



**ARCTIC DOMAIN
AWARENESS CENTER**
A DEPARTMENT OF HOMELAND SECURITY CENTER OF EXCELLENCE

ADAC Summary for CMR 26 Aug 2020

A presentation by

Arctic Domain Awareness Center
University of Alaska Executive Director



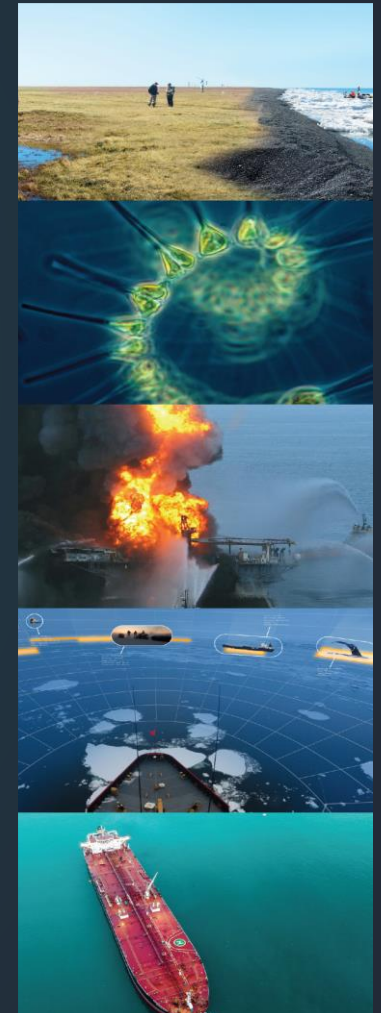
Upfront: Addressing ADAC's contributions to Homeland Security

ADAC is a DHS S&T UP Center of Excellence in Maritime Research, hosted by the University of Alaska.

ADAC is a research network with its hub located at the University of Alaska Anchorage.

ADAC advances Arctic Science in the following categories of research:

- Geophysical environmental modeling;
- Marine robotics;
- Decision support science;
- Biological & marine environmental science;
- Satellite support;
- Civil engineering;
- Big data analytics;
- Social science...to include gaining insights from rural Alaska and Arctic communities.



ADAC: Research for the Arctic Operator... For Today and For the Future

University of Alaska's Arctic Domain Awareness Center...

- “Operator driven research” to support the Arctic maritime mission of the U.S. Coast Guard...
- ...and other U.S. federal maritime security and safety activities
- ...and to support the public good.

Meet our customers



Courtesy NASA.gov



Courtesy The Arctic Institute



Courtesy Defense news.com



Courtesy The Alaska Eskimo Whaling Commission

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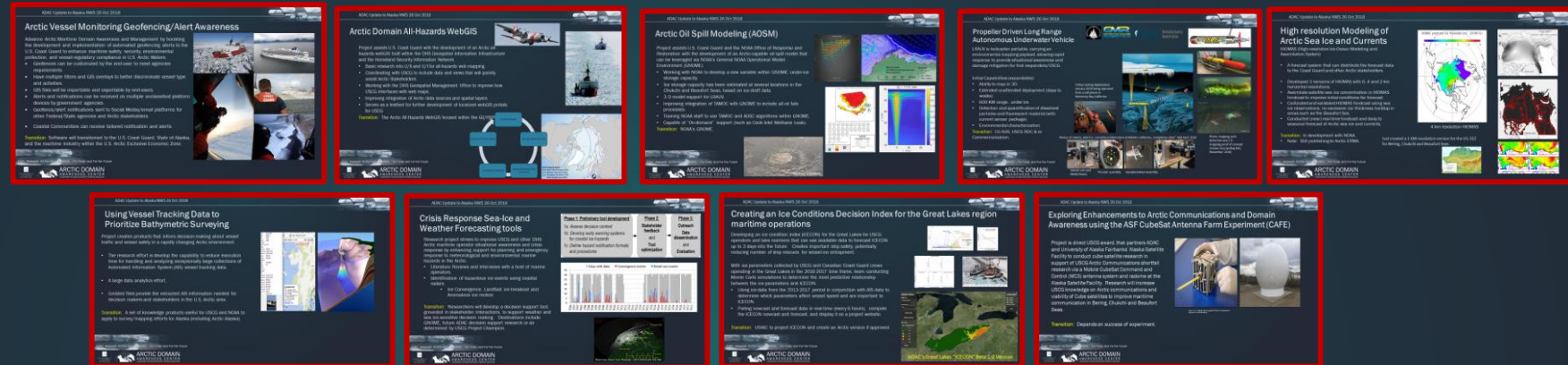
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ADAC's strategic approach Advance S&T, Convene and Educate

1. Lead Arctic focused Science and technology research



2. Convening experts via Arctic focused workshops to create new understandings and solve problems



3. Conduct a educational Programs



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Many Traditions One Alaska

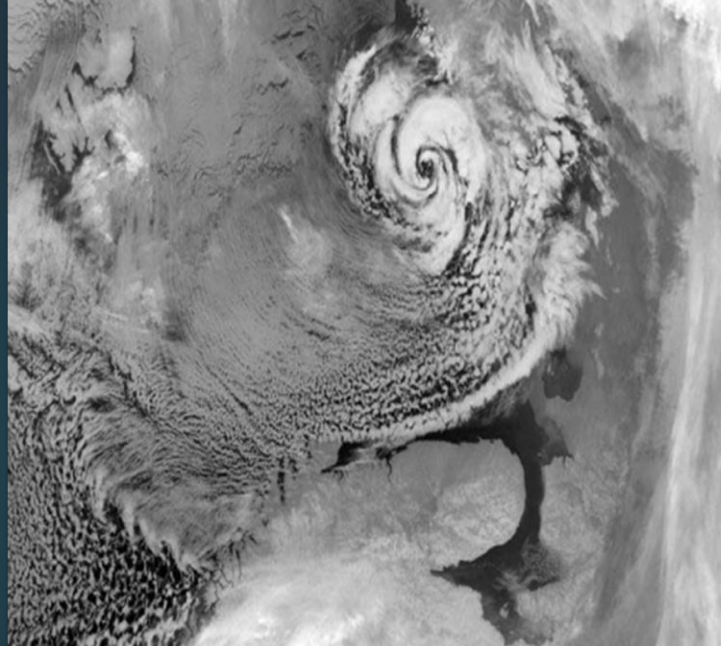


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(Some) of the Challenges faced by the maritime operator

- Weather
- Illumination
- Distances
- Sea ice (its more complicated than one may think)
- Logistics
- Infrastructure
- Communications
- Bathymetry (what's below the waves?)

Goal = Strengthening
Research Partnerships
in support of Operations



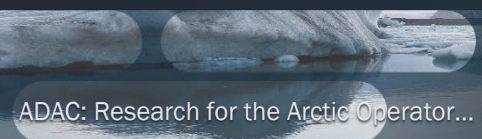
A polar low northeast of Scandinavia in the Barents Sea.
Credit: Erik Kolstad/Tlickr.

Helping the operator...means improving the...

- Ability to locate people who need help
- Ability to locating people who are doing illegal activities
- Ability to suitably respond to disasters
- Ability to identify threats and risks to our interests
- In sum...an ability to respond

Accordingly...ADAC's Mission = an opportunity to help via:

- S&T Solutions
- Knowledge Products
- Convening experts to study, discern and propose
- Educate next generation of HSE professionals...steeped in science



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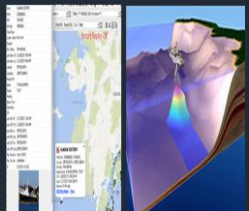
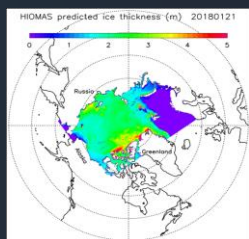
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ADAC...*operator driven science & technology*...for the Arctic

- **Models on the Physical Characteristics of the Arctic**, such as fine scale sea-ice characterization at various scales.
- **Decision support tools** for Marine operations in the Bering, Chukchi & Beaufort Seas and Great Lakes ice conditions characterized and tailored for vessel types.
- **Tactical tools** for mariner use based on localized sea-ice hazards.
- **Oil spill studies** to understand impact to Arctic mussels and copepods, & future Arctic spill modeling.
- **Induced polarization** to characterize oil spills within sea ice conditions
- **Big Data analytics** to support NOAA bathymetric survey prioritized on vessel traffic.
- **Models to support disaster response**: Oil Spills in Arctic Ocean environments and Storm Surge in Western Alaska.
- **Long-range Autonomous Platforms** to support oil spill response characterization and other physical aspects
- **Geo-spatially oriented data aggregation** for all hazards & geofencing for USCG command centers
- **Support to small satellites** to improve Arctic communications.
- **Sensors, chemical isotope detection, smart camera development & community based observations**
- **Mariner training** in support of IMO polar code.



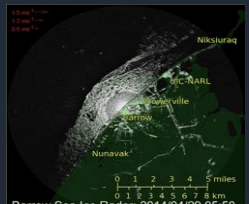
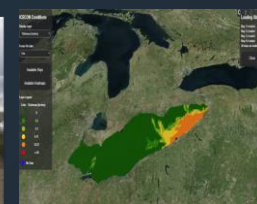
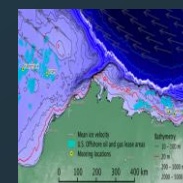
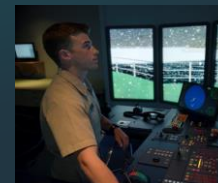
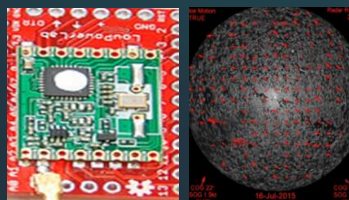
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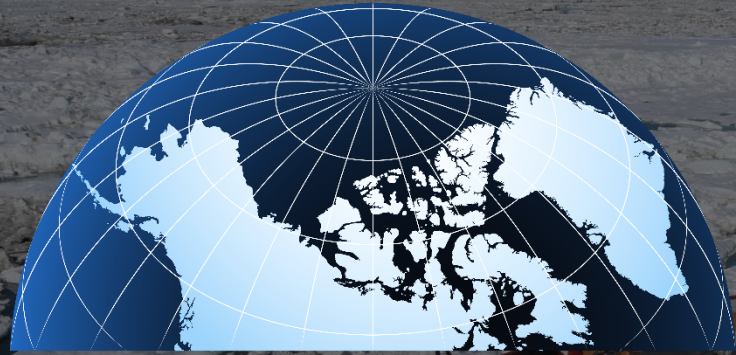


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Ready for Questions & Discussion

...Thank you for your attention!



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