Integrated Intelligent System of Systems (IISoS)

Arctic Domain Awareness Center (ADAC)
A DHS Center of Excellence

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Integrated Intelligent System of Systems (IISoS)

- Integration of data.feeds
- Near real time
- Client Interface
- Scenarios
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- General NOAA Operational Modeling Environment (GNOME)
  - HYCOM + NCODA
  - NCEP NAM (#2) and GFS (#1)
- CBONS
- AIS
- WaveWatch III
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GNOME using HYCOM & GFS Data as inputs for the ship drift simulation
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Web based animated isotope footprint from port sensor for detecting sea ice
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Web Application consuming Web Map Services (WMS)
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Ship Drift and CBON data displayed via MapOptix on the web
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- Crystal Serenity SAR Scenario
  - Bering Strait/St. Lawrence Island
  - Nearby ship fails at a known time/location
  - Provide prediction of ship location over time
    - GNOME model output consumed by GeoNorth client interface
    - Forecast of environmental conditions
    - Stricken ship trajectory history and forecast
IISoS: ADAC R&D Demo

**Goal:** ADAC researchers working to test and demo the current state of the system in a scenario demo:

**The scenario:** A ship is fails nearby Lawrence Island – at known time and location. Goal: predict the ship for an extended time. Use observer feedback.

**Requirements:**
1. Platform to run GNOME on the GeoNorth platform to make drift predictions
2. System to pull data streams to run GNOME: sea currents, sea ice, wind
   a. Locate and fetch/pre-fetch the data
   b. Storage
3. System to pull and store real-time observations to restart gnome
   a. Multiple instance of gnome running concurrently if conflicting observations
4. Display Geo spatial layers to display
   a. The stricken ship trajectory history and forecast
   b. Forecast environmental conditions
   c. Resources including local observers
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Ship Drift Simulation displayed along with CBON data and AIS ship tracking in ARCGIS via WMS.

- Descr: People seen evacuating the ship to the shore of King Island.
- Descr: Cruise ship has run aground.
- Descr: Ship spotted dangerously close to the south shore of King Island.
- Descr: Ship seen adrift in rough seas toward King Island.
- Descr: Cruise ship to the South of King Island.
- Descr: Boat spotted listing to port and spewing smoke.
- Descr: Smoke and flares seen.
- Descr: Spotted debris and remnants of a lifeboat.
- Descr: Thick black smoke seen to the north.
- Descr: Cruise ship seen appears to be adrift. Saw flares being fired.
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Scenario Demonstration