

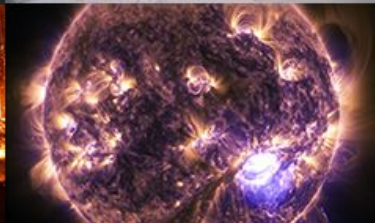
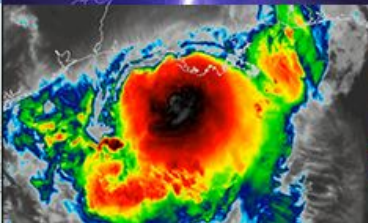
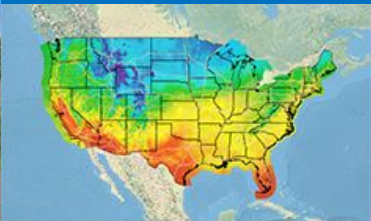
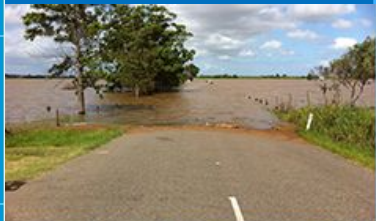


**NATIONAL  
WEATHER  
SERVICE**

# UFS Sea Ice Information from User Perspectives






June 30, 2023

Presenters: Robert Grumbine NWS/NCEP/EMC









# Outline

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- Decision time scales:
    - 6 hours
    - 6 days
    - 6 weeks
    - 6 months
  - Evaluating model to support users
  - ~~6 years~~
- 
- 
- 
- 

# 6 hours

Products and Services	Requirements (e.g., observations, models)
 Land fast ice formation/break up	Sensible weather, ice thickness, ice motions, ...
Ivu ( <u><a href="#">ice shoves</a></u> )	Sensible weather, wave conditions, ice motions...
 Initial oil spill response	Sensible weather, wave conditions, sea ice conditions, ocean circulation,
 Search and Rescue	Sensible weather, wave conditions, sea ice conditions, ocean circulation,
Ice deformation	Sensible weather, ice thickness, ice motions, .
	



## 6 days

Products and Services	Requirements (e.g., observations, models)
Fishing near or shipping past the ice edge	ice edge motion through forecast period, vessel icing guidance, ...
Walrus hunting ( <u>SIWO</u> )	sensible weather, P(winds > 25 kts), ice thickness
Oil spill response (drift of contaminated ice and waters)	Sensible weather, wave conditions, sea ice conditions (thickness, motion), ocean circulation, ...

## 6 weeks

Products and Services	Requirements (e.g., observations, models)
<u>Northwest</u> or <u>Northeast</u> Passage transit	Ice in / ice out timing along route between resupply ports (approx, say, Nome to Newfoundland or Murmansk?), wave conditions along route, ...
Tactical decisions on village resupply ( <u>Nome 2011/2</u> )	Ice in / ice out dates along shipping resupply routes, probabilistic
Oil platform management decisions	Sea ice motion and stresses, probability of ice cover in platform area, ...

# 6 months

Products and Services	Requirements (e.g., observations, models)
Strategic decisions on village resupply	Ice in / ice out dates along shipping resupply routes, probabilistic





# Evaluating Model to Support Users



Ice Motion	Drift (buoy obs)
Ice Thickness	VIIRS, Icesat, Cryosat, SMOS, ...
Ice Conditions (? – exactly how this differs)	
Ice Concentration	Passive Microwave, NIC+AR Analyses, ...
Ice Edge	<a href="#">IIEE</a> , total extent, <a href="#">MHD</a> , rms
<a href="#">Ice in / ice out</a>	
Probability of area being ice covered	(begun in <a href="#">SIPN</a> )
Ice Stress	





# Evaluating Model to Support Users



Sensible weather	EVS applied to T2m, U10, ...
Wave Conditions	
Vessel Icing	(Postprocessed from air and water vars)
Ocean Circulation	
Probability of high winds	







# Supplementary



[Ice Scoring Library](#)

[Ice Drift 1998](#)



[Long Range Ice Drift 2013](#) (consideration of which metrics)



[Including some consideration of concentration verification](#)





# Climate scale (years/decades)



## Products and Services

## Requirements (e.g., observations, models)

Village relocation decisions



# Situations/examples

[Hydrographic survey](#)

[NASA Icebridge research](#)

[River ice forecasting](#)

[Cruise Ship Emergency](#)

[Search and Rescue](#)

[Savoonga \(7 day lead\) DSS](#)

[Water level obs + forecasting](#)



# Polar Forecaster Support

Highest Priority
Ice Concentration
Ice Thickness
Ice Velocity
Surface Temperature
Snow Thickness
Freeze-Melt
Landfast Ice

[Interesting Sea ice variables](#)