




ALASKA  
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SYMPOSIUM

**JANUARY 28 – FEBRUARY 1, 2019**  
**HOTEL CAPTAIN COOK & ANCHORAGE HILTON**  
**ANCHORAGE, ALASKA**

*Showcasing Marine Research in the Arctic Ocean, Bering Sea, and Gulf of Alaska*



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## MONDAY, JANUARY 28

1:00 p.m. – 1:30 p.m.

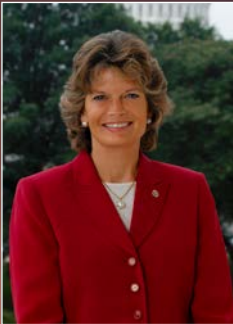
### WELCOME & OPENING REMARKS

Betsy Baker, Executive Director, North Pacific Research Board  
Molly McCammon, Executive Director, Alaska Ocean Observing System

### CONGRESSIONAL VIDEO ANNOUNCEMENTS

1:10 – 1:15 pm

**Senator**  
**Lisa Murkowski**



1:15 – 1:20 pm

**Senator**  
**Dan Sullivan**



1:20 – 1:25 pm

**Representative**  
**Don Young**



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# Keynote Speakers

## Monday, January 28

1:30 p.m. – 2:15 p.m.

**PETER HAEUSSLER, PH.D., RESEARCH GEOLOGIST, U.S. GEOLOGICAL SURVEY<sup>†</sup>**

### Earthquakes and Tsunamis of the Southern Alaska Margin and their Relationship to the 30 November 2018 M7 Anchorage Earthquake



The M7 Anchorage earthquake of 30 November 2018 served as a reminder that southern Alaska is situated above a tectonically active, earthquake-prone subduction zone. Subduction zone earthquakes, such as the 1964 M9.2 event, can produce strong shaking, and some may cause seafloor deformation that may in turn trigger tsunamis. The 2018 Anchorage earthquake occurred at a depth of about 45 km within the slab of ocean lithosphere that is subducting beneath the North American plate, thus it is referred to as an “intraslab” earthquake. The source mechanism of the earthquake indicates it was related to the slab being pulled apart as it sinks into the mantle. Smaller magnitude earthquakes of this type are common in the Anchorage region,

but dramatically different in nature than the 1964 M9.2 earthquake, which remains the second largest ever recorded worldwide. The 1964 earthquake occurred on the shallow “megathrust” fault that marks the interface between converging tectonic plates. Slip on the fault caused large areas on- and offshore to uplift (to 10 m) and subside (to 2 m). In contrast, the 2018 earthquake resulted in subsidence (to 0.08 m) over a limited area onland in the Matanuska-Susitna Valley without an associated tsunami. In contrast, the 1964 earthquake produced large-scale change of the ocean bottom, because the megathrust ruptured the seafloor and generated shaking that lasted as long as 4-5 minutes. These effects dislodged blocks and resurfaced the bottom of many fjords, generating tsunamis that killed many people along the coastline as well as fish in the water column. Both types of earthquakes are inevitable consequences of a tectonically active plate boundary and they reflect different processes occurring at different depths along a subduction zone. Although these earthquakes vary in size and effects, they both show that Alaska needs to be prepared for, and resilient to, the effects of earthquakes and tsunamis.

Peter J. Haeussler is a Research Geologist at the U.S. Geological Survey in Anchorage, Alaska, where he has lived and worked for the last 26 years. His current research focuses on understanding active tectonic processes in southern Alaska, with studies on the frequency of earthquakes, the location and rate-of-movement of active faults, and mountain building. Other research efforts relate to submarine-landslides and their role in tsunami generation, as well as framework geology for energy and mineral resource assessments. He is author or co-author on more than 130 scientific publications. He completed his B.S. in Geology from Michigan State University, and his Ph.D at the University of California, Santa Cruz.

**<sup>†</sup>If the federal government shutdown persists at the time of the Symposium, this talk may be canceled. However, the Symposium will still stay on the schedule listed in the program.**

2:15 p.m. – 3:00 p.m.

**RICHARD THOMAN**, ALASKA CLIMATE SPECIALIST, ALASKA CENTER FOR CLIMATE ASSESSMENT AND POLICY

## One More Complication: Alaska’s Changing Oceans



The oceans around Alaska are vital to the state and the world. But the oceans are no longer passive players to be traveled upon, to be studied, or holding resources to be exploited. Our oceans are changing: warming water and decreasing sea ice are already generating cascading impacts to the biology and the larger climate and environmental system for which we have only a limited understanding. This talk will review some of the ongoing changes in the oceans around Alaska and present some challenges in moving forward.

Rick Thoman has worked in Alaskan weather and climate for more than 30 years. He recently retired from the National Weather Service Alaska Region as the Climate Science and Services Manager and is spending his golden years working as a Climate Specialist with the Alaska Center for Climate Assessment and Policy.

3:00 p.m. – 3:45 p.m.

For other AMSS events marking the 30th Anniversary of the EVOS, see pp. 14 and 17.

**JEFF SHORT, PH.D. (RET.)**, FORMER EVOS SCIENTIST

## Opening Our Eyes to Ecosystem Change: the Scientific Legacy of the *Exxon Valdez* Oil Spill



Thirty years ago, the 1989 *Exxon Valdez* oil spill strongly perturbed the nearly-pristine marine ecosystem in Prince William Sound (PWS). Occurring during oceanographic spring, the spill polluted thousands of square kilometers of sea surface just before the arrival of innumerable birds, mammals and fish to reproduce. The affront to the nation released unprecedented resources to evaluate the effects, which were especially clear with the general absence of other contamination sources. State and federal agencies recognized the need to distinguish natural ecosystem change from responses attributable to the spill. Supported with a \$900M fund from the settlement, the *Exxon Valdez* Oil Spill Trustee Council (EVOSTC)

was created to meet these challenges. The administrative procedures of the EVOSTC were designed at the outset to ensure that funded studies met the highest scientific standards of evaluation, monitoring, and review. Funded research led to major discoveries regarding the effects of the spill, including the ecotoxicology of oil pollution, the persistence of oil, and long-term impairment of affected marine life populations. These discoveries have informed damage assessments of every subsequent large oil spill worldwide. Companion studies on the functioning and secular change of the marine ecosystems revealed previously unknown ecosystem processes and created long-term time-series of ecosystem behavior. Direct benefits include early detection of abrupt ecosystem change such as oceanographic regime shifts, and the recent marine heat wave in the Gulf of Alaska (aka “the Blob”). Moreover, recognition of the need for participating researchers to collaborate and share their findings led to the EVOSTC Oil Spill Symposium in January, 1993, which subsequently evolved into the Alaska Marine Science

# Keynote Speakers

Symposium. This visionary approach to integrated ecosystem research continues to provide Alaskans, the nation, and the world with the knowledge needed to plan for an increasingly uncertain future.

Jeffrey Short retired from a 31-year career as a research chemist at the U.S. National Oceanic and Atmospheric Administration, where he worked primarily on oil pollution and other contaminant issues. He was the leading chemist for the governments of Alaska and the United States for the damage assessment and restoration phases of 1989 *Exxon Valdez* oil spill, and did numerous studies on the distribution, persistence and effects of the oil on the marine ecosystem affected by it. Dr. Short is the author of more than 70 scientific publications and has contributed to 3 books on oil pollution. Dr. Short now works as a consultant on oil pollution fate and effects, and has worked on projects and advised government agencies of Canada, China, Ecuador, Korea, Norway, and the Russian Federation regarding issues related to oil spills and oil pollution.

**3:45 p.m. – 4:30 p.m.**

**JUDE ISABELLA, EDITOR-IN-CHIEF, HAKAI MAGAZINE**

## The Origin of a Story



When I fell into journalism in the pre-internet age, I discovered that stories could inspire people to change their thinking, behavior, or situation. Narratives proved themselves to have power. And over the years, it's become apparent that the stories with the strongest impact on an audience are the ones that sweep away writers before they place their hands on a computer keyboard—they grab the scent of an idea and hunt for the elements that give it form.

It seems an act of wizardry to conjure 6,000 — or 50,000 — words out of what begins as a thought. But writers train themselves to recognize a story's building blocks, to identify compelling characters, and to connect details incongruent on the surface. And that's all so much easier if you pay attention to what sets your mind on fire, and to the thoughts that jab you at odd times again and again.

Jude Isabella has been a science journalist for over 25 years. She has a BA in political science and history from the University of Rhode Island, and an MA in writing and anthropology from the University of Victoria. As a journalist she has worked for newspapers and magazines on staff and as a freelancer. She spent a dozen years as managing editor of the award-winning *YES Mag*, *Canada's science magazine for kids*, while also freelancing for science publications and writing the book, *Salmon, a Scientific Memoir*. After four years of research and field work, Jude created a narrative that offers readers an understanding of the salmon ecosystem through the different lenses.

In 2015, she launched *Hakai Magazine*, an online publication focused on coastal science and societies. Supported by the Tula Foundation, *Hakai Magazine* has made a name for itself in the science journalism world and won numerous awards. As rewarding as it is to edit and write long form science journalism, Jude continues to write for young readers. She's written five books for kids, one of which won the prestigious American Institute of Physics award. Her latest book, about the wolves of Yellowstone National Park for Kids Can Press, is slated for publication in 2019.

4:45 p.m. – 5:00 p.m.

## Presentation of the 2019 Alaska Sealife Center Alaska Ocean Leadership Marine Research Award

**SPONSORED BY: CLARENCE PAUTZKE AND MAUREEN MCCRAE**

**PRESENTED BY: TARA RIEMER, ALASKA SEALIFE CENTER AND  
ROBERT SUYDAM, NORTH SLOPE BOROUGH WILDLIFE DEPARTMENT**



Awarded to Kathy Frost and Lloyd Lowry, preeminent Alaska marine mammal biologists, for outstanding achievements in marine mammal research over the past 45 years. Both were biologists for the Alaska Department of Fish and Game, based in Fairbanks, and were key on the ground restoration scientists in Prince William Sound following the *Exxon Valdez* oil spill. Their passion for studying marine mammals and informing others about that research has inspired many scientists, subsistence hunters, and managers. They mentored many students and motivated colleagues and collaborators to publish

study results. Working closely with scientists and subsistence hunters, they promoted co-management as few others have done. Their involvement in the Alaska Beluga Whale Committee as Charter Members dramatically influenced a new way of doing business. That led to hunters, scientists, and managers sitting together at the table for the first time, jointly making recommendations about the most important information to be collected, and helping outline the actions necessary for conservation and sustainable harvests of marine mammals. The manuscripts and data they both produced will be cited for decades to come, and their work ethic has inspired scientists and non-scientists alike. We all mourn Lloyd's passing on November 25, 2018.

6:00 p.m. – 9:00 p.m.<sup>†</sup>

## Monday Poster Session, Gulf of Alaska/Bering Sea

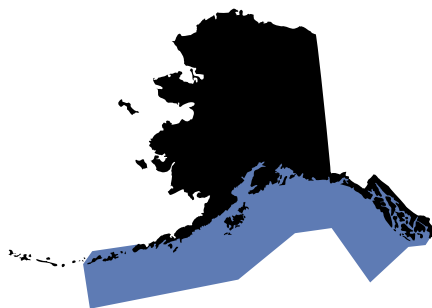
6:00 p.m. – 9:00 p.m.<sup>†</sup>

## Tuesday Poster Session, Bering Sea/Arctic

<sup>†</sup>Anchorage Hilton, 500 W 3rd Ave, 2nd Floor. All posters will remain on display from Monday at 5 p.m. through Tuesday at 9:00 pm.



# Gulf of Alaska Plenary Session



**Tuesday, January 29** 7:30 a.m. – 5:00 p.m.

7:30 A.M. – 8:00 A.M. CONTINENTAL BREAKFAST

## **CLIMATE & OCEANOGRAPHY**

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- 8:00 - 8:15 **Claudine Hauri** Influence of ocean acidification and climate change on the biogeochemistry in the Gulf of Alaska: A regional modeling study
- 8:15 - 8:30 \***Marina Washburn** Impact of elevated, variable pH on the Pacific razor clam in Alaska
- 8:30 - 8:45 \***Jesse Ross** Potential role of marine snow in the fate of spilled oil in Cook Inlet, Alaska

## **LOWER TROPHIC LEVELS**

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- 8:45 - 9:00 **Sonia Batten** Impact of the marine heat wave on Gulf of Alaska plankton communities. Has normal service now been resumed?
- 9:00 - 9:15 **Suzanne Strom** Mixotrophy in the Gulf of Alaska: Abundant plant-animal cells have major implications for ecology and biogeochemistry
- 9:15 - 9:30 **Nina Bednarsek** Ocean acidification driven biological vulnerability in the high latitudes: comparison between the Gulf of Alaska, Bering Sea, and Beaufort Sea
- 9:30 - 10:00 COFFEE BREAK
- 10:00 - 10:15 \***Ashley Rossin** Examining the effects of ocean acidification on Alaska bivalves of subsistence importance

## **FISHES & FISH HABITATS**

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- 10:15 - 10:30 **Mike Booz** Manager's perspective on the recovery of east Cook Inlet razor clams
- 10:30 - 10:45 \***Meredith Pochardt** Harnessing environmental DNA to monitor the spatial and temporal dynamics of eulachon in Northern Southeast Alaska
- 10:45 - 11:00 **David McGowan** Spatial and temporal dynamics of capelin (*Mallotus villosus*) in the Gulf of Alaska: Implications for fisheries and ecosystem-based management
- 11:00 - 11:15 \***Matt Callahan** Size-based patterns of energy allocation in juvenile sablefish
- 11:15 - 11:30 **Kyle Shedd** Relative reproductive success between hatchery strays and wild pink salmon in a natural stream in Prince William Sound



## SEABIRDS

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11:30 - 1:00 LUNCH PROVIDED

1:00 - 1:15 **Heather Coletti** Birds of a feather flock together...or do they? Regional and temporal patterns of community composition and abundance in nearshore marine birds across the Gulf of Alaska

## MARINE MAMMALS

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1:15 - 1:30 **\*Lauren Wild** Trophic connections between sperm whales and their prey in the Gulf of Alaska

1:30 - 1:45 **\*Madison Kosma** Revelations from an aerial perspective: How hungry whales work smarter not harder

1:45 - 2:00 **Eiren Jacobson** Assessing cetacean populations using integrated population models: an example with Cook Inlet beluga whales

2:00 - 2:15 **Daniel Monson** Brown bears and sea otters along the Katmai coast: Offshore islands as predator pits

2:15 - 2:30 **Jan Straley** Ecosystem implications for the decline in reproductive success in humpback whales in the Gulf of Alaska

2:30 - 3:00 COFFEE BREAK

## HUMAN DIMENSIONS

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3:00 - 3:15 **Ian Davidson** Managing the invasive tunicate, *didemnum vexillum*, in Sitka, Alaska: Is eradication feasible?

3:15 - 3:30 **Suzie Teerlink** Boats, whales, humans, dollars: Teasing apart the many dimensions of Juneau's growing whale-watching industry

3:30 - 3:45 **Kimberly Raum-Suryan** The first Ocean Guardian School Program in Alaska: Inspiring marine stewardship in schools

3:45 - 4:00 **Julie A. Matweyou** Paralytic shellfish toxins in butter clam tissues and effect of cleaning methods used by Kodiak harvesters

## ECOSYSTEM PERSPECTIVES

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4:00 - 4:15 **\*Szymon Surma** Pacific herring trophodynamics and fisheries in the southeastern Gulf of Alaska

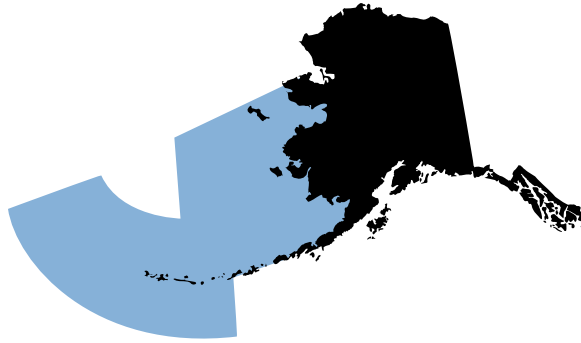
4:15 - 4:30 **Katrina Counihan** Physiological and gene transcription assays in combination: a new paradigm for marine intertidal assessment

4:30 - 4:45 **\*Wendel Raymond** Ecological relationships between recovering sea otters and eelgrass communities in southeast Alaska

4:45 - 5:00 **Judith Rosellon-Druker** Development of socio-ecological conceptual models as the basis for an IEA framework in Southeast Alaska

6:00 - 9:00 **Tuesday Poster Session, Bering Sea/Arctic**

# Bering Sea & Aleutian Islands Plenary Session



**Wednesday, January 30** 7:30 a.m. – 5:00 p.m.

7:30 A.M. – 8:00 A.M. CONTINENTAL BREAKFAST

## **CLIMATE & OCEANOGRAPHY**

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- 8:00 - 8:15 **Darren Pilcher** Impact of local biogeochemical processes and climate variability on ocean acidification in the Bering Sea
- 8:15 - 8:30 **Joannes Westerink** Coupled tide, storm surge, and wave modeling under varying ice coverages along Alaska's Bering, Chukchi and Beaufort coasts processes and climate variability on ocean acidification in the Bering Sea
- 8:30 - 8:45 **\*Stephanie O'Daly** Downward organic carbon flux, average particle sinking speed, and the role of particle-associated microbial respiration on the Bering and Chukchi shelf

## **LOWER TROPHIC LEVELS**

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- 8:45 - 9:00 **\*Christina Goethel** Tracking benthic bivalve population shifts: Changes in recruitment and dominant size classes of *Macoma calcaria* and *Nuculana spp.* in the Northern Bering Sea from 1998-2015
- 9:00 - 9:15 **Patrick Ressler** How many krill are there in the eastern Bering Sea and Gulf of Alaska?

## **FISHES & FISH HABITATS**

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- 9:15 - 9:30 **Louise Copeman** Observations of Alaskan juvenile crab (*Chionoecetes spp.*) energetic condition from the last Bering Sea cold pool: Effects of temperature and food quality
- 9:30 - 10:00 COFFEE BREAK
- 10:00 - 10:15 **William Long** Effects of ocean acidification on snow crab larvae: Carryover effects from embryogenesis and oogenesis reduce direct effects on larval survival
- 10:15 - 10:30 **James Thorson** Forecast skill for predicting distribution shifts: A retrospective experiment for marine fishes in the Eastern Bering Sea
- 10:30 - 10:45 **\*Samuel May** Salmon homing in time and space: Factors influencing fine-scale homing in wild Alaskan sockeye salmon (*O. nerka*)
- 10:45 - 11:00 **\*Kaitlyn Manishin** Late stage marine mortality of Chinook salmon helps explain observed changes in age structure of Chinook salmon returns

## SEABIRDS

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- 11:00 - 11:15 **Tuula Hollmen** Effects of increased salinity in coastal wetlands on threatened Steller's eider (*Polysticta stelleri*) and spectacled eider (*Somateria fischeri*) ducklings
- 11:15 - 11:30 **Jessie Beck** Genetic assignment of Northern Fulmar bycatch reveals contributions from major breeding colonies
- 11:30 - 1:00 **LUNCH (ON YOUR OWN)**
- 1:00 - 1:15 **Timothy Jones** Seabird mortality events in the Bering Sea

## MARINE MAMMALS

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- 1:15 - 1:30 **Michael Cameron** Observations during a springtime Bering Sea research cruise in a year of record-low sea ice extent
- 1:30 - 1:45 **Lorrie Rea** Compound specific nitrogen isotope ratios of amino acids in Steller sea lion whiskers reflect seasonal changes in baseline isotope values in their Alaska marine food webs
- 1:45 - 2:00 **Carey Kuhn** Unmanned surface vehicles map prey landscapes to elucidate Northern fur seal behavioral responses to prey availability
- 2:00 - 2:15 **Josh M. London** Surveying harbor seals in the Pribilof Islands with advanced drone imagery
- 2:15 - 2:30 **Lauren Divine** Piloting sUAS for harbor seal monitoring in the Pribilof Islands: A collaboration between tribal and federal governments

## HUMAN DIMENSIONS

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- 2:30 - 3:00 **COFFEE BREAK**
- 3:00 - 3:15 **Jennafer Malek** Marine mammal co-management in Alaska: Recommendations for effective relationships
- 3:15 - 3:30 **\*Marcus Gho** Dual permit operations in the Bristol Bay Pacific salmon drift gillnet fishery

## ECOSYSTEM PERSPECTIVES

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- 3:30 - 3:45 **Jessica Cobby** Community connections: Bringing place-based science into classrooms to strengthen student understanding
- 3:45 - 4:00 **Stephani Zador** Communication, collaboration, and transparency: How ecosystem science informs fisheries management in times of change
- 4:00 - 4:15 **Carolyn Kurle** Reconstructing decades of food web structure in the North Pacific and Bering Sea using bulk and compound-specific stable isotope analyses from archived Northern fur seal teeth
- 4:15 - 4:30 **Calvin Mordy** Innovative tools for ecosystem research
- 4:30 - 4:45 **Janet Duffy-Anderson** Ecosystem stress test: What an ice-free winter might mean for the eastern Bering Sea
- 4:45 - 5:00 **Best Student Poster Presentation Winners Announced**

# Arctic Plenary Session



**Thursday, January 31** 7:30 a.m. – 5:00 p.m.

7:30 A.M. – 8:00 A.M. CONTINENTAL BREAKFAST

## **CLIMATE & OCEANOGRAPHY**

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- 8:00 - 8:15 **Carol Ladd** Variability in the Chukchi Sea: A decade of observation
- 8:15 - 8:30 **Seth Danielson** Recent surface heat fluxes and thermal and sea ice conditions of the Bering-Chukchi Continental Shelf
- 8:30 - 8:45 **Phyllis Stabeno** The changing Chukchi Sea: Anomalous sea-ice and environmental conditions in 2017 and 2018
- 8:45 - 9:00 **Samuel Laney** Optical properties and hydrography associated with the spring freshet of the Kuparuk and Sagavanirktok Rivers in nearshore Beaufort Shelf waters

## **LOWER TROPHIC LEVELS**

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- 9:00 - 9:15 **\*Lauren Sutton** A comparison in functional diversity of two Alaskan Arctic shelf systems
- 9:15 - 9:30 **Russell Hopcroft** A visual tour of the macrozooplankton over the Arctic's Chukchi Borderlands
- 9:30 - 10:00 COFFEE BREAK
- 10:00 - 10:15 **\*Ann-Christine Zinkann** Digging deep: Depth distribution and utilization of carbon sources in Chukchi Sea sediments
- 10:15 - 10:30 **\*Brittany Jones** Benthic respiration rates across the northern Bering and southern Chukchi Sea shelf
- 10:30 - 10:45 **\*Caitlin Meadows** Mustering records or Arctic exploration: Alaskan bivalve distributions in the Chukchi and Bering Seas over the last 150 years

## **FISHES & FISH HABITATS**

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- 10:45 - 11:00 **Cathleen Vestfals** Modeling growth and transport of Arctic cod and saffron cod early life stages in the Pacific Arctic under variable climate forcing
- 11:00 - 11:15 **\*Caitlin Forster** Spatial patterns, environmental drivers, and potential seasonal differences of Arctic cod (*Boreogadus saida*) distribution in the Chukchi Sea
- 11:15 - 11:30 **Benjamin Laurel** Acute and latent bioenergetic impacts of oil on a keystone Arctic forage fish (*Boreogadus saida*)

11:30 - 1:00 LUNCH PROVIDED

### SEABIRDS

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- 1:00 - 1:15 **Douglas Causey** The effects of rapid destabilization of coastal marine ecosystems
- 1:15 - 1:30 **Alexis Will** Sea ice loss and the post-breeding migration of planktivorous Arctic seabirds

### MARINE MAMMALS

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- 1:30 - 1:45 **John Citta** Declining winter sea ice is associated with a northward shift of bowhead whale winter range
- 1:45 - 2:00 **\*Casey Clark** Zinc concentrations in teeth of female Pacific walrus reflect onset of reproductive maturity
- 2:00 - 2:15 **Greg O’Corry-Crowe** Migratory culture, philopatry, and kinship in beluga whales (*Delphinapterus leucas*)
- 2:15 - 2:30 **Donna Hauser** Vulnerability of Arctic marine mammals to vessel traffic in the increasingly ice-free Northwest Passage and Northern Sea Route
- 2:30 - 3:00 COFFEE BREAK

### HUMAN DIMENSIONS

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- 3:00 - 3:15 **Stephen Braund** Alaska Eskimo bowhead whale subsistence sharing practices
- 3:15 - 3:30 **\*Kristen Green** Climate change impacts on access to coastal resources by subsistence harvesters in Arctic National Parks: Implications for NPS management

### ECOSYSTEM PERSPECTIVES

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- 3:30 - 3:45 **Max Goldman** An assessment of ecological value and vulnerability in the Bering, Chukchi, and Beaufort Seas
- 3:45 - 4:00 **Carin Ashjian** The impact of shelf break upwelling on Beaufort Shelf distributions of zooplankton and fish
- 4:00 - 4:15 **Jacqueline Grebmeier** Pelagic-benthic coupling in the Chukchi Sea ecosystem: A key part of the Arctic Marine Biodiversity Observing Network (AMBON)
- 4:15 - 4:45 **Seth Danielson** The Arctic Integrated Ecosystem Research Program: Observations of 2017-2018 conditions and consequences
- 4:45 - 5:00 **Best Student Oral Presentations Winners Announced and Closing Remarks**

# Workshops

*Workshops held at Hotel Captain Cook*

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## All Week

### Lactation Station

8:00 a.m. – 5:00 p.m., Women's Restroom Next to Quarter Deck

### Media Room

8:00 a.m. – 5:00 p.m., Resolution Room

### EVOS 30th Anniversary Film Loop & Display (Mon. – Thurs.)

8:00 a.m. – 5:00 p.m., Adventure Room

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## Sunday 1/27

### AMERICAN GEOPHYSICAL UNION (AGU) COMMUNICATIONS WORKSHOP

All Day, 1007 W 3rd Ave, Suite 100

This year, the Alaska Marine Science Symposium is partnering with the American Geophysical Union and their "Sharing Science" group to deliver a 1.5 day science communication workshop. Open to all scientists, science communicators, media, and other audiences. One-on-one consultation sessions will be available Monday morning for critique and evaluation of materials, products, and project ideas. Visit their website at: <https://sharingscience.agu.org/>

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## Monday 1/28

### COMMUNICATING OCEAN SCIENCES WORKSHOP FEATURING JUDE ISABELLA

9:00 a.m. – 12:00 p.m., Ballroom | AGU Office Hours 2:00 p.m. – 4:00 p.m., Library

Each year, the Communicating Ocean Sciences Workshop provides practical information, great speakers and information on current best practices in education, outreach and media. In this hands-on workshop, Jude—author, editor-in-chief at *Hakai Magazine*—will focus on scientific writing, crafting compelling narrative, all the while paying particular attention to sentence structure. This workshop is free and space is not limited.

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## Tuesday 1/29

### JUPYTER NOTEBOOK BOOTCAMP

1:00 p.m. – 5:00 p.m., Quadrant Room

Join the Python gurus from Axiom Data Science for a 4-hour session designed to get you excited about using Jupyter notebooks for reproducible analysis in the Research Workspace and beyond. This workshop will include a hands-on example of how to create and write a notebook that analyzes a simple dataset and creates publication-ready plots, as well as everything you need to know to get up and running with Jupyter notebooks. No experience necessary, though familiarity with Python or R is suggested.

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### OCEAN EDUCATOR NIGHT

5:00 p.m. – 7:00 p.m., Anchorage Hilton

Educators and scientists - Please join us Tuesday, 5:00 p.m. - 7:00 p.m. at the Anchorage Hilton Hotel for the third annual Ocean Educator Night. Details to follow as the symposium draws closer.

## Wednesday 1/30

### METADATA 411

**1:00 p.m. – 5:00 p.m., Quadrant Room**

This workshop will provide an overview of how to write metadata to describe scientific datasets. Presenters will demystify the content and scope of scientific metadata, describe its value to funders and scientists, and guide attendees on best practices for writing standards-compliant metadata. Attendees will gain a practical understanding of the information that makes up a metadata record while practicing by using the Research Workspace Metadata Editor. This workshop is aimed at scientists and technicians tasked with writing metadata or who want to better understand metadata and its creation. Attendees should bring a laptop and dataset of their own that they want to begin documenting. For more information, email your questions to [metadata@axiomdatascience](mailto:metadata@axiomdatascience).

### ALASKA MARINE ISOTOPE (AMI) WORKING GROUP

**2:00 p.m. – 5:00 p.m., Whitby Room**

Stable isotope techniques are widely applied to understanding organism and ecosystem-scale trophic and nutrient cycling processes. The increase in use of stable isotopes over 40 years in Alaska's terrestrial and marine systems highlights the need for centralizing methods and results that can better support future studies and enhance collaborations to address larger-scale questions. We propose the Alaska Marine Isotope Working Group (AMI) to bring together all investigators using stable isotopes within Alaska's marine systems. The goals of AMI will be to discuss potential connections in current and future work, standardize methods and collections, and to develop a centralized repository of isotope data for past, current, and future studies. The first meeting of AMI will occur as a breakout session within the 2019 Alaska Marine Science Symposium.

### HARMFUL ALGAL BLOOMS (HABS) IN THE BERING SEA

**5:00 p.m. – 7:00 p.m., Endeavor Room**

The workshop will convene active researchers, local community members, and interested public to present results of current findings of occurrence and effects of HABS on marine life, humans, and subsistence hunting in the Bering Sea region. We will plan to engage all participants in discussing next steps for research, monitoring, collaboration and communication.

### ARCTIC RESEARCH PLANNING NIGHT

**7:00 p.m. – 9:00 p.m., Quarter Deck**

Fairweather Science is hosting the annual Arctic Research Planning Night at the Quarterdeck. This event is held to facilitate collaboration, networking, and knowledge sharing among Arctic researchers. Please either send in advance or bring a thumb drive with a few slides that outline your research plans for 2019 and beyond. Include research platform (vessel, aircraft, etc), location of study, duration, objectives, types of data to be collected, available space, and length of contract. Send slides to Sheyna Wisdom at Fairweather Science ([sheyna.wisdom@fairweather.com](mailto:sheyna.wisdom@fairweather.com)). The Arctic Research Consortium of the U.S. (ARCUS) will have a resource table at the event.

### 30TH ANNIVERSARY OF THE EXXON VALDEZ OIL SPILL

**7:00 p.m. – 9:00 p.m., Fore Deck**

This year marks 30 years since the *Exxon Valdez* ran aground and the Alaska Marine Sciences Symposium is perhaps its greatest legacy. Presenters at this session will examine how these observations informed damage assessments following two other major spills: the 2007 Hebei Spirit spill near Taean National Park, South Korea and the 2010 Deepwater Horizon spill in the Gulf of Mexico.

# Workshops

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## Thursday 1/31

### NATIONAL GEOGRAPHIC SOCIETY EARLY CAREER GRANTS PROGRAM

**11:30 a.m. – 1:00 p.m., Quadrant Room**

The National Geographic Society invites current graduate students and recent graduates to attend a presentation on the National Geographic Grants Program, which provides grants to early career scientists, conservationists, storytellers, technologists, and educators. This presentation will provide an introduction to our grants and the application process, as well as share a unique opportunity for funding for Early Career Grant projects in Alaska. Following the presentation, there will be time to discuss questions, projects, and ideas with a National Geographic Grants Program Officer.

### METADATA 411: OFFICE HOURS

**1:00 p.m. – 5:00 p.m., Library**

An open session for help writing metadata and preparing data to be archived. This is a BYOD (bring your own dataset) session with no formal instruction. Bring your laptop, your data, and your questions, and spend some time working on your metadata with some of the nerds from Axiom Data Science.

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## Friday 2/01

### PCCRC PI SYMPOSIUM

**8:00 a.m. – 5:00 p.m., Adventure Room**

Principal investigators and their graduate students will give 30 minute presentations on the status of research projects funded by the Pollock Conservation Cooperative Research Center.

### ARCTIC INTEGRATED ECOSYSTEM RESEARCH PROGRAM (IERP)

**9:30 a.m. – 12:30 p.m., Aft Deck**

We invite you to join us to learn about the preliminary results of the Arctic Integrated Ecosystem Research Program and to discuss your ideas for new collaboration opportunities. We anticipate approximately one hour of presentations and plenty of time for collaborative discussions.

### ALASKA COASTAL MARINE INSTITUTE, ANNUAL STUDIES REVIEW

**12:00 p.m. – 4:00 p.m., Quadrant Room**

This workshop presents updates on 10 current environmental research projects, including graduate student work, funded through the CMI Program. The CMI, a collaboration between the University of Alaska, the Bureau of Ocean Energy Management, and the State of Alaska, works to inform management of petroleum resources in Alaska's Outer Continental Shelf regions. The public is encouraged to attend and participate in learning about ongoing research programming.



**Friday 2/01**

## **GEOFENCES & WATCHDOGS: TOOLS FOR MONITORING AND MEASURING VESSEL TRAFFIC**

**12:30 p.m. – 1:30 p.m., Resolution Room**

On any given day, there are 100-400 large vessels operating within the Alaskan Arctic. As sea ice continues to retreat for longer periods each year, managers and communities are increasingly interested in understanding traffic patterns. This project is funded by the Arctic Domain Awareness Center and is a collaboration between the Alaska Maritime Prevention and Response Network, Marine Exchange of Alaska, the Aleutian and Bering Initiative (“ABSI”), and the University of Alaska, Anchorage. We are developing a watchdog tool to report on vessel movements to parties who want to better understand large vessel traffic in particular areas. We are also developing another tool to create virtual fencing or “geofences” that can automatically send ‘alerts’ when large ships enter sensitive areas like waters around marine mammal haulouts. Please come offer your insights on how these tools can be designed to meet the needs of managers and communities working in Alaska’s Arctic.

### **2019 AMSS Exhibitors**

Alaska Ocean Observing System

Alaska Sea Grant

ASL Environmental Sciences

Audubon Alaska

Cook Inlet Regional Citizens Advisory Council

*Exxon Valdez* Oil Spill Trustee Council

Fairweather Science

JOA Surveys

North Pacific Research Board

Norseman Maritime Charters

Ocean Marine Services Inc.

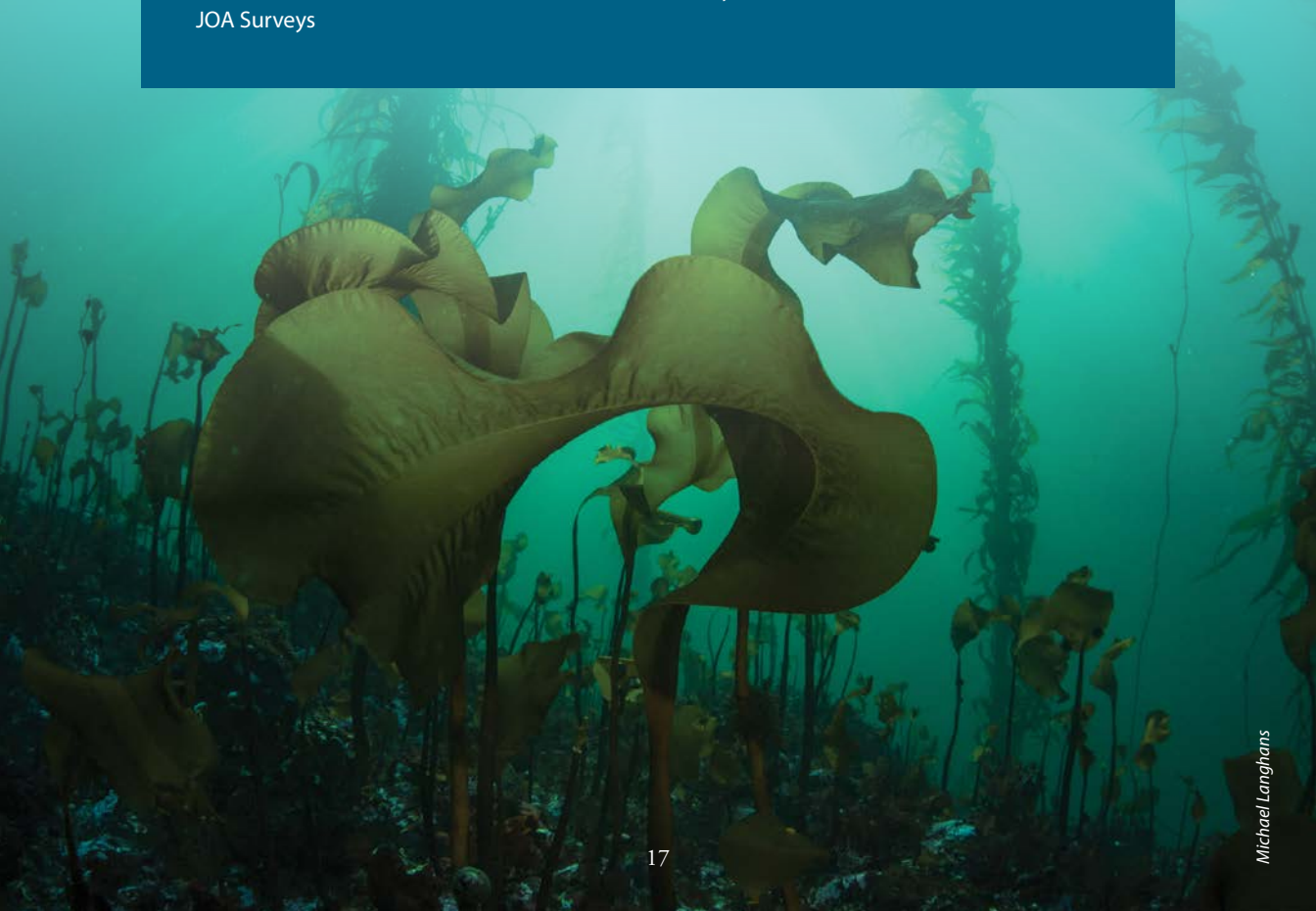
Sitka Sound Science Center

Southern Cross, LLC - R/V *Ukpik* & R/V *Annika Marie*

Support Vessels of Alaska, Inc.

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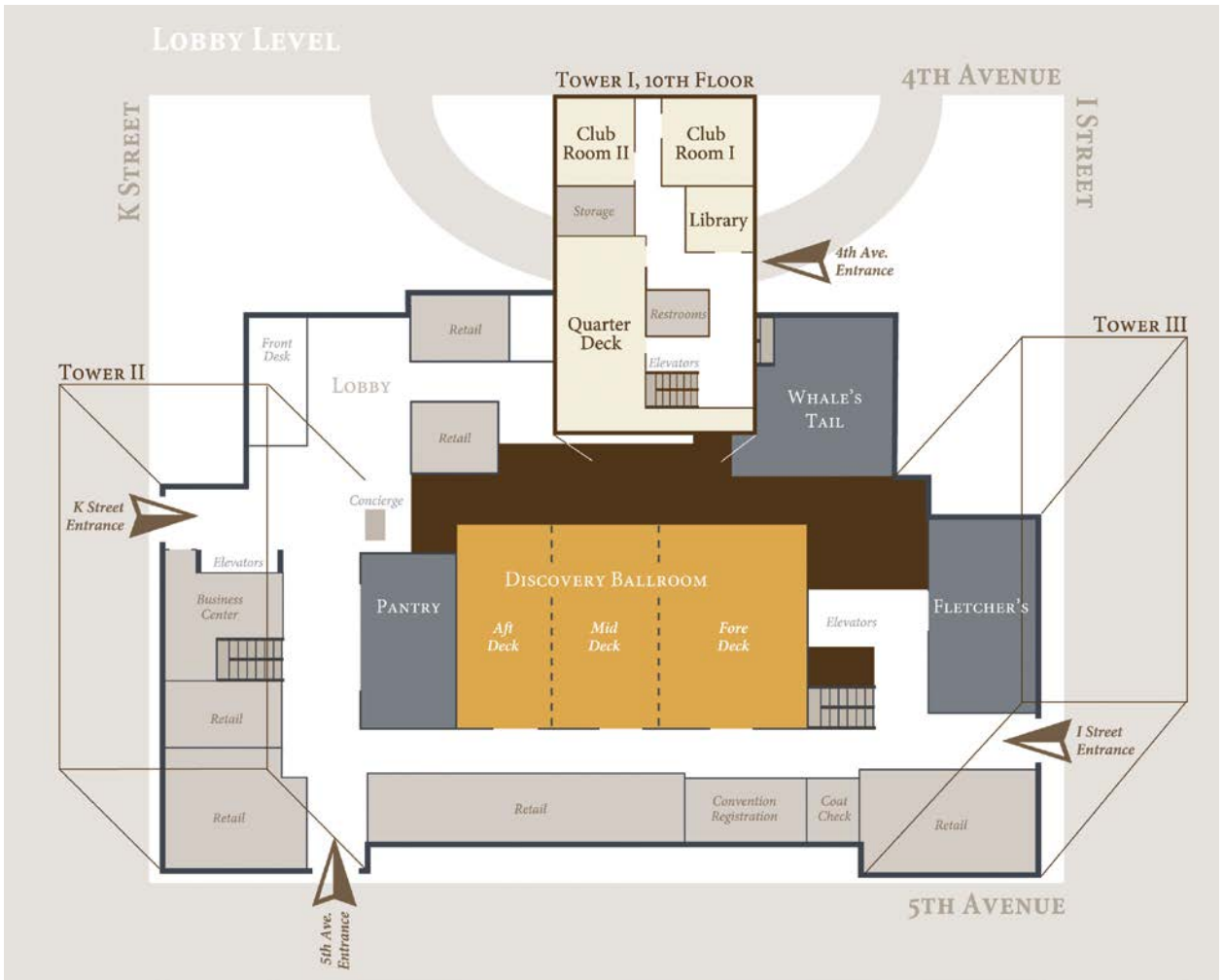
U.S. Navy c/o ManTech International



# Venue Maps

*Plenary Sessions & Workshops held at Hotel Captain Cook*

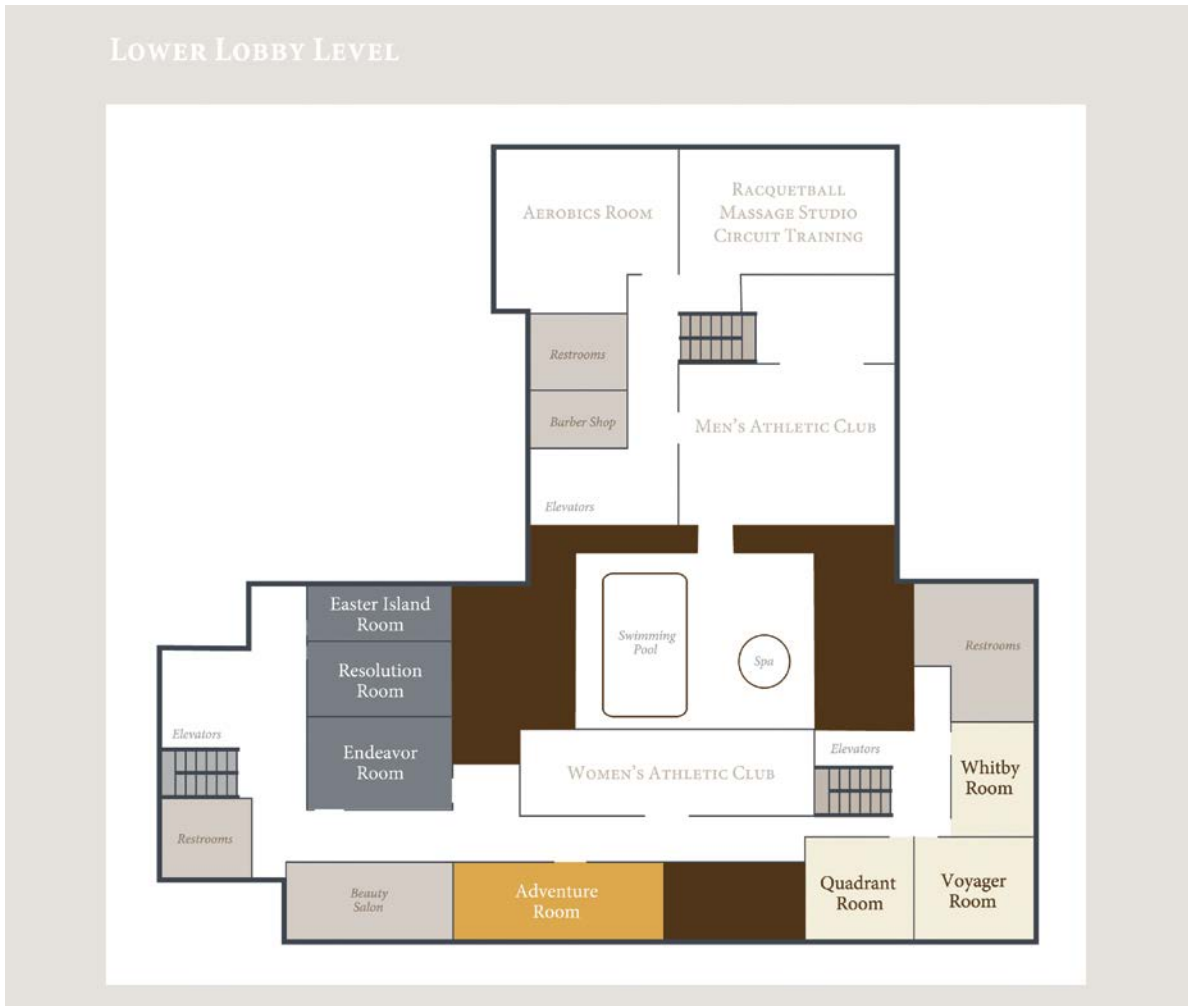
## Hotel Captain Cook, 939 W. 5th Ave. Lobby Level and Tower



*Shuttle service is provided between the Hotel Captain Cook (939 W. 5th Ave.) and the Hilton Anchorage (500 W. 3rd Ave.) from 6:00 p.m. – 9:00 p.m. to assist those needing transportation to and from the Poster Sessions.*

*Plenary Sessions & Workshops held at Hotel Captain Cook*

## Hotel Captain Cook, Lower Lobby Level



*Shuttle service is provided between the Hotel Captain Cook (939 W. 5th Ave.) and the Hilton Anchorage (500 W. 3rd Ave.) from 6:00 p.m. – 9:00 p.m. to assist those needing transportation to and from the Poster Sessions.*

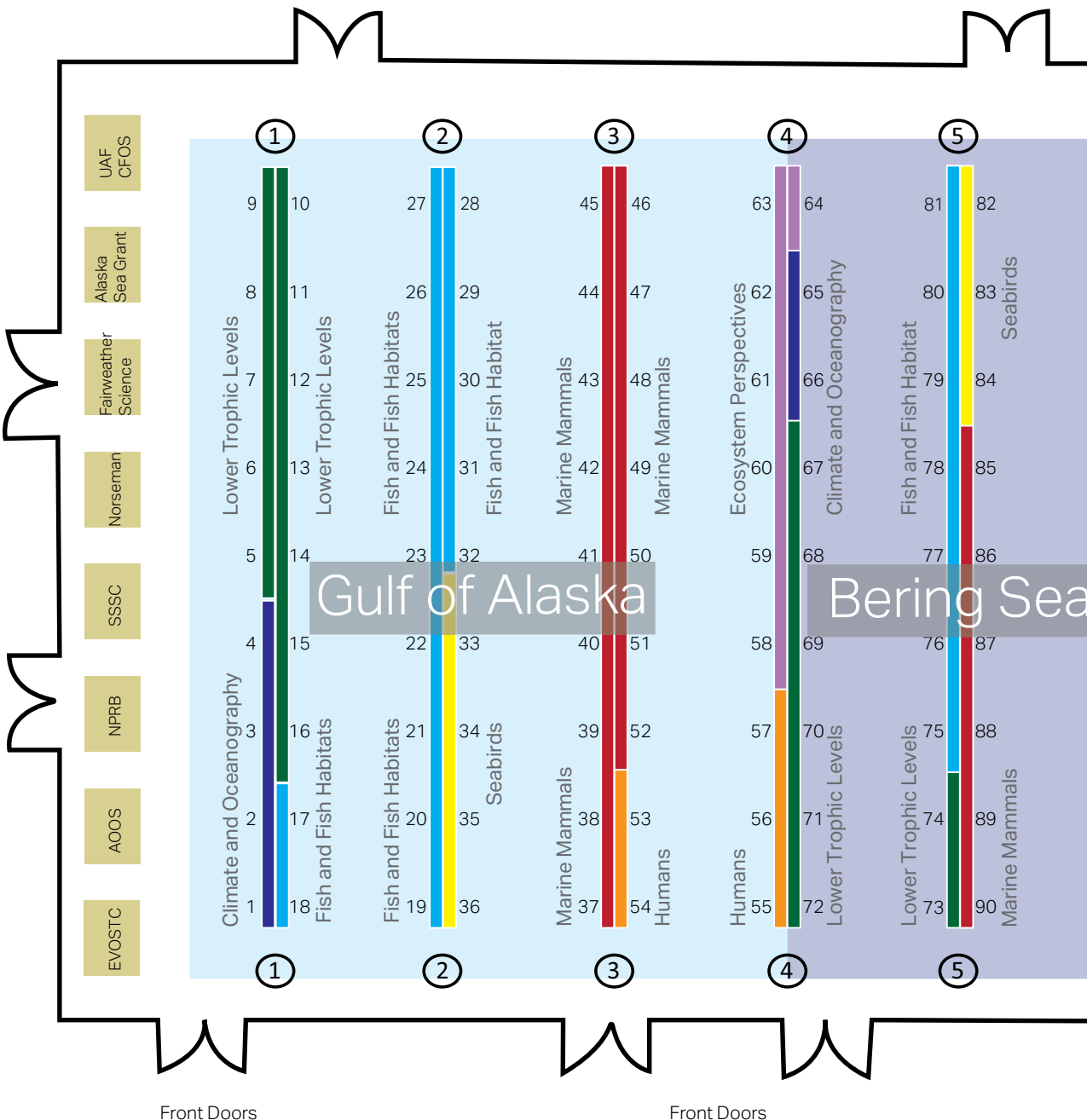
# Venue Maps

Poster Sessions at Hilton Anchorage

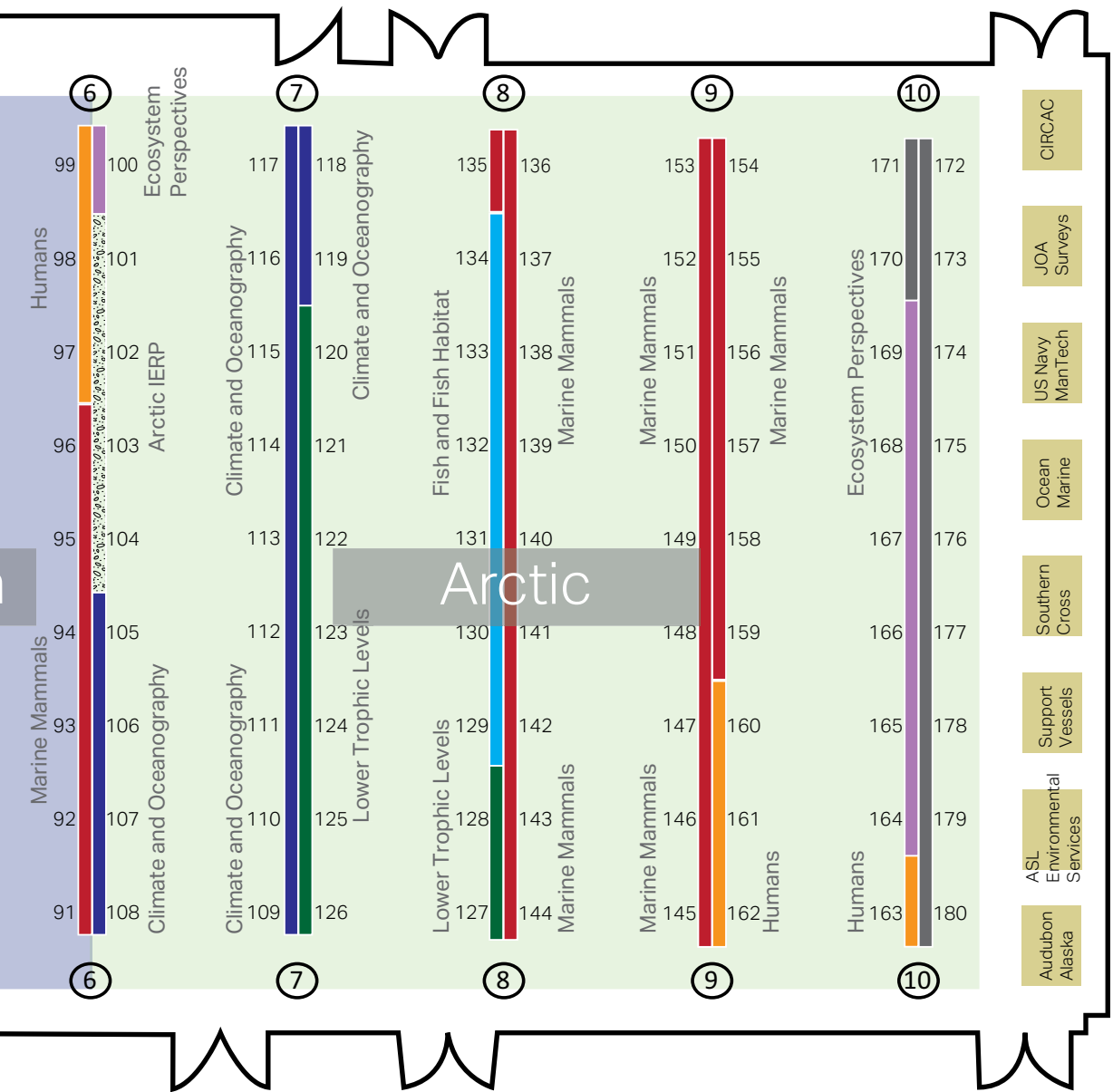
**\*New Location—Hilton Anchorage, 500 W. 3rd Ave.  
Alaska Ballroom Hall**

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15 Row #      Mammals      Seabirds



Poster Sessions at Hilton Anchorage



CIRCAC

JOA Surveys

US Navy ManTech

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Southern Cross

Support Vessels

ASL Environmental Services

Audubon Alaska

Front Doors

Front Doors

# Thank You!

The Symposium would not have been possible without the help of many volunteers!

Thank you to the **AMSS Organizing Committee** and a special thanks to the following for a substantial contribution by coordinating key aspects of the Symposium:

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Registration, Time Keeping, Student Judging, and Poster Volunteers  
**We cannot thank you enough for donating your time!**

# Thank You Sponsors!

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**Pollock Conservation Cooperative Research Center**



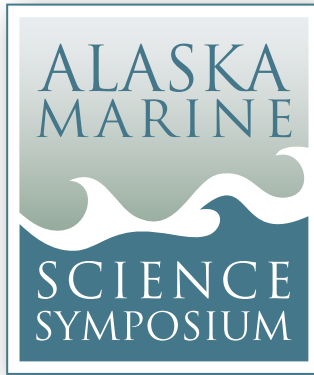
**United States Arctic Research Commission**



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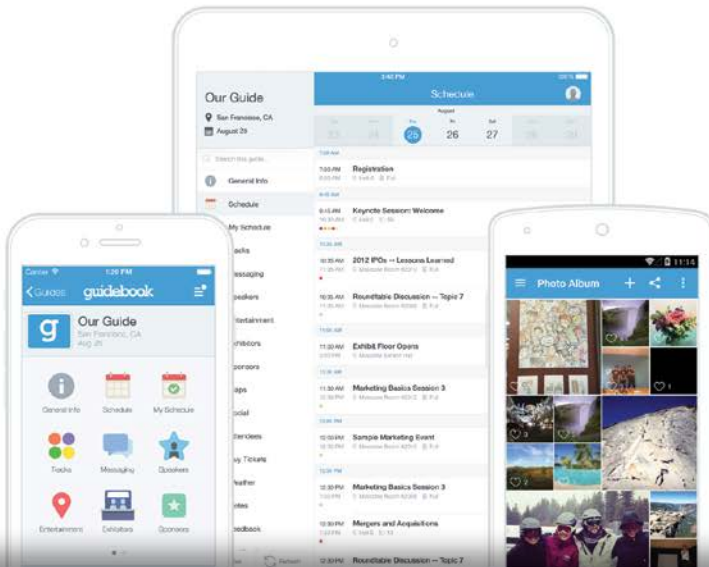


**US Arctic Field Program**



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