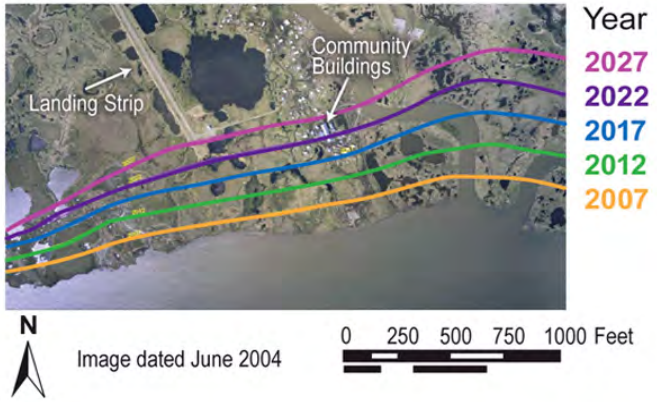
Pacific Arctic Observations and modeling of the Causes and Consequence of Sea Ice Loss:

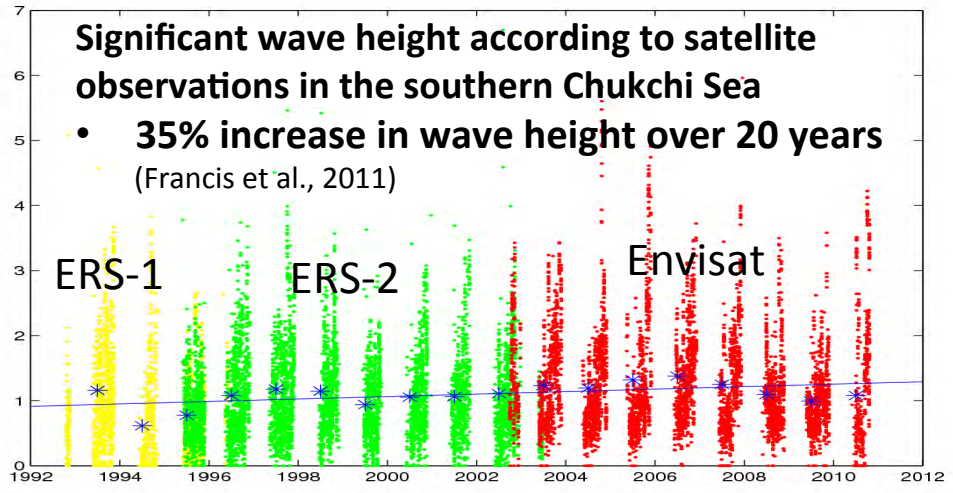
“Observations and analysis of surface waves, currents, ice thickness and wave-ice interaction in the Chukchi Sea”

We propose to deploy and conduct simultaneous observations of the ocean currents, sea surface waves and ice in the Chukchi Sea from several (3) bottom mounted Sentinel Vs.

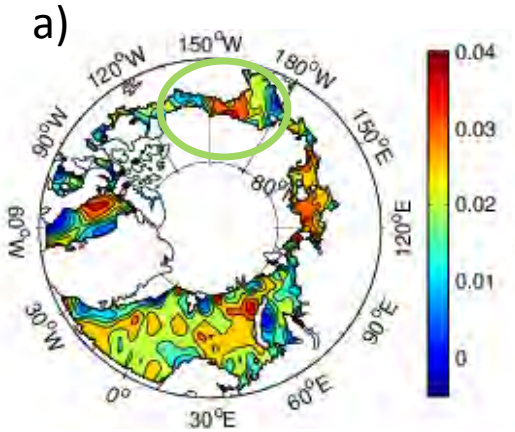
Having 5 beams in the Sentinel V significantly outperforms other ADCPs and AWACs in accuracy of wave spectra observations and allows one to keep all RAW observations, which is important for analysis of wave spectra and wave-ice interaction.

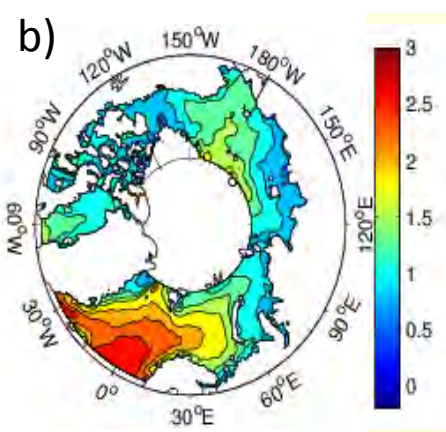
Coastal erosion in the north of Alaska



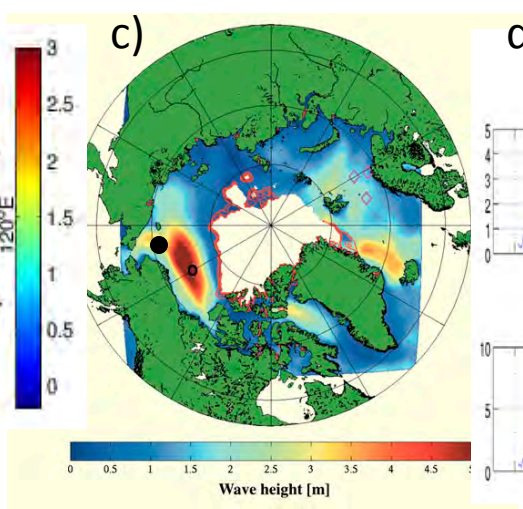


Giant waves in the Pacific Arctic

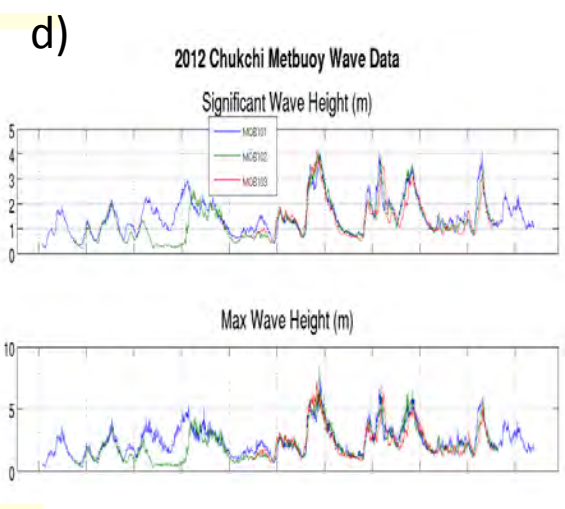




(a) SWH increments (m/year) and (b) mean SWH (m) in the AO during June-October 1992-2011.

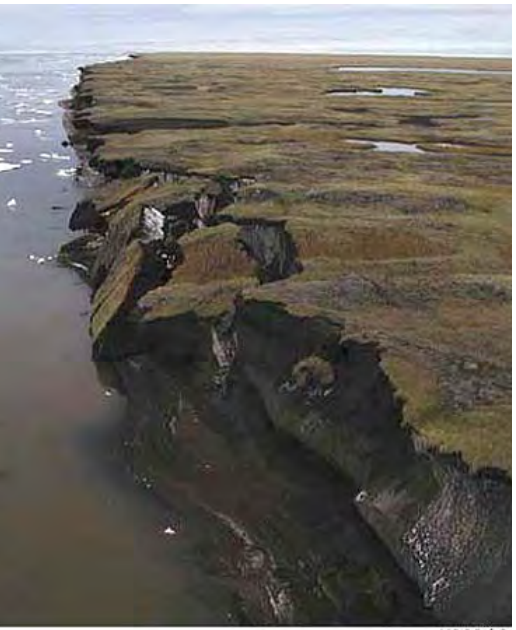


(c) SWH during the storm in September 2012 (NRL WWIII model)



(d) Sea waves observations during the 2012 in Alaska

Alaska



USGS / G

- Giant waves were observed in the Arctic for the first time in 2012
- Pacific Arctic has the strongest increase in wave heights among all Arctic regions
- Waves cause the strongest impact on the coastal erosion along the Alaskan coast
- Coastal erosion brings organic materials to the ocean and:
  i) affects local ecology; ii) does not allow use of satellite observations thus field observations are needed
- For accurate analysis of waves – ice and wave-coastline interaction we need accurate sea wave spectra observations
- Sentinel V data (i.e. current velocity, sea wave spectrum, and ice concentration observations), will provide additional contribution to RUSALCA and DBO observational programs