

Arctic Marine and Coastal Monitoring at the GSCA Monitoring Programs

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Coastal

- Eastern Arctic - Bob Taylor
 - status: last surveys 1992
- Western Arctic - Steve Solomon
 - status: last surveys 1999

Marine

- ice keel scouring - Steve Blasco
 - status:
 - western Arctic - last survey 1991
 - Resolute - scour degradation monitoring - last survey 1998

Coastal Monitoring Objectives

- Create a times series of forcing variables and coastal response
 - Improve understanding of land-ocean interaction
 - impacts of climate change
 - Input into land-use planning decisions (e.g. pipelines, infrastructure)

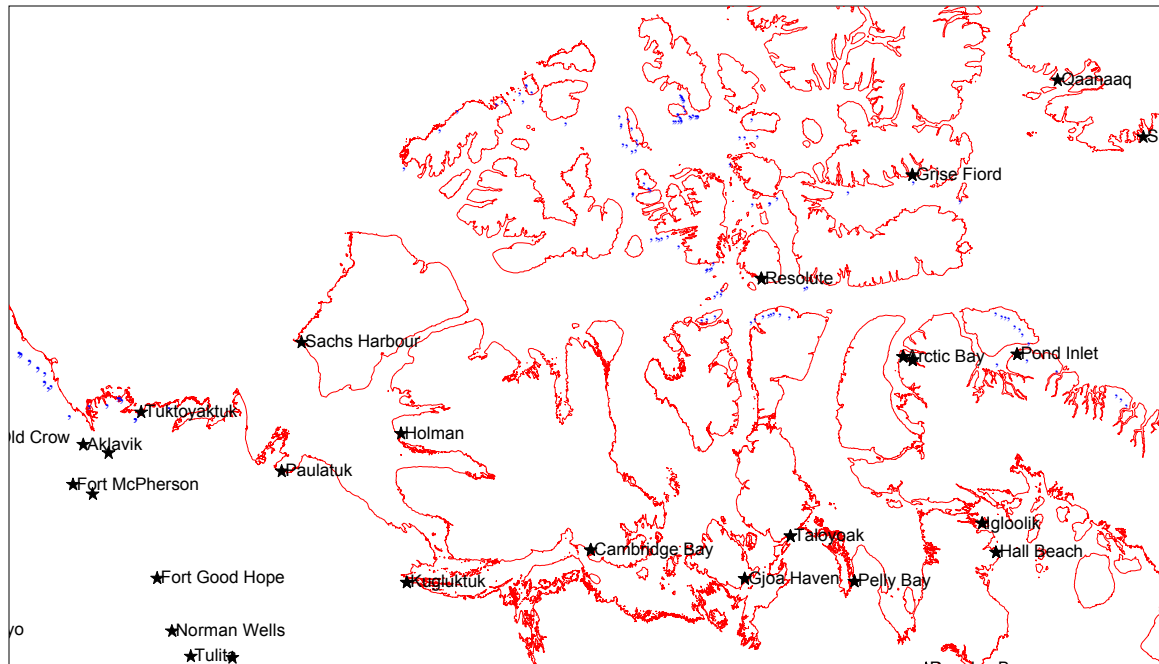
Coastal Monitoring

- Rate and direction of coastal change depends on interaction between pre-existing conditions (geology and morphology) and environmental forcing (winds, waves, water levels, etc.)
- Mechanism of interaction is complex - difficult to identify climate signal directly.
- Requires significant input from other monitoring activities (climate, ice, and oceanography)

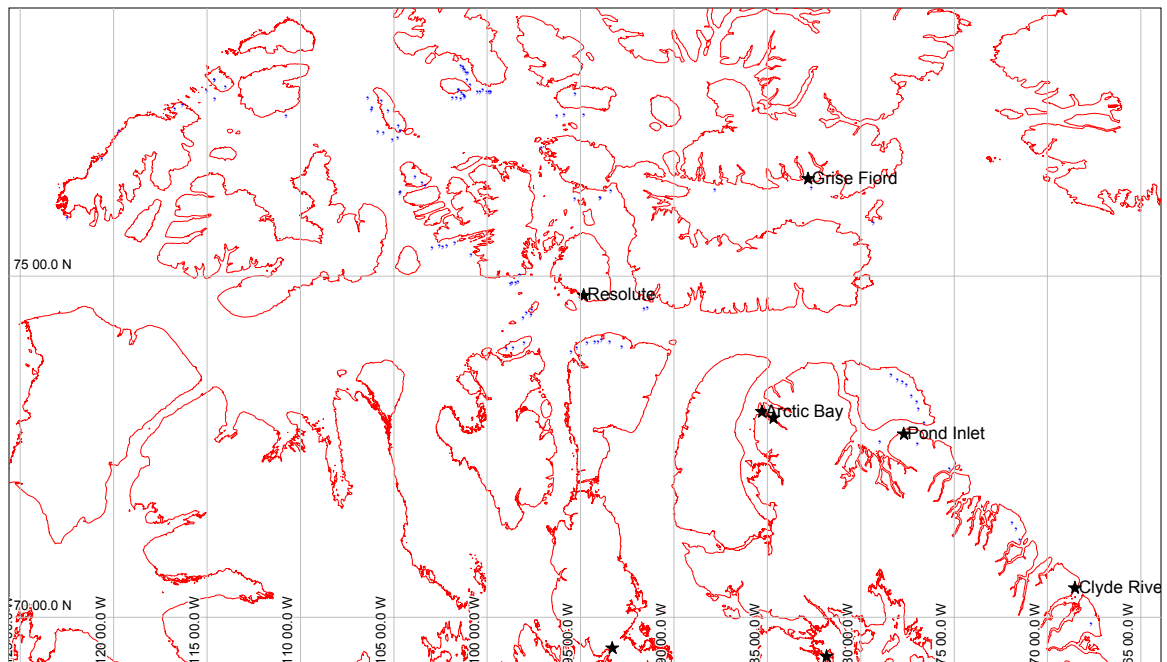
Coastal monitoring data

- Site description - geological, cryological and morphological
- Survey data - above and below water line
- Samples - grain size and shape
- Cores - stratigraphy, dating, ice content
- Geophysical surveys - sidescan, subbottom
- Environmental data - winds, waves, WL, currents, temperature

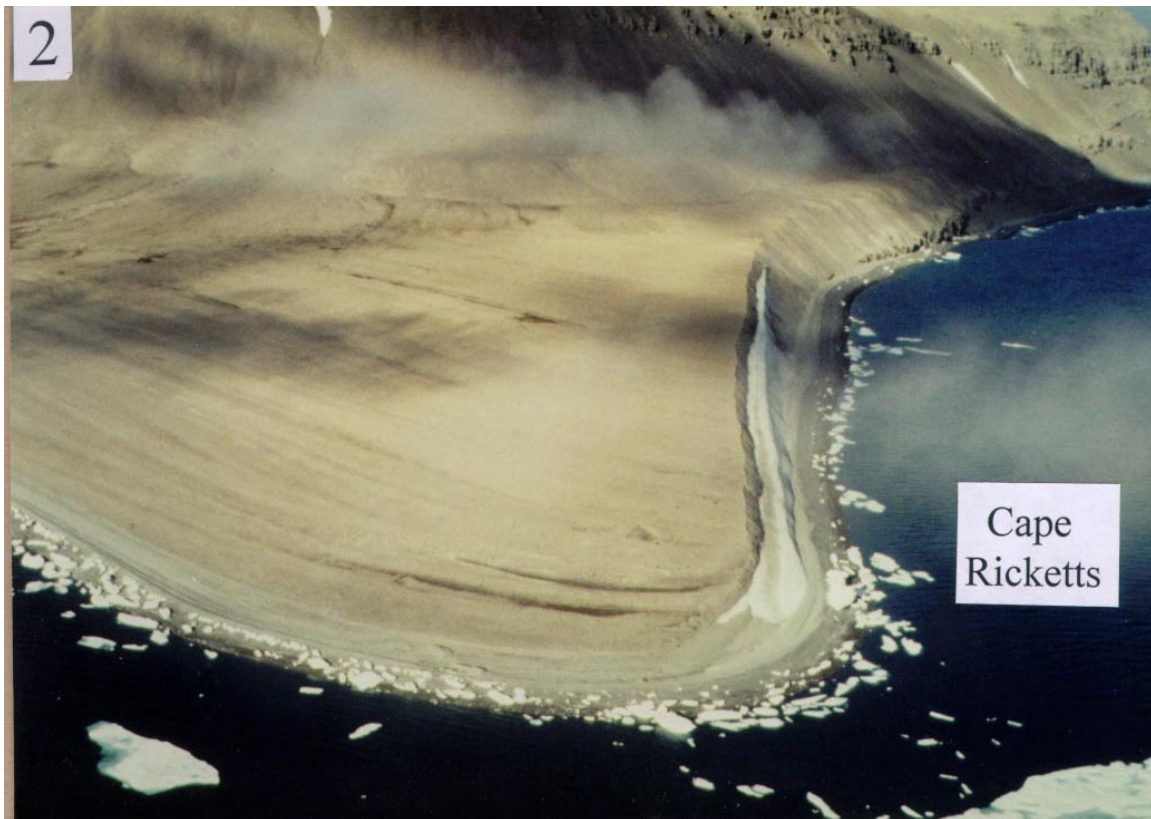
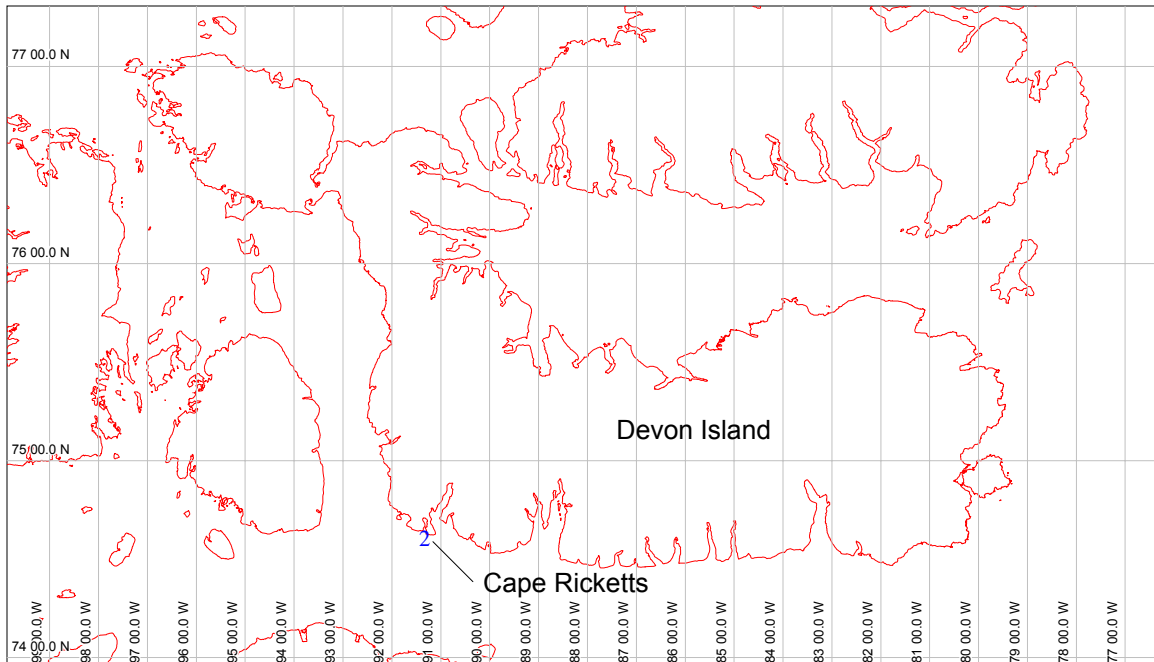
Arctic Coastal Monitoring Sites

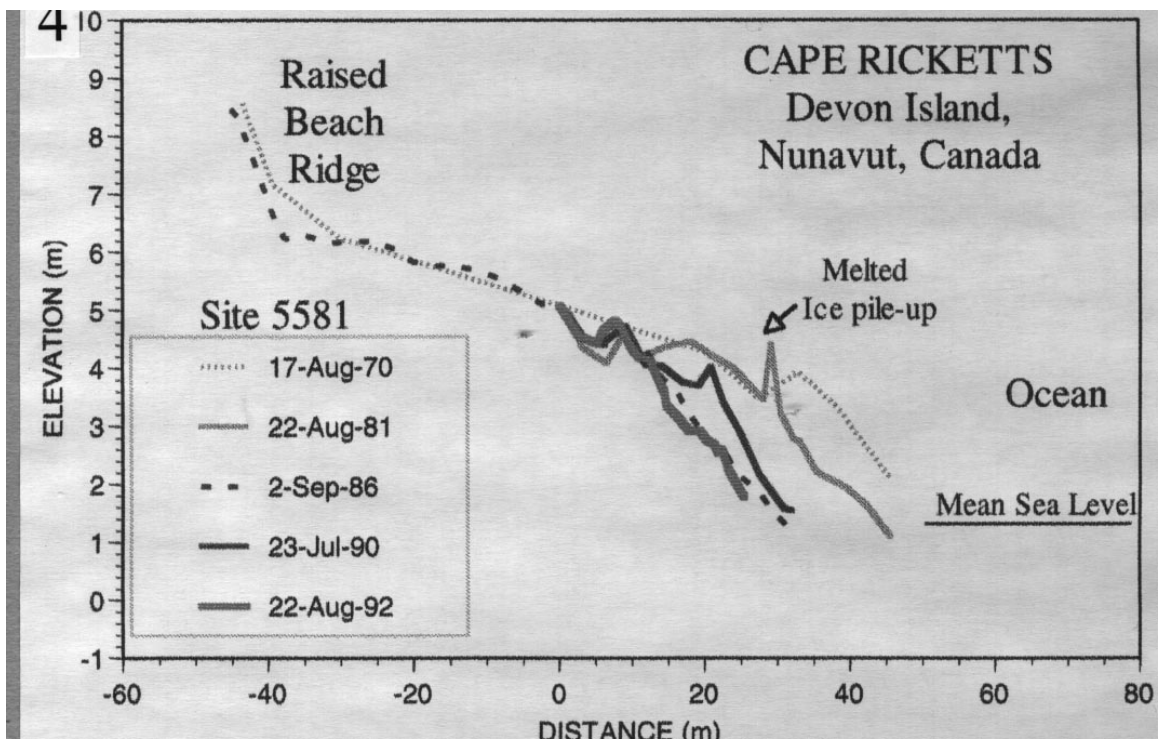
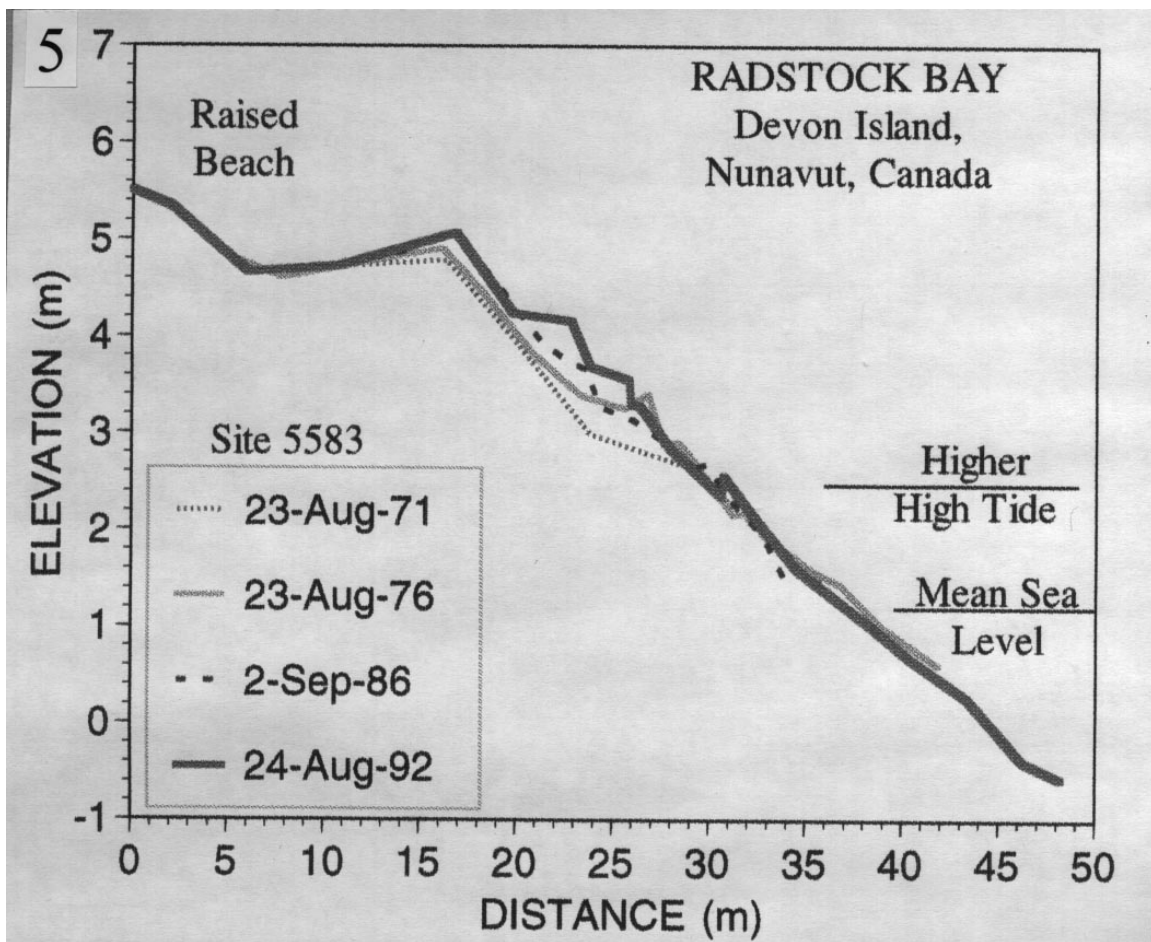


Eastern Arctic Monitoring Sites

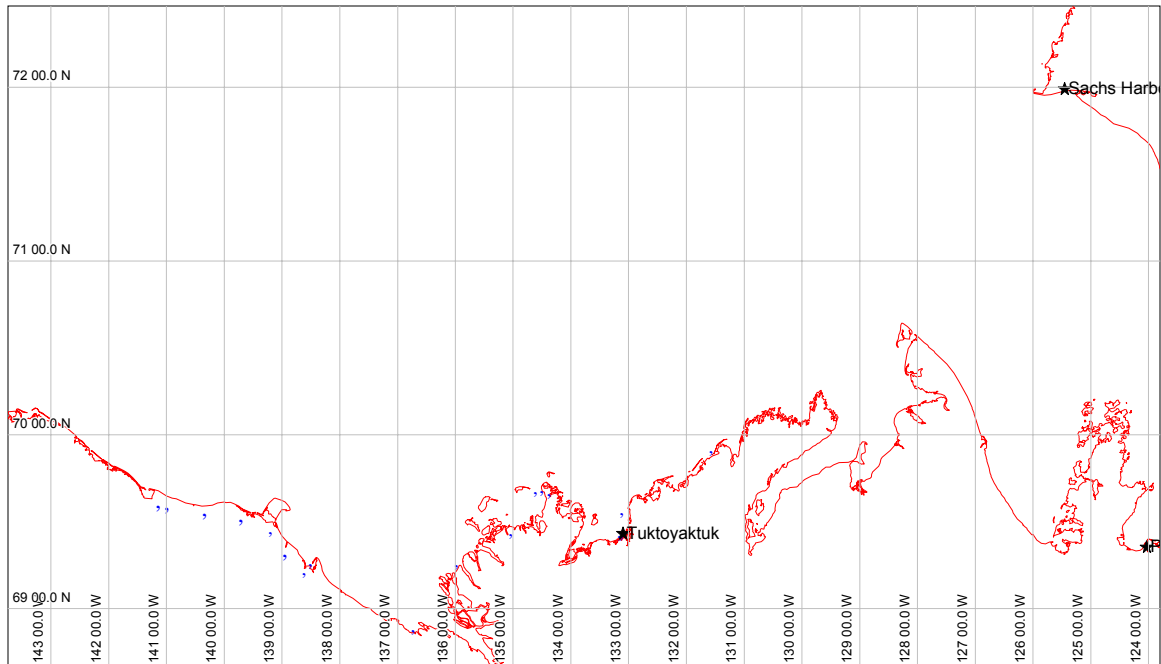


Results - Eastern Arctic

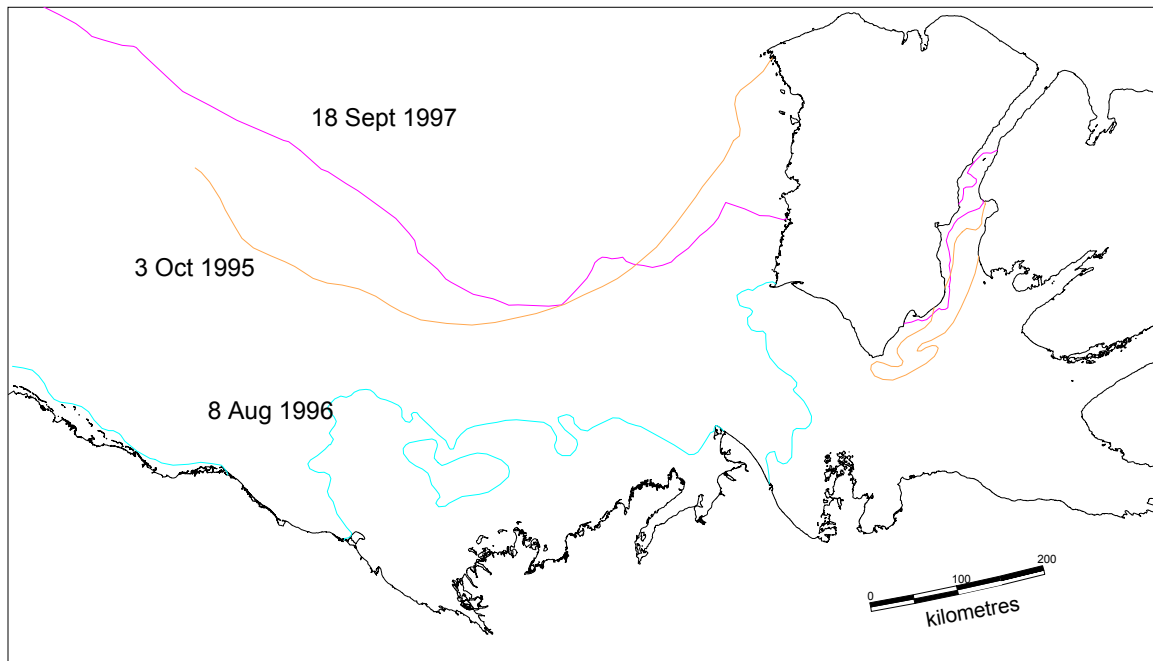




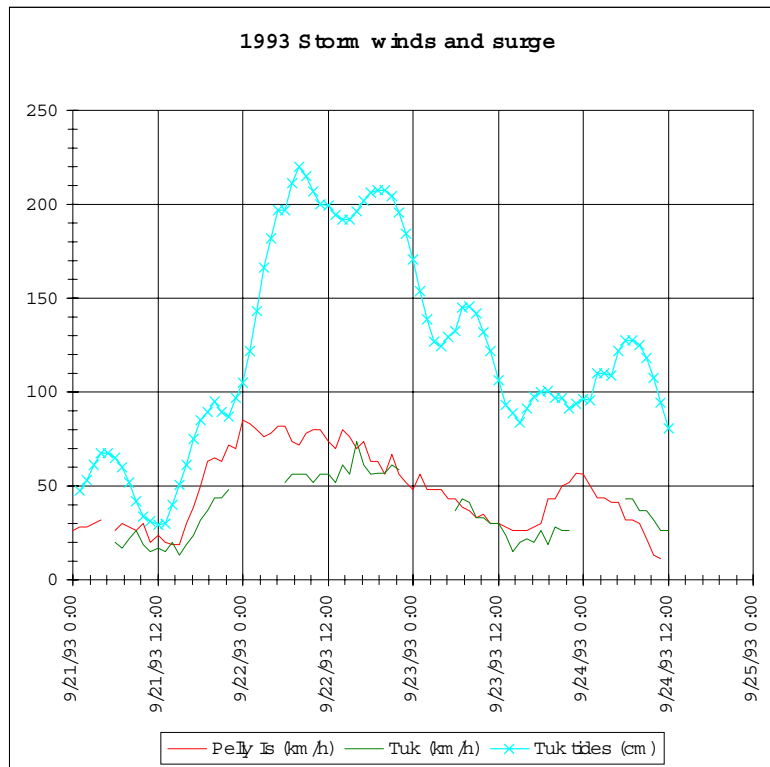
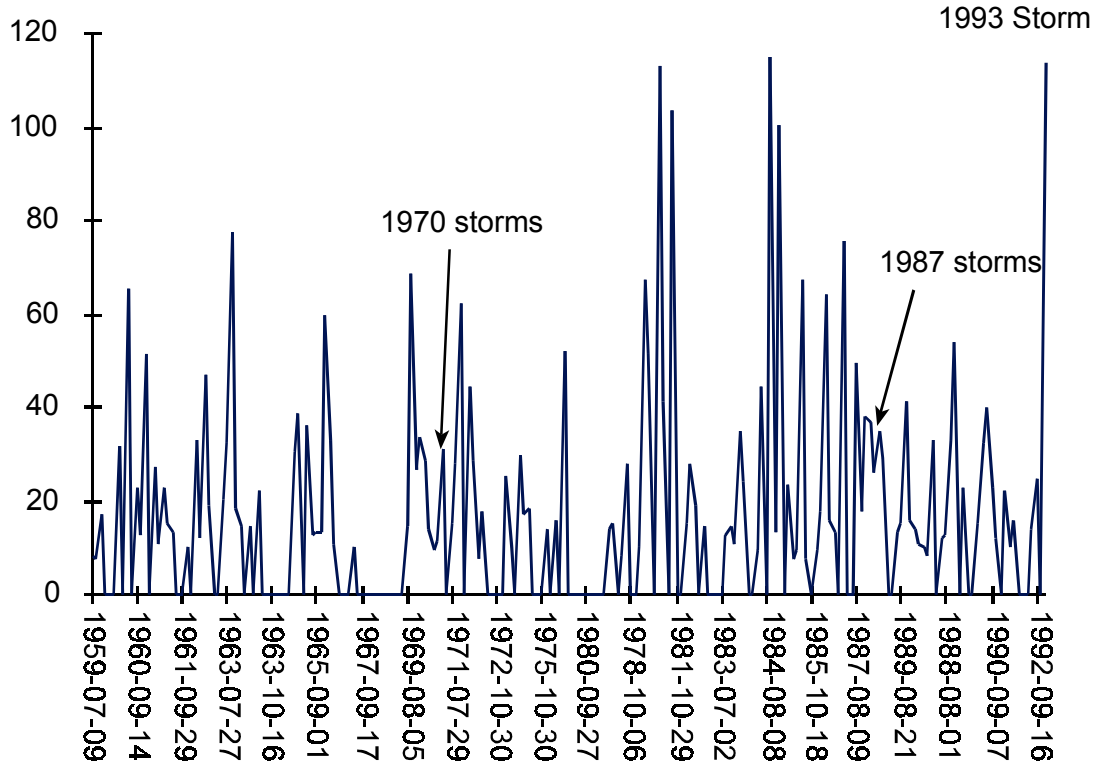
Western Arctic Monitoring Sites



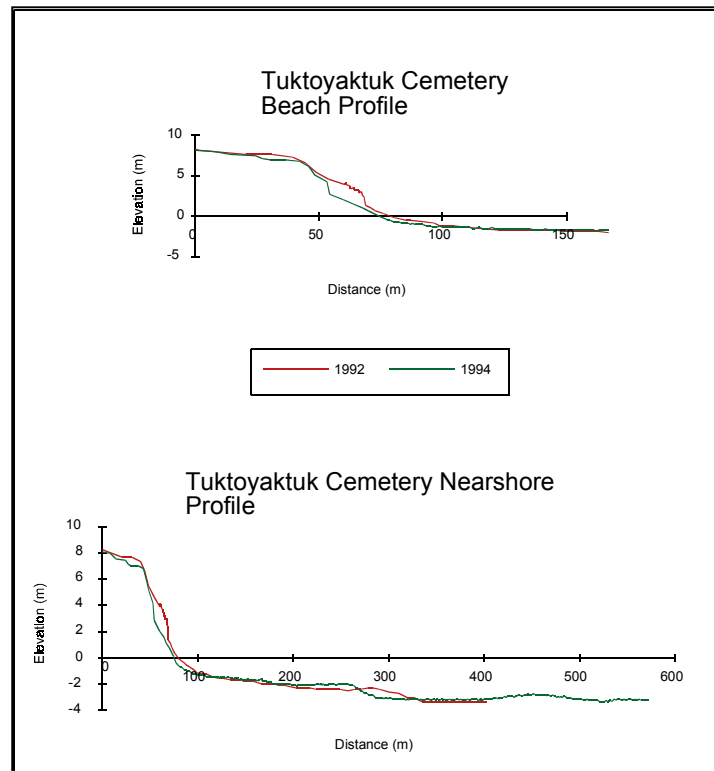
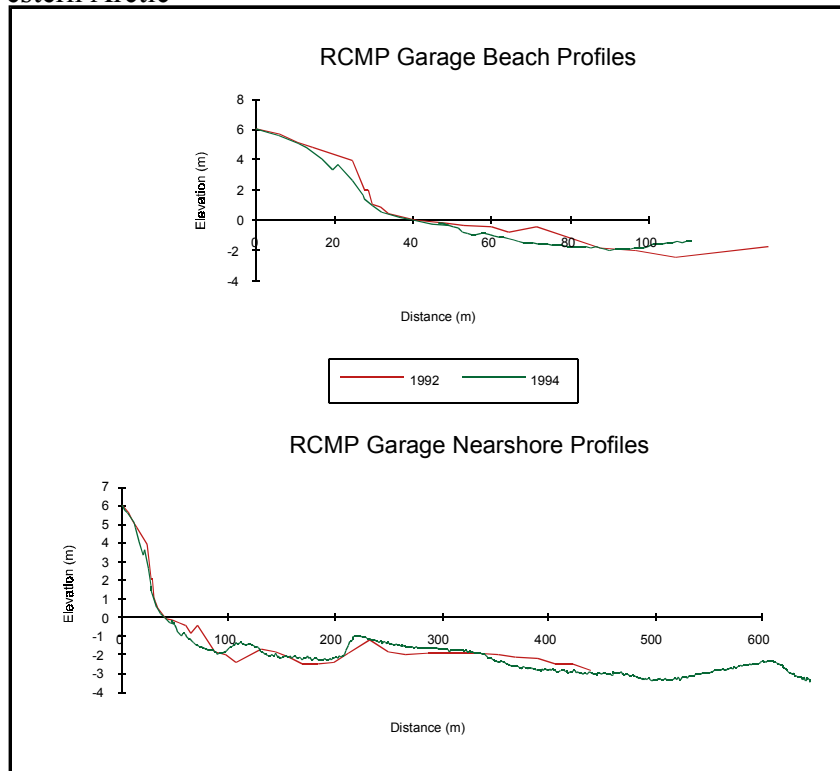
Maximum Open Water Development 1995-1997

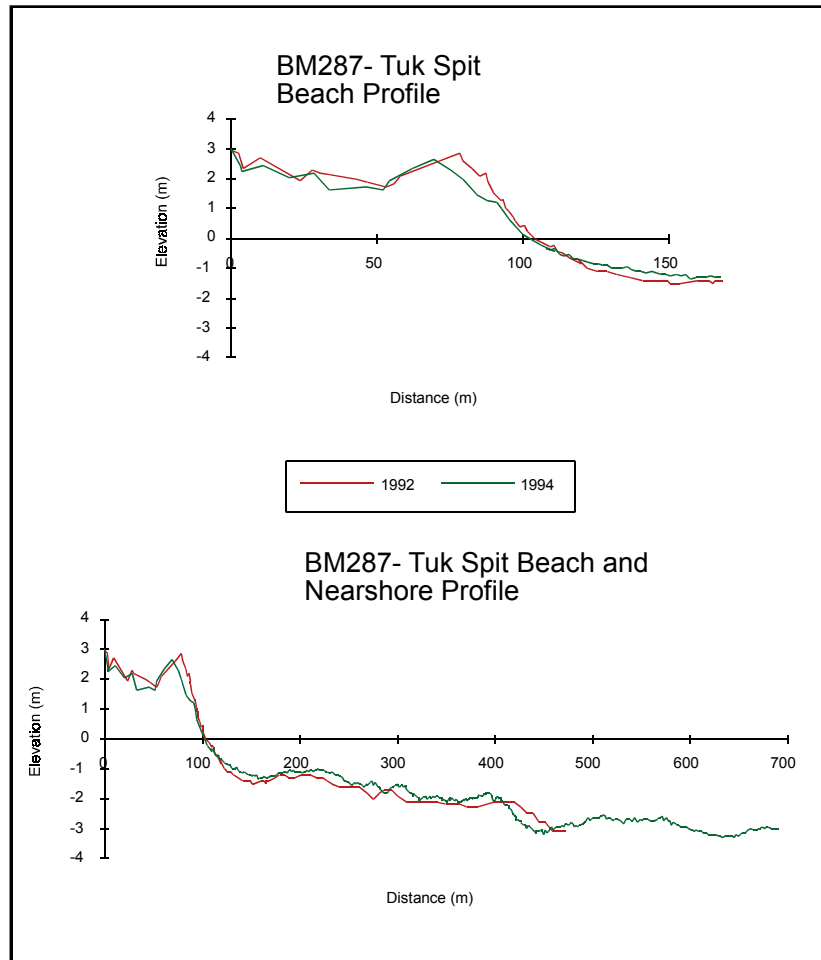


Storm Intensity 1958 to 1993

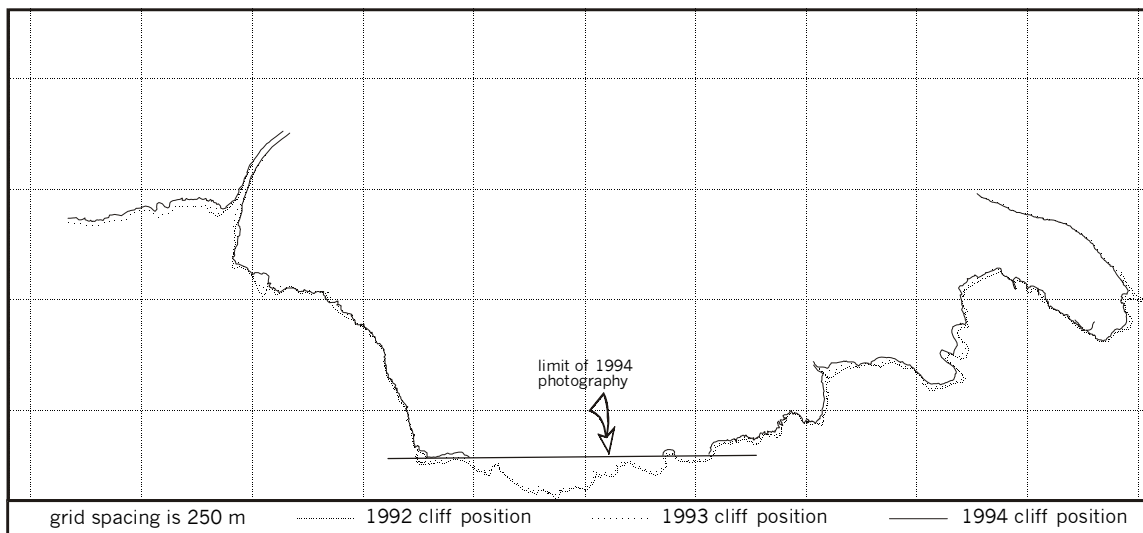


Results - Western Arctic



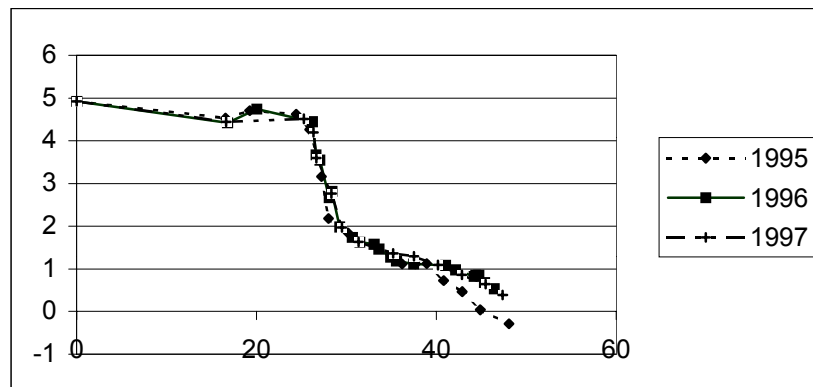


Tent Island



Cliff and Beach Survey - Stokes Pt.

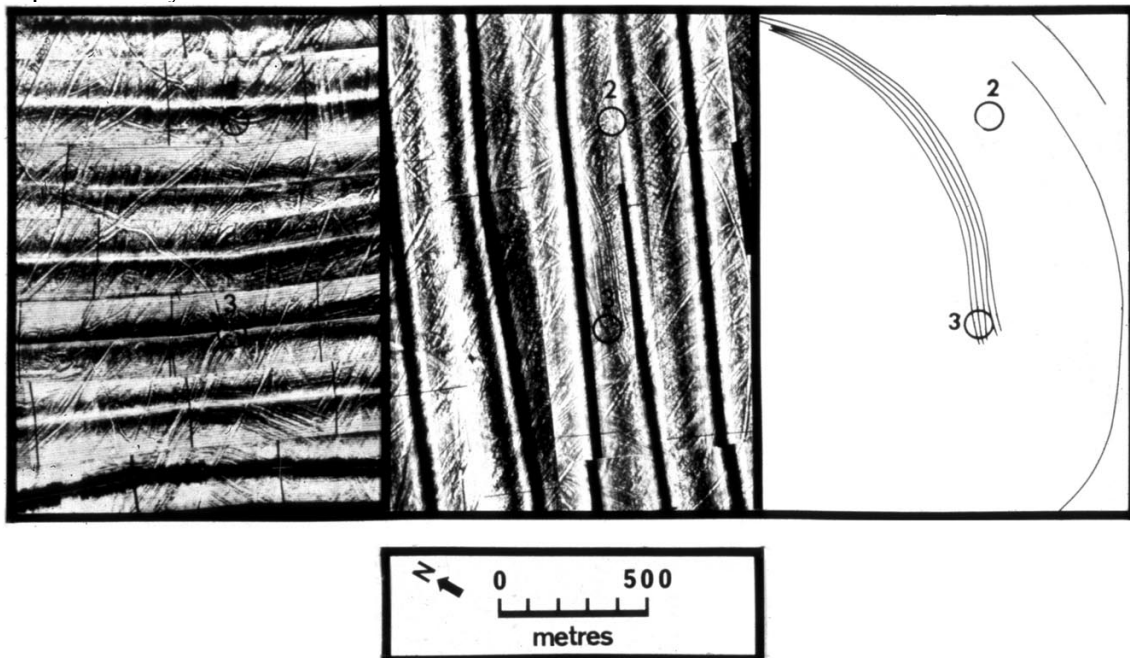
		1995	1996	1997
BM145	0	4.9229		
ice wedge melt-out front :	16.549	4.5262		
crack	19.218	4.6965		
crack	24.389	4.6149		
edge bluff	25.91	4.2565		
mid-slope	27.212	3.1576		
base rubble on sad	28.019	2.1736		
base dftwd	30.183	1.8444		
sd->grav	36.183	1.116		
crest gravel berm	37.657	1.1163		
gravel to sd	38.913	1.1182		
WL@1735 MDT smpl stc	40.803	0.7279		
top droff- grav	42.875	0.4632		
drop off - level out grav	44.898	0.0409		
drop off	48.074	-0.2867		

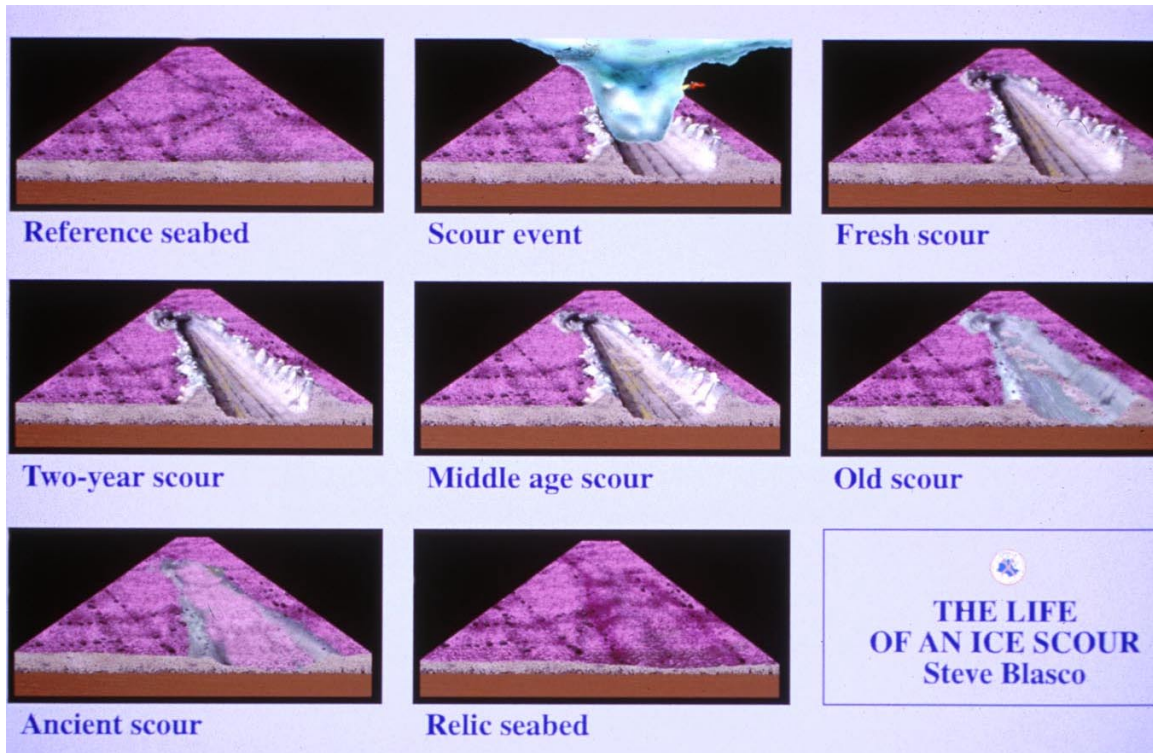


Ice Keel Scour Monitoring

- Objective: Determine scour severity and frequency in support of oil development activities
- Funding from PERD and ESRF
- Duration 1984-1991
- Activity: repetitive mapping of ice scoured zone (10-30 m) using sidescan sonar and subbottom profilers
- Climate Link: ice scour severity is linked to mobility and
- Strength of ice pack

Repeat Survey with new scour





Ice keel Scour Monitoring

