

UAS Research Overview 2019



UNIVERSITY
of ALASKA
SOUTHEAST

Note: This is an expanded version of a report on research presented to the University of Alaska Board of Regent in November 2019. It stresses growth and diversity in our research profile and portfolio over the past decade while also highlighting future opportunities and needs. We welcome your comments which can be emailed to the Vice-Provost for Research and Sponsored Programs: tthornto@alaska.edu.

- Research is embedded in our UAS Mission:

*“Student learning enhanced by **faculty scholarship, undergraduate research** and creative activities, community engagement, and the cultures and environment of Southeast Alaska”*

- UAS research strengths: * * *
Coastal Rainforests, Environmental Science, Marine Biology, Fisheries & Mariculture
- Funded research has grown significantly in the last 10 years
 - 117% increase in submitted proposals
 - 22% increase in Research & Sponsored Programs expenditures (\$5.7M in FY19)
- Distinctive attributes of UAS research
 - Exceptional faculty with strong research capacity, including 3 recent Fulbright Research Scholars
 - *Alaska Coastal Rainforest Center* - hub for collaborative research in the Pacific
 - UAS is a partner in securing and collaborating on UA-wide federal grants: EPSCoR, INBRE, BLaST
 - Use of shared services—e.g., collaboration with UAF on Institutional Review Board (IRB)
 - Exceptional opportunities for undergraduate and interdisciplinary research (URECA)
 - UAS Research website (<http://www.uas.alaska.edu/research/index.html>) highlighting current projects; searchable database of 400+ peer-reviewed publications:

Alaska Coastal Rainforest Center



The Alaska Coastal Rainforest Center builds partnerships and catalyzes collaborative ecological, economic, and social research in the north Pacific coastal temperate rainforest to support vibrant and resilient communities and ecosystems.



Coastal Linkages

- Coastal Rainforest Margins Research Network
- Alaska EPSCoR Fire & Ice Coastal Margins Team
- Partnerships with UAA and UAF



Glacier Dynamics

- Understanding glacial lake outburst floods at Suicide Basin and beyond



Stream Dynamics

- Stream chemistry and food web modeling
- Extreme weather events and stream flow for infrastructure planning and design



Land Ecosystems

- Yellow-cedar decline ecology and salvage logging opportunities
- Alpine vegetation change monitoring
- Wildlife habitat change assessment



Ocean Resources

- Ocean acidification monitoring via the ferry *Columbia*
- Monitoring and modeling harmful algal blooms and PSP events

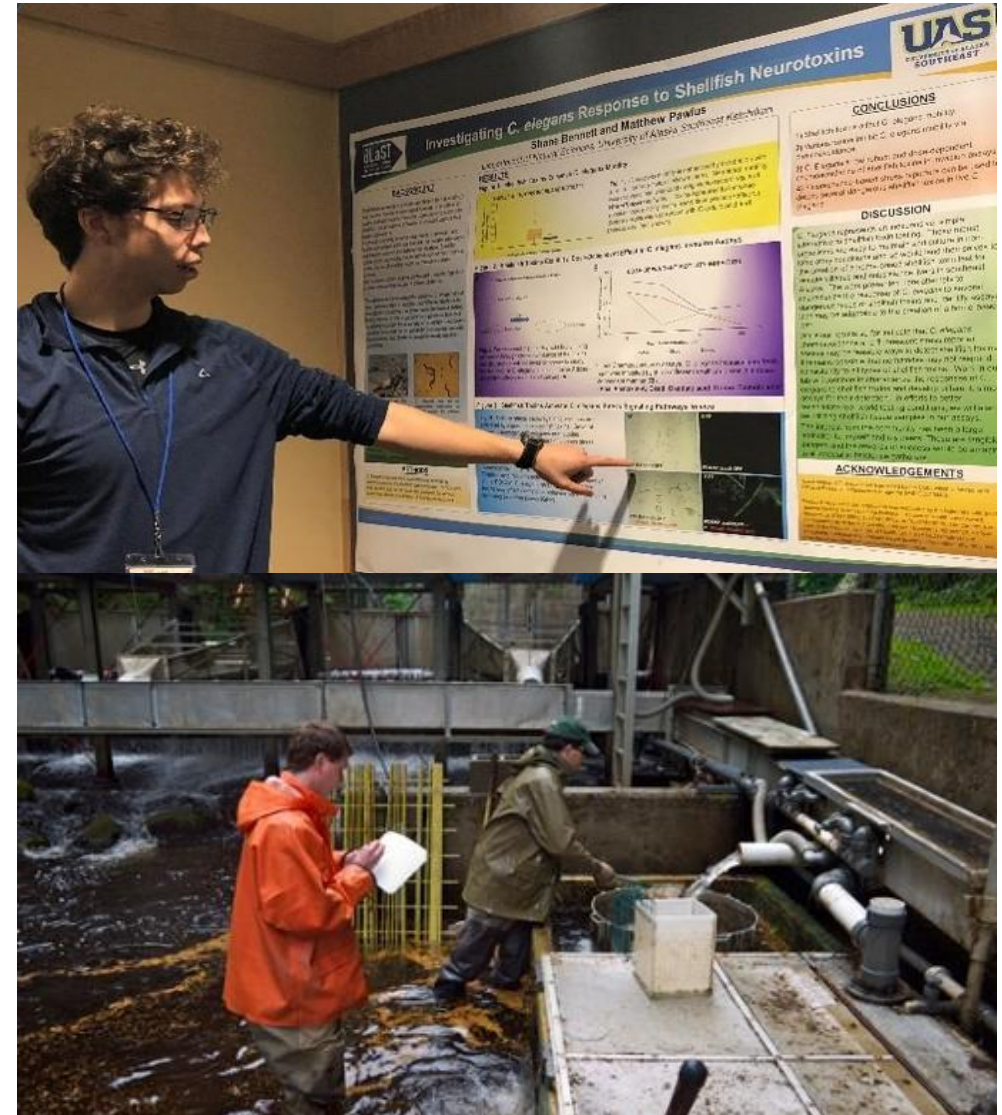
Funding Partners:

AK DOT, AK DGGs, AK DNR, AK DCCED, ADF&G
USGS, USFS, NOAA NMFS, NOAA NWS, NOAA PMEL, NIH
NSF, AOOS, Tula Foundation

UAS Collaborations



- **One Health biomedical research:** *Spatiotemporal variability of water quality impacts in Southeast Alaska*
- **Undergraduate research opportunities** in health & science: *Biosensor for Shellfish Toxins (BLaST/NIH)*
- **Building research capacity: EPSCoR, Phase 4 (NSF)—Forest Ecology, Coastal Margins, and Microbiology (new position)**
- **Southeast Oceanographic data analysis:** *NASA Space Grant and summer Kayak Oceanography course.*
- **Alaska Native and Community Partnerships:** Sealaska Heritage Institute (herring populations); Sitka Tribe (toxicology); Sitka Sound Science Center (WhaleFest)



Research Spotlight: Ocean Health and Coastal Resources

Climate-driven changes to the ocean that affect fisheries and human health



Ocean Acidification Monitoring via the Ferry M/V *Columbia*

Partners:

- Alaska DOT, Alaska Marine Highway System
- Alaska Ocean Observing System
- NOAA Pacific Marine Environmental Lab
- Tula Foundation



Monitoring and Modeling Harmful Algal Blooms

Partners:

- NOAA
- NIH/BLAST program, UAF
- Sitka Tribe of Alaska



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Research Spotlight: Ocean Health and Coastal Resources



Using innovative tools to understand changing ecosystems



Auke Creek Weir, NOAA

Using eDNA to quantify salmon runs and
Identifying factors limiting coho stocks

Partners:

- NMFS Alaska Science Center
- Oregon State University
- Auke Creek Salmon Weir



Using drone technology for research

Modeling extreme climate events for infrastructure
planning – atmospheric rivers & drought

Partners:

- Alaska Department of Transportation & Public Facilities
- Alaska Division of Geological and Geophysical Surveys
- National Weather Service
- US Geological Survey

Research Spotlight: Marine Mammals in Coastal Ecosystems

- **Sea Otters, Ocean Carbon & Climate Change**
 - Relationship of Sea otters, urchins, & kelp
More kelp = more carbon stored
 - Marine conservation is an innovative strategy for climate change mitigation in Alaska
- **Sustainability of Whale Watching**
 - A rapidly growing industry in Juneau: ~\$35M/yr
 - Humpback whales respond negatively to whale-watch vessels
 - Sustainable management practices will preserve the long-term health of the industry



Research Spotlight: *Safe Scent*—Guiding Marine Life Away from Danger

Award winner in the 2019 Arctic Innovation Competition
Professor Jan Straley, UAS Sitka



2019 Arctic Innovation Competition

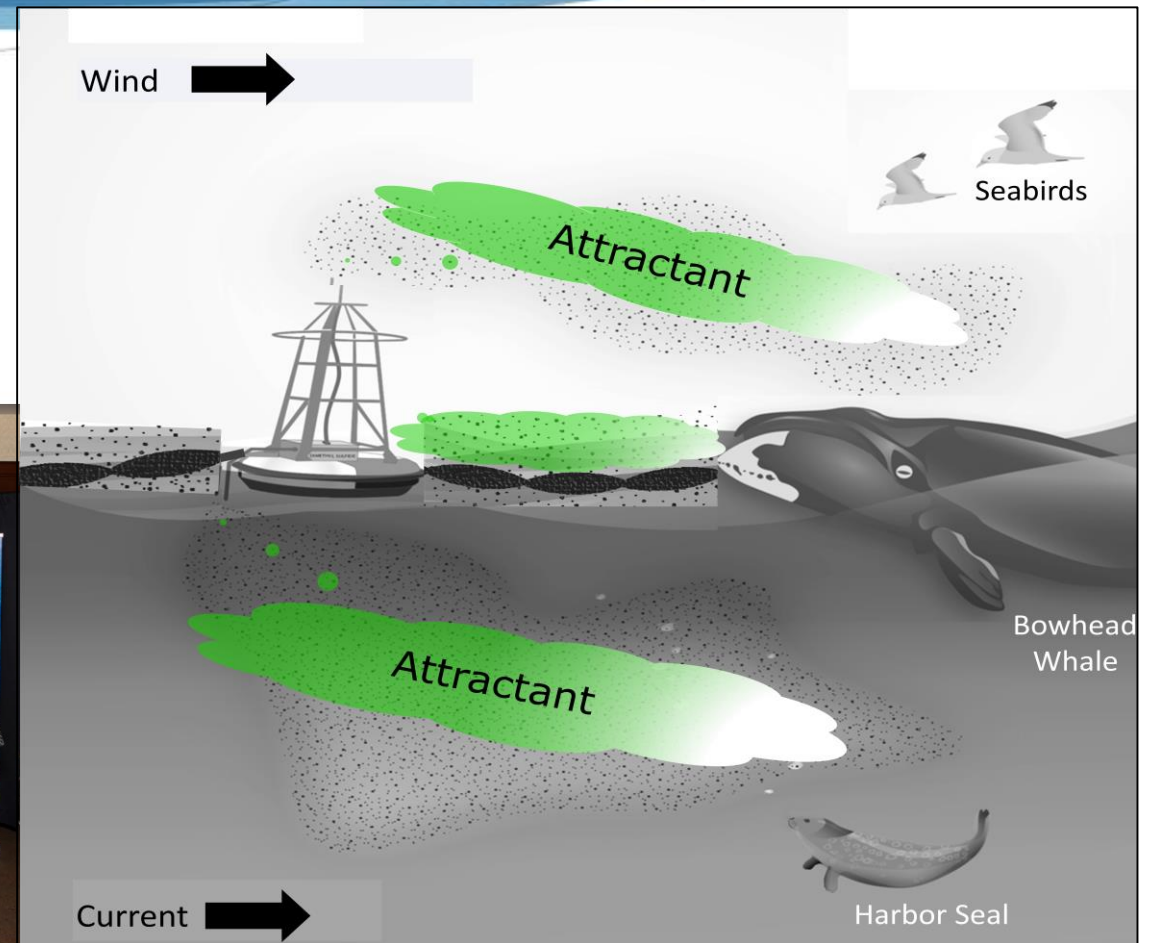
You are invited to attend AIC!
Watch the top finalists present their innovative ideas
and compete for **\$30,000 in prizes.**
See the top ideas at www.arcticinno.com

THREE DIVISIONS

MAIN	JR	CUB
ages 18+	ages 13-17	ages 12 and under

Saturday, October 19, 2019

Safe Scent is a novel method for luring high-profile marine predators away from hazards – such as oil spills or busy shipping lanes – by releasing a natural, food-related chemical cue to guide them in a safe direction.



Opportunities to Enhance UAS Research



- Enhance Alaska Coastal Rainforest Center to boost UAS environmental research capacity
- Increase Post-Doctoral fellows, Visiting Research Faculty program:
 - Short-term funded opportunities for research faculty
- Expand and formalize UA-wide research networks:
 - Opportunities in mariculture, renewable energy, toxicology, sustainability science
- Construct UAS Auke Bay Integrated Science Facility to consolidate research labs & faculty on UAS campus
 - Adds efficiencies and creates more compact footprint
- Looking forward: Consider adding new one-year Master's degree with research or practicum components linked to university projects and state needs