



# Climate Change Impacts on Alaska Coastal Erosion

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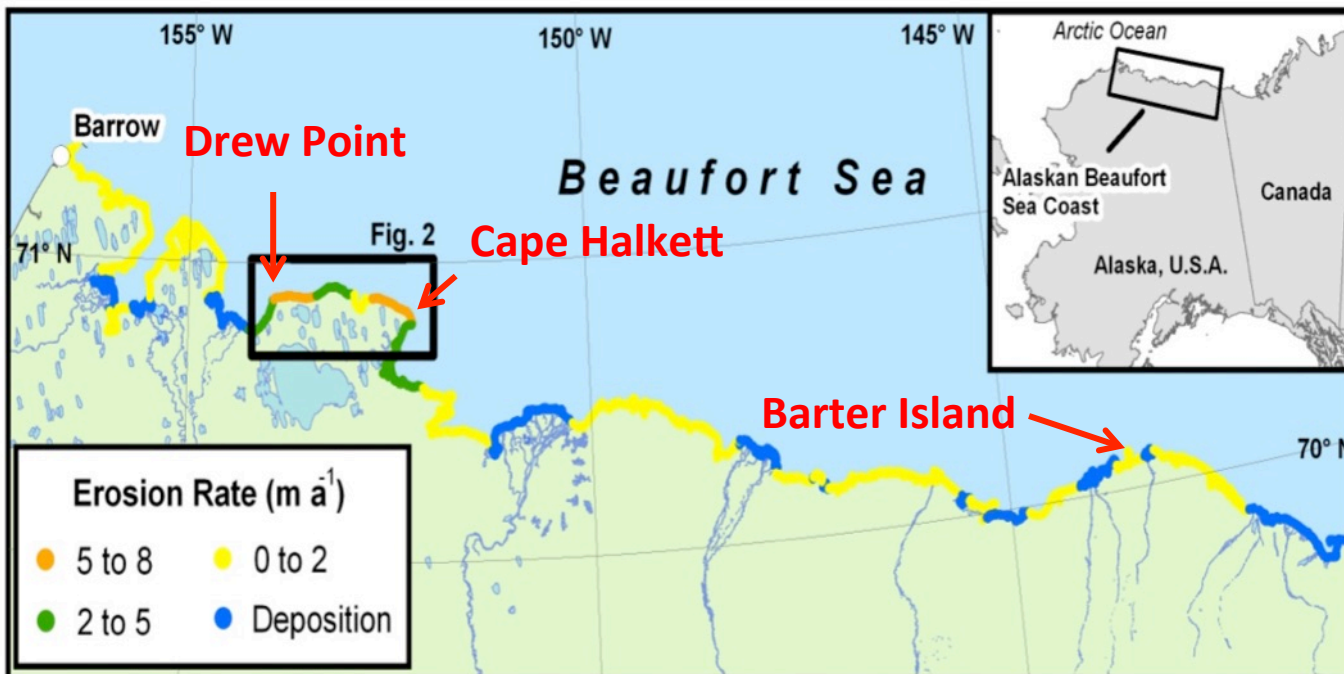
Arctic Domain Awareness Center at UAA



# Coastal Erosion Rates on the North Coast of Alaska (1980's era data shown)

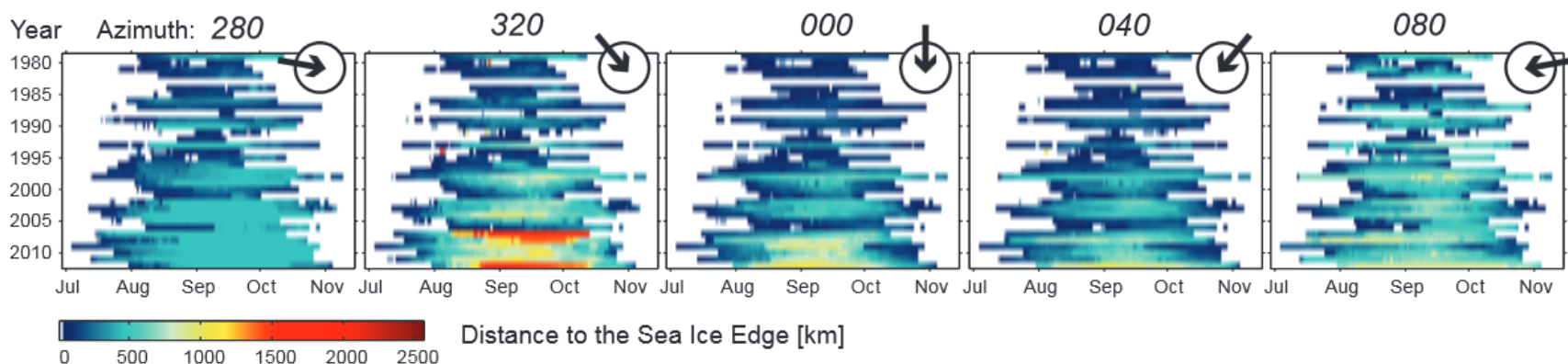
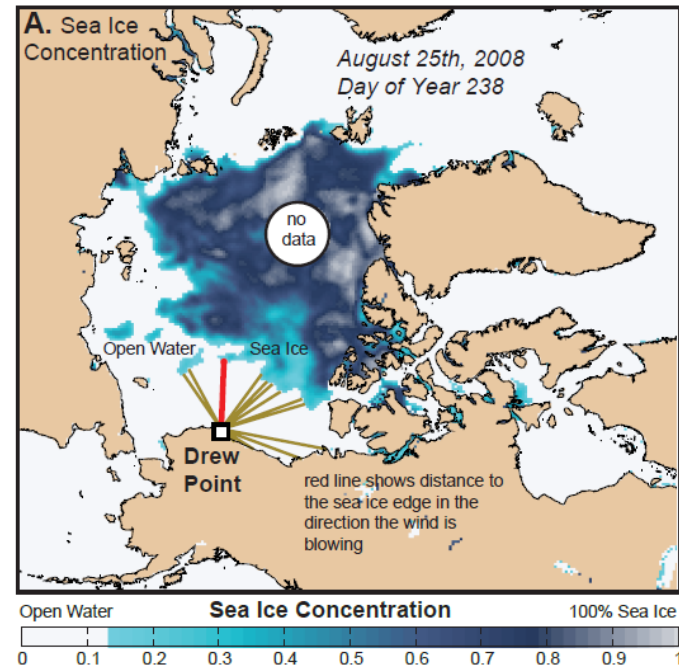


Cape Halkett  
Ben Jones, USGS



Ben Jones, USGS

# Environmental change in the Arctic Alaska coastal zone: increasing fetch, open water period, and temperature



**Figure 7.** Distance to the sea-ice edge from Drew Point for the period 1979–2012. Both the length of the open-water season and the distance to the sea-ice edge have increased in this time period. The distance to the sea-ice edge has increased the most in the northwest direction, which is the direction from which wind blowing sets up nearshore water levels.



# Increasing Coastal Erosion in West Coast Communities and in Cook Inlet

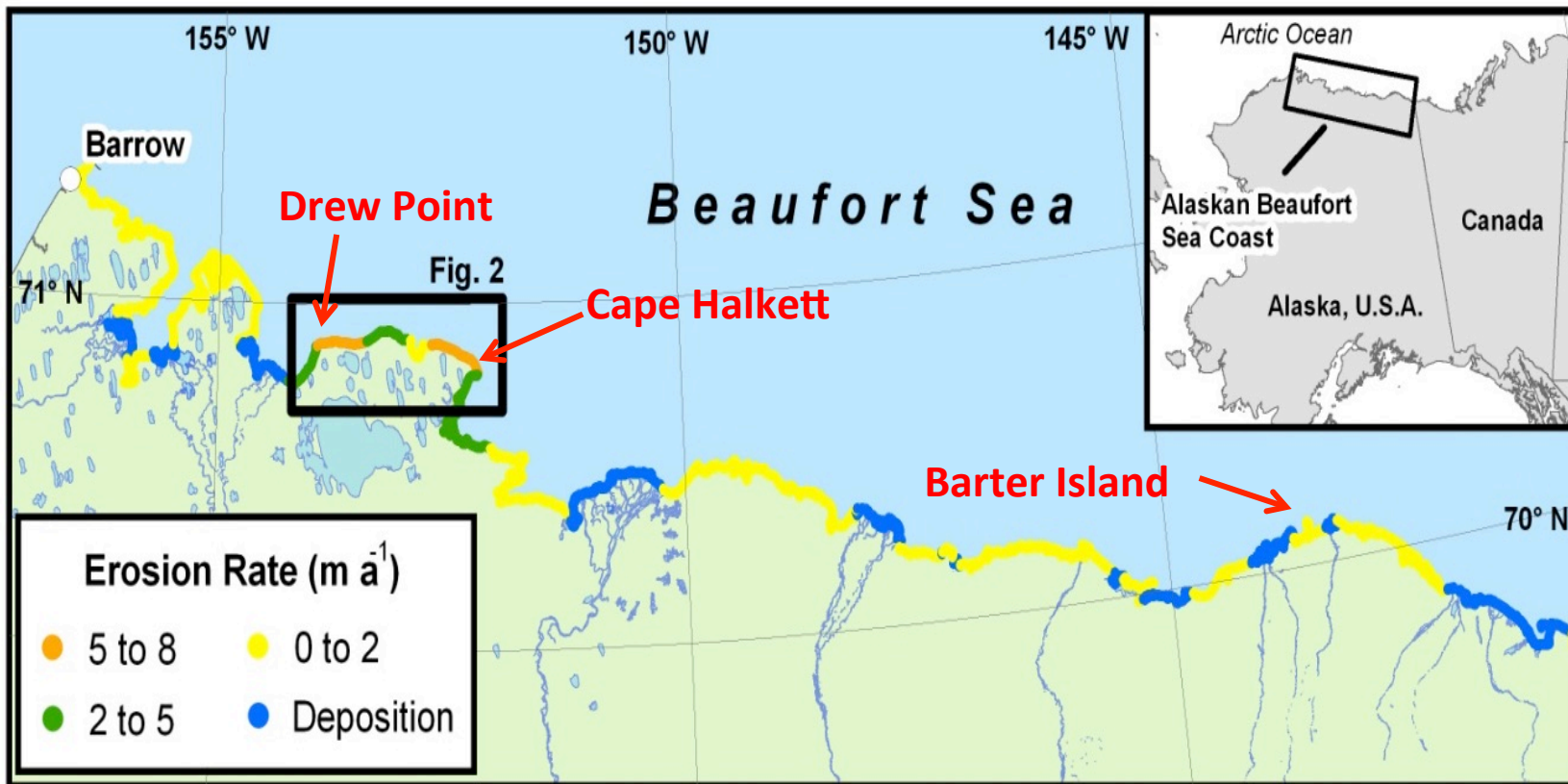


Shishmaref, Alaska  
[nsidc.org](http://nsidc.org)



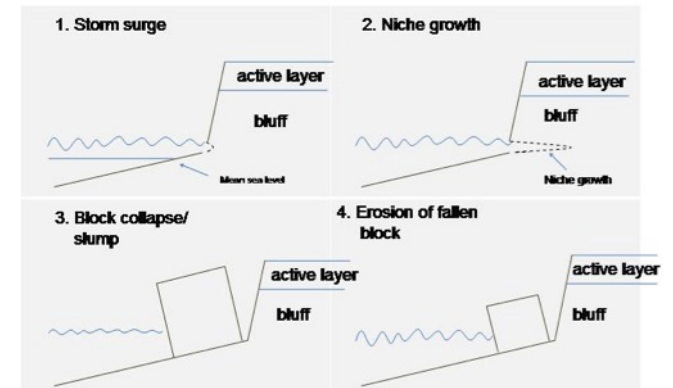
Erosion protection from shorefast ice, Point Woronzof Anchorage

## Distribution of Coastal Erosion Rates on North Coast of Alaska (1980's era data)

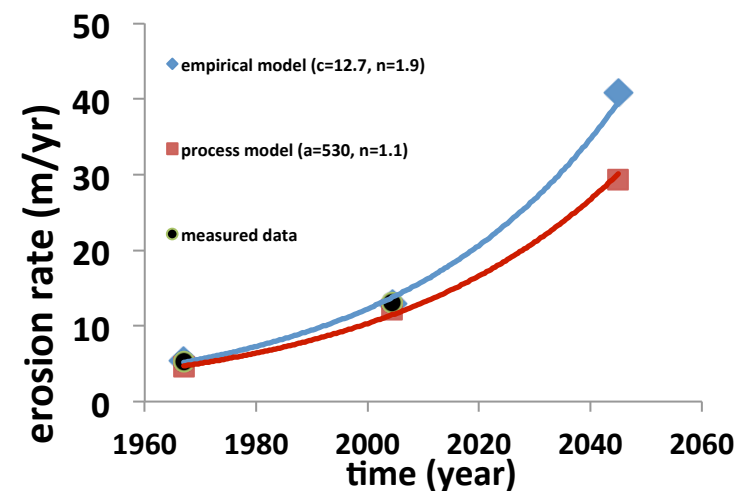


Courtesy of Ben Jones, USGS

# Arctic Coastal Erosion – Drew Point

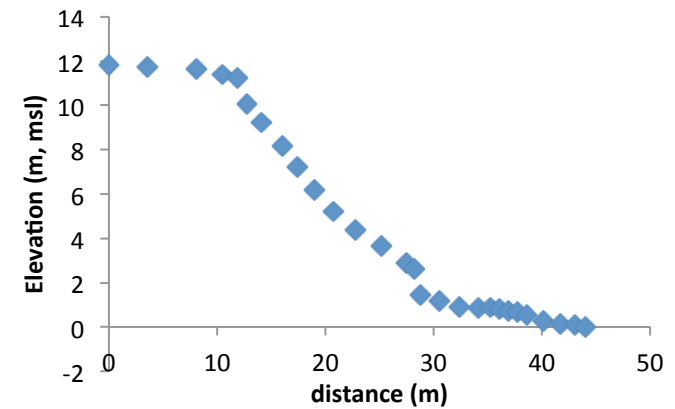
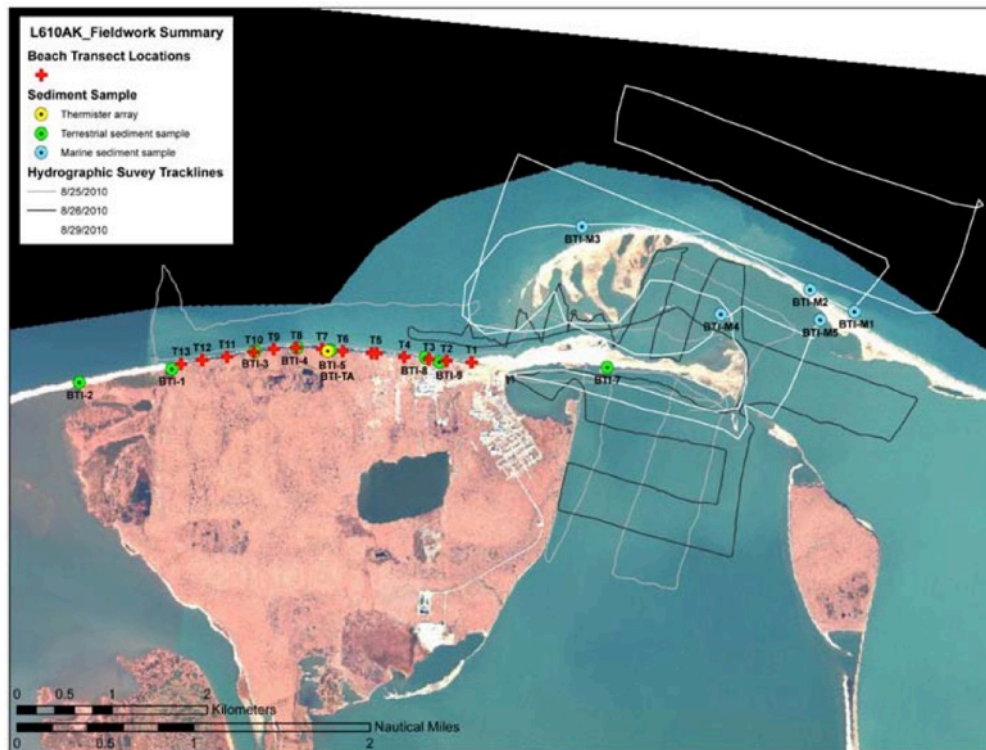


Time period	Measured erosion rate (m/yr)	Calculated erosion rate (m/yr)	Calculated fraction of time shoreline is block-free (%)
Aug. 1979 – July 2002	$8.0 \pm 0.9$	$8.0 \pm 0.8$	$68 \pm 3$
Aug. 2002 - July 2007	$14.1 \pm 1.7$	$14.9 \pm 1.4$	$78 \pm 2$





# Coastal Erosion at Barter Island



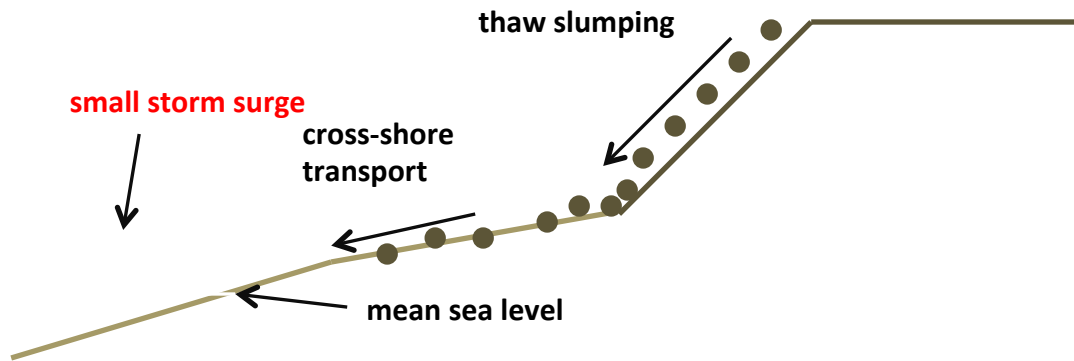
# Retrogressive thaw slumping video (Ben Jones, USGS)



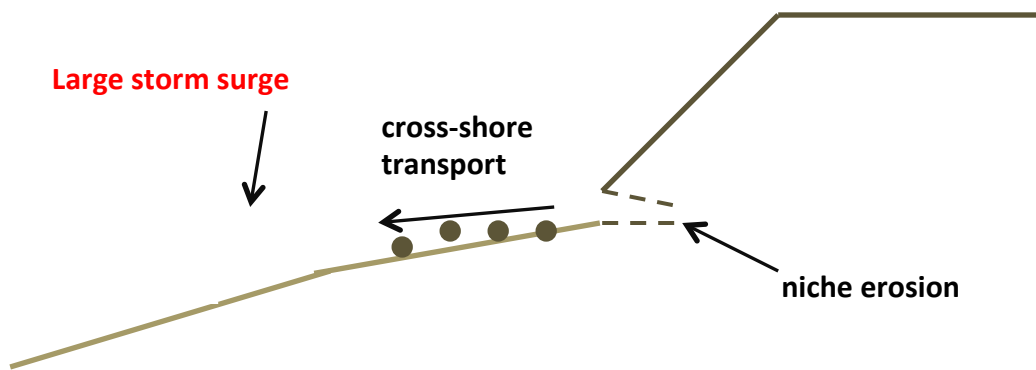


# Conceptual Model of Coastal Erosion at Barter Island

Annual processes: thaw slumping and offshore transport driven by mild storms.



Episodic processes: niche erosion/block collapse, transport driven by large storms.



# Thanks!



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