

Sea Ice Overview

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Seasonal cycle:

Winter and spring: landfast ice (immobile) and pack ice (moving)

Summer and fall: pack ice (moving) or no ice

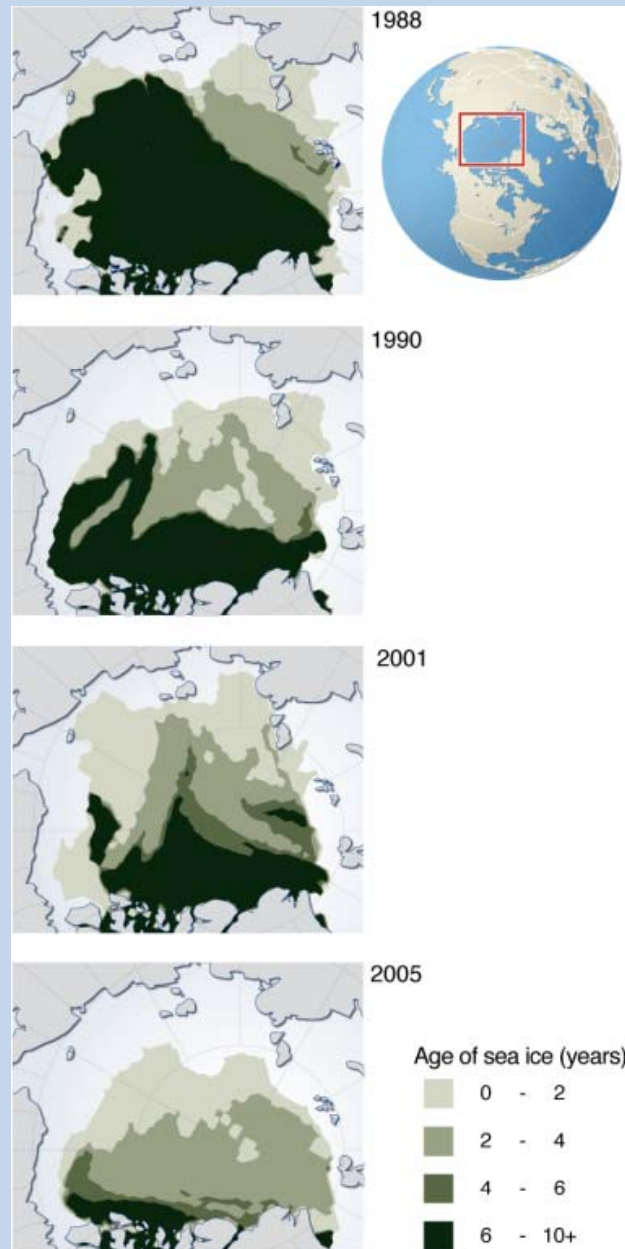
Pack ice movement : Beaufort Gyre vs. Chukchi Sea

Landfast ice in Beaufort Sea vs. Chukchi Sea:

Differences in Extent and Timing

Contact points between oil and ice

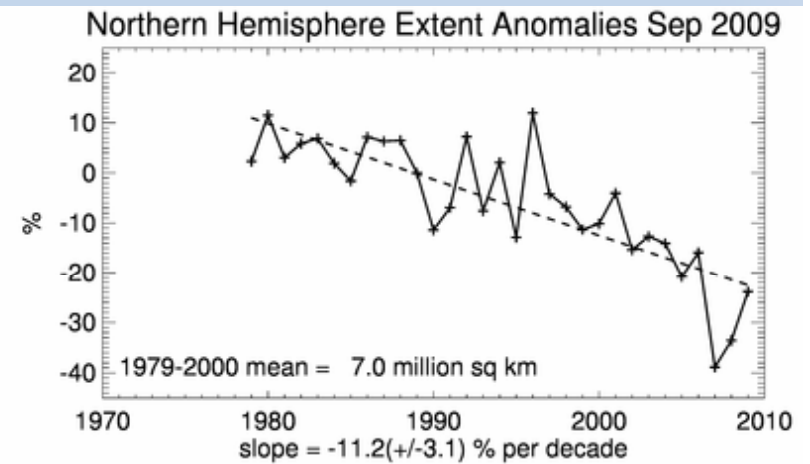
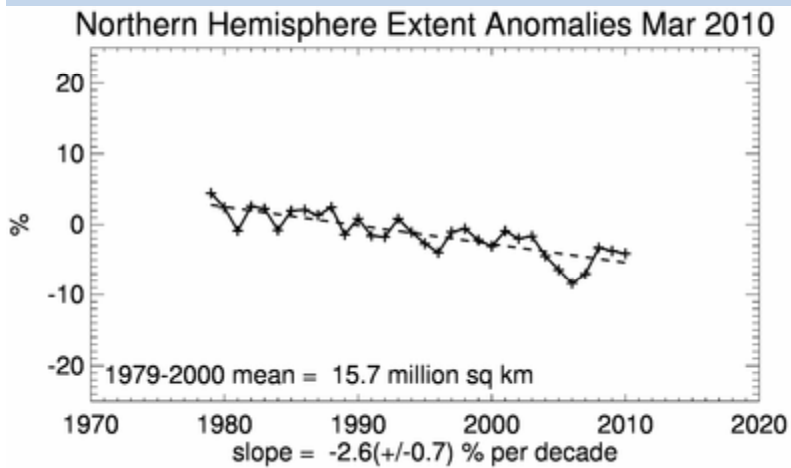
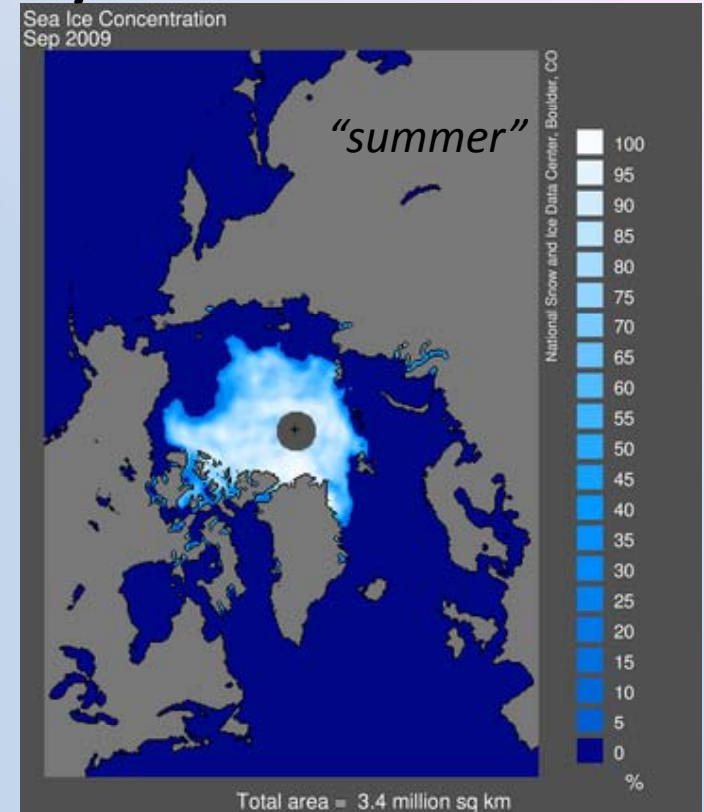
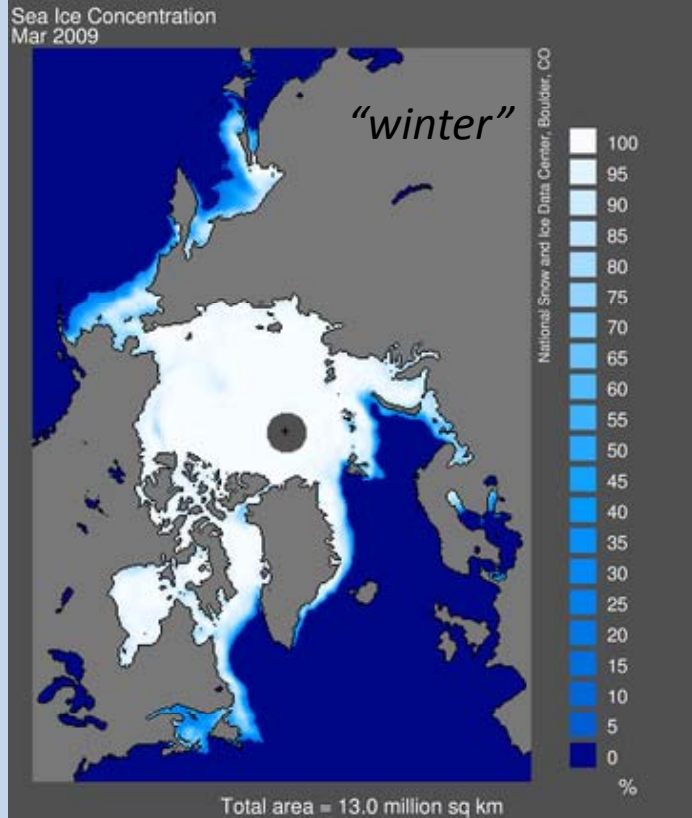
Age of Sea Ice in the Arctic



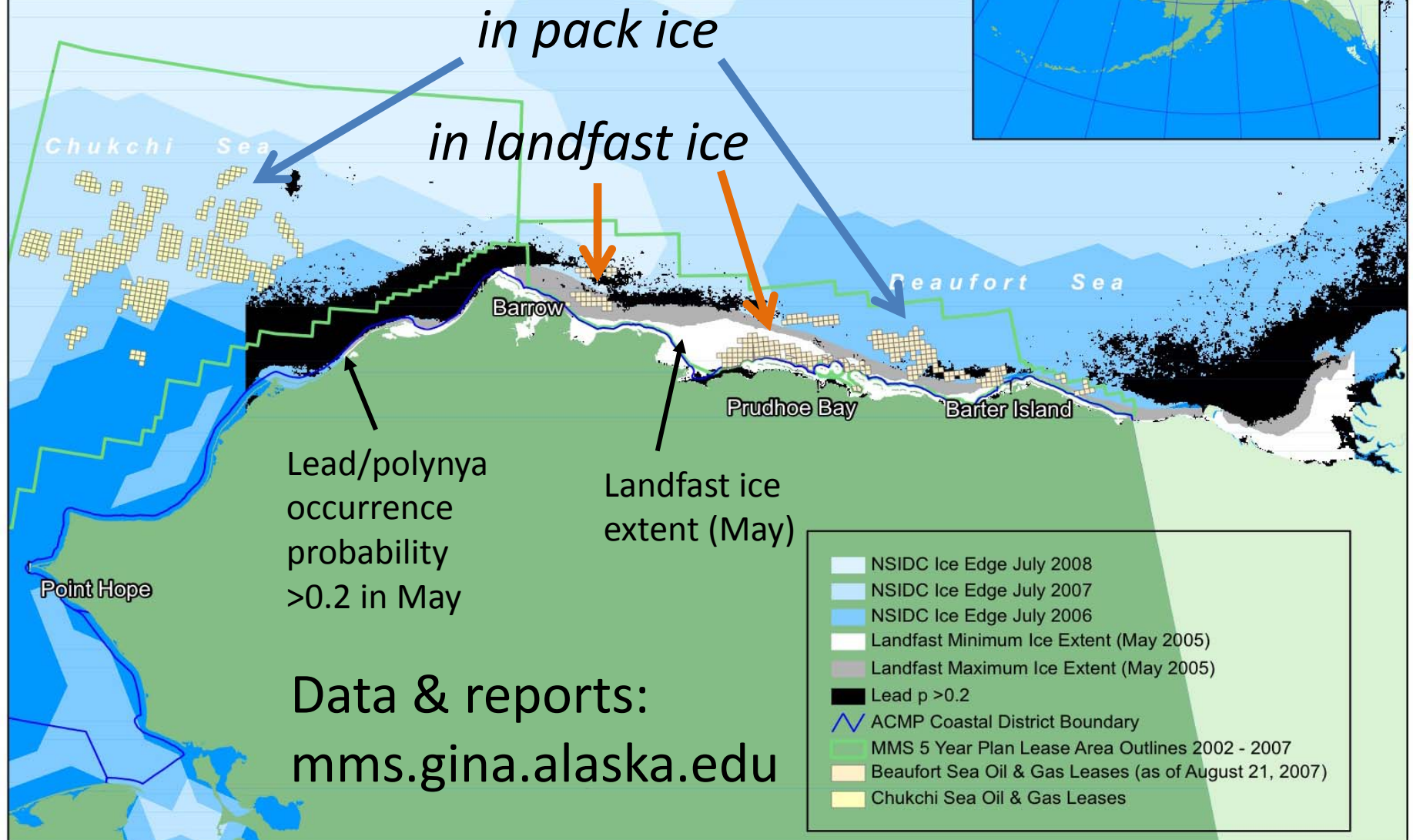
pack ice is getting younger
(thinner)

UNEP, Global Outlook for Ice and Snow (2007),
based on State of the Arctic Report (2006)

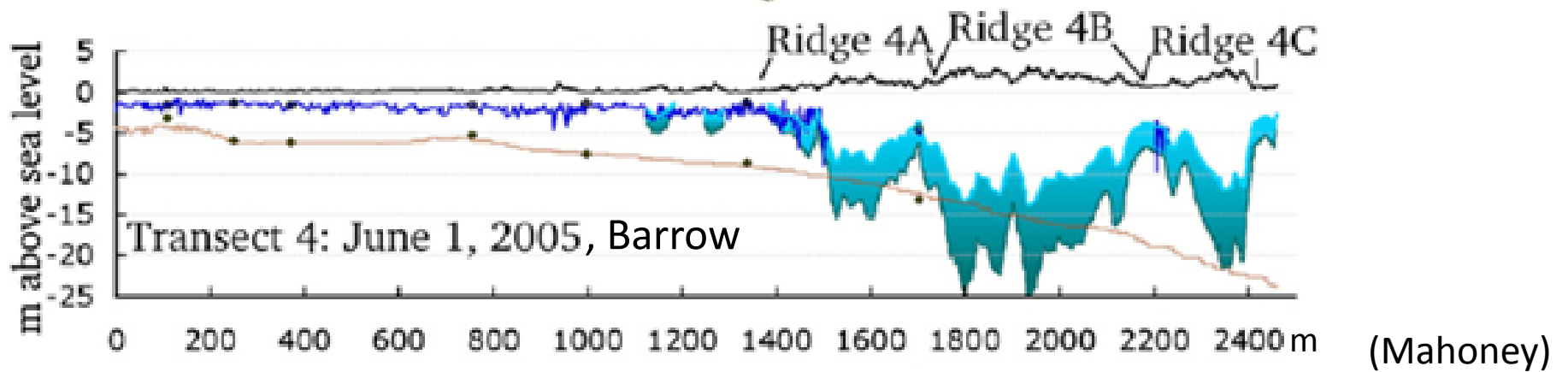
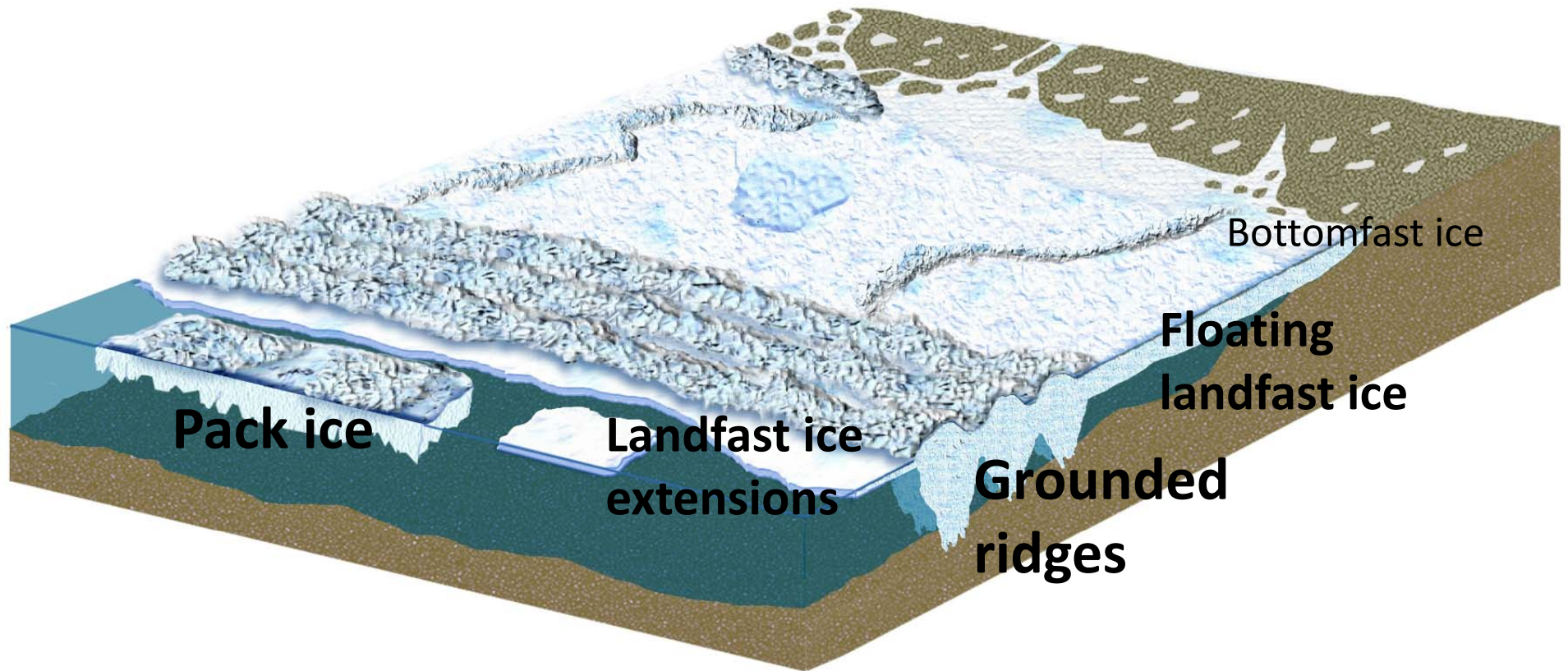
Seasonal Sea Ice Cycle



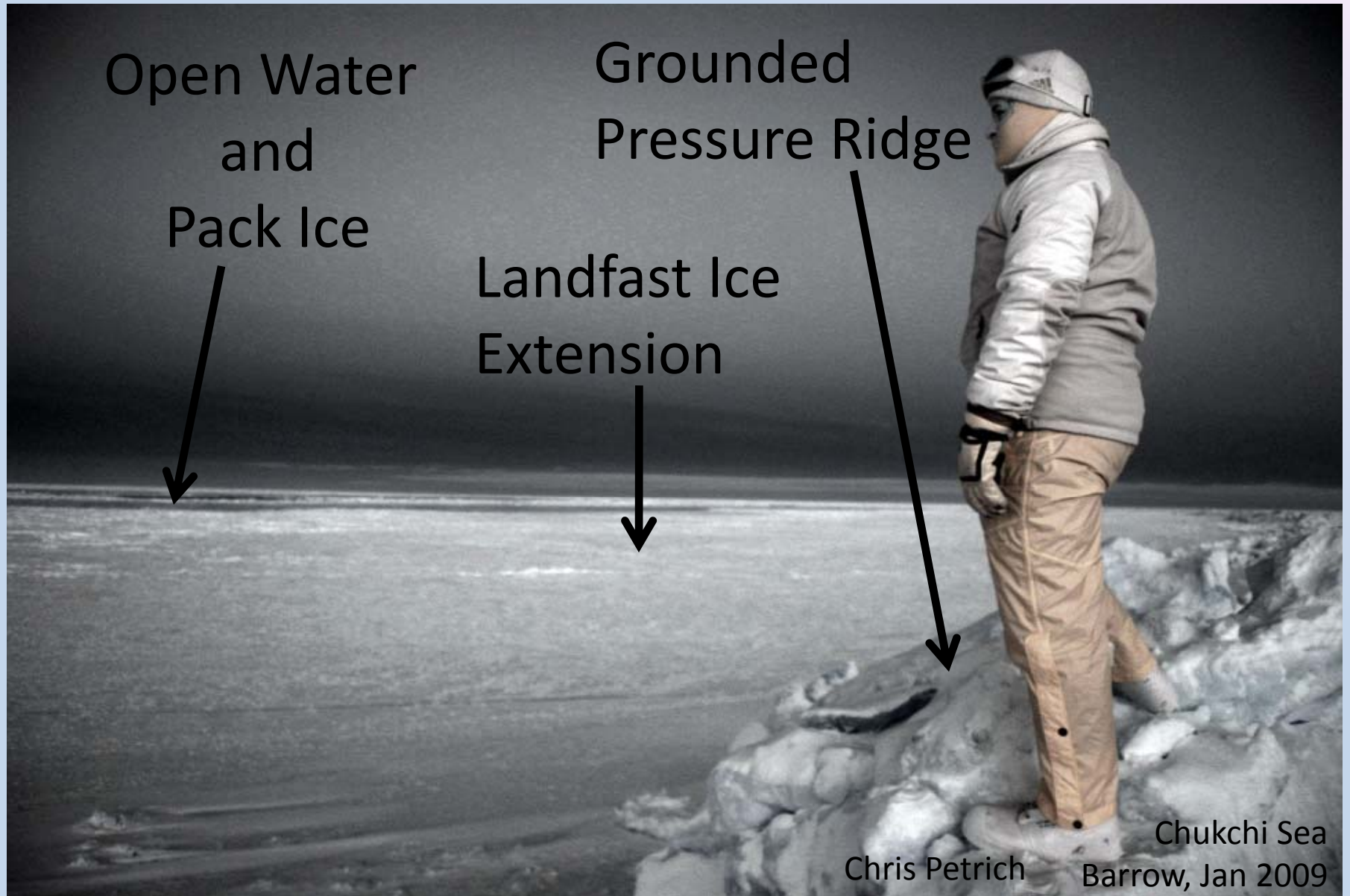
Offshore leases & the sea-ice environment



Landfast Ice



Landfast Ice Edge

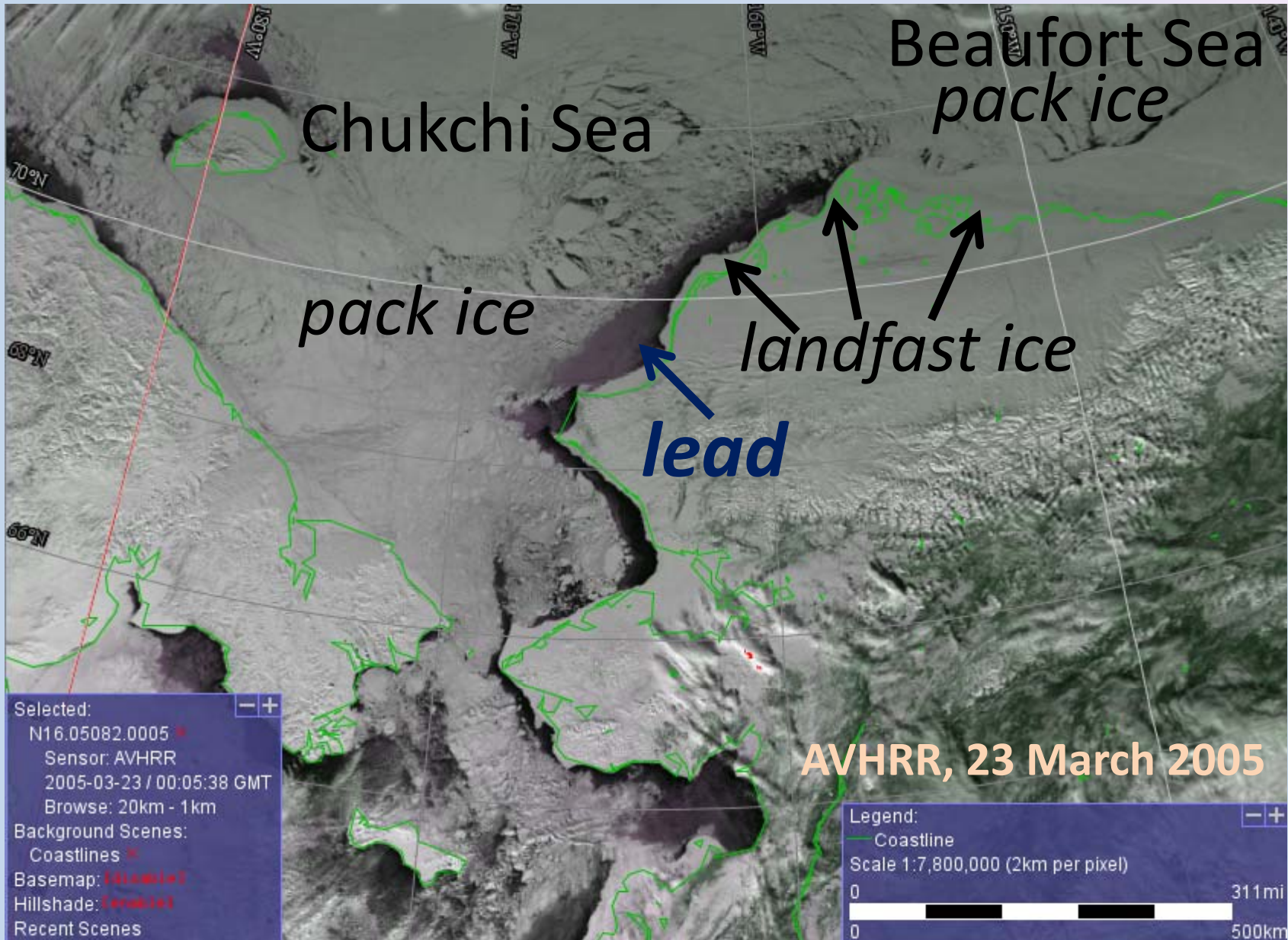


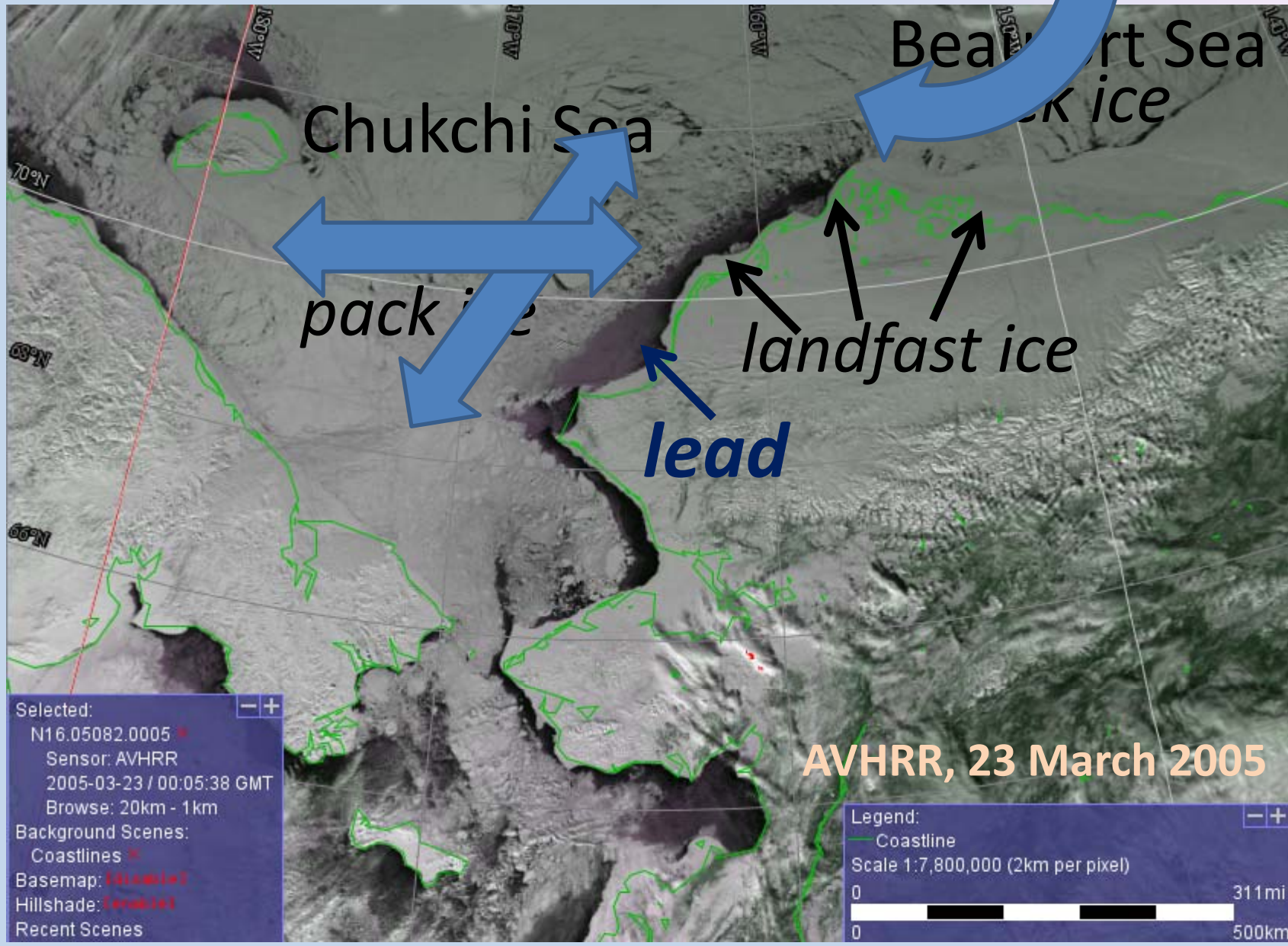
Landfast Ice Edge



Bill Hess

Photo © Bill Hess





Beaufort Gyre

Beaufort Sea
pack ice

Chukchi Sea

pack ice

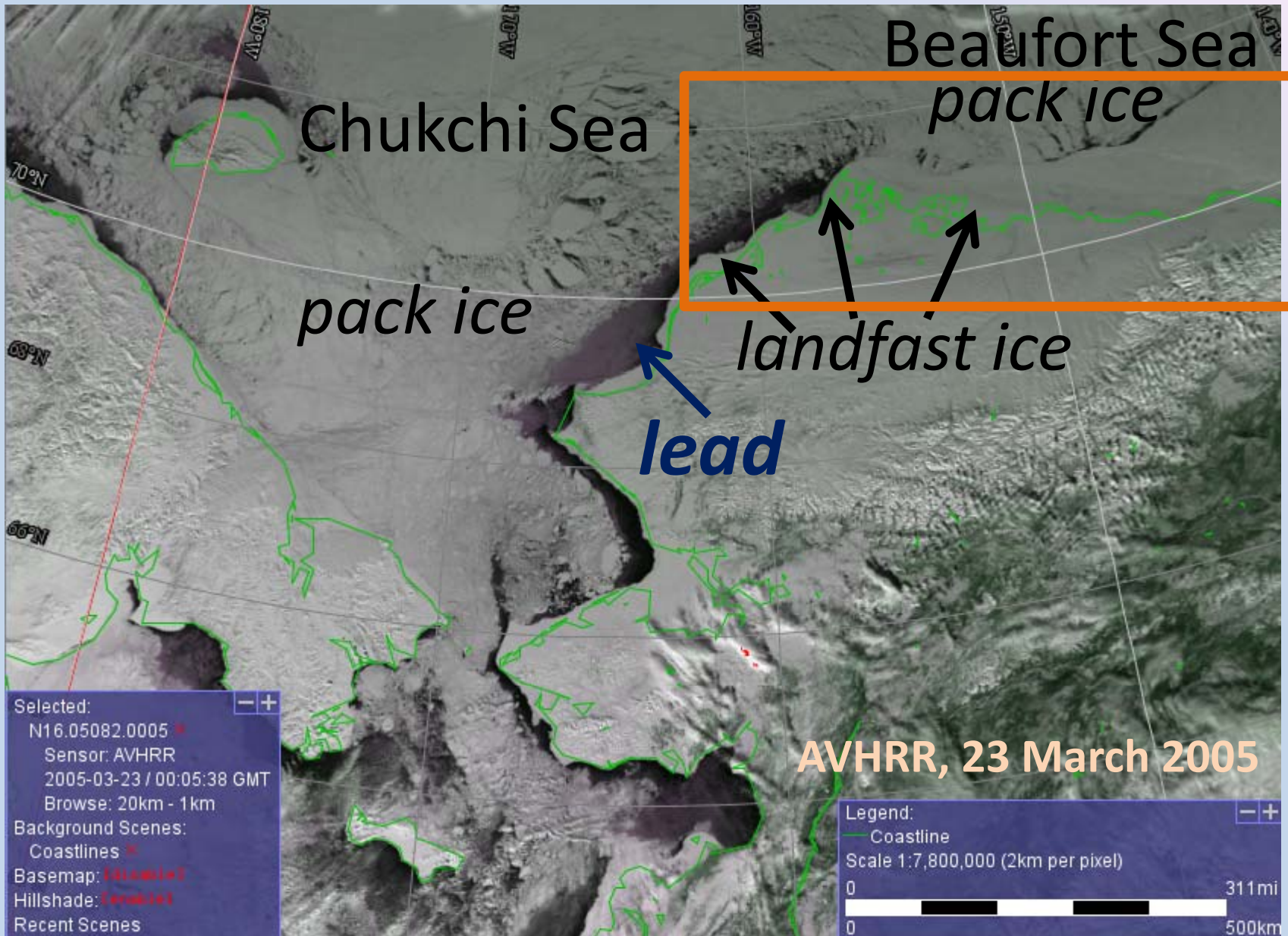
landfast ice

lead

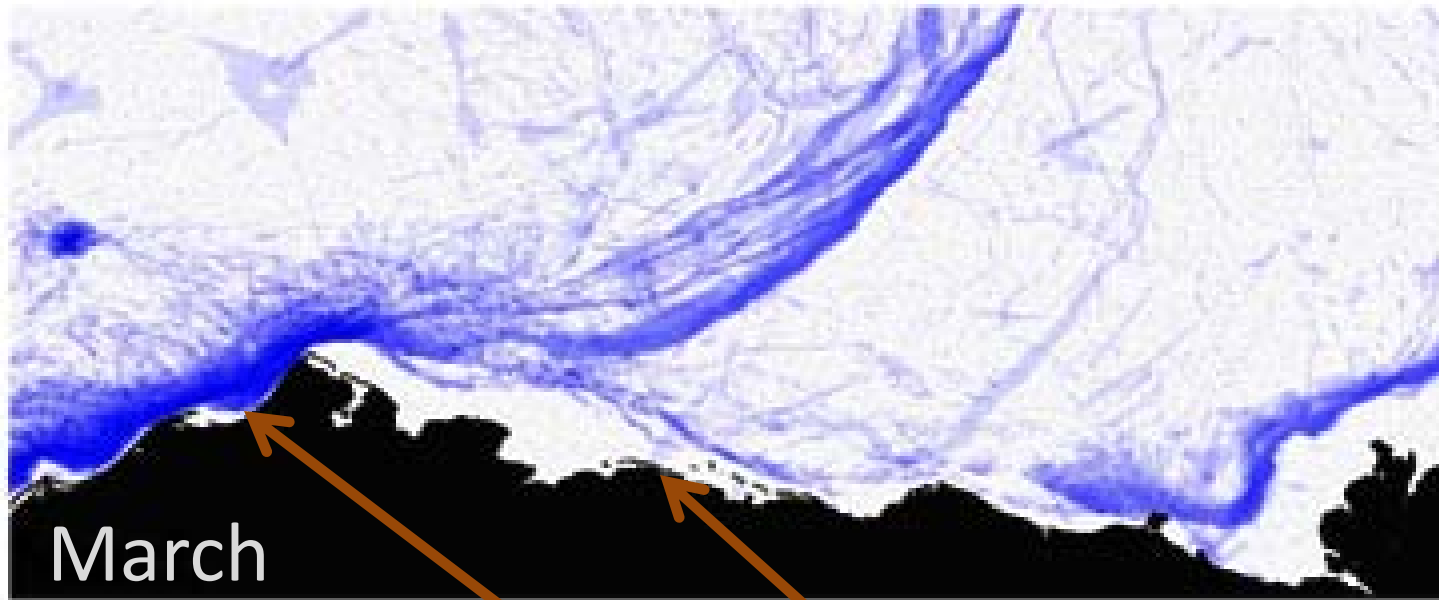
AVHRR, 23 March 2005

Selected: - +
N16.05082.0005
Sensor: AVHRR
2005-03-23 / 00:05:38 GMT
Browse: 20km - 1km
Background Scenes:
Coastlines
Basemap: (Automatic)
Hillshade: (Automatic)
Recent Scenes

Legend: - +
Coastline
Scale 1:7,800,000 (2km per pixel)
0 311mi
0 500km



Lead Occurrence Patterns (1993-2004)



March

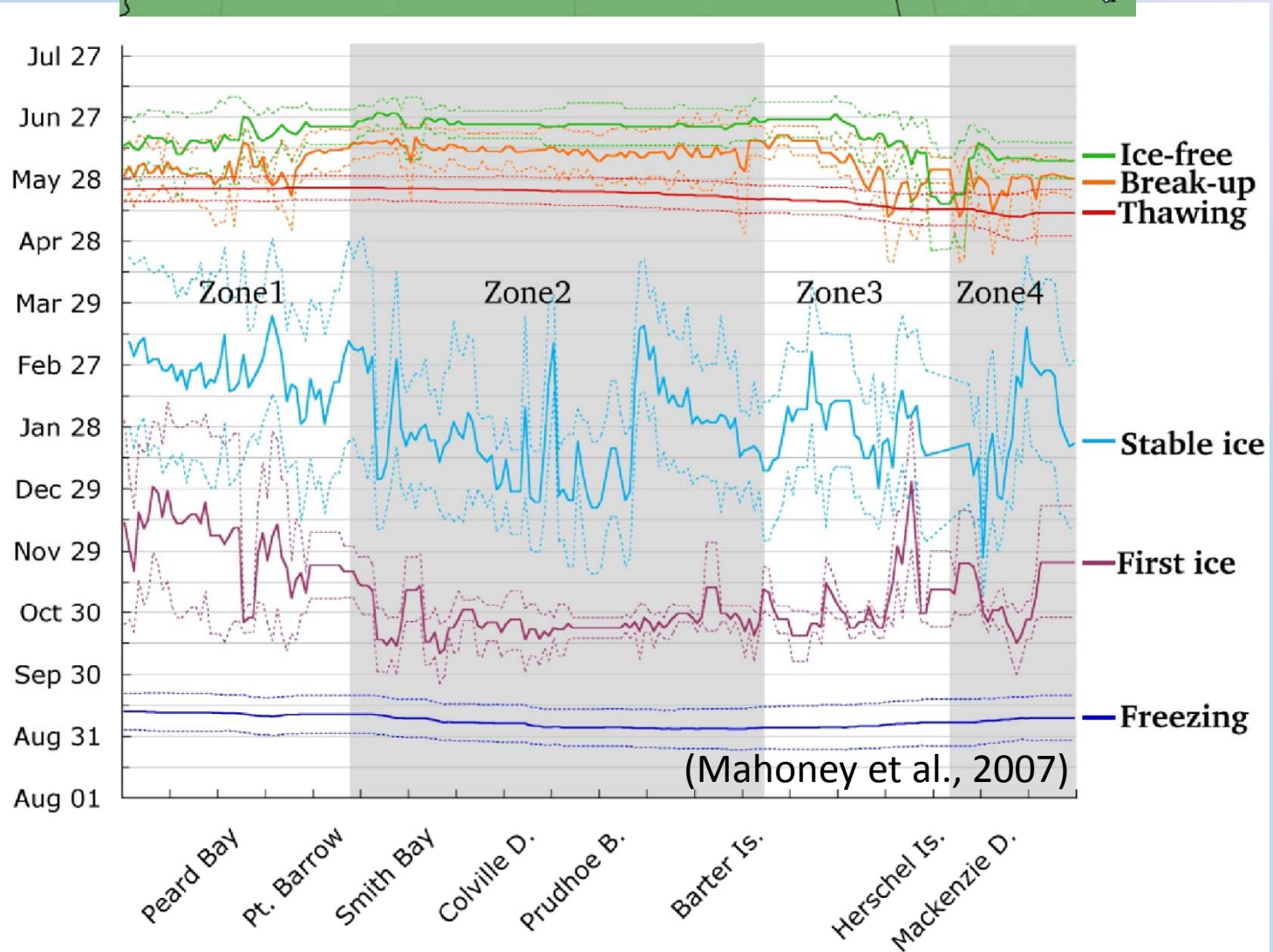
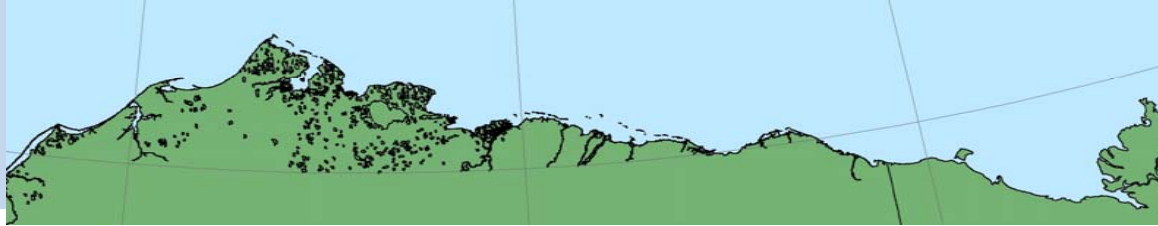
Lead occurrence frequency



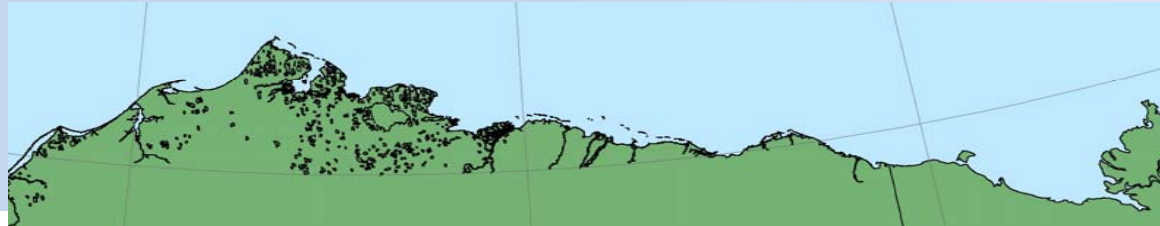
Landfast ice zone
wider
in Beaufort Sea
than
in Chukchi Sea

(Mahoney et al., 2007)

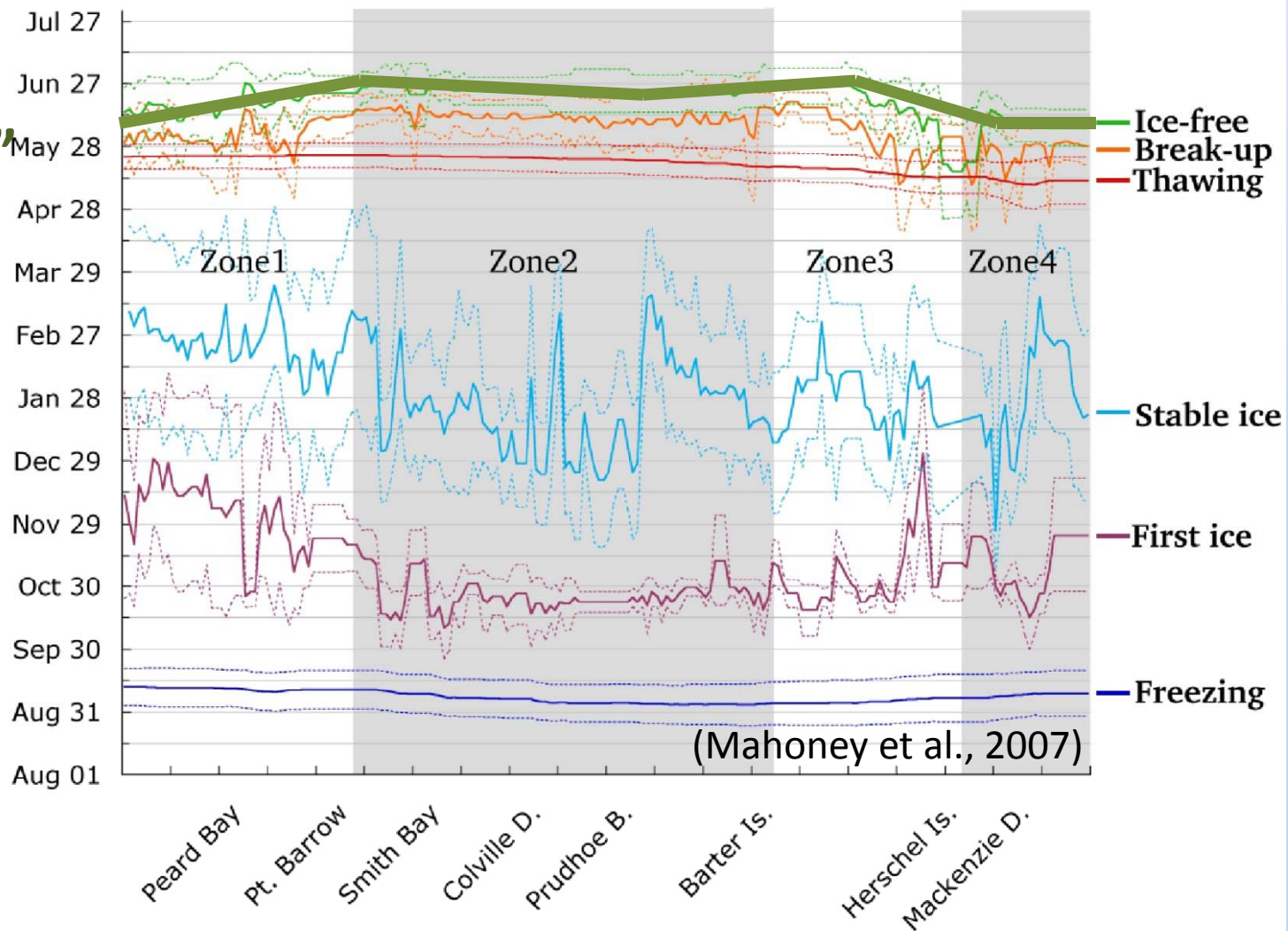
Landfast Ice in Chukchi vs. Beaufort: Different Timing



Landfast Ice in Chukchi vs. Beaufort: Different Timing

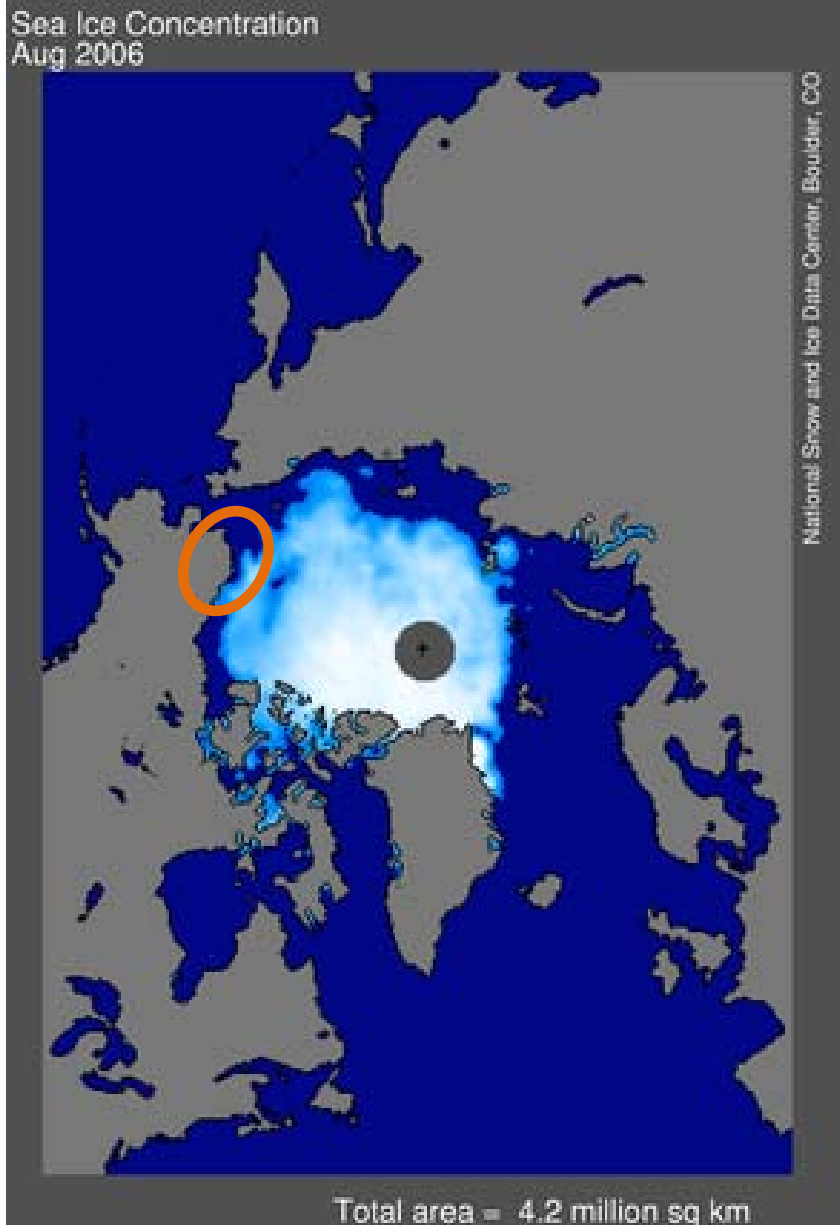


“Landfast
Ice-Free”

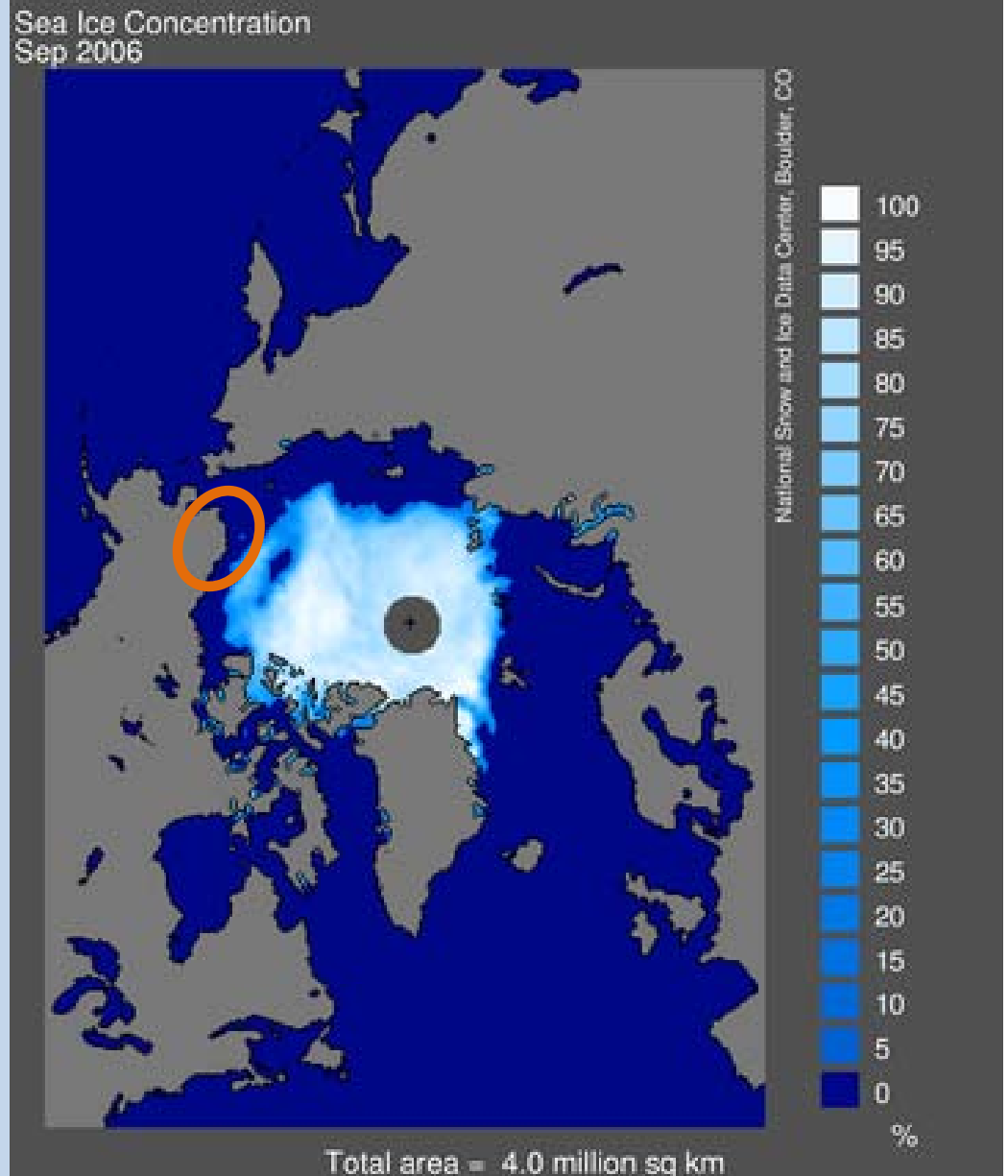


An Anecdote of 2006

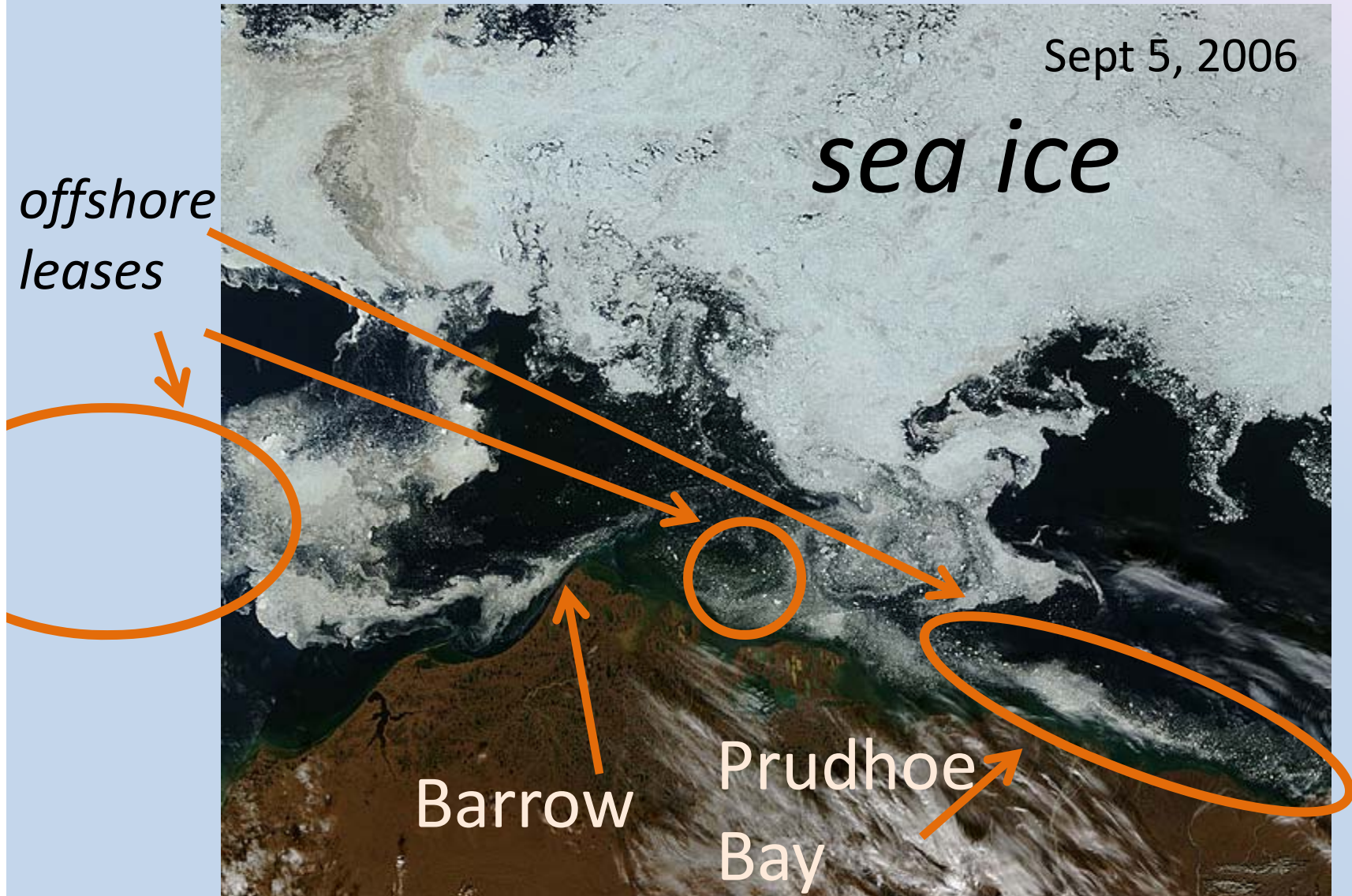
August



September



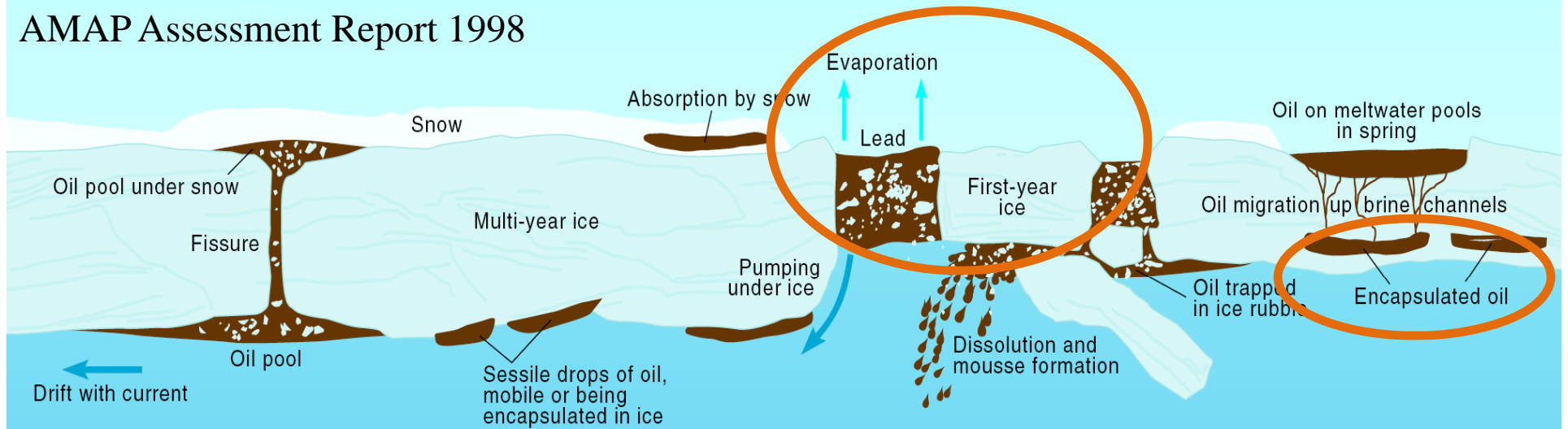
Coastal pack ice all summer: 2006



Courtesy: MODIS Rapid Response Team
AERONET_Barrow.2006248.terra.1km.jpg

Points of interaction between oil and ice

AMAP Assessment Report 1998



Oil in ice-covered waters



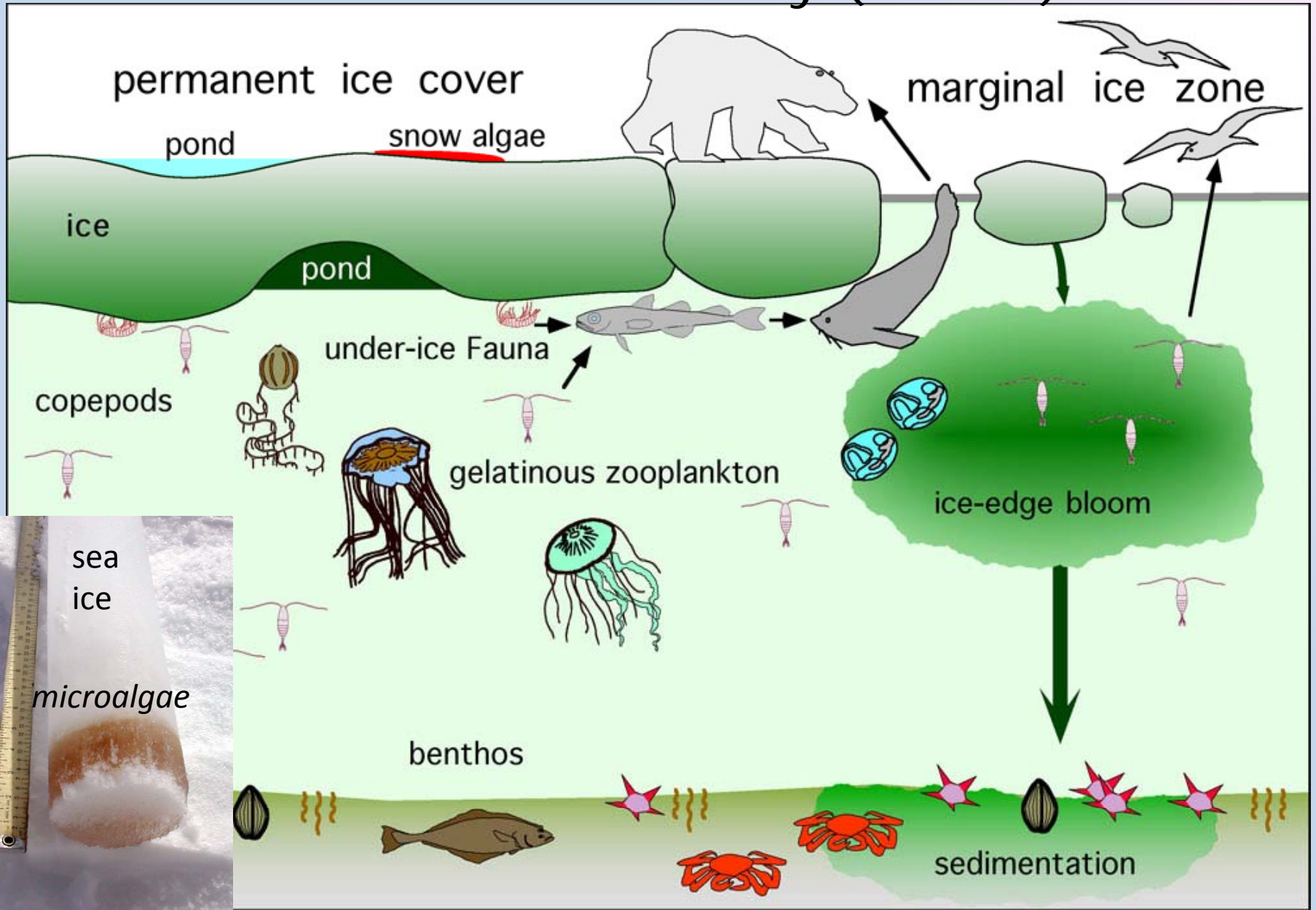
Oil in slush among pancake ice off the Canadian East Coast, 1986
(SL Ross and DF Dickins, 1987)

Example of oil encapsulation



NORCOR, 1975

Arctic Ocean Diversity (ArcOD)



C. Krembs