers of environmental change and established research infrastructure make this an ideal setting to address aquatic habitat questions of longstanding interest to Arctic resource managers and scientist. Thus, a new multidisciplinary team of scientists is now focusing here on the broad hypothesis that surface-water availability, connectivity, and temperature operate as a coupled system that physically mediate habitat and trophic dynamics of Arctic freshwater ecosystems. These researchers are working to understand how these interrelated processes form a shifting mosaic of freshwater habitats across the landscape by classifying, mapping, and modeling responses to past and future climate and land-use change. Using this understanding, our goal is to develop scenarios of freshwater habitat change in a spatial and temporal context that will provide managers and scientists with a template to evaluate a range of potential responses to climate and land-use change.

Poster Abstracts

Poster: Using acoustic telemetry to monitor Pacific herring during spring spawning

Bishop, Mary A., Prince William Sound Science Center

McKenzie, Megan, Prince William Sound Science Center

Eiler, John, NMFS, AFSC, Auke Bay Laboratories

Reynolds, Brad, Prince William Sound Science Center

Powers, Sean P., Dauphin Island Sea Lab, Univ. South Alabama

Abstract
As part of a 2012 pilot study designed to better understand pre- and post-spawn movements of Pacific herring, Clupea pallasii, were surgically implanted with coded acoustic transmitters. Herring (194-255 mm SL; n = 25) were released into Port Gravina and passively monitored by a VR2W receiver located approximately 600 m from shore and in 12 m of water. Twenty-three of the 25 tagged individuals were detected multiple times (≤ 227 detections) on one or more days (≤ 5 d) post release. Two fish exhibited signs of post-tagging mortality and were excluded from analysis. Peaks in detection frequency occurred throughout crepuscular and nighttime periods, with a significant decrease in fish detection during daylight hours. Concurrent detections of multiple individuals indicative of schooling behavior (≥ 2 fish detected/3 min interval) were observed in up to 43% of all detections and were primarily associated with high tide. Final detections of tagged fish coincided with the cessation of spawning in this area (14 April 2012), suggesting that fish may have departed Port Gravina into central Prince William Sound. This study was the first attempt to acoustically tag and release wild Pacific herring. Individual response to the handling and tagging procedures suggest that additional acoustic tagging studies on herring in Prince William Sound are feasible and may allow for further, more detailed examination of movement patterns.

Poster Abstracts

Poster: New Acoustic Arrays Available for Telemetry Studies in Prince William Sound

Bishop, Mary A., Prince William Sound Science Center

McKinzie, Megan, Prince William Sound Science Center

Abstract
The Prince William Sound Science Center (PWSSC) in partnership with the Ocean Tracking Network (OTN) has added capacity to OTN's global acoustic tracking network. In March 2013, a curtain of acoustic receivers (27 VR4s and 7 VR2Ws) was deployed across the major entrances to the Prince William Sound from the Gulf of Alaska. These arrays span Hinchinbrook Entrance, Montague Strait, as well as Prince of Wales, Elrington, Latouche, and Bainbridge Passages. OTN's primary objective is to develop and use state-of-the art tracking technologies to identify on small to large scales the critical habitats and migration pathways of aquatic animals important to humans. The receivers can detect all VEMCO coded acoustic transmitters and will record a tags ID number, time/date stamp and sensor values for all successfully logged detections. The PWSSC will maintain the array and download data at least once a year. Collected data will be shared with collaborating scientists through the OTN data warehouse. We encourage scientists to join us in initiating telemetry studies that make use of this amazing new resource. To learn more about PWSSC and the OTN, please visit us at www.pwssc.org and www.oceantrackingnetwork.org.

Poster Abstracts

Poster: Documenting anadromous waters in the Tanana Flats, Alaska, in response to proposed road development

Brinkman, Aleya R. Center for Environmental Management of Military Lands, Colorado State University. Fort Wainwright, Alaska.

McCall, Patricia L. Center for Environmental Management of Military Lands, Colorado State University. Fort Wainwright, Alaska.

Abstract
There is immediate interest in road development within the Blair Lakes region of the Tanana Flats, originating at the Tanana River railroad bridge, near Salcha, Alaska. However, there are several anadromous and potentially anadromous streams that extend into this area that may be affected by development. These streams are McDonald, Bear, Clear, and Five-mile Clear Creeks. During 2013 and 2014, our objectives are to identify and inventory fish species in the Blair Lakes region of the Tanana Flats. More specifically, we seek to further document life stage distribution and add new findings to the State of Alaska Anadromous Waters Catalog. For summer 2013, we employed a repeat sampling design with two sampling occasions for Clear, Bear, and Dry Creeks as well as Blair Lakes. We used baited minnow traps, backpack electrofishing, minnow seines, long-handled dipnets, and angling to capture and identify fish. New findings for Clear Creek include juvenile chinook (Oncorhynchus tschawytscha) salmon found 12 km further upstream than previously known, and the first documentation of chum salmon (O. keta) spawning in this creek. New findings for Bear Creek include documentation of chum salmon spawning 9 km further upstream from known anadromous waters. These novel findings will yield a more complete knowledge of species and life stage distribution that will provide permitting agencies with information important for project placement and insight into appropriate mitigation measures. Ultimately, the results from this study will be used to advise development in the Tanana River drainage with respect to the conservation of salmon and habitat critical to their survival.

Poster: Biological Responses to Increasing Water Temperatures in Lakes of the Barrow/Atqasuk Focus Watershed: An Interdisciplinary Bioenergetics and Contaminants Study

Christian E. Zimmerman

Heidi K. Swanson

Michael P. Carey

Joshua C. Koch

Joel A. Schmutz

Abstract
Climate change is expected to result in increasing air temperatures in Arctic Alaska. How aquatic ecosystems respond to increasing temperature is poorly understood. We are conducting an interdisciplinary study in the Barrow-Atqasuk watershed to better understand how changes in thermal regimes may affect fish growth, food web structure, and bioaccumulation of mercury. Our research includes both collection of empirical data and modeling, and our overall aim is to enable better predictions of ecological and ecotoxicological consequences of climate change in Arctic lakes. Study lakes were selected from lakes monitored by the Circumarctic Lake Observation Network (CALON). Lakes in the CALON network are distributed across a latitudinal gradient, which we are using to examine physical and biological response to a range of thermal regimes. In this study, we are building upon the foundational data collected by CALON and examining how thermal changes affect aquatic ecosystems. We will develop a predictive model that simulates water temperature and ice thickness based on present and future atmospheric and landscape factors.
We will apply biochronological tools to determine the relationship between environmental variables and growth histories of fish. Bioenergetic models will be constructed to predict fish growth relative to temperature. Food web structure will be examined by developing models using stable isotope, water chemistry, and growth data to describe energy and mercury transfer through aquatic communities. Ultimately, integration of study findings will result in predictions of how increasing air temperature may influence lakes on the North Slope of Alaska.

Poster Abstracts

Poster: Community-Based Stream Habitat Mapping in Traditional Hydaburg Subsistence Use Areas

Cohen, Norman. The Nature Conservancy.

Christianson, Anthony. Hydaburg Cooperative Association.

Needham, Cathy. Kai Environmental Consulting Services.

Woll, Christine. The Nature Conservancy

Abstract

For the past two years, The Nature Conservancy, the Hydaburg Cooperative Association, and Kai Environmental Consulting Services have partnered to improve stream habitat mapping in the traditional subsistence use areas of the residents of Hydaburg on Prince of Wales Island. In 2012 and 2013, residents of Hydaburg actively performed fish and fish habitat surveys on all fish-bearing freshwater habitats in the Hetta Lake, Eek Lake, Natzuhini Creek, Kasook, Keete, Hydaburg River, and Nutkwa watersheds. These watersheds represent areas traditionally used by Hydaburg residents for harvesting salmon and other subsistence uses. They also represent watersheds currently under documented in the state's anadromous waters catalog as well as areas that are unprotected from future timber harvest. Surveys were intended to protect these watersheds as anadromous waters but also to document baseline habitat quality and quantity in the event of future changes in habitat conditions or to direct possible restoration actions where conditions are already degraded. Between 2012 and 2013, more than 40 km of streams have been surveyed, with a large percentage of them being submitted or eligible for submission as new anadromous water bodies. Partners hope to continue this work until all relevant watersheds in the area have been mapped as well as to expand these community survey and monitoring efforts to other communities on Prince of Wales Island.

Poster Abstracts

Poster: Chena River Basin Landscape-Scale Freshwater Physical Habitat Studies (2013-2016)

Falke, Jeffrey A. U.S. Geological Survey, Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska Fairbanks, Fairbanks, Alaska 99775 USA

Benda, Lee. Earth Systems Institute, Mt. Shasta, California 96067 USA

Adams, F. Jeffrey. Fairbanks Fish and Wildlife Field Office, U.S. Fish and Wildlife Service, Fairbanks, Alaska 99701 USA

Abstract
Watershed-scale analyses provide important information that contributes to our understanding of physical and biological processes that control the formation, maintenance, and distribution of freshwater aquatic habitats. We are currently developing a digital landscape model for the Chena River basin (Alaska) using NetMap, an integrated set of watershed terrain parameters and analysis tools. Attributes such as valley geometry, channel gradient, sediment supply, and wood recruitment and storage will be calculated across the basin. These factors will be used to characterize and rank habitat quality for Chinook salmon based on an intrinsic potential model. Field data will be used to parameterize and evaluate both the digital watershed and fish habitat quality models. In a separate but related study, we are building a network of stream water temperature sensors to characterize thermal regimes across the Chena River basin. Thermal regimes are important to aquatic ecosystems as they control species distributions, productivity, and abundance. Knowledge of the distribution of water temperatures across the Chena River basin will allow us to develop a spatial statistical stream network model and predict stream temperatures and thermally suitable fish habitats, as well as characterize uncertainty in those estimates, continuously throughout the basin. Pilot work to establish representative sites and evaluate logger installation techniques began in Summer 2013. In combination, these studies are expected to better our understanding of the influence of physical process and thermal regimes on fish habitats in the Chena River and provide useful tools for basin-scale resource management and planning.

Poster Abstracts

Poster: A spatially-explicit, age-structured stock assessment model of north Pacific sablefish, Anoplopoma fimbria

Fenske, Kari H. University of Alaska Fairbanks

Hanselman, Dana H. NOAA Auke Bay Laboratory

Quinn II, Terrance J. University of Alaska Fairbanks

Abstract
Sablefish are a commercially valuable long-lived groundfish species in the North Pacific. They are unique among groundfish because of their complex movement dynamics and potential for long distance migrations. Sablefish in the north Pacific are thought to be one stock, with ontogenetic movement from shallow shelf waters to deep slope habitats as they age. The current stock assessment for sablefish in the Alaska does not accommodate sablefish movement patterns, though 30 years of mark-recapture data exist. We present the preliminary methods from a spatial age-structured stock assessment model and movement estimates developed outside the assessment model.

Poster Abstracts

Poster: Bioelectrical impedance analysis as a measure of energy density in Arctic grayling (Thymallus arcticus)

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Lunde, Michael J. Alaska Cooperative Fish and Wildlife Research Unit, Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, AK 99775 USA

Bailey, Lauren T. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Fairbanks, AK, 99775 USA

Falke, Jeffrey A. U.S. Geological Survey, Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska Fairbanks, Fairbanks, AK, 99775 USA

Gryska, Andrew D. Sport Fish Division, Alaska Department of Fish and Game, Fairbanks, AK, 99701 USA

Abstract

The energetic status of fish represents the mass of protein and lipids stored for surplus energy, and is an important physiologic factor that reflects an individual's capacity for reproduction, migration, and life history expression and ultimately is a direct influence on survival. However, there is relatively little information on how energetic status fluctuates across life stages, seasons, and environments at the individual-level. Much of this uncertainty stems from the fact that traditional methods are time consuming, lethal, and not practical for repeated measures, field applications, or large numbers of individuals. The objective of this research is to develop methods to accurately characterize the energetic condition of Arctic grayling using a non-lethal method: bioelectrical impedance analysis (BIA). Before BIA can be employed extensively, statistical models specific to Arctic grayling must be developed which describe the relationship between BIA readings and estimates of energy content derived from proximate analysis (e.g., lipid, protein, carbohydrates, water, and ash). We collected grayling to parameterize BIA models in the field during Spring, Summer, and Fall 2013 to capture a range of individual conditions (e.g., post-spawning, rearing, pre-wintering). Here we present preliminary results contrasting various condition metrics through time from Arctic grayling populations in the Chatanika, Delta, Nenana, and Salcha river drainages of interior Alaska. Development of BIA models for grayling will allow for rapid, precise, and non-lethal measures of individual energy density in lab or field situations and serve as a critical step towards future research on the biology and ecology of the species.

Poster Abstracts

Poster: Effects of habitat variation on salmon populations in the Mat-Su Valley

Humphrey, Kristen

Davis, Jeff

Davis, Gay

Jensen, Leslie

Burns, Rachel

Crabb, Alison

Abstract
Multiple different physical and biotic variables can influence the abundance and growth of juvenile salmon among streams. Understanding these relationships is necessary to protect salmon habitat and to ensure continued salmon production. Stream water temperatures are an important habitat variable and are predicted to increase as a result of climate change in some Southcentral streams. In order to investigate the influence of water temperature on salmon habitat we sampled the fish community of 12 streams within the Mat-Su valley representative of three different stream types that have been shown to have distinct temperature regimes. Fish were sampled seasonally from a 200-m sampling reach in each stream with baited minnow traps. All salmonids were identified to species, measured for fork length, and weighed. Water temperatures were measured with data loggers and directly during sampling. A positive correlation existed between the relative abundance of coho salmon and stream temperature. However, higher abundance was associated with lower condition factors (length weight ratios). The higher temperatures observed may be energetically ideal for fish metabolism, but may result in density dependent growth limitation. These findings are consistent with other studies and demonstrates the need to further investigate factors influencing temperature effects to juvenile salmon growth and production.

Poster: Intergradation of Mitochondrial Lineages in Threespine Stickleback Populations Along the North Pacific

Lescak, Emily A.

Marcotte, Robert W.

Kenney, Leah A.

von Hippel, Frank A.

Colgren, Jeffrey J.

Sherbick, Mary L.

Abstract
We characterized the geographic pattern of intergradation between two ancient mitochondrial lineages of threespine stickleback (Gasterosteus aculeatus) populations within the North Pacific and determined boundaries in the distribution of the two clades. We established the mitochondrial clade designation of 1,327 individuals from 67 locations across approximately 8,000km of the coastal North Pacific using restriction fragment length polymorphism assays of the cytochrome b mitochondrial gene. We supplemented our dataset with published clade designations from additional North Pacific populations to test the correlation between clade composition of a population and its location along the North Pacific coastline. The western-most boundary of the Euro-North American clade is Simushir Island in the Kuril Islands and the eastern-most boundary of the Japanese clade is British Columbia. Coastline distance from Japan is a significant predictor of Japanese clade abundance. Clade composition variance is high at small geographic scales in apparent discordance with the broader scale pattern of intergradation. Such admixture zones present an opportunity to study patterns of introgression that arise when genomes that have adapted to different environments for extensive periods subsequently come into secondary contact. Patterns of stickleback clade abundance in the Kuril and Aleutian Islands mirror distributions of other taxa, suggesting shared biogeographic histories and the importance of deep-water trenches in shaping species distributions.

Poster Abstracts

Poster: Use of Sr:Ca in inconnu otoliths from the Kuskokwim River as an aid in describing anadromy

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Randy J. Brown, US Fish and Wildlife Service, Fairbanks FWFO, Alaska 99701

Abstract

An on-going radiotelemetry study on inconnu (Stenodus leucichthys) from the Kuskokwim River in Alaska has expanded our understanding of spawning locations, seasonal distribution, and movements throughout this drainage. This study has shown various degrees of anadromy in this population. Radiotelemetry data show that inconnu spawn in 4 to 5 upper Kuskokwim River locations during early fall. Twenty-two otoliths were collected from inconnu at their spawning grounds on the Big River and Middle Fork of the Kuskokwim River in late September 2011. Otolith Strontium:Calcium (Sr:Ca) levels were analyzed with a microprobe over entire thin-sectioned inconnu otoliths encompassing all of the annuli over the fishes lifetime prior to capture. Approximate Sr:Ca exposure and incorporation was examined for each otolith to ascertain the occurrence and degree of anadromy and to corroborate with the radiotelemetry data. Sr:Ca is positively correlated with salinity, with freshwater environments having significantly lower Sr:Ca values than marine systems. The otolith Sr:Ca distributions of two otoliths showed clear evidence of anadromy. However, Sr:Ca levels in the others suggested limited exposure to salt water. Most of the radiotagged inconnu overwintered in the lower Kuskokwim River and perhaps the upper reaches of Kuskokwim Bay, which is a brackish environment. Soon after spring ice out many of these fish swam upriver and spent summers at the mouths of major tributaries. However, some inconnu spent the entire summer in the lower Kuskokwim River and others spent the entire winter in the middle and upper Kuskokwim River with year to year variations for individual inconnu.

Poster: Relationships among mitochondrial haplotypes, sex, and phenotype in threespine stickleback from Prince William Sound and the Gulf of Alaska

Lucas, Ryan B.

Lescak, Emily A.

Colgren, Jeffrey J.

Sherbick, Mary L.

von Hippel, Frank A.

Abstract
Threespine stickleback (Gasterosteus aculeatus) belong to one of two mitochondrial clades that are thought to have diverged 0.8-1.2 million years ago. Individuals belonging to the Japanese clade are found primarily in coastal areas of the West Pacific basin, while the Euro-North American clade is found mainly in the eastern Pacific and Atlantic basins. However, Alaska and British Columbia are both regions of clade admixture. Using RFLP analysis of the mitochondrial cytochrome B gene, we identified the proportions of individuals with Japanese and Euro-North American haplotypes in oceanic and freshwater stickleback populations from islands located in the Gulf of Alaska and Prince William Sound. Both clades are present in this region, with the Euro-North American haplotype predominant over the Japanese. However, fine-scale sampling reveals a great deal of spatial heterogeneity in clade proportions. We are now testing for relationships between phenotype and clade as well as differences in clade proportions due to sex to better understand the roles of selection and demography in maintaining spatial heterogeneity in haplotype frequencies.

Poster Abstracts

Poster: Ontogenetic and spatial variation in the trophic roles of Chukchi Sea Fishes

Marsh, Jennifer M. University of Alaska Fairbanks, School of Fisheries and Ocean Sciences

Mueter, Franz J. University of Alaska Fairbanks, School of Fisheries and Ocean Sciences

Abstract
With climate warming and longer open-water seasons in the Arctic, there is an increased interest in shipping, oil exploration and the expansion or development of commercial fisheries. Anticipated natural and anthropogenic changes are expected to alter the ecosystem of the Chukchi Sea, including its fish communities. As a component of the Arctic Ecosystem Integrated Survey, our project is assessing the ontogenetic, spatial and temporal variability of the trophic roles (trophic level and diet source) of key fish species in the Chukchi Sea using C and N stable isotope data in the absence of a commercial fishery. Unlike diet analysis, stable isotope analysis integrates only food items assimilated by consumers, accurately representing a transfer of energy between trophic levels. During August and September of 2012, sixteen fish species and three baseline invertebrate species were collected from surface, midwater and bottom trawls within the U.S. Chukchi Sea. Generalized additive models were used to detect possible variation in the relationship between length and either δ13C or δ15N among water masses (or other environmental variables) letting either δ13C or δ15N co-vary with length for each fish species. We present preliminary results on the ontogenetic and spatial variability in the trophic roles of saffron cod (Eleginus gracilis), Arctic cod (Boreogadus saida), chum salmon (Oncorhynchus keta) and walleye pollock (Theragra chalcogramma).

Poster Abstracts

Poster: An In-Season Run Timing Prediction Model for Yukon River Chinook Salmon

Mecum, Bryce D. UAF

Adkison, Milo D. UAF

Quinn, Terrance J., II UAF

Hamazaki, Toshihide ADFG

Mundy, Phil R. NOAA

Abstract
The Yukon River Chinook Salmon fishery is considered a gauntlet fishery, where salmon are harvested in numerous fisheries along the main stem of the river and its tributaries. Historically, fishing effort in both subsistence and commercial fisheries has been controlled through time and area closures as well as gear restrictions. Due to this indirect method of controlling catch, it is crucial for fisheries managers to be able to predict both the timing and abundance of salmon throughout the river and during the entire migratory season. This research aims to assist managers by providing a set of models to (1) predict arrival timing at the mouth of the river and (2) produce in-season estimates of run timing and relative abundance at various locations along the river. These models represent a synthesis of a diverse set of information types which include sonar counts, test fishery catches, genetic stock identification and radio telemetry data. This research will be incorporated into a tool which will be made available to managers as well as interested members of the public.

Poster Abstracts

Poster: Ecology and Genetics of a Newly Discovered Population of Chinook and Other Salmonids in Portage Valley, Alaska

Nishkian, Maio A. UAA Dept. Biological Sciences. mnishkian@uaa.alaska.edu

Padula, Veronica M. UAA Dept. Biological Sciences

Rinella, Dan J. UAA Dept. Biological Sciences

Chilcote, Mark W. U.S. Forest Service Girdwood

Causey, Doug UAA Dept. Biological Sciences

Abstract

Salmon are vital component to Southcentral Alaska's freshwater and marine ecosystems, and are the basis of active commercial, sport and subsistence fishing lifestyles of many Alaskans. Population declines in recent decades of coho (-45%) and chinook (-85%) salmon in the upper Cook Inlet may indicate that these and other salmonids are ecologically unstable. We predicted that marginal populations in glacier dominated drainages were least impacted than other more accessible populations, and began survey in the Three Rivers region of upper Turnagin Arm. This complex drainage system comprises Portage, Placer and Twentymile watersheds, which all drain into Turnagain Arm and Cook Inlet. During Fall and Winter of 2012-2013, we made the first discovery of juvenile chinook salmon in Portage Valley, and documented significant populations of coho salmon, Dolly Varden, and other salmonids. Ground water and active glacier streams proved to be important factors for juvenile rearing, but the specifics of habitat use by individuals and species is complex and still under study. Population and landscape genetic analysis using SNPs is helping provide greater insight into the relationships, migration and evolution of the Three Rivers salmonid populations. These observational studies and genetic analyses will help form better conservation plans and management of this newly discovered fisheries resource.

Poster: Arctic Coastal Ecosystem Survey (ACES) characterizations of near-shore fish processes

Samual George

Ann Robertson

Mark Barton

Abstract
The Arctic nearshore is important for sustaining resources for local Alaskans as well as the fish and animals on which they subsist. The retreating sea ice trend has drawn the attention of industries that could potentially affect the ecosystems function. The ACES project aims to establish a baseline to document changes in the Arctic nearshore in the face of climate change, as well as characterize the role of the Arctic nearshore as a nursery for juvenile fish and foraging grounds for larger predators. The project builds on the earlier work by Thedinga et. al (In Press) who conducted brief trawling and seining surveys to provide an initial characterization of the arctic near shore ecosystem. In summer 2013, seining portion was conducted from 14 July to and 25 August. A total 22,050 fish were caught representing about 40 species of which 98% were age 0. sandlance and capelin made up about 75% of the catch. We conducted weekly seining of 12 different sites: 5 Chuchki, 2 Beaufort, 2 Elson Lagoon, and 1 North Salt Lagoon. Our surveys showed some similarities to their results but indicated that the situation is much more complex than formerly thought and the fish (species) assemblage changed both temporally and spatially than the initial studies. It was clear from the surveys that these nearshore waters act as a nursery for young of the year forage fish such as sandlance, capelin, arctic cod and various sculpin species.

Poster Abstracts

Poster: Habitat Assessment and Relative Abundance of Lamprey Ammocoetes in the East Fork of the Andreafsky River, Alaska

Shink, Katie G. University of Alaska Fairbanks

Mears, Jeremy D. U.S. Fish & Wildlife Service

Lopez, Juan A. University of Alaska Fairbanks

Sutton, Trent M. University of Alaska Fairbanks

Abstract

To characterize baseline habitat preference and distribution for larval lamprey (Lenthenteron spp.), relative abundance (catch-per-unit-effort; CPUE) and habitat assessments were conducted from June through July 2013 in the East Fork of the Andreafsky River, Alaska. Specific objectives of this study were to: 1) identify optimal habitat zones for larval lampreys; 2) determine distributional gradient of larval lampreys; and 3) associate habitat parameters to larval lamprey abundance. Relative abundance was determined by the number of known volume bucket samples it took to capture a target sample size (n = 300). Larval density, larval length, substrate size, hydraulic conductivity, organic content, current velocity, water depth, water temperature, pH, and dissolved oxygen were measured at 29 sites, spanning 90 river kilometers, on the East Fork of the Andreafsky River. Relative abundance of larval lamprey at 15 sites that were determined to be optimal habitat was 6.06 larval lampreys per known volume bucket sample. Multiple regression analyses yielded no evidence of linkages between larval abundance and six of the eight measured habitat parameters. Regression analyses encompassing all habitat parameters are pending because of ongoing assessments of two habitat parameters (substrate size and organic content). To complement the habitat preference study, evaluations have been initiated to characterize the degree of genetic differentiation and the levels of gene flow between Lenthenteron populations in Alaska through a combination of multi-locus microsatellite genotypes and mitochondrial DNA sequencing.

Poster Abstracts

Poster: Will There Be More Zombie Crabs with a Warming Climate?

Sloan, Leah M. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Hardy, Sarah M. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Abstract

The parasitic barnacle Briarosaccus callosus can infect all commercially-harvested Alaskan king crab species. Once infected the crabs are transformed into "zombie crabs". In other words, the parasite does not kill its crab host, but reduces it to no more than a body that is controlled by the parasite. Infected crabs can no longer reproduce; instead they raise and care for the eggs and larvae of the parasite. Prevalence and distribution of B. callosus is poorly understood. Most records indicate a low level prevalence (< 1%) throughout Alaskan waters. However, outbreaks have occurred in some areas of southeast Alaska where over 75% of king crabs were infected. B. callosus outbreaks at this level will greatly reduce reproductive output in king crab populations and likely lead to population declines. Causes of variability in B. callosus prevalence have not been identified. There is some evidence that warmer water temperatures may increase survival of B. callosus larvae. Due to climate change, increased water temperatures are expected in the arctic and subarctic, suggesting that B. callosus could increase in prevalence. We are examining the effects of temperature on B. callosus larval development and infection rate. To this end, we raise larvae at a range of temperatures to determine larval survival under different temperature regimes and then allow larvae to infect juvenile king crabs to assess how temperature influences infection rate. This study will inform managers about the water temperatures most likely to promote outbreaks of B. callosus now and in the future.

Poster Abstracts

Poster: A Comparative Histological Analysis of Pacific Hake, Darkblotched Rockfish and Canary Rockfish Maturity and Reader Variability from Samples Collected Along the U.S. Pacific Coast

Stokes, Gretchen L. North Carolina State University

Head, Melissa. NOAA Northwest Fisheries Science Center

Hastie, James D. NOAA Northwest Fisheries Science Center

Abstract

Maturity analysis of histological characteristics, oocyte diameter, maturity stage, and presence of atresia is necessary for estimating the maturity status, spawning potential and fecundity of a fish species. This study compares analysis measurements between two independent readers to identify potential bias in estimates of the lengths and ages at which 50% of a population reaches maturity (L50, A50), for three species of groundfish (Merluccius productus, Sebastes pinniger, and Sebastes crameri). It also aims to understand how reader variability may be correlated with species according to life history and estimated lifespan. Variability data were modeled using glm, nls and Gompertz programming in R and the best fit model was selected for each species, based on model robustness and AIC values. Traditionally an asymptote of 1 is assumed in calculating L50. We suggest an alternative approach to asymptotic determination for some species. A comparison of present to historical age and length at 50% maturity indicates changes in the onset of spawning as a potential effect of increased fishing pressure, environmental changes, or methodological changes in determining maturity. These data provide stock assessment scientists with a coefficient of variation for maturity curves and support the use of multiple readers in future studies. With continued efforts, these data will enable scientists to establish a reader protocol for standardized measurements to reduce reader variability and incorporate variability estimates into assessments. A better understanding of maturity analysis will prove useful for understanding reproductive output and providing stronger management recommendations to support reproductive success of groundfish species.

Poster Abstracts

Poster: Early Marine Ecology and Regional Discrimination of Chum Salmon in Alaskan Waters Using Otolith Elemental Analysis

Sutton, Trent M. University of Alaska Fairbanks

Pangle, Kevin L. Central Michigan University

Abstract
Chum salmon Oncorhynchus keta are the most widely distributed Pacific salmon in Alsaka; however, few studies have examined their early marine life history. Further, chum salmon exhibit lower genetic divergence than other Pacific salmon, thereby reducing reliable stock delineation using standard genetic methods which have historically been used for resolving stock mixtures for salmonids. The objectives of this study were to examine the utility of using otolith elemental analysis to examine the early marine ecology of juvenile chum salmon and determine the feasibility for differentiating among and within-region variability of fish collected from the Chukchi Sea (wild origin), North Bering Sea (wild origin), and Southeastern Alaska (Icy Straight; wild versus hatchery origin). Elemental concentrations (particularly Strontium and Barium) along otolith transects provided a clear indication of the timing of ocean entry. Consistent peaks in Strontium concentration at the otolith core were indicative of maternal effects, the magnitudes of which have shown to serve as a proxy for parental female duration spent in freshwater prior to spawning. Based on the otolith element composition associated with early life history in freshwater, accuracy of discrimination from neighboring regions was relatively high (mean = 85.8%). In contrast, the ability to discriminate fish among sites within a region was relatively poor (mean = 28.7%). These results suggest regional separation among chum salmon stocks, but a mixed-stock assemblage within regions. Hierarchical cluster analysis of otolith elemental composition revealed distinct groups of individuals that were independent of location, further supporting the mixing of stocks within regions.

Poster Abstracts

Poster: Summary of Chinook Salmon Escapement, Distribution, and Run Timing in the Togiak River Watershed Using Radio Telemetry, Togiak National Wildlife Refuge, Alaska, 2008-2012

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Sethi, Suresh, A., U.S. Fish & Wildlife Service, Biometrics, Anchorage, AK, USA 99503; 907-786-3655; suresh_sethi@fws.gov

Abstract

Chinook salmon Oncorhynchus tshawytscha returning to spawn in the Togiak River watershed are harvested in subsistence, sport, and commercial fisheries. Recent Chinook salmon production throughout the region, as well as much of Alaska, is in decline. In response to stakeholder concerns, we instituted a comprehensive radio telemetry study to examine Chinook salmon run timing and spawning distribution within the Togiak River drainage beginning in 2008. Using fixed stations, aerial searches, and intense boat tracking, we were able to record fish movement and use within the system, as well as assign fates to our radio tagged fish. Our telemetry work revealed a spawning distribution that consistently differs from that observed in traditional aerial counts conducted from 1987 to 2005. Spawning distribution within the mainstem and between its tributaries is variable to some extent from year to year. We will also present information on fish movement, including preliminary data on lower river mainstem holding behavior and 'drop back' movement into Togiak Bay. Tests to determine differences in run timing between tributary and mainstem spawning populations indicate that tributary fish entered the lower river earlier than mainstem spawning fish. A mark-recapture component was added to the study in 2010 to estimate spawning population abundance

Poster Abstracts

Poster: Length-Weight-Age Relationships of Demersal Fishes in the Beaufort Sea

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Edenfield, Lorena E. Institute of Marine Science, School of Fisheries and Ocean Sciences, 134 O'Neill, University of Alaska Fairbanks, Fairbanks, Alaska 99775 USA

Holladay, Brenda A. Institute of Marine Science, School of Fisheries and Ocean Sciences, 134 O'Neill, University of Alaska Fairbanks, Fairbanks, Alaska 99775 USA

Abstract

Interest is increasing in Arctic marine fish species due to climate change and recent increased activity in oil and gas exploration in the Beaufort Sea. Though studies have been conducted on fish distribution and community analyses, this study's focus is understanding the basic life history, such as length, weight and age, of nine common species found in the offshore waters of the Beaufort Sea: Arctic Cod (Boreogadus saida), Saffron Cod (Eleginus gracilis), Arctic Staghorn Sculpin (Gymnocanthus tricuspis), Shorthorn Sculpin (Myoxocephalus scorpius), Arctic Alligatorfish (Aspidophoroides olrikii), Canadian Eelpout (Lycodes polaris), Stout Eelblenny (Anisarchus medius), Slender Eelblenny (Lumpenus fabricii), and Bering Flounder (Hippoglossoides robustus). Fish were captured using bottom trawls. Length-weight relationships were analyzed using the fisheries equation W=aLb. Otoliths were transversely sectioned, then photographed under transmitted light and aged by two readers independently first, then in collaboration. Length-at-age regressions were calculated. Lengths ranged from 21 mm to 300 mm across species. All but two species' weight-length regressions had r2 values from 0.93 to 0.97. The range of b values was 3.18 – 2.58, with eight out of nine species showing isometric growth. All species had linear length-at-age relationships. In the future, more fish will be added from current cruises to create a firmer understanding of the basic life history of these Arctic fish species.

Poster: Community Composition and Feeding Ecology of Fishes in Southeast Alaska Estuaries

Whitney, Emily J. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Juneau, AK 99801

Beaudreau, Anne H. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Juneau, AK 99801

Bergstrom, Carolyn A. University of Alaska Southeast, Juneau, AK 99801

Abstract
Estuaries are highly productive habitats at the boundary of the terrestrial, freshwater, and marine environments, and provide a vast number of ecosystem services. In Southeast Alaska, rapidly receding glaciers and changes in rainfall will have a major impact of freshwater discharge and could affect the transport of nutrients to coastal ecosystems. Estuaries are highly variable by nature and detecting future climate-driven or anthropogenic changes in estuarine communities requires information on their current range of spatial, seasonal, and interannual variation. Therefore, in this study our objectives are to 1) characterize the structure of fish and invertebrate communities in three Juneau estuaries adjacent to watersheds that differ in degree of glacial and forest coverage and 2) quantify spatial and temporal variation in the relative importance of energy and nutrients delivered to estuarine food webs. We will use stable isotope (carbon, nitrogen, and sulfur) and diet analysis in concert to examine the feeding habits and trophic positions of estuarine fishes. In August 2013, during an initial field sampling, 151 fish from 6 taxa were collected in beach seines at two Juneau estuaries for stomach content analysis and future stable isotope work. Additional sampling will occur between fall 2013 and fall 2015 and will include an additional estuary site. Here we will outline our project goals and provide an overview of the methodology that will be used to establish a baseline for assessing future change in these estuarine communities.

Alaska Chapter of the American Fisheries Society

40th Annual Business Meeting Agenda

10 October 2013

Fairbanks Princess Lodge, Fairbanks, Alaska

1. Call to Order – Mark Wipfli (President)
2. Determination of a Quorum
3. Approval of Agenda
4. Approval of minutes from the 2012 Alaska Chapter AFS Business Meeting
5. Reports
   a. Treasurer's report — Lee Ann Gardner
   b. Committee reports
      i. Awards — Theresa Tanner
      ii. Continuing Education — Tammy Hoem Neher
      iii. Cultural Diversity — Sara Gilk-Baumer
      iv. Electronic Communication — Burt Lewis
      v. Environmental Concerns — Cecil Rich
      vi. Finance — Ray Hander
      vii. Fisheries Communication and Education — Katrina Mueller/Cheryl Anderson
      viii. Membership — Jennifer Stahl
      ix. Molly Ahlgren Scholarship — Ray Hander
      x. Newsletter — Bill Bechtol
      xi. Past Presidents — Trent Sutton
      xii. Program — Phil Loring
      xiii. Resolutions and Bylaws — Hamachan Hamazaki
      xiv. Student Sub-units — Kari Fenske
      xv. Wally Noerenberg Award — Ken Gates
6. Outgoing President's Address – Mark Wipfli
7. Old Business
8. New Business
   a. AFS Western Division report (Christina Swanson)
   b. Update to Vice President election
   c. Reappointment of all committee chairs
9. Open forum
10. Adjourn

Alaska Chapter of the American Fisheries Society

39th Annual Business Meeting Notes

24 October 2012

Kodiak Convention Center, Kodiak, Alaska

1. Trent Sutton, President, called meeting to order at 5:21 p.m.
2. A quorum was present.
3. Agenda was presented and approved unanimously without changes.
4. 2011 minutes were presented and approved unanimously without changes.
5. Reports
    a. Treasurer's Report: Lee Ann Gardner handed out the Chapter financial summary. She reminded the attendees that the bylaws require the Treasurer to hand out a hard copy and suggested that if it was moved to eliminate this requirement we could save some trees. Attendance to the meeting so far is 220 and surpasses the goal of 200. Meeting gross revenues $60,000 so far. The balance is inflated because we haven't paid bills for the meeting yet. Royalties this year from Fishes of Alaska total $1,100 which go in to the general fund.
    b. Committee Reports
        i. Awards: Teresa Tanner stated that she typically submits her report after the meeting so it includes all the awards. The best student paper award went to Trevor Haynes for his talk entitled, "Using Multiple Survey Methods to Examine Detection Probabilities of Arctic Fishes in Lakes in the North Slope, AK". The best student poster was awarded to Kyle Shedd for, "Trophic Patterns of Mercury Accumulation in a Anadromous Aquatic Ecosystem, in Southwest Alaska".
        ii. Continuing Education: Tammy Hoem Neher planned 7 workshops but cancelled four due to lack of enrollment. She surveyed the membership to determine the workshop topics and had 74 respondents. Unfortunately response to the poll didn't translate to class attendance. Classes offered were: Aircraft Survival, Hands on DIDSON and Scientific writing with statistics. Cost of paying instructor expenses and fees dictated price resulting in elevated prices this year due to remote location of the meeting.
        iii. Cultural Diversity: Sarah Gilke-Baumer reported having eight great applicants of which two, Casey Stockdale and Danielle Duncan, were awarded funds. Next year she will update the application because it is getting outdated.
        iv. Electronic Communication. Allen Bingham was chair but it is vacant. Audra Brase has taken on the webpage duties, Hamachan Hamazaki manages the list serve. Bert Lewis volunteered to take over management of the membership database from Allen.
        v. Environmental Concerns: Cecil Rich stated that the committee was established by the Excom to provide comments on issues that could affect Alaska's fisheries resources. The committee considered a letter from Rick Steiner encouraging the Chapter to urge the legislature to develop a Scientific Advisory council. The Excom declined to support promoting development of a scientific advisory council because the legislature was unlikely to favor it. There was a question for the attendees about whether the Chapter is going to take a position on Pebble Mine. Trent summarized that a resolution asking for independent review of the data has been approved by the parent Society and will be put to the Society membership for review, comment and ultimately a vote.
        vi. Finance Committee: Lee Ann reported for Ray Hander. The committee is Lee Ann, Ray

and Tim Joyce. The committee purpose is to provide financial oversight on investment of Chapter funds. The committee meets quarterly and reviews recommendations of the investment planner. The goal of investing is 4-5% return. Chapter funds are currently invested conservatively because of market volatility. Chapter moneies are in 3 funds: Cultural Diversity, Molly Algren and Wally Noerenberg. Have dispersed $4,800 during this meeting to recipients.

vii. Fisheries Communication and Education: Cheryl Anderson will be giving a luncheon presentation on using social medial as a communications tool.

viii. Membership: Phil Loring detailed the membership this year compared to last year with 250 regular members (211 last year), 32 down from 35 lifetime members, 104 student members down from 110 students last year and a grand total of 435 members (up from 425 last year). Of the Chapters in the Western Division, Washington and Oregon are larger than Alaska but WA had national meeting so that bolsters numbers.

ix. Molly Ahlgren Award: Hal Geiger reported for chair Ray Hander that the committee had the most angst this year of any year since committee inception in 2005 because they had so many good candidates but they did pick one (Ryan Lucas, a biology student at UAA).

x. Newsletter: Bill Bechtol reiterated that article submission deadline is the 10th of month before each quarter. He publishes a feature article. Connie Taylor lays it out and she and Bill then circulate the draft to some chairs. There was no extra election issue this year. He printed 65 paper copies and circulated 2,038 electronic copies. Total cost was $1,650. He's always looking for articles so contact him with your ideas and submissions. He recalled the days when significant revenues were needed from annual meeting revenues to publish the news letter which is thankfully no longer the case.

xi. Past Presidents: Audra Brase reviewed the topics at the Past Presidents lunch where eight PP's and Mark Wipfli and Trent Sutton attended. Covered topics were the National Meeting bid, getting more attendees at the continuing education classes and ideas for publicizing the existence of the American Institute of Fisheries Research biologists (AIFRB) such as the organization giving an award. Other ideas were for AIFRB to submit an article in the newsletter, have a student award in AIFRB's name or mentor a student by paying their AFS membership fees. The PP's also spoke about involving more people in meeting planning and growing people up through the Excom.

xii. Program Committee: Mark Wipfli was pleased with the successful meeting so far. He thought that 220 registrants was good for a remote location. He felt that the three continuing education classes, three good plenary speakers and 18 special sessions helped contribute to the attendance. Additionally there were 25 posters, 122-123 oral presentations, five socials and six tours. Still to look forward to, is the social with music by local band White Twang (who will be Twang once removed due to a member's absence). The auctioneer, Michael Bach, a UAF student, has lots of great auction items and there are many excellent silent auction items. Contributors include Bering Sea Fishermen's Association, ADF&G, etc.

xiii. Resolutions and Bylaws. Hamachan Hamazaki reported there were no resolution requests and no bylaw change requests this past year.

xiv. Student subunit. Thomas Farrugia reported the Kodiak meeting was attended by 49 students this year and 34 of those students are presenting. The Chapter supported 28 of the attending students with travel expenses. During 2011/2012 students attended the Wakefield Symposium and the National meeting. All three student chapters have been growing and increasing their participation in various fisheries meetings. The subunits convened a student symposium in April supported by AFS. There are 19 new graduate students in the

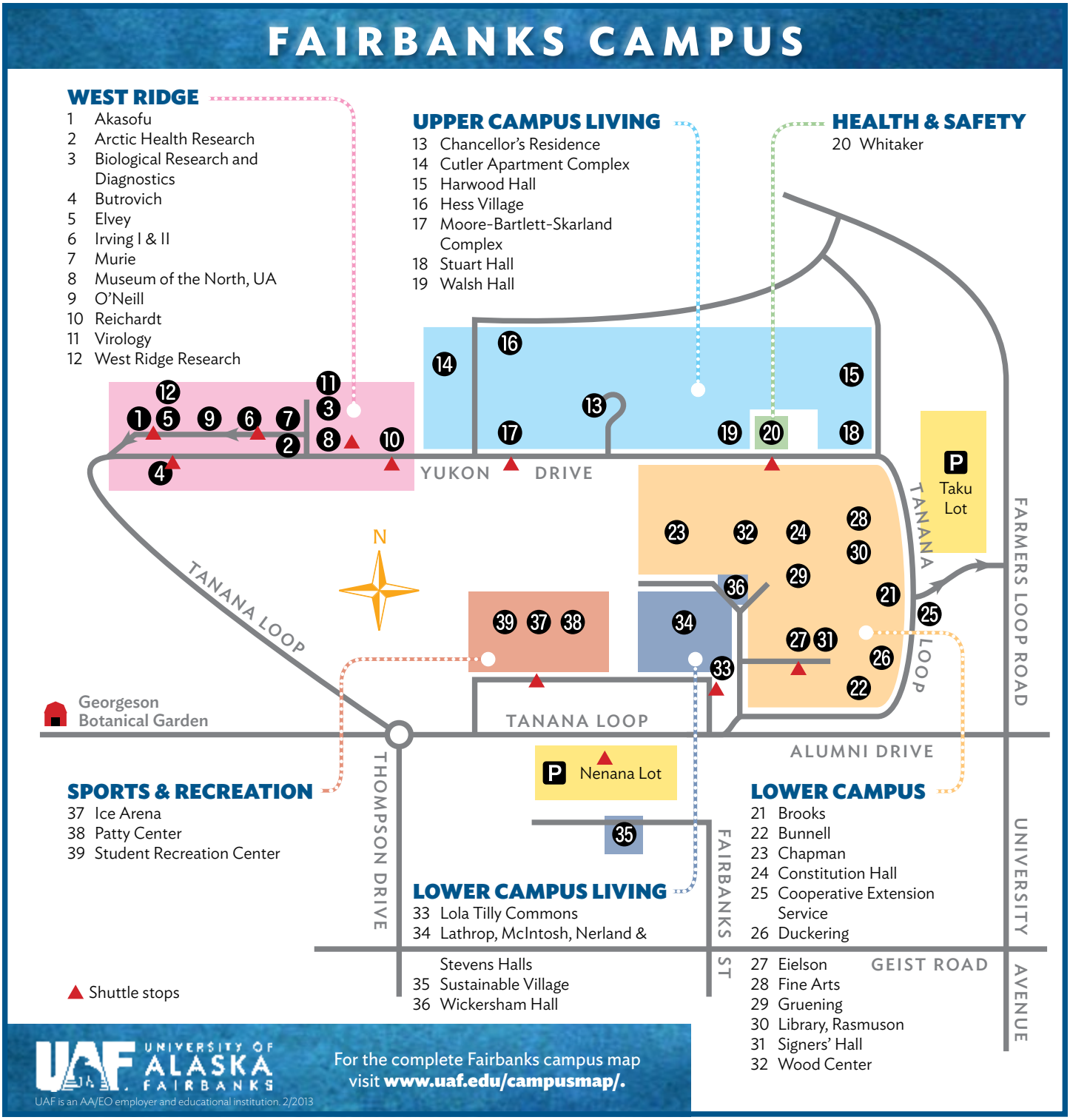
subunit. Carrie Fenske is the new student representative. Thomas suggested trying to get more students in APU and UAK SE to join the subunit.

xv. Wally Nornberg Award: Ted Otis reported for Ken Gates that there have been 15 recipients since the award inception in 1981. Committee is made up of three past presidents and one general member and consists of Bill Wilson, Hal Geiger and Bill Bechtol. The membership rotates with a new past president appointed to replace the longest sitting member. Jim Reynolds will replace Bill Wilson this year. Not many nominations this year but many last year and there will be an award this year. They can hold nominations for 2 years but nominee can resubmit. Deadline for submission January 31. (Chuck Meacham was the recipient this year and donated the award money to student travel).

6. Outgoing President's Address – Trent Sutton spent much of his time as President on iterations of bids to host for various meetings including the World Fisheries Congress (unsuccessful) and the 2016 National AFS meeting bid which evolved into the 2017 National AFS meeting bid. No other chapters have submitted a bid for the 2017 national meeting so he thinks we are in a good position to host that meeting. He thanks everyone for their support. Mark presented Trent with an award for his service as President.
7. New Business
   a. AFS Western Division (WD) report: Mary Buckman, the Secretary/ Treasurer for Western Division explained that the chapters don't interact with the Parent society directly but rather resolutions and other business goes through the divisions. The goals of the divisions are to share regional information at the division meetings that happen each spring. WD meetings will be in Boise (2013), Mazatlan (2014) (1st part of April), Portland (2015). There will be travel support for the Mazatlan meeting from contributions at the National level as well as from WD and from each chapter. A comment was made that it's difficult to go to the WD meetings because the timing is when people are preparing for the field season. WD provides a voice to issues through resolutions which this year were the Bristol Bay and Snake River dam resolutions which were both approved at the national meeting this year. WD signed on to an amicus brief Dec. 9 on a Supreme Court case on whether sediment from logging roads is point source or non-point source pollution. They will speak as a friend of court. Gus Rassam, the executive director of AFS, is retiring so an executive director in Bethesda is being recruited. Other chapters are frustrated interacting with Bethesda so there is hope that a new administration will improve communication and efficiency. Governing Board is too big so they are looking at ways to make organization to work better. Western Division is looking at having a student representative on the WD Excom.
   b. Election update - Vice president elect is Jennifer Stahl and Lee Ann is the treasurer again.
   c. Karen Gillis, the Executive Director of Bering Sea Fishermen's Association, reported on the bids to host the World Fisheries Congress and the 2016 National AFS meeting that she and Visit Anchorage representatives submitted. Although there the WFC bid was unsuccessful, she was encouraged by all the support and believes that Alaska is a likely location for a future WFC. The rates that were promised by hotels and convention centers for the 2016 National AFS meeting are in place for the 2017 for the national meeting bid. She will be in Little Rock to submit the bid for the 2017 meeting. It will require a big organizing committee and be a huge undertaking. The point was made that more chapter volunteers must be identified before the bid is submitted.
   d. 25-year Membership Pins will be presented at the banquet. Jeff Adams is one of the recipients and was recognized at the business meeting.
8. Reappointment of all committee chairs: As empowered in the Alaska Chapter bylaws, Mark Wipfli reappointed all the committee chairs with the exception that Bert Lewis will manage the membership database, Trent Sutton will replace Audra Brase as the chair of the Past President's Committee, Jennifer Stahl replaces Phil Loring on the membership committee, Phil Loring moves to chair the Program Committee and Thomas Farrugia passes the chair of the Student Subunit committee to Carrie Fenske.

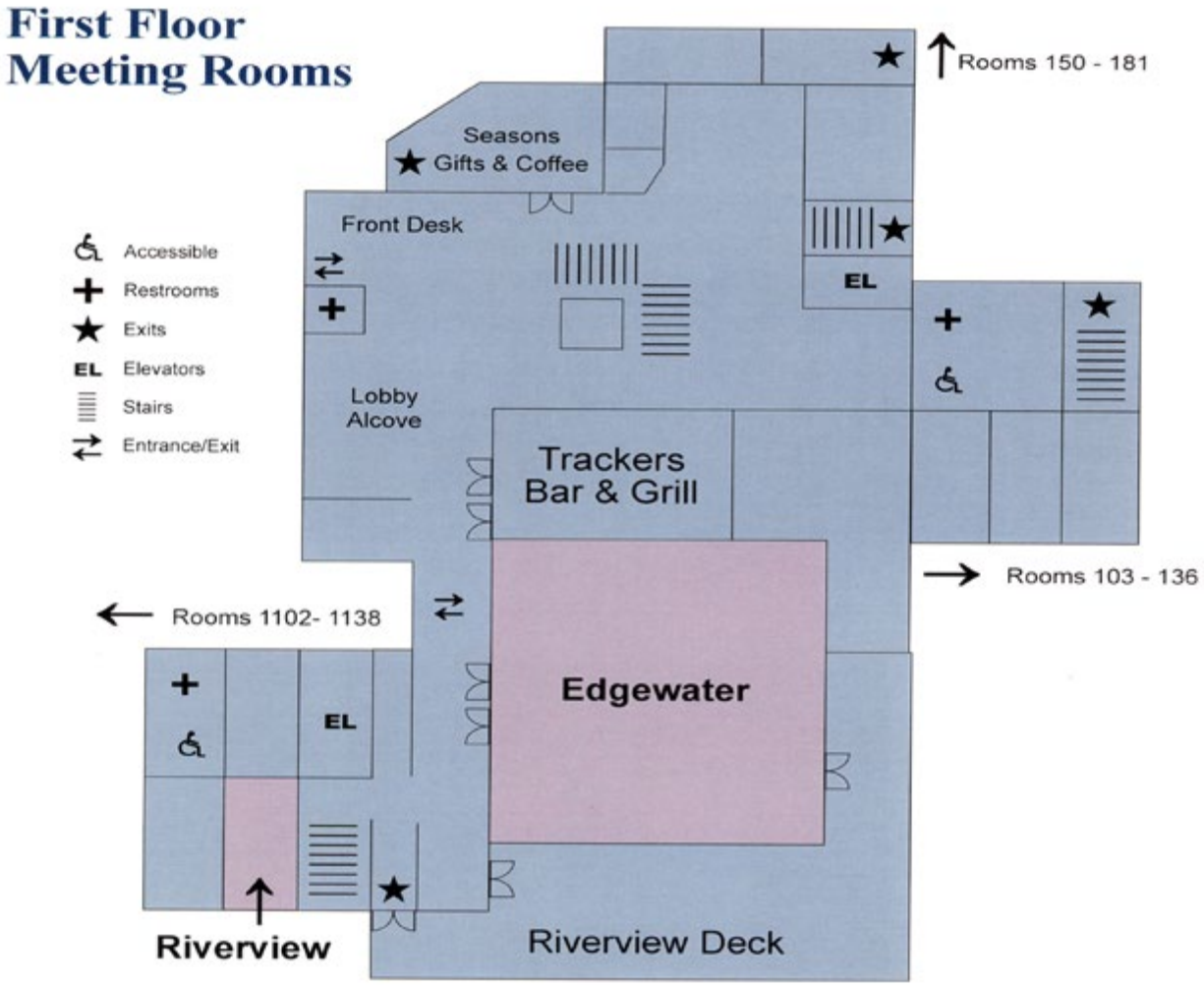
9. Open forum: Ron Wolfe SE Alaska Corp Natural Resource Manager and Doug Martin, consultant to SE Alaska Corp made a proposal to convene a symposium of forest practices and impacts on salmon at the next Chapter annual meeting on the topic of whether current forest practices are achieving the goal of fisheries sustainability. There have been advances in forest practices. it is timely to review the impacts of current forest practices and forest rehabilitation work. The first symposium on this topic was in 1968 and kicked off a lot of research. The last forum on the topic was in 1984. They support the AFS meeting being held in Juneau in 2013 to improve attendance to the symposium. The symposium topics would be open rather than chosen beforehand but they want it focused on forest practices and fisheries in SE. It would result in the meeting in Juneau being out of cycle. A comment was made that it's Fairbanks' turn so it could illicit complaints. It would be good to pair up with other agencies such as USFS to have a joint meeting. Could have a workshop instead of having the entire meeting in SE.
10. Comments from attendees: Randy Brown, Chapter Historian, requested documents from Trent from his term.
11. Pat Holmes, retired biologist, was pleased that retired people could attend without paying a registration fee. He is proud of the society. He stated that mentorship is very important; he mentored Lee Ann as a graduate student. He started Fisheries and Education Committee. Suggested job fairs and social sessions to advise students on how to get work in fisheries. Pat praised the advertizing for this meeting. He suggested find out who the tribal leaders are when the annual meeting is held to to encourage them to attend.
12. Ted Otis moved to do away with paper business report. It was seconded and supported unanimously.
13. Moved to adjorn and adjourned at 6:50.

University of Alaska Fairbanks Campus Map



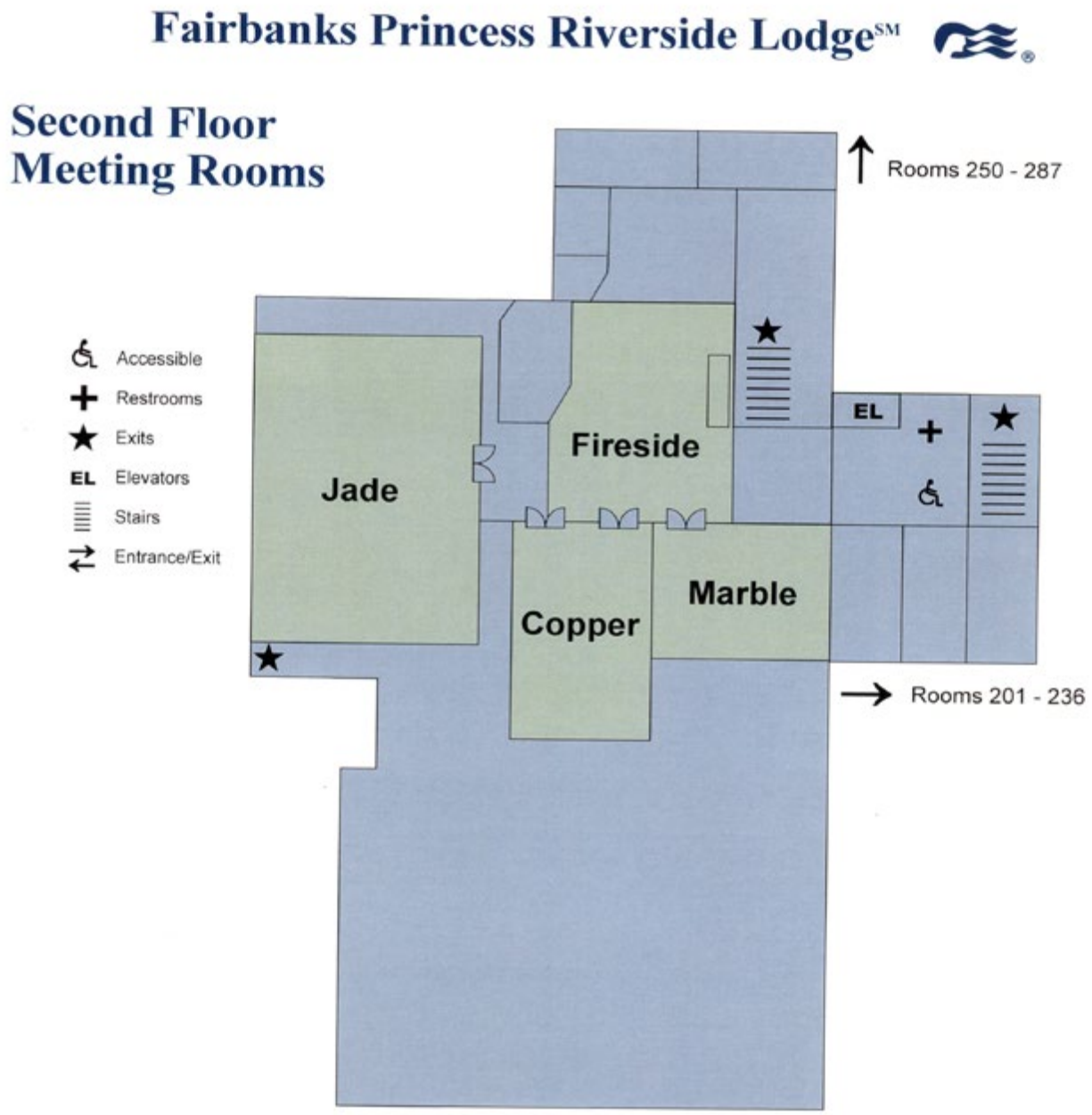
Princess Lodge Map, Floor 1

Fairbanks Princess Riverside Lodge℠



	Square Feet	Dimensions	Hollow-Square Seating	U-Shaped Seating	Banquet Round Seating	Boardroom Seating	Classroom Seating	Theater Seating	Reception
Edgewater	4,800	80' x 60'	200	120	360	120	220	370	400
Jade	2,200	50' x 44'	50	40	150	50	100	185	200
Copper	1,240	40' x 31'	45	30	90	36	50	100	125
Marble	527	31' x 17'	–	20	30	24	22	40	55
Riverview	368	16' x 23'	–	–	20	20	18	25	20
Fireside	312	12' x 26'	–	–	–	–	–	–	20

Princess Lodge Map, Floor 2



	Square Feet	Dimensions	Hollow-Square Seating	U-Shaped Seating	Banquet Round Seating	Boardroom Seating	Classroom Seating	Theater Seating	Reception
Edgewater	4,800	80' x 60'	200	120	360	120	220	370	400
Jade	2,200	50' x 44'	50	40	150	50	100	185	200
Copper	1,240	40' x 31'	45	30	90	36	50	100	125
Marble	527	31' x 17'	–	20	30	24	22	40	55
Riverview	368	16' x 23'	–	–	20	20	18	25	20
Fireside	312	12' x 26'	–	–	–	–	–	–	20

Sponsor and Venue Information

http://www.atstrack.com

http://www.alaskanbeer.com

http://accap.uaf.edu

http://seagrant.uaf.edu/

http://www.alaskasealife.org

http://www.alaskaseafood.org

Sponsor and Venue Information

http://www.afs-alaska.org

http://www.beaversports.com

http://www.bigrays.com/

http://hoodoobrewery.com/

http://ine.uaf.edu/werc/human-dimensions-laboratory/

Sponsor and Venue Information

Karen Olanna Sculpture

http://www.karenolanna.com

Miller's Landing

http://www.millerslandingak.com/index.php

UNIVERSITY OF ALASKA MUSEUM OF THE NORTH

http://www.uaf.edu/museum/

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http://www.princesslodges.com/fairbanks-lodge.cfm