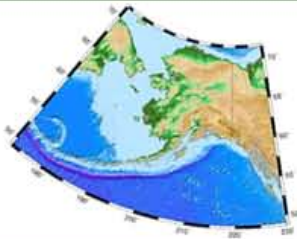


# The Alaska Marine Information System

*Dr. Mark Johnson  
Professor of Marine Science  
Institute of Marine Science  
University of Alaska Fairbanks*

Google "Alaska Ocean Observing System" or "AOOS"  
See "Access the data" at upper left  
Click Alaska Marine Information System

- Or go to: <http://ak.aos.org/aos/index.html>
- And see the AMIS demo page: <http://ak.aos.org/amis/demo/>



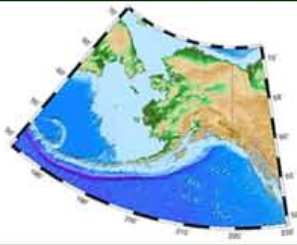
## Sponsors

The Alaska Ocean Observing System

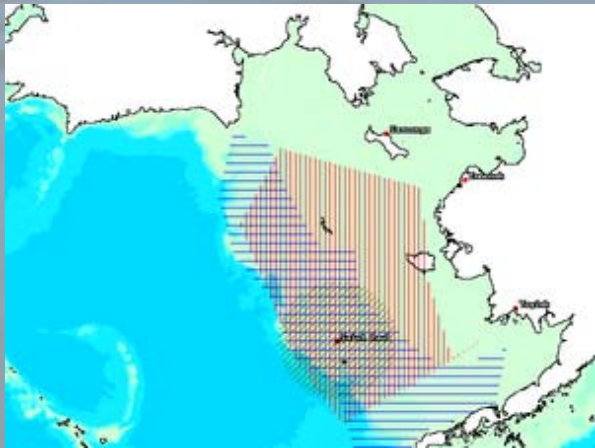
Molly McCammon, Executive Director

The North Pacific Research Board

Clarence Pautzke, Executive Director



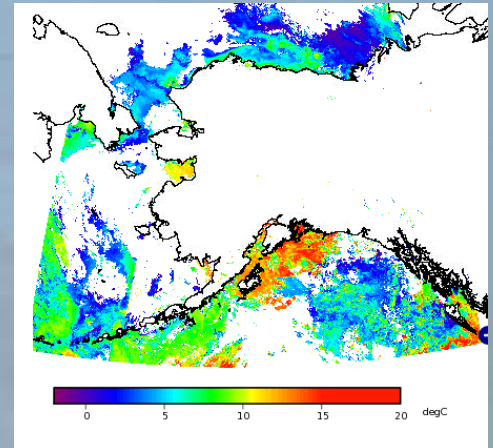
*AMIS is an online interactive tool to view information and obtain data from Alaska's marine environment.*



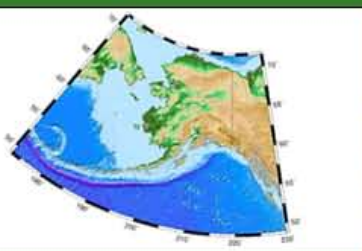
Project locations



Ship tracks



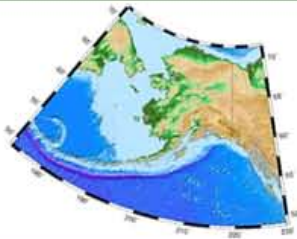
Satellite data



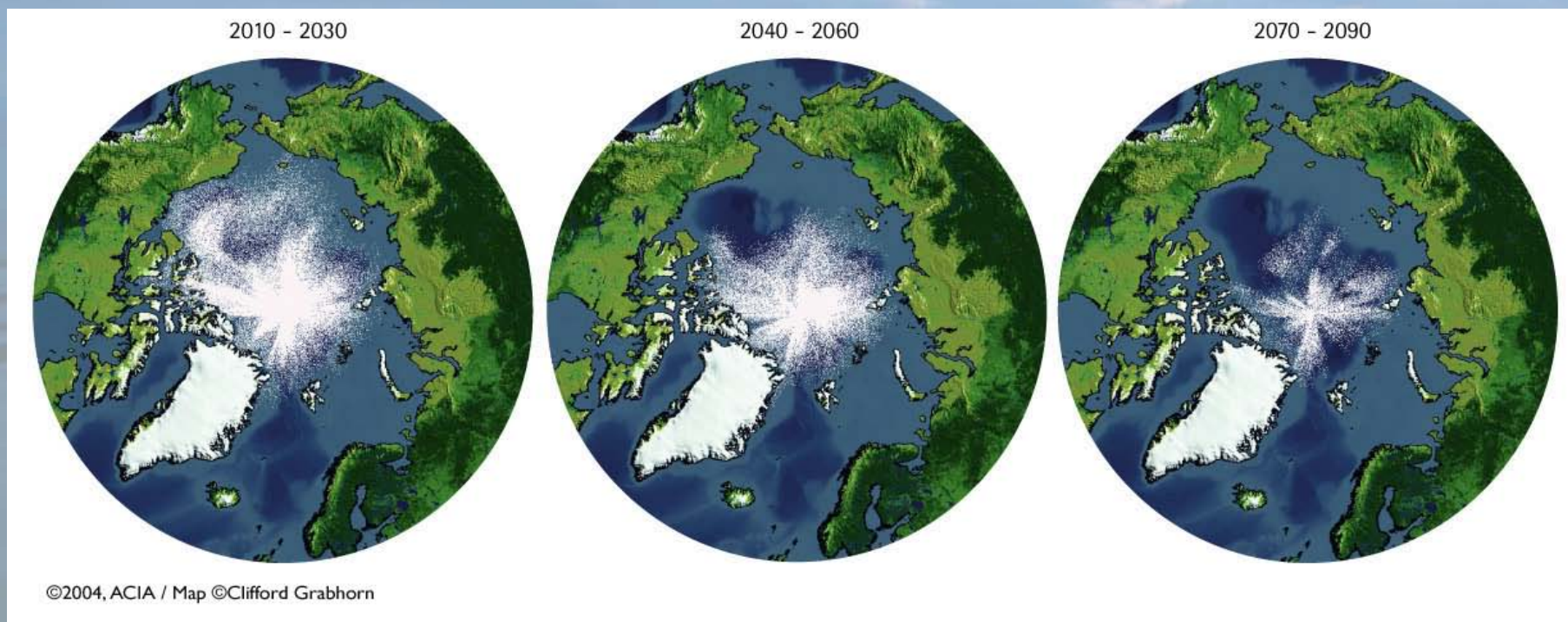
## Why AMIS ?

- Information needs to be accessible:
  - For better decision making
  - To guide policy at the local and national levels
  - To make efficient use of existing resources
  - Sustainability of the marine environment

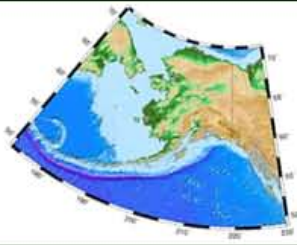
Better information means better decisions



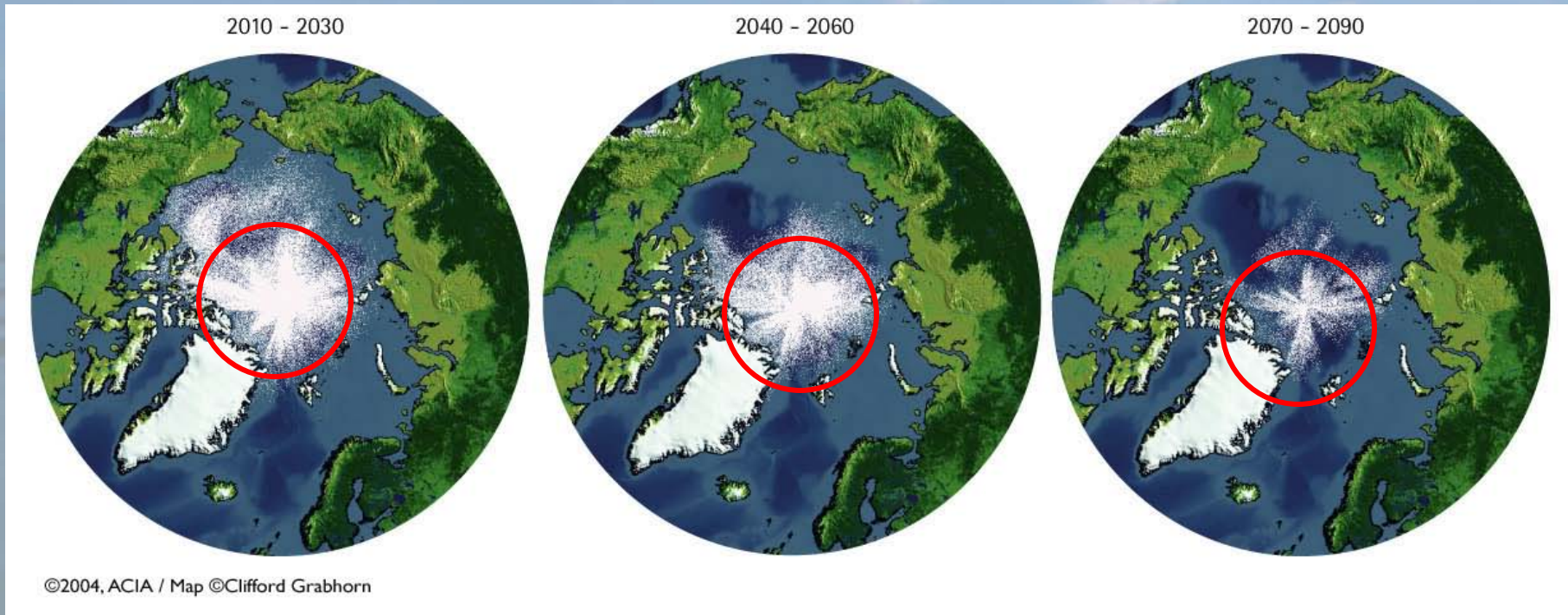
## ACIA Sea Ice Projections to 2090



# Model Validation

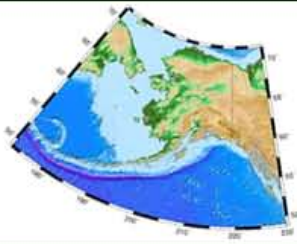


## ACIA Sea Ice Projections to 2090

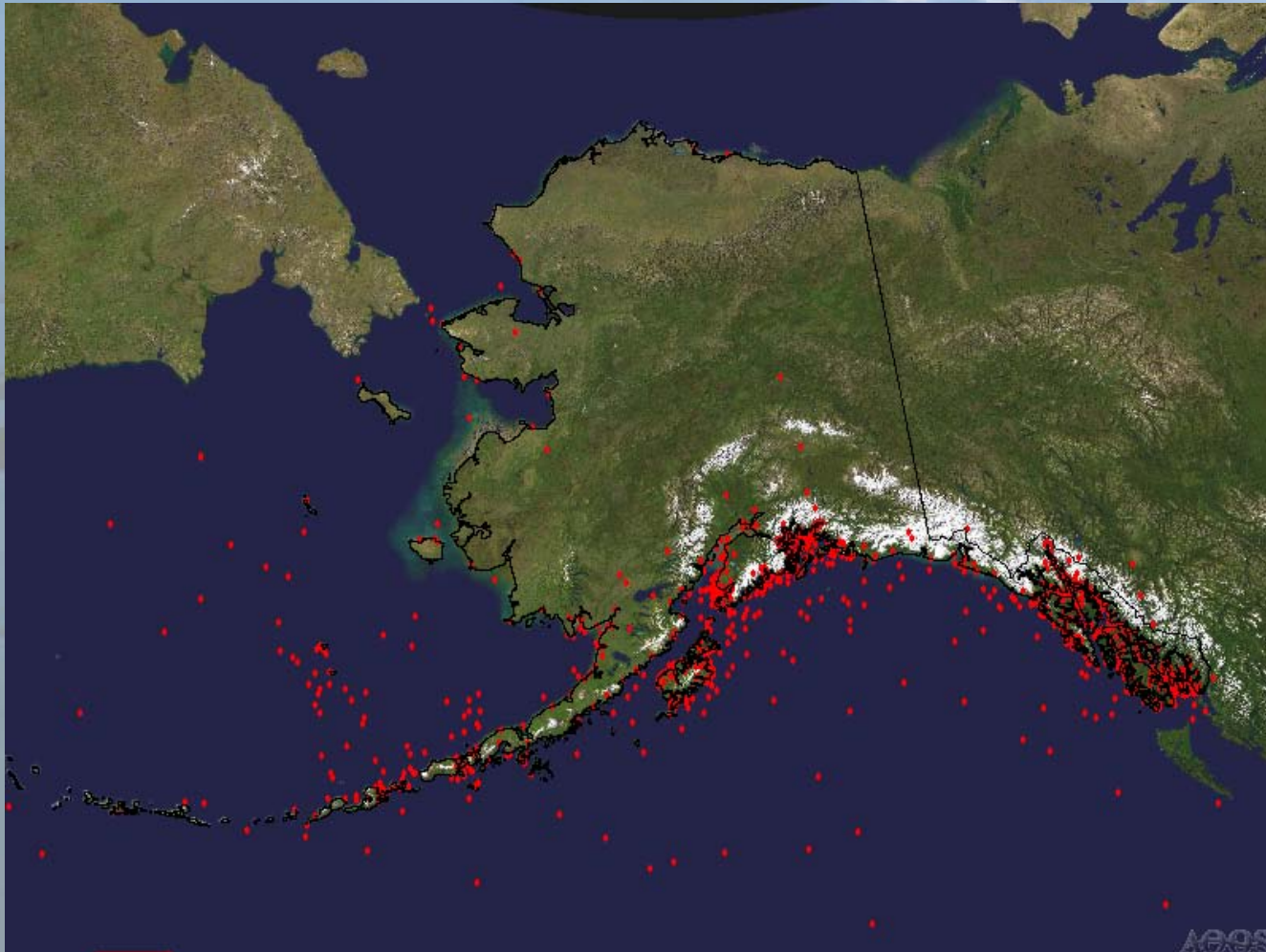


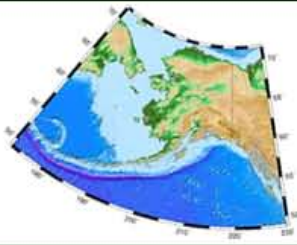
**These distributions are not real !**

Where is the information to test these forecasts?



# *Search and Rescue*

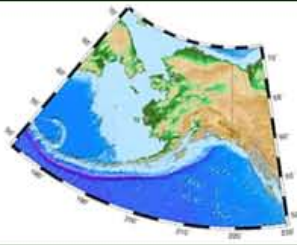




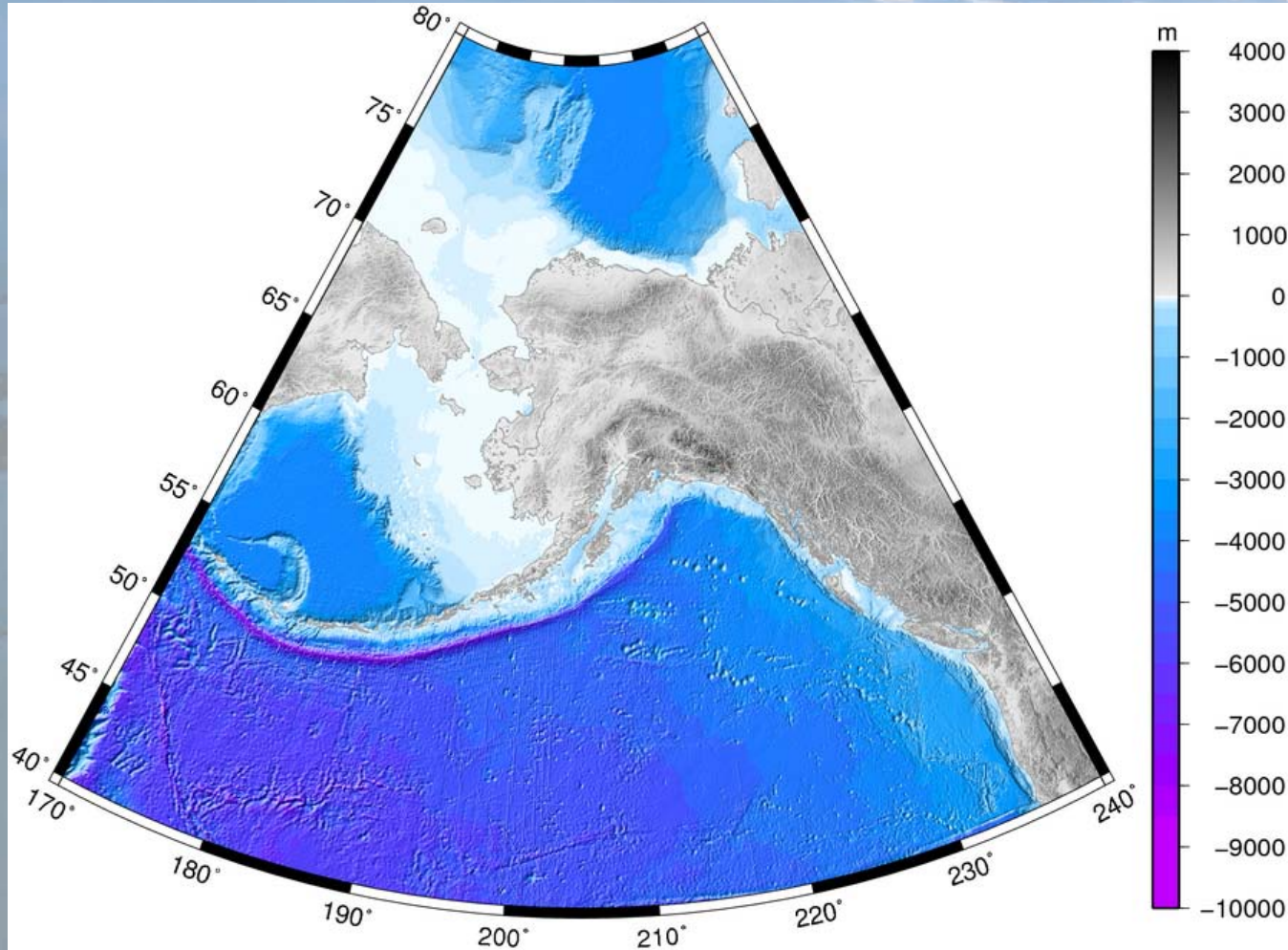
# Finding answers with AMIS

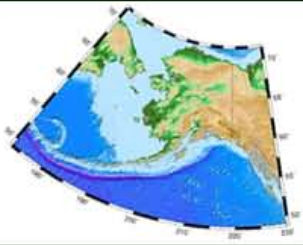
- *What is the best bathymetry for a particular region?*
  - Search:  
"Alaska",  
"Bathymetry"

**AMIS returns the latest data**

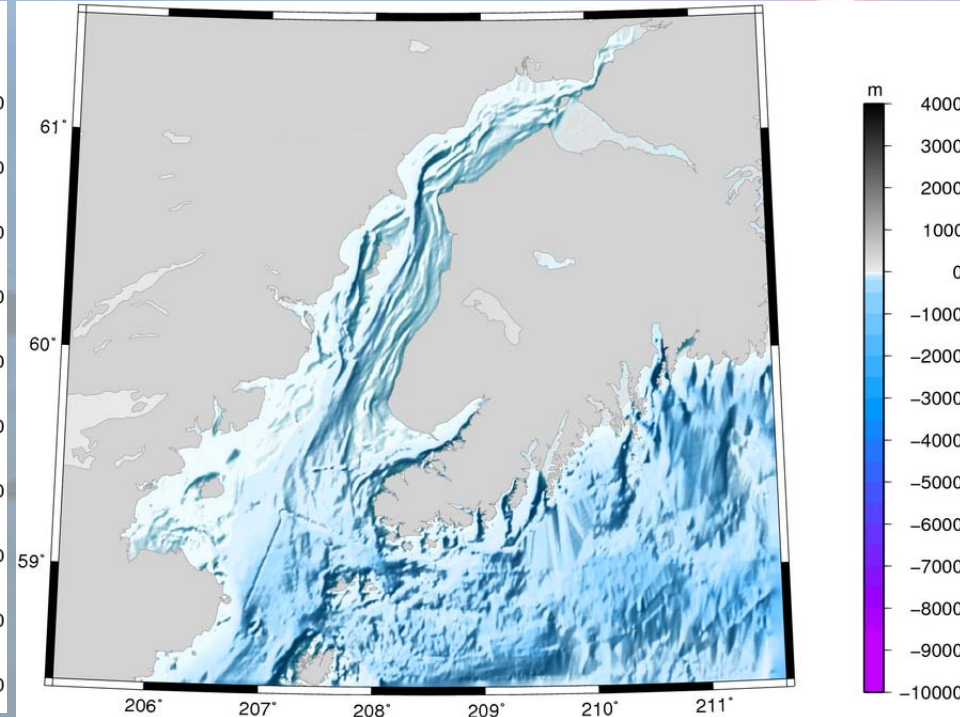
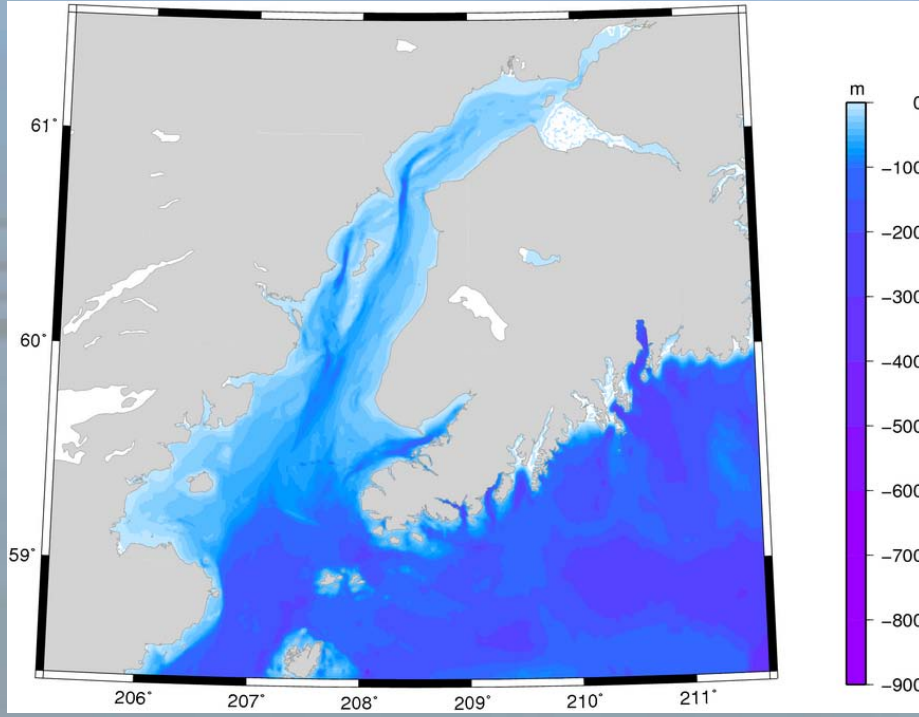


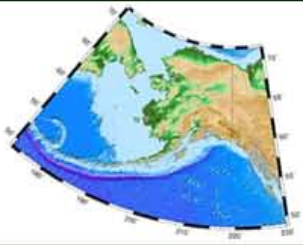
# Statewide



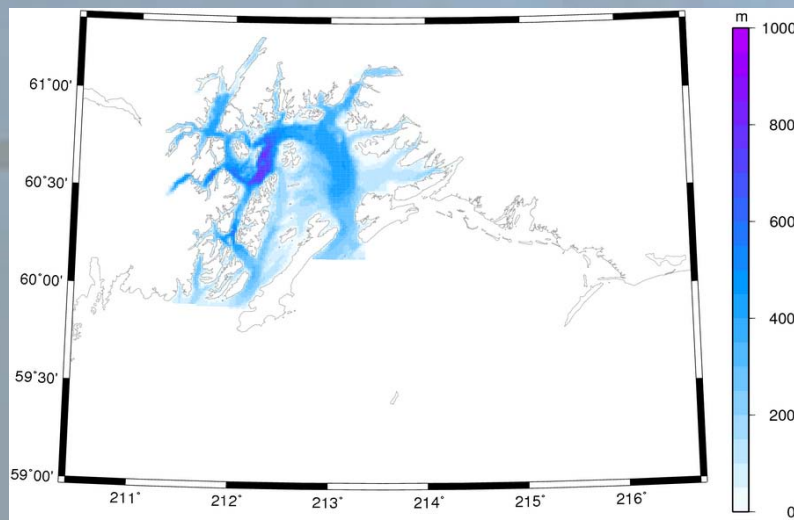
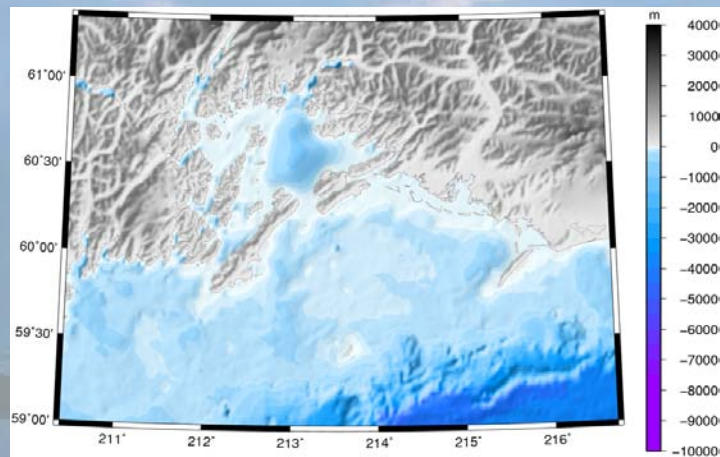
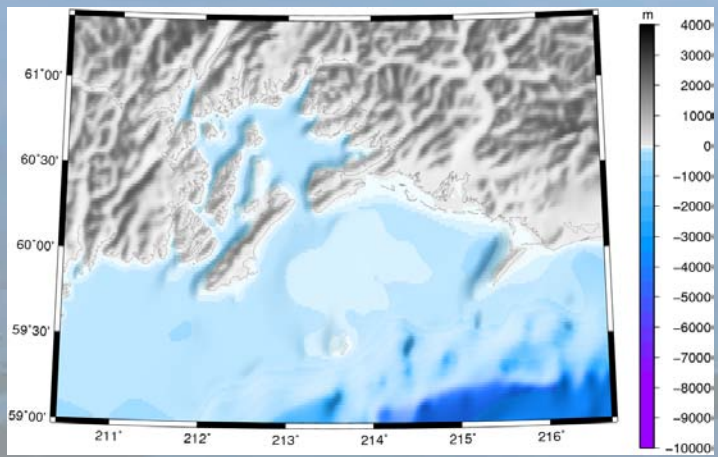


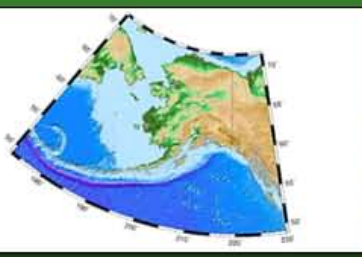
# Cook Inlet





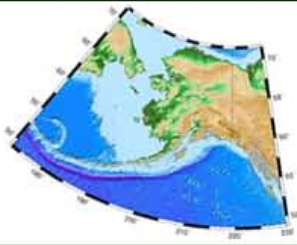
# Prince William Sound





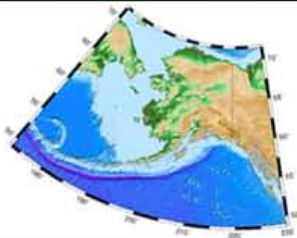
# *Goals*

- Allow discovery of past projects and historical data
- Assist project planning and coordination
- Make better use of existing observations
- Provide visual exploration of datasets
- Provide data download in industry standard formats
- Provide tools to project and data managers
- Provide a central marine database

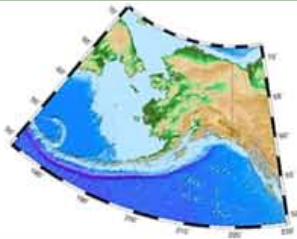


# Searching for projects

- *What projects exist in a particular region?*
    - Search a region and a person:  
“Bering Sea”,  
“Mark Johnson”
- AMIS returns:**
- **A map with project information**
  - **Access to related data**



|              |  |                       |
|--------------|--|-----------------------|
| Agency       | Alaska Department of Fish and Game                               | Andrews, Elisabeth    |
| Agency       | Alaska Department of Fish and Game                               | Andrews, Elisabeth    |
| People       | Alaska Fisheries Science Center                                  | Aydin, Kerim          |
| Program      | Alaska Fisheries Science Center, Kodiak                          | Boveng, P             |
| Region       | Alaska Legislature   | Byrd, Vernon          |
| Time range   | Alaska Ocean Observing System                                    | Cameron, M            |
| Variable     | Alaska Science Center  | Castellini, Michael   |
| Words in ... | Alaska Sealife Center  | Cermak, Joseph        |
|              | Alaska State Division of Environmental Health                    | Ciannelli, Lorenzo    |
|              | Alaska State Legislature   | Clapham, Phil         |
|              | Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative             | Coyle, Ken            |
|              | Consortium for Risk Evaluation with Stakeholder Participation II | Devol, Al             |
|              | CRESPII  | Fall, Jim             |
|              | Exxon Valdez Oil Spill Trustee Council                           | Farley, Edward        |
|              | Institute of Marine Science                                      | Freitag, Gary         |
|              | Knowledge Network for Biocomplexity                              | Friday, Nancy         |
|              | Minerals Management Service                                      | Gradinger, Rolf       |
|              | National Aeronautics and Space Administration                    | Grebmeier, Jacqueline |
|              | National Biological Information Infrastructure                   | Griscavage            |
|              | National Marine Fisheries Service                                | Harvey                |
|              | National Ocean Service   | Heintz, Ron           |



[MyAOOS](#)

**Search**   **Explore**   **Access**

select category ▾

Clear Set   New Set   Delete Set   Clear All

Search Term Sets

Data Term set

[delete](#) region::predef: Aleutians

Project Term set 1

[delete](#) region::predef: Aleutians

Search

Proposal/Project Results

Improving sea ice forecasting using measurements of sea ice thickness

Ichthyoplankton Information System

Bering Sea temperatures and their relationship to walleye pollock 🐟 fisheries: a feasibility study of year-round near-real time data acquisition.

Amchitka Oceanographic Survey

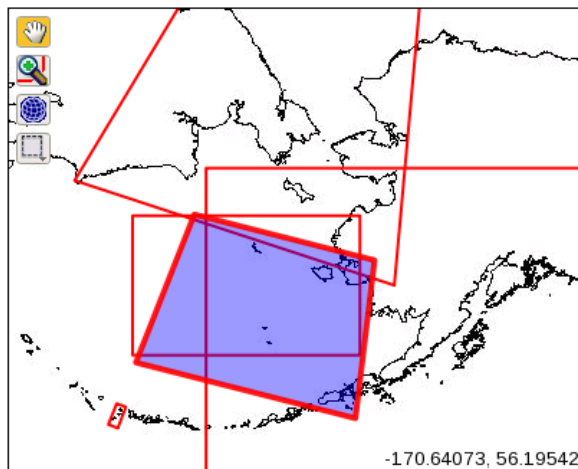
USGC Cutter Healy Cruise HLY0701 CTD

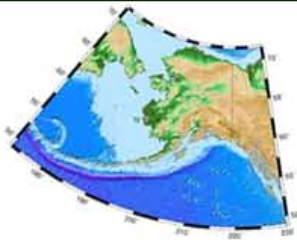
Dataset Results

Unselect all

[AFSC IIS](#)

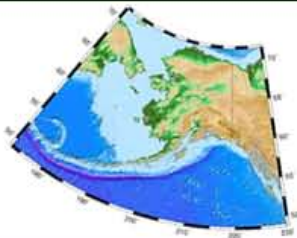
[PMEL CTD Profiles](#)



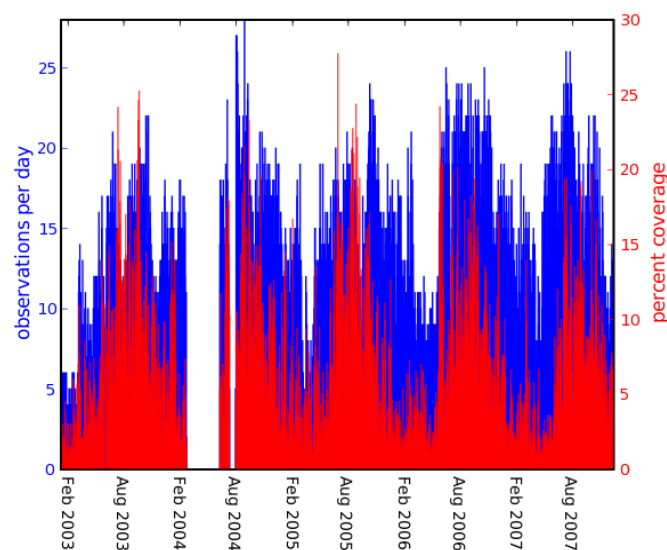
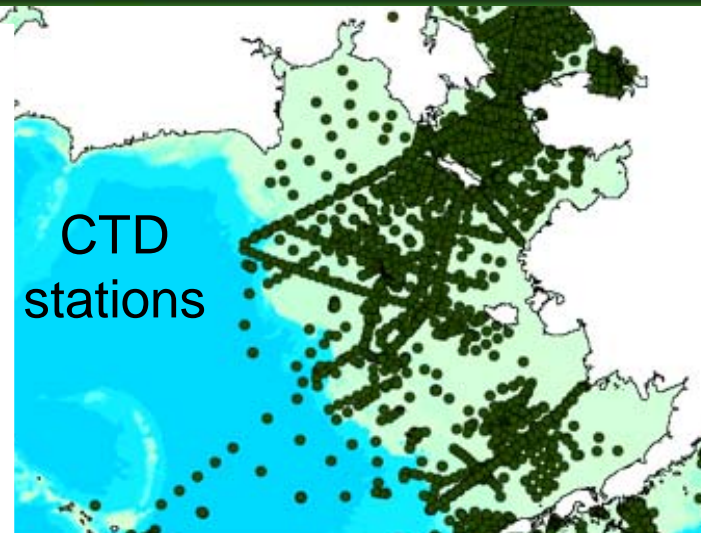
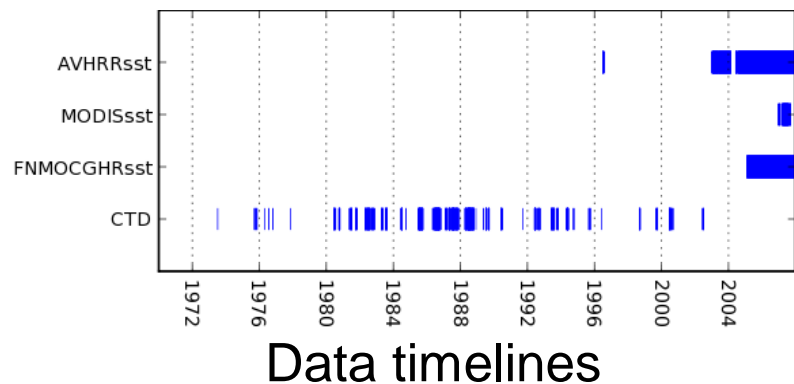


# Searching for data

- *What data exist for a particular region?*
    - Search:  
“Bering Sea”,  
“Temperature”
- AMIS returns:**
- **CTD station locations**
  - **ARGO float locations**
  - **ship and survey tracks**
  - **AVHRR and MODIS satellite data availability**
  - **mooring locations**

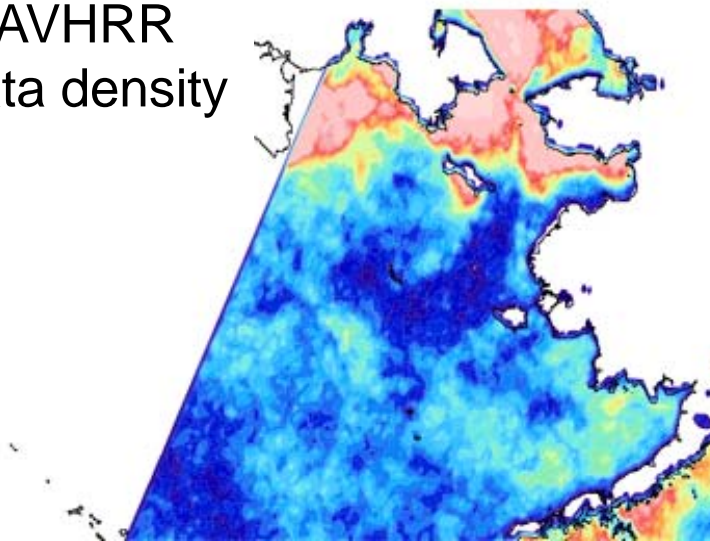


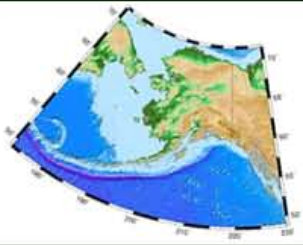
# Graphical data summary



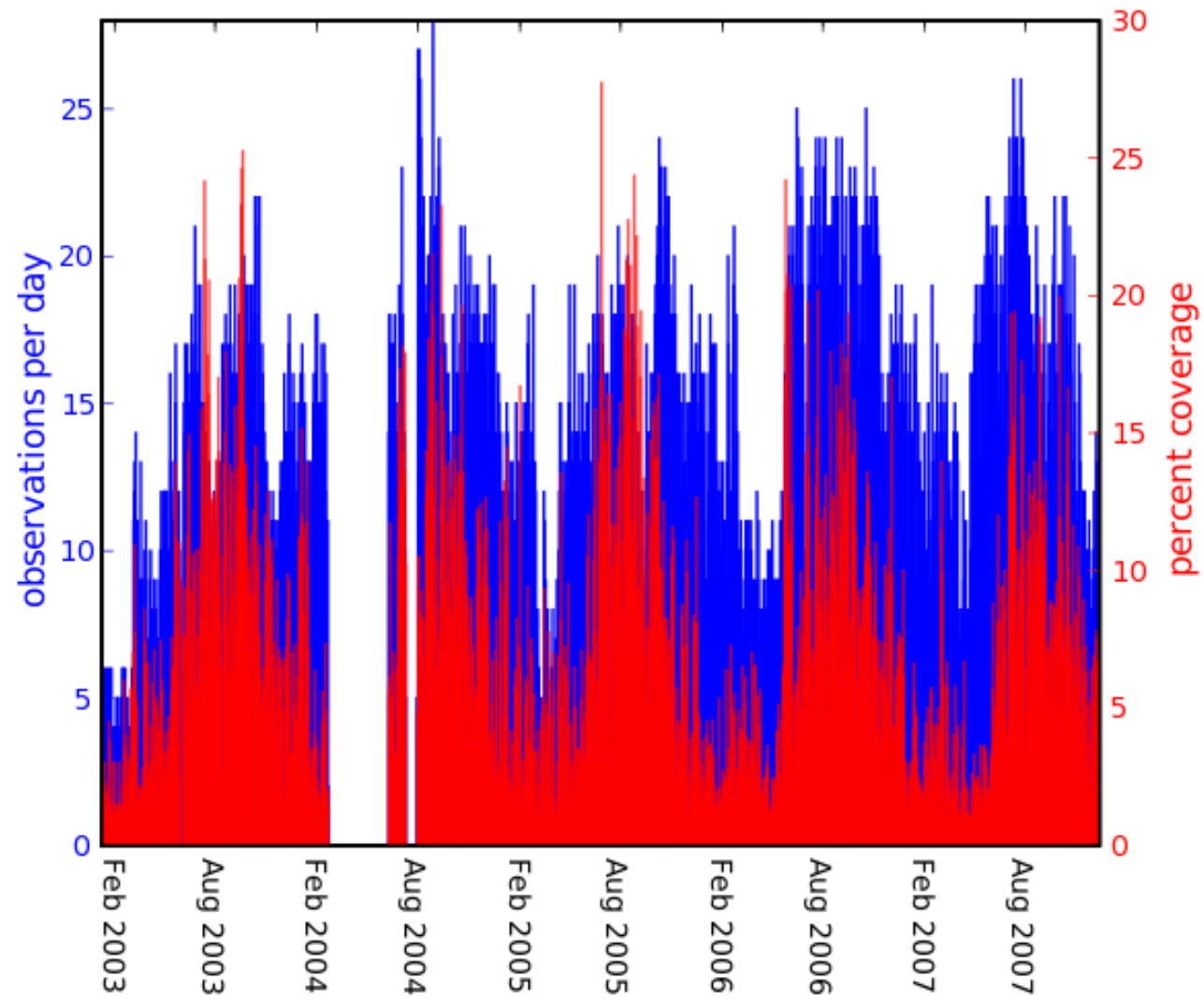
AVHRR data density

AVHRR temporal history





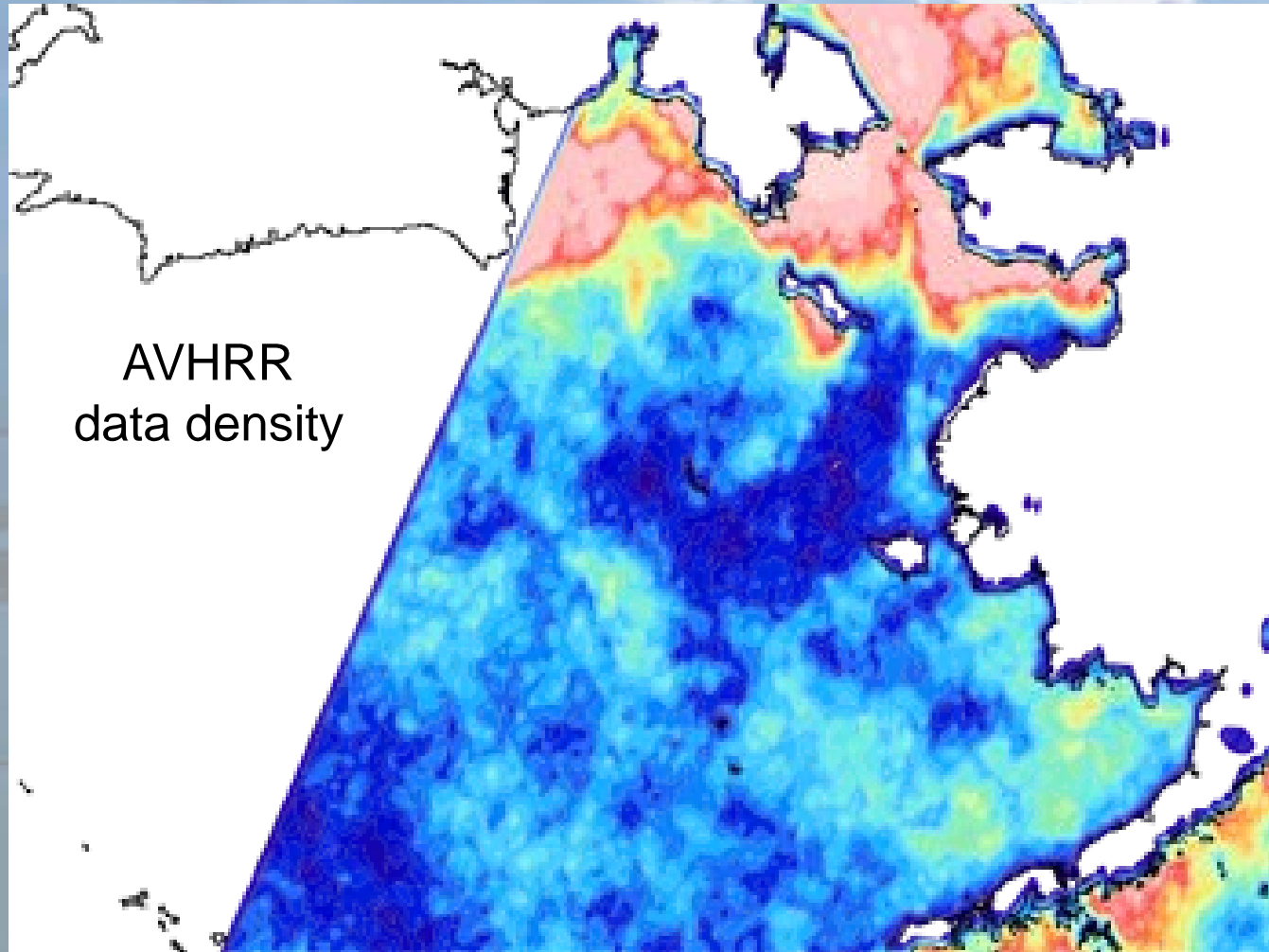
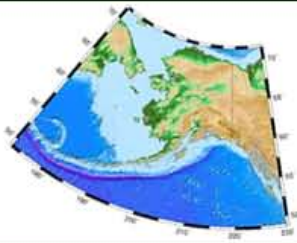
## AVHRR temporal history



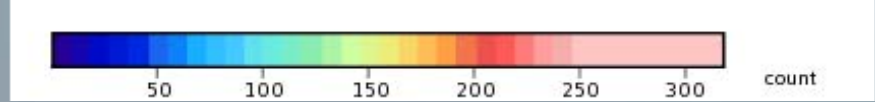
# AOOS

Alaska Ocean Observing System

*The Eye on Alaska's Oceans and Coasts*



AVHRR  
data density



# AOOS

Alaska Ocean Observing System

*The Eye on Alaska's Oceans and Coasts*



CTD 1970s



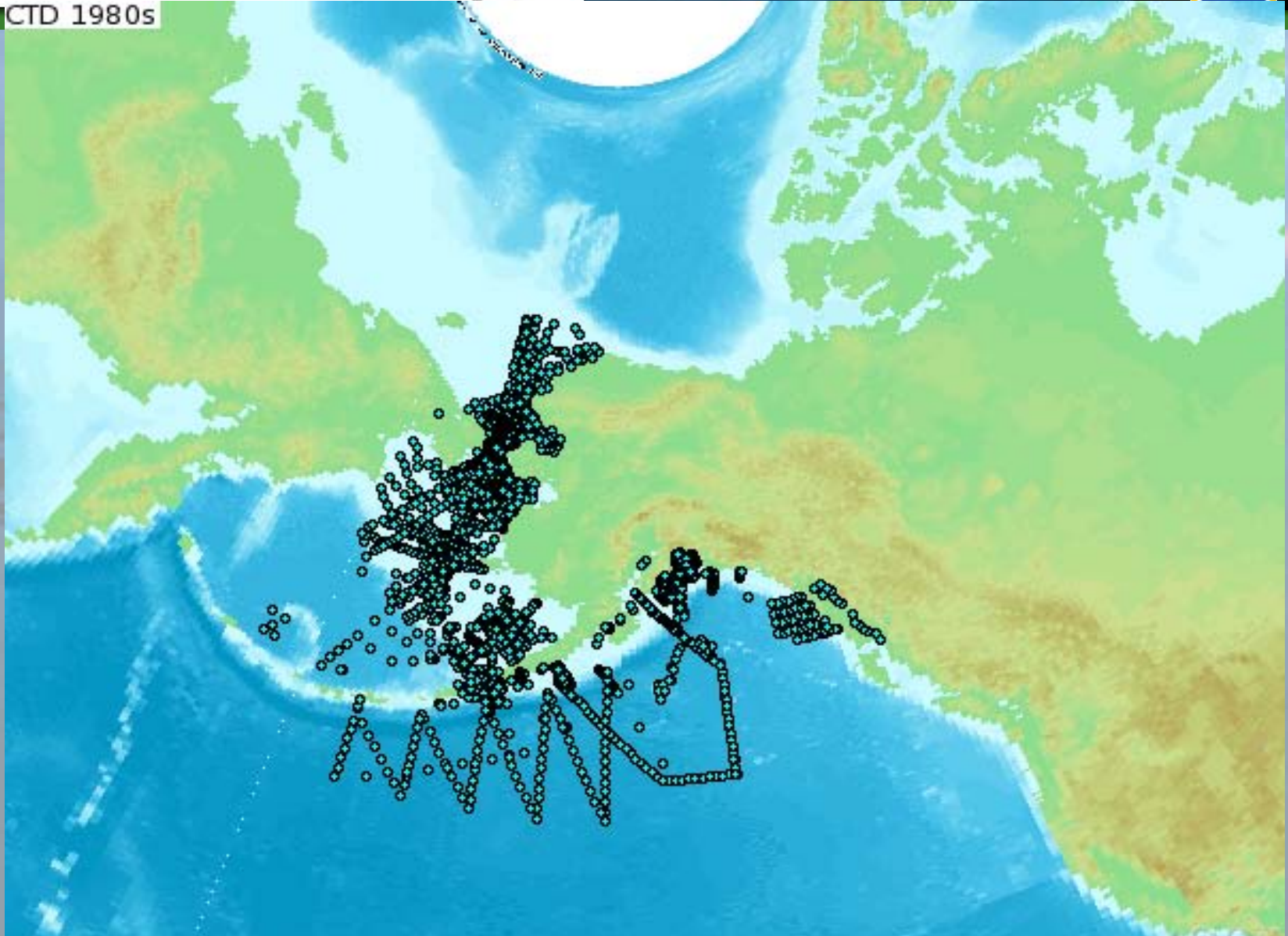
# AOOS

Alaska Ocean Observing System

*The Eye on Alaska's Oceans and Coasts*



CTD 1980s



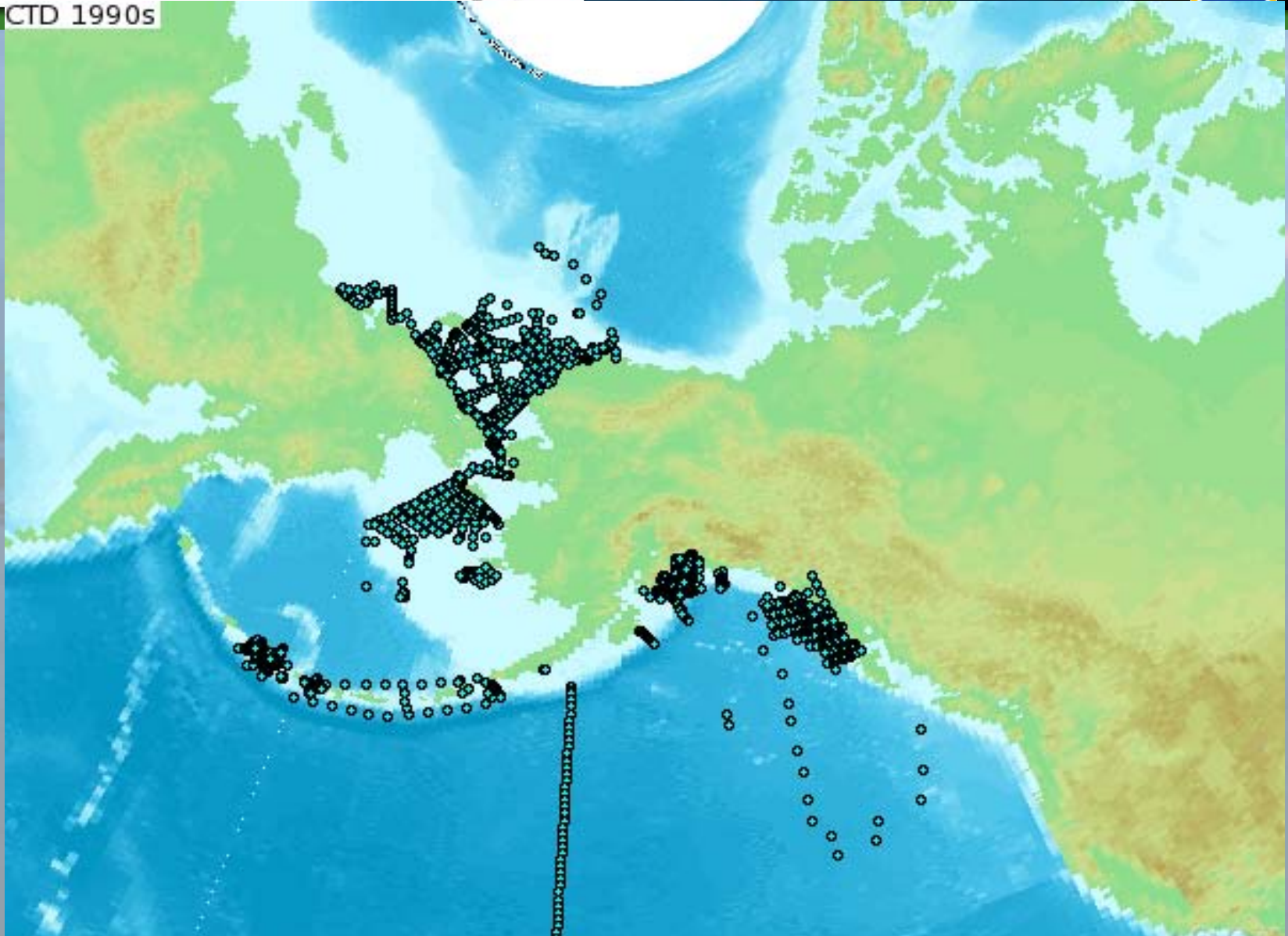
# AOOS

Alaska Ocean Observing System

*The Eye on Alaska's Oceans and Coasts*



CTD 1990s



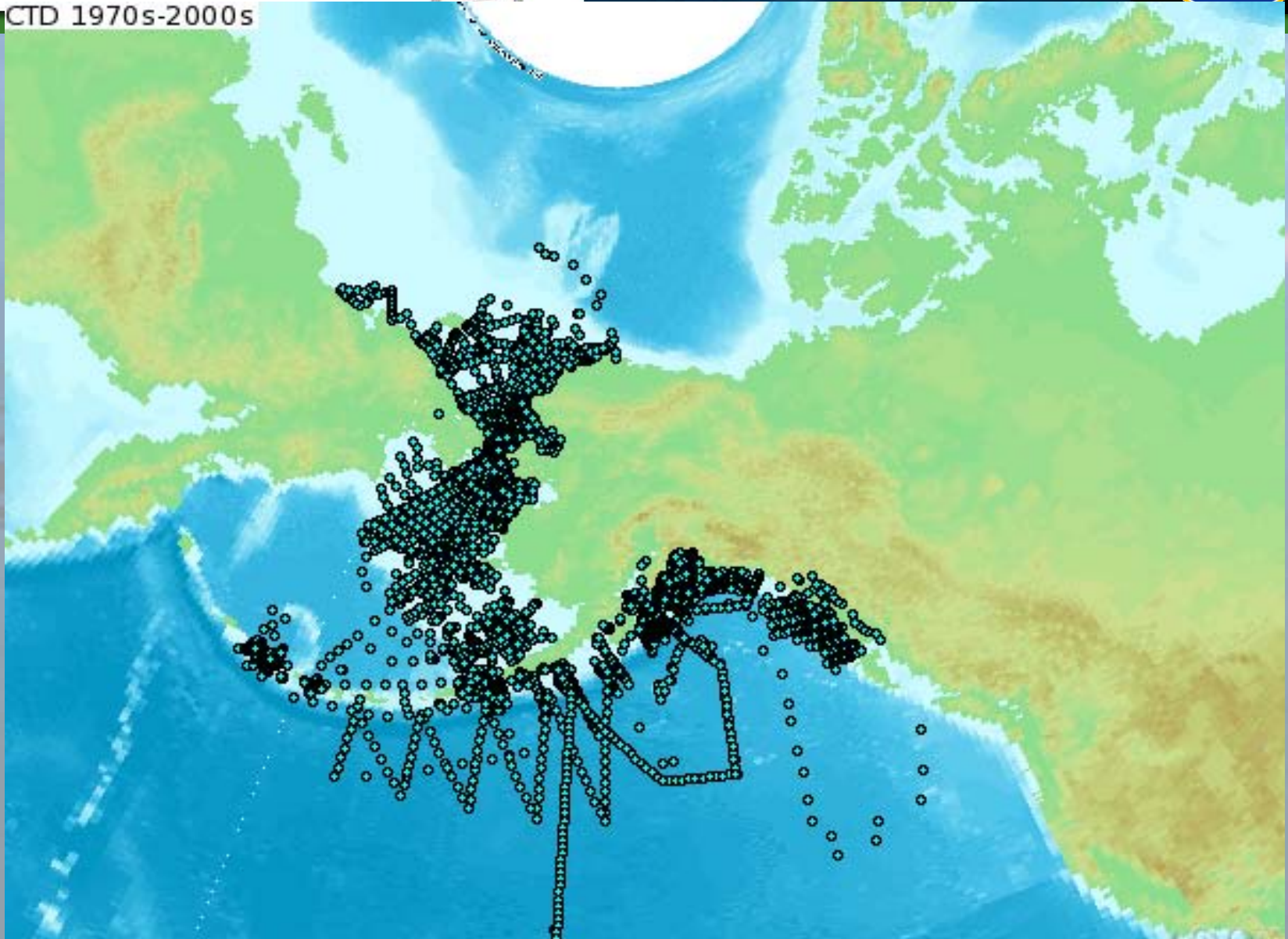
# AOOS

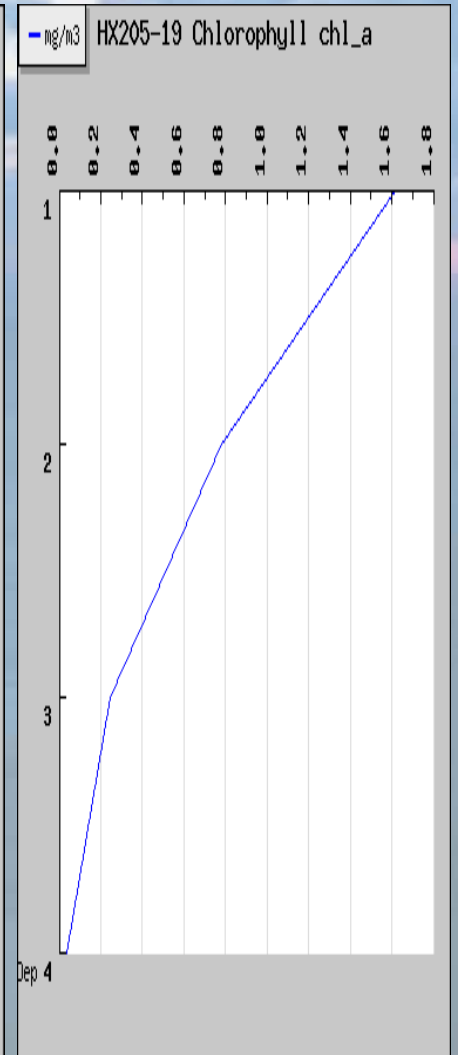
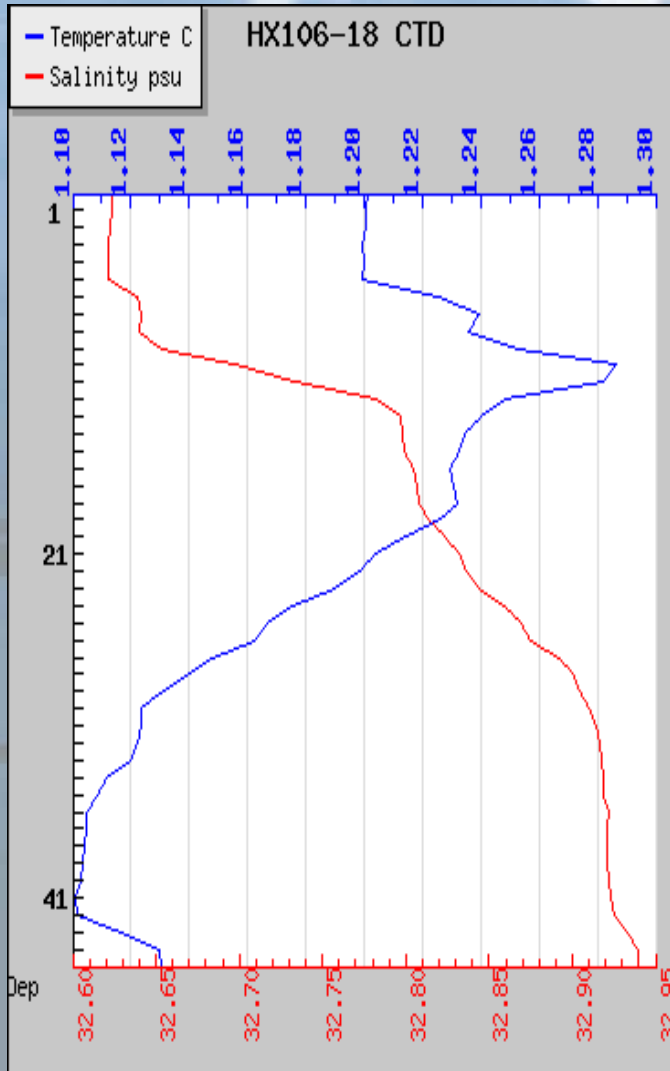
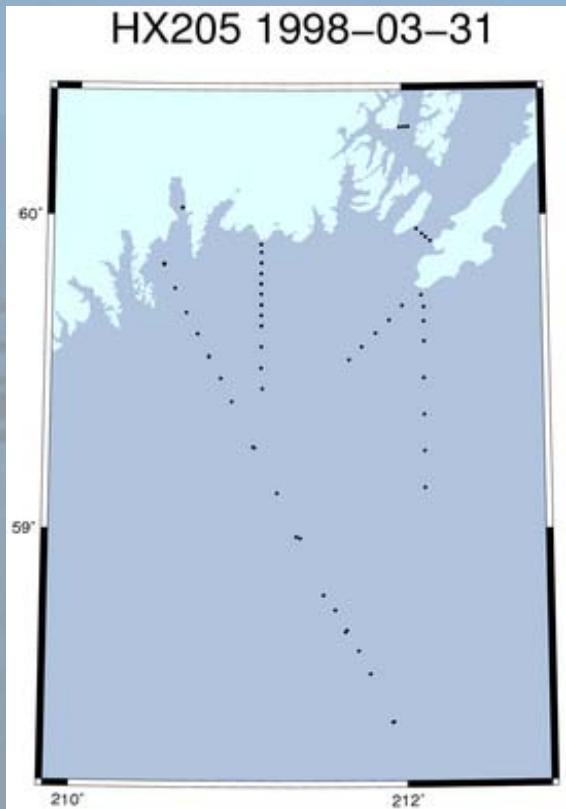
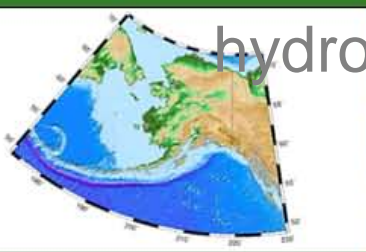
Alaska Ocean Observing System

*The Eye on Alaska's Oceans and Coasts*



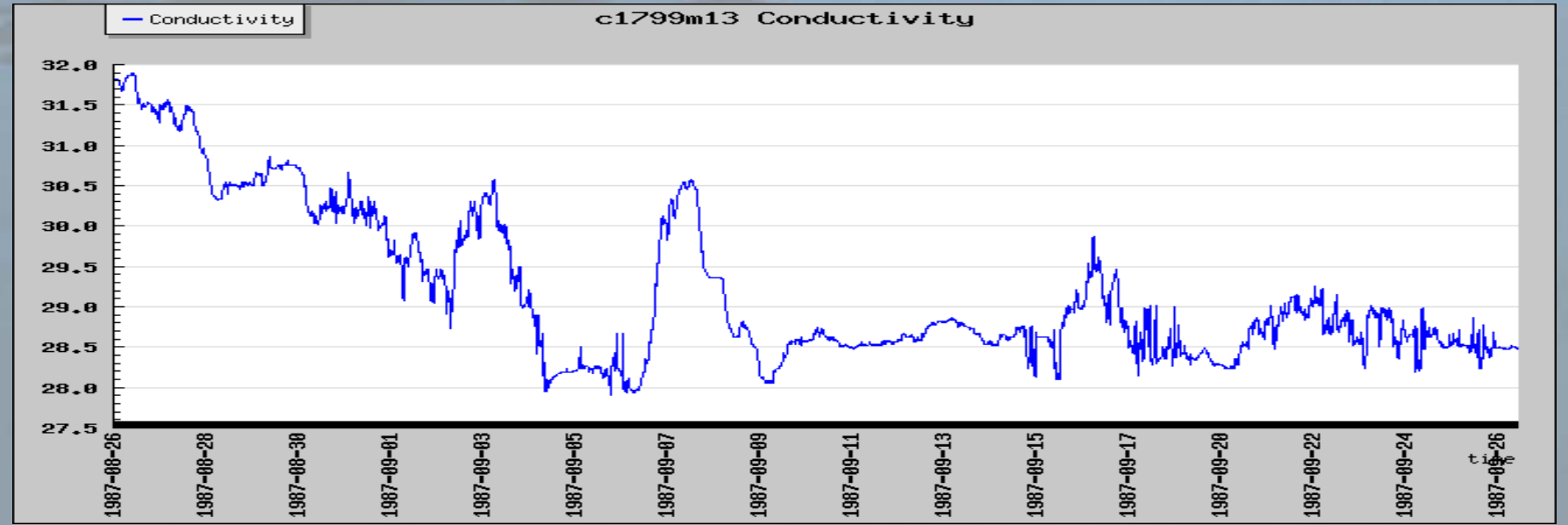
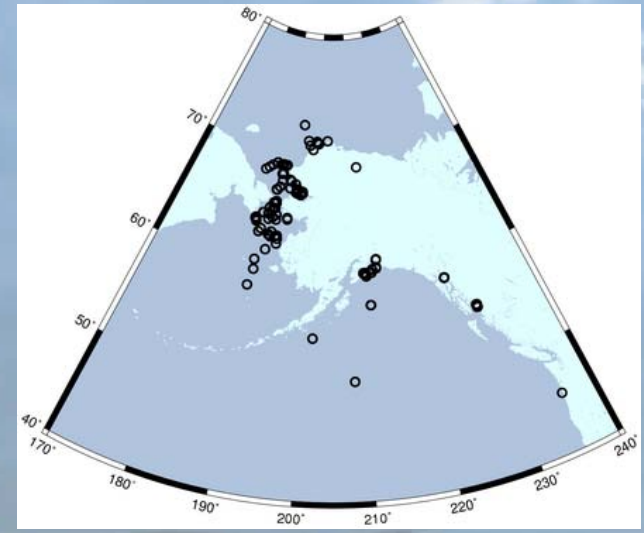
CTD 1970s-2000s

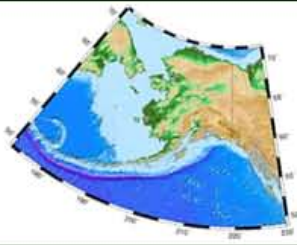






current meter data

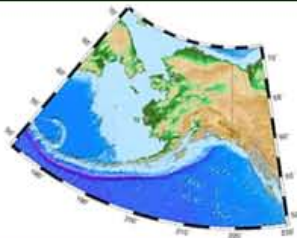




# Asking questions

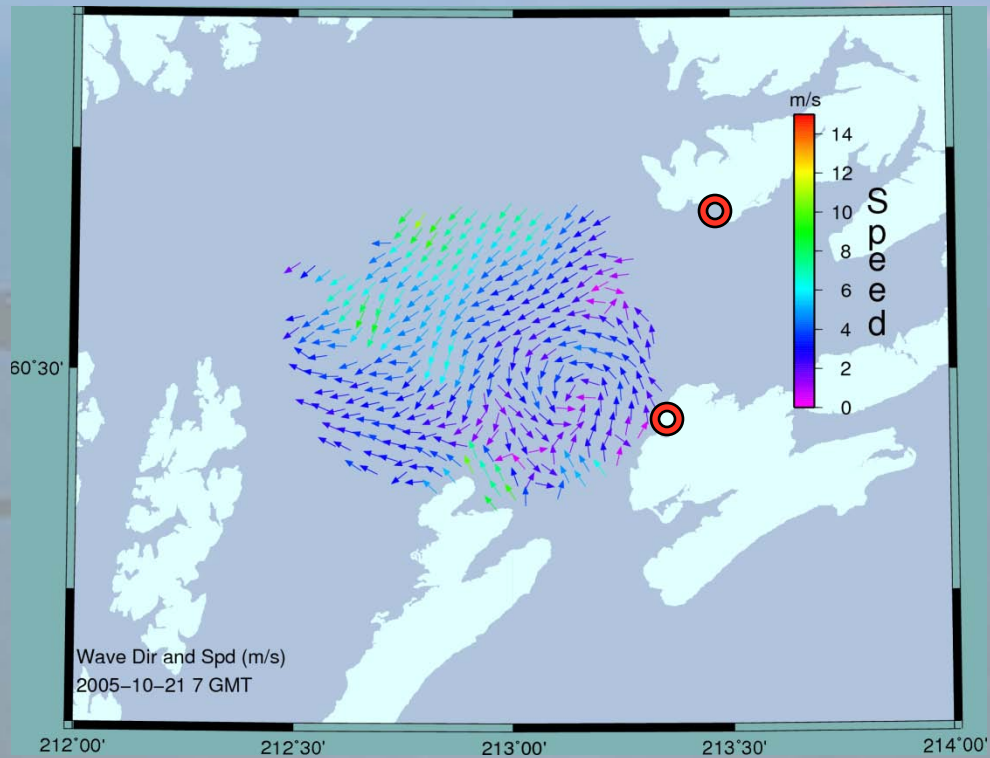
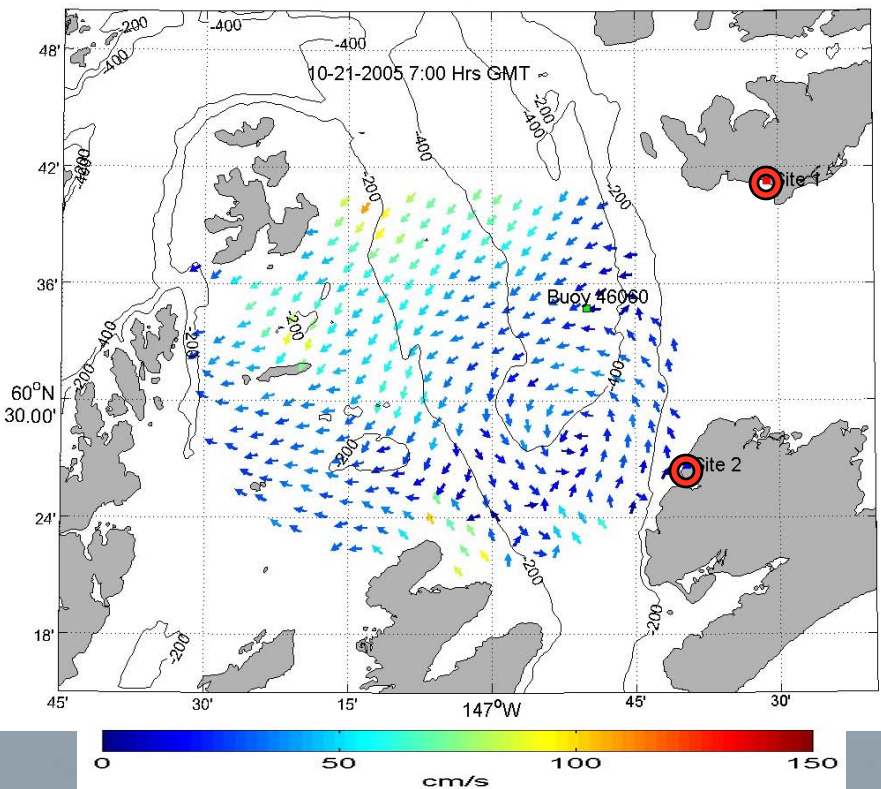
- *Is there information on surface currents in Prince William Sound?*
  - Search:  
“Prince William Sound”,  
“Surface currents”

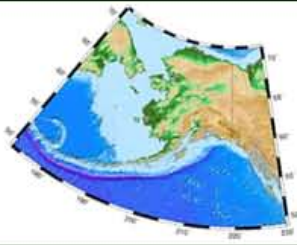
**AMIS returns the latest data**



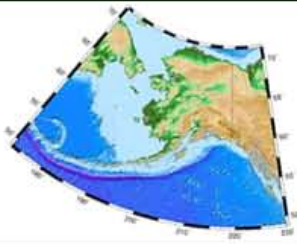
## HF Radar (surface currents) in Prince William Sound

Prince William Sound CODAR Surface Currents





- *Setting up the search*



**AOOS** Alaska Marine INFORMATION SYSTEM  
Alaska Ocean Observing System

① Set up SEARCH ② Explore RESULTS ③ Request DATA

Variable

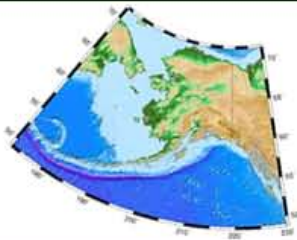
Search Term

Data Term

Project Term

- Bathymetry
- Biology
- Bottom Character
- Contaminants
- Currents
- Dissolved Nutrients
- Dissolved O2
- Fish Abundance
- Fish Species
- Heat flux
- Ice Distribution
- Ocean color
- Optical properties
- Pathogens
- Phytoplankton species
- Salinity
- Sea Level
- Surface Currents
- Surface Waves
- Temperature

***Set up your search***  
*You may choose from Agency, People, Time Range, Program, Variable, Keywords...*



① Set up **SEARCH** ② Explore **RESULTS** ③ Request **DATA**

select category ▾

Clear Set New Set Delete Set Clear All

Search Term Sets

Data Term set

[delete](#) variable: Temperature

Project Term set 1

Search

Clear Set New Set Delete Set Clear All

Search Term Sets

Data Term set

[delete](#) variable: Temperature

Project Term set 1

[delete](#) program: Bering Sea Integrated Ecosystem Program

Search

Proposal/Project Results

- Biophysical Moorings
- Patch Dynamics Study
- Acoustic Survey
- Bering Sea Hydrography and Circulation
- Local and Traditional Knowledge Component
- Baleen Whale Broad-Scale Distribution

Dataset Results

Unselect all

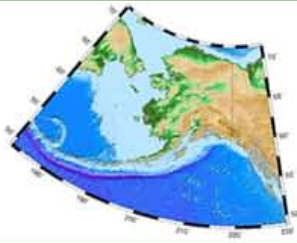
[ARCOD](#)

[ARGOUSG](#)

[AVHRR](#)

Sea Surface Temperature Daily Composite

*Add to your search  
or remove items  
as needed*




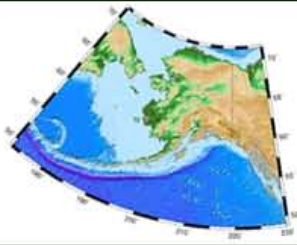
# *When you have Datasets you can learn more about each by clicking **Explore RESULTS***

Dataset Results

- Unselect all
- [ARCOD](#)
- [ARGOUSG](#)
- [AVHRR](#)
  - Sea Surface Temperature Daily Composite
  - Sea Surface Temperature Monthly Composite
  - Sea Surface Temperature Swath
  - Sea Surface Temperature Weekly Composite
- [FNMOC](#)

Fleet Numerical Meteorology and Oceanography Center (FNMOC)
- Sea Surface Temperature Analysis
- Sea Surface Temperature Monthly Composite
- [IMS CTD Profiles](#)

A screenshot of a map interface. On the left, there is a vertical toolbar with icons for zooming, panning, and other map functions. The map itself shows a coastline with a prominent red line drawn across the ocean area.

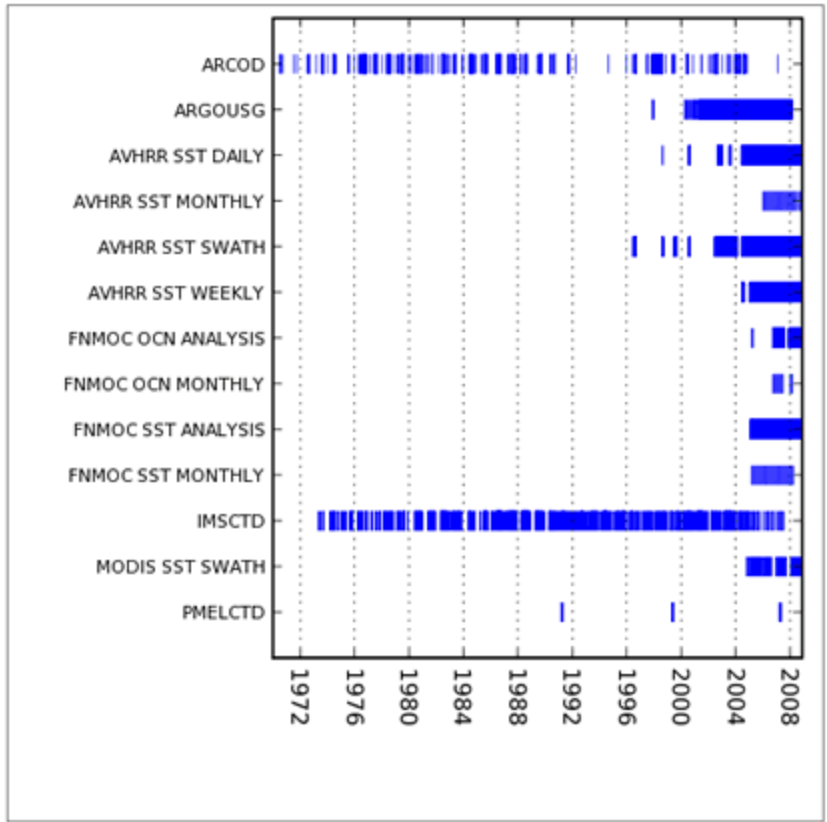


- ① Set up SEARCH
- ② Explore RESULTS
- ③ Request DATA

myAOOS

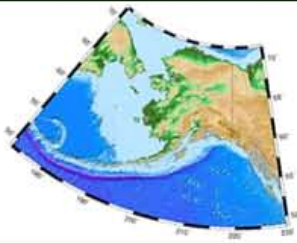
- Global timeline
- [ARCOD](#)
- [ARGOUSG](#)
- [AVHRR](#)
- [FNMOC](#)
- [IMS CTD Profiles](#)
- [MODIS](#)
- [PMEL CTD Profiles](#)

- A See DATA SETS timeline**
- B Preview DATA**



**A See DATA SETS timeline**

*Explore Results takes you to a timeline of the data*



① Set up SEARCH ② Explore RESULTS ③ Request DATA

myAOOS

**B** Preview DATA

AVHRR

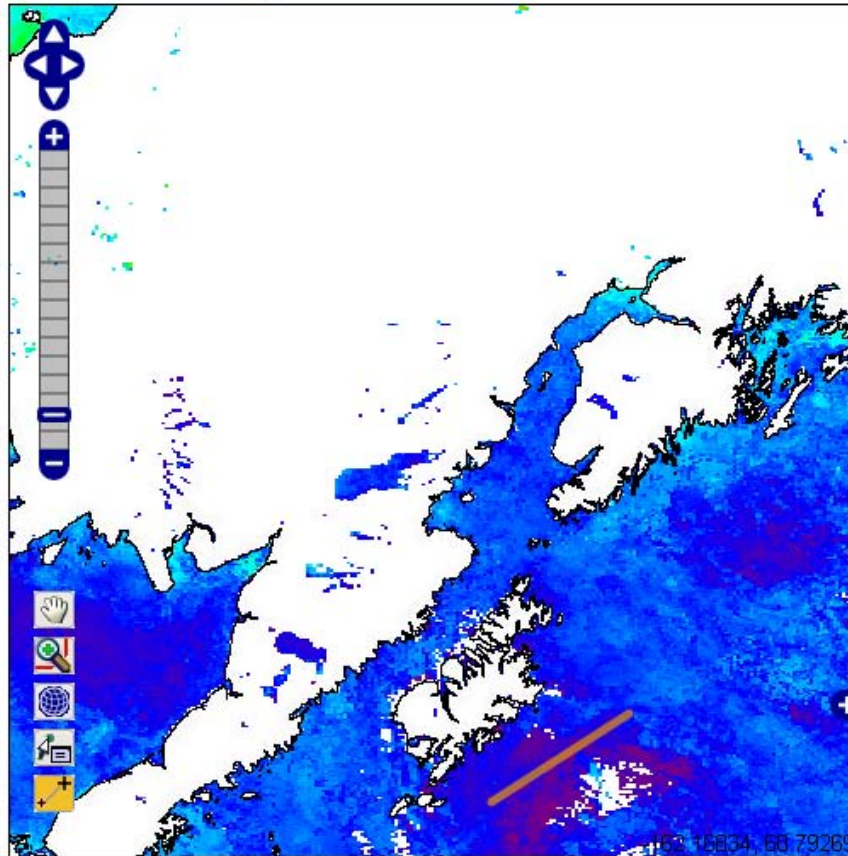
**Data Layers**

- sea surface temperature daily composite  
LEGEND  PLOT DATA
- sst monthly composite  
LEGEND  PLOT DATA
- sea surface temperature swath  
LEGEND  PLOT DATA
- sst weekly composite  
LEGEND  PLOT DATA
- pixel brightness swath  
LEGEND  PLOT DATA

**Spatial Distribution Layers**

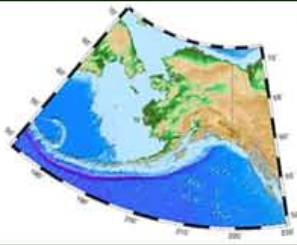
- Sea Surface Temperature Daily Composite  
LEGEND
- Sea Surface Temperature Monthly Composite  
LEGEND
- Sea Surface Temperature Swath  
LEGEND
- Sea Surface Temperature Weekly Composite  
LEGEND
- Visible Swath  
LEGEND

**A** See DATA SETS timeline **B** Preview DATA

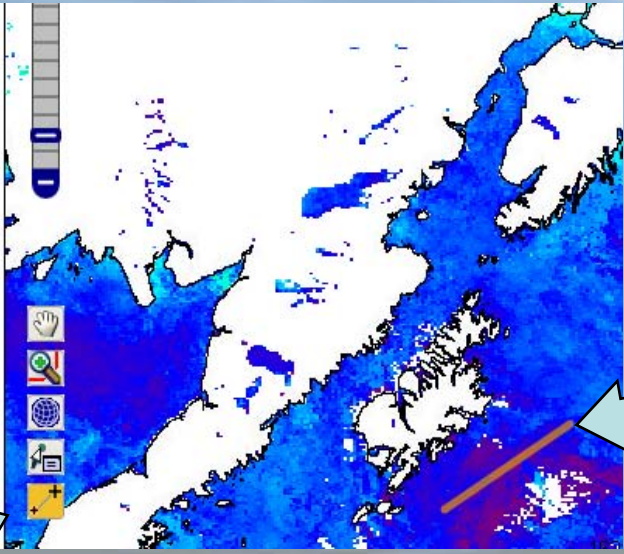


**Turn on data layers**  
*view the results in the map window*

*Use the map tools to get more information*



- sst weekly composite
- pixel brightness swath
- Spatial Distribution Layers**
- Sea Surface Temperature Daily Composite
- Sea Surface Temperature Monthly Composite
- Sea Surface Temperature Swath
- Sea Surface Temperature Weekly Composite
- Visible Swath

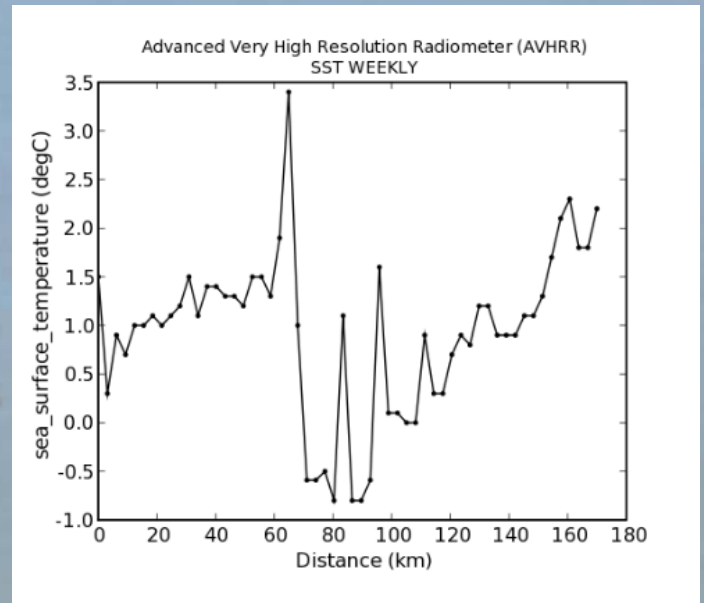


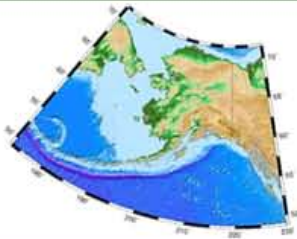
*Draw a line in data*

**Click PLOT DATA**



*If this is the data you want click Request DATA*





① Set up SEARCH ② Explore RESULTS ③ Request DATA

myAOOS

0 0 360 1970-01-01 00:00:00Z 2009-01-07 22:44:00Z

Update

[AVHRR Sea Surface Temperature Daily Composite](#)

use global domain

[NetCDF](#)  [HDF](#)  [GeoTiff](#)  [KMZ](#)  [CSV](#)

Result size: 1802 files requiring 3604 operations

[AVHRR Sea Surface Temperature Monthly Composite](#)

use global domain

[NetCDF](#)  [HDF](#)  [GeoTiff](#)  [KMZ](#)  [CSV](#)

Result size: 34 files requiring 68 operations

Total result size: 1836 files requiring 3672 operations

By submitting, I agree to the following terms and conditions:

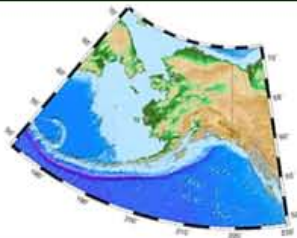
This server and data are not considered "operational." We do not guarantee availability or timely delivery of data. Data is provided "as is," and we disclaim any and all warranties, whether express or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose. In no event will we be liable to you or to any third party for any direct, indirect, incidental, consequential, special or exemplary damages or lost profit resulting from any use or misuse of this data.

I have read and understand the terms above

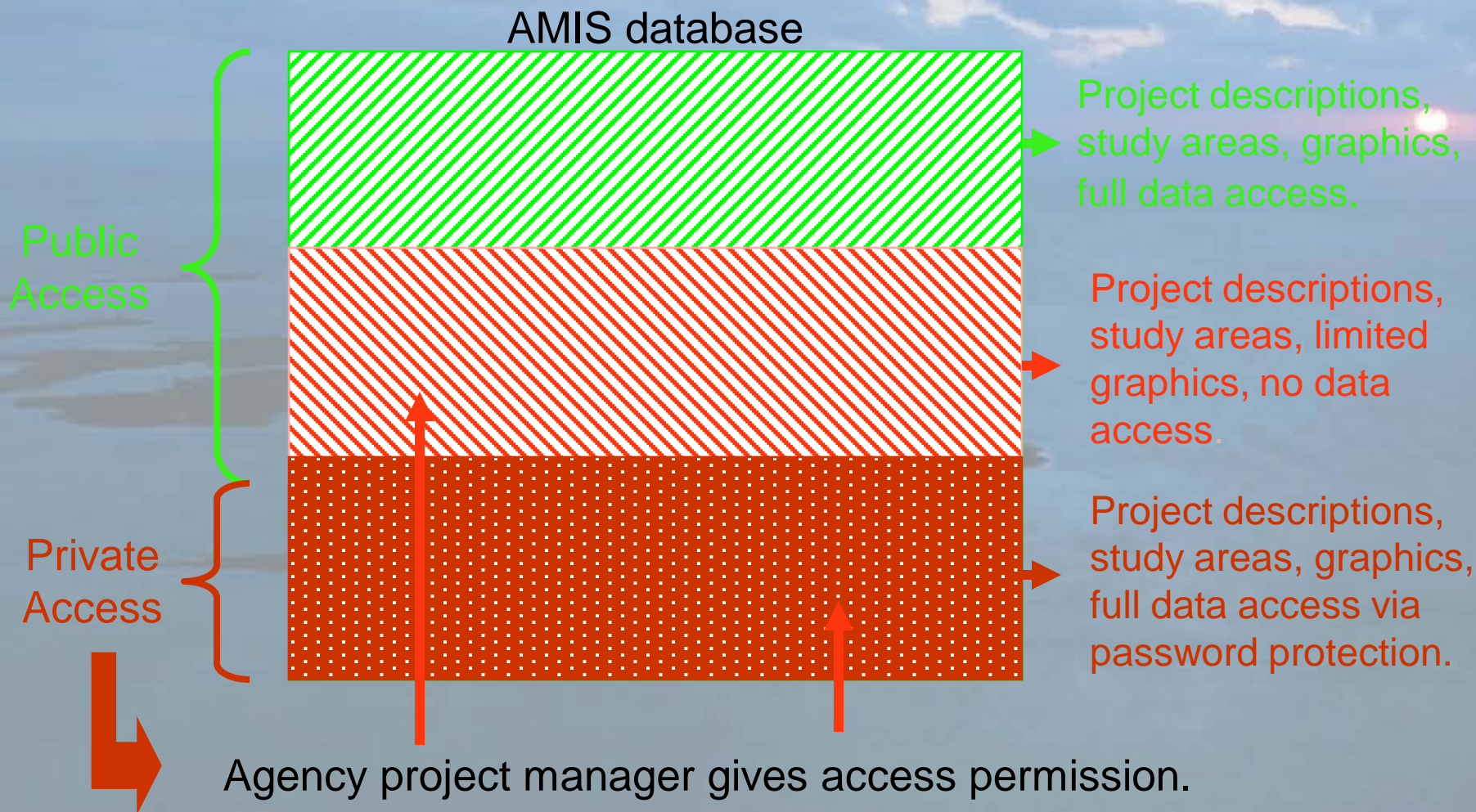
Submit Job!

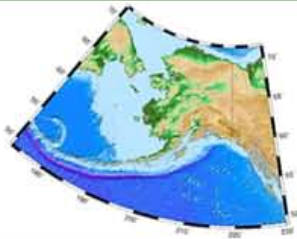
*When you Request DATA  
you choose the export  
format right for you:*

**NetCDF**  
**GeoTIFF**  
**HDF**  
**KMZ (Google)**  
**Shapefile**  
**CSV**



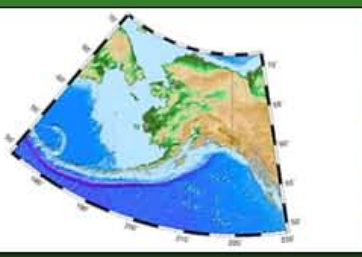
## *AMIS data access is secure*





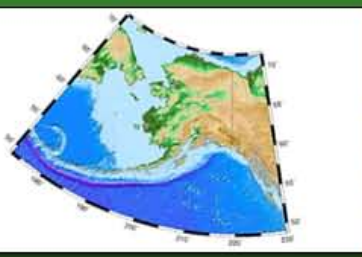
## AMIS Accomplishments

- Successful interface for project/proposal ingestion and return
  - Title, people, summary, timeline, project area, data density, ship tracks...
- Successful construction of an end-to-end system
  - CTD, moorings, ARGO floats
  - satellite (AVHRR, MODIS, SAR)
  - model SST, surface currents, ice concentration
  - overlaying and stacking of multiple data sets
  - data delivery with data protection provided by myAOOS
- In progress
  - testing with users and agencies
  - Data acquisition



## *AMIS made possible by:*

- Rob Cermak, UAF, AOOS Data Manager
- Steve Gaffigan, UAF, AOOS Programmer
- Janene McMahan, UAF, AOOS Web Design
- Steve Sweet, UAF, AOOS Programmer



Let others know what you like...  
Let me know what you don't!

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Thank you