What is happening with the sea ice in the Arctic?

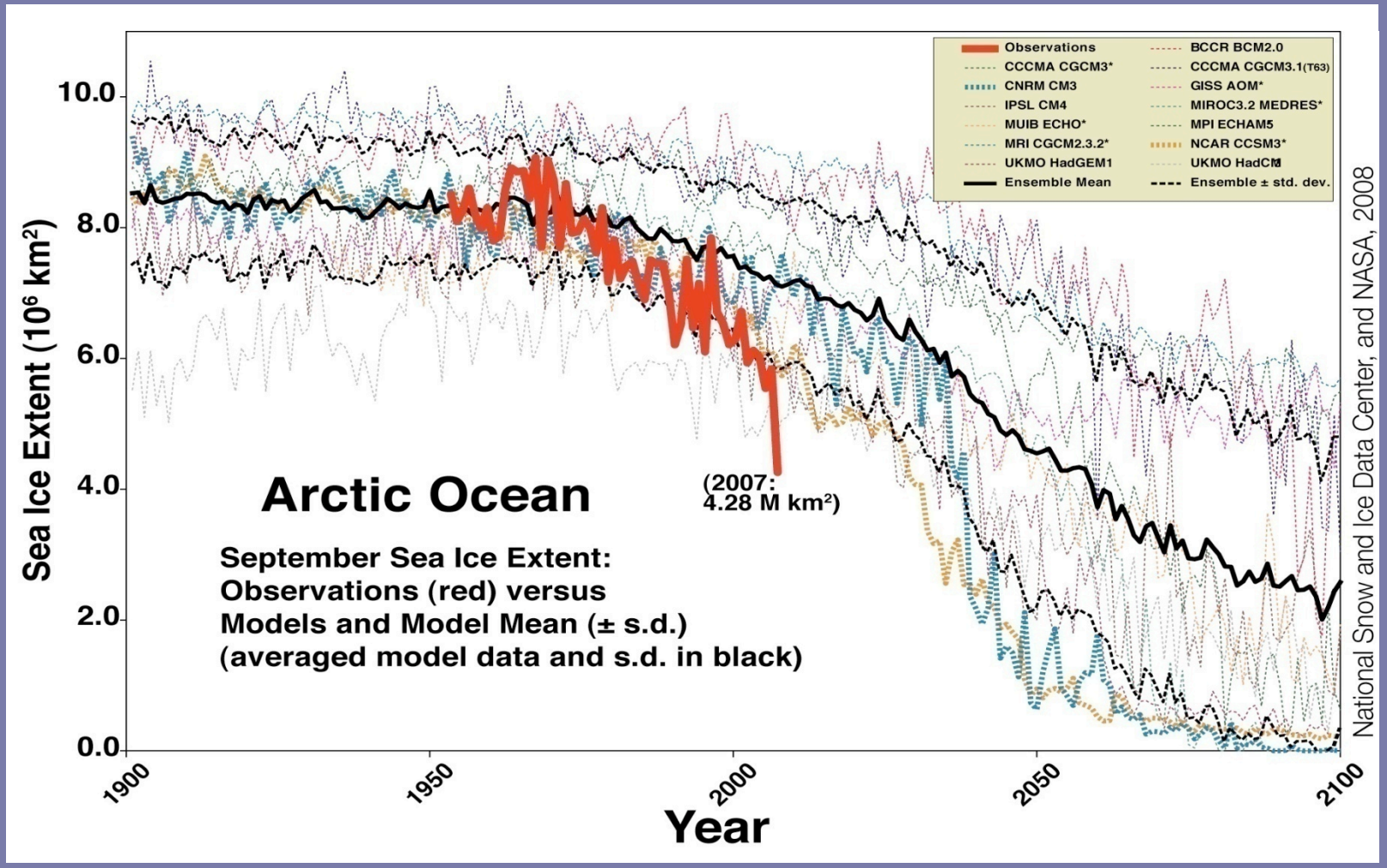
MELTING ICE – REGIONAL DRAMAS, GLOBAL WAKE-UP CALL

IMPACTS OF A WARMING ARCTIC

Projected Ice Extent

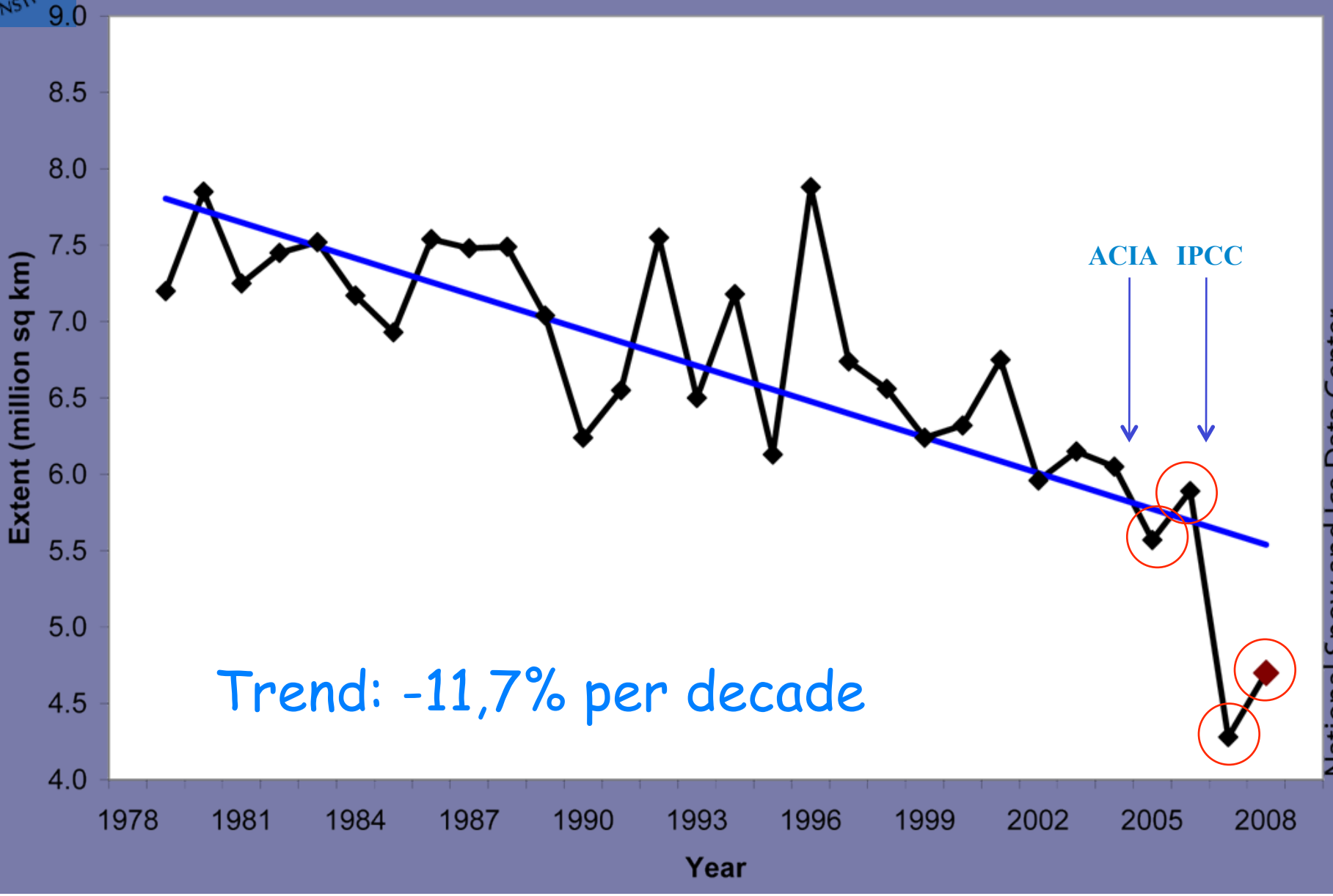
State-of-the-art knowledge (4,5 years ago)

Arctic sea ice extent in September: Observations and model simulations



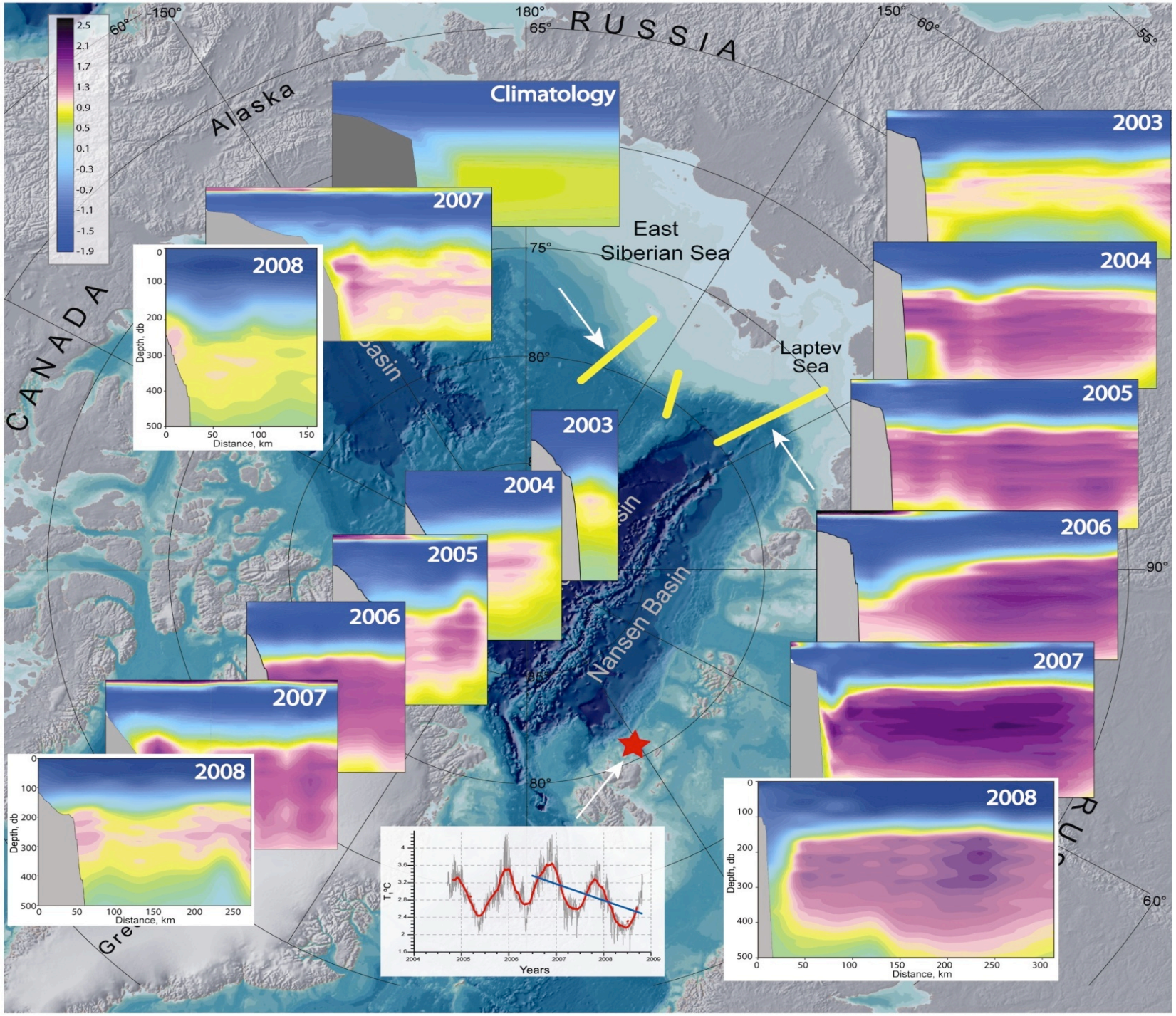
- Climate models show the same tendency of retreat as the observations
- Observed changes are faster than most climate models project
- High variability in climate in the Arctic

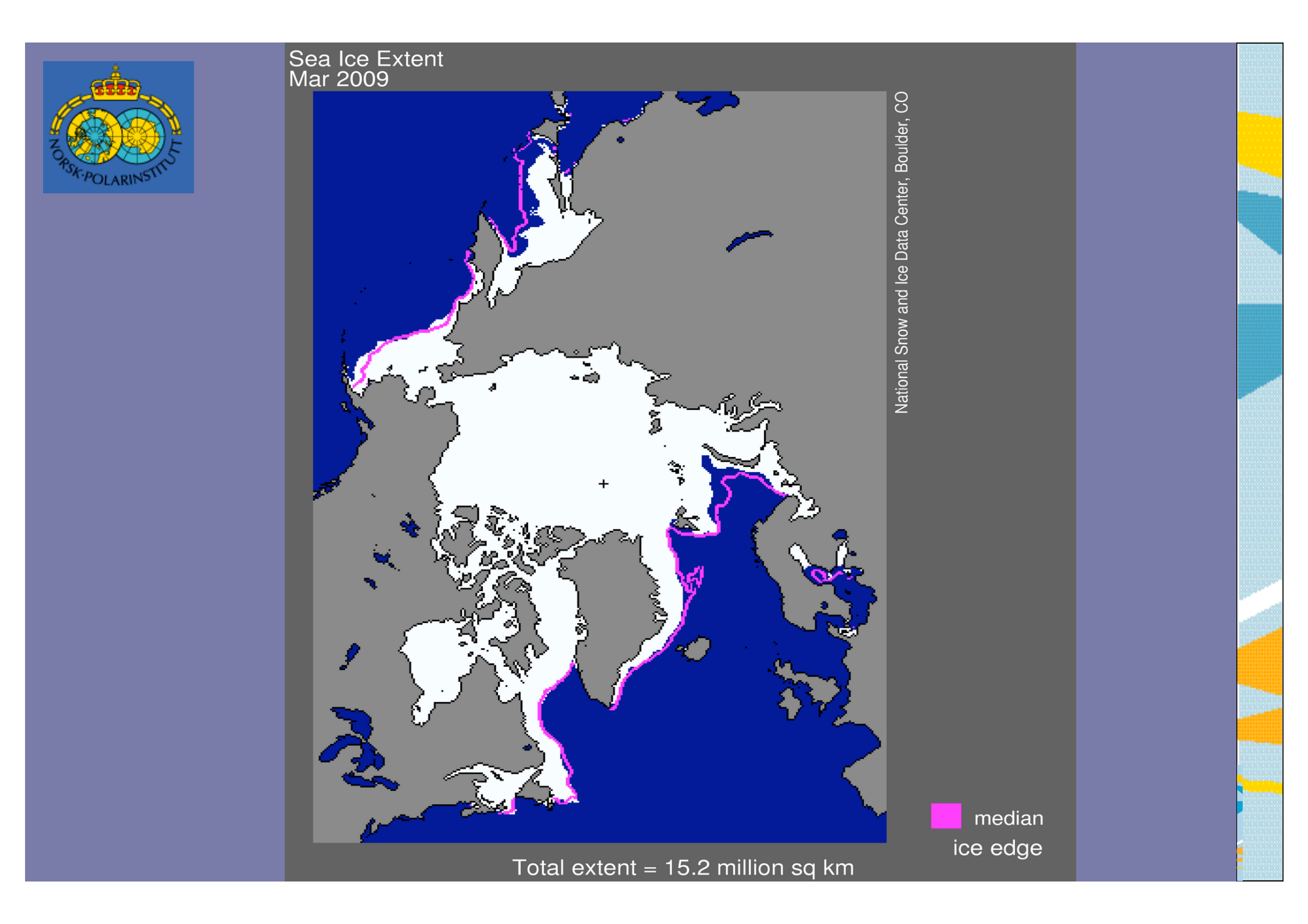
Summer sea ice extent

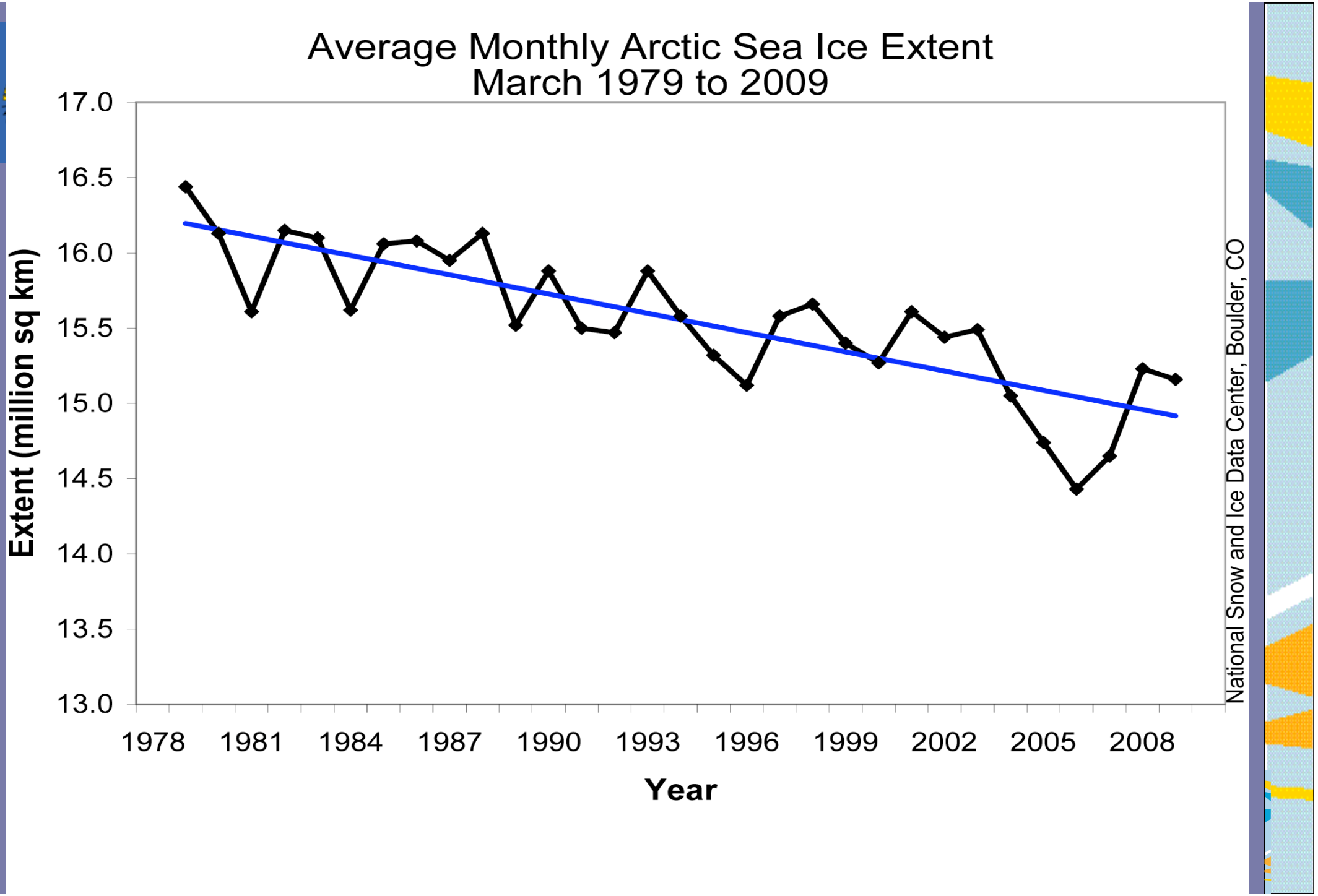


Kilder: NSIDC & Univ. Bremen

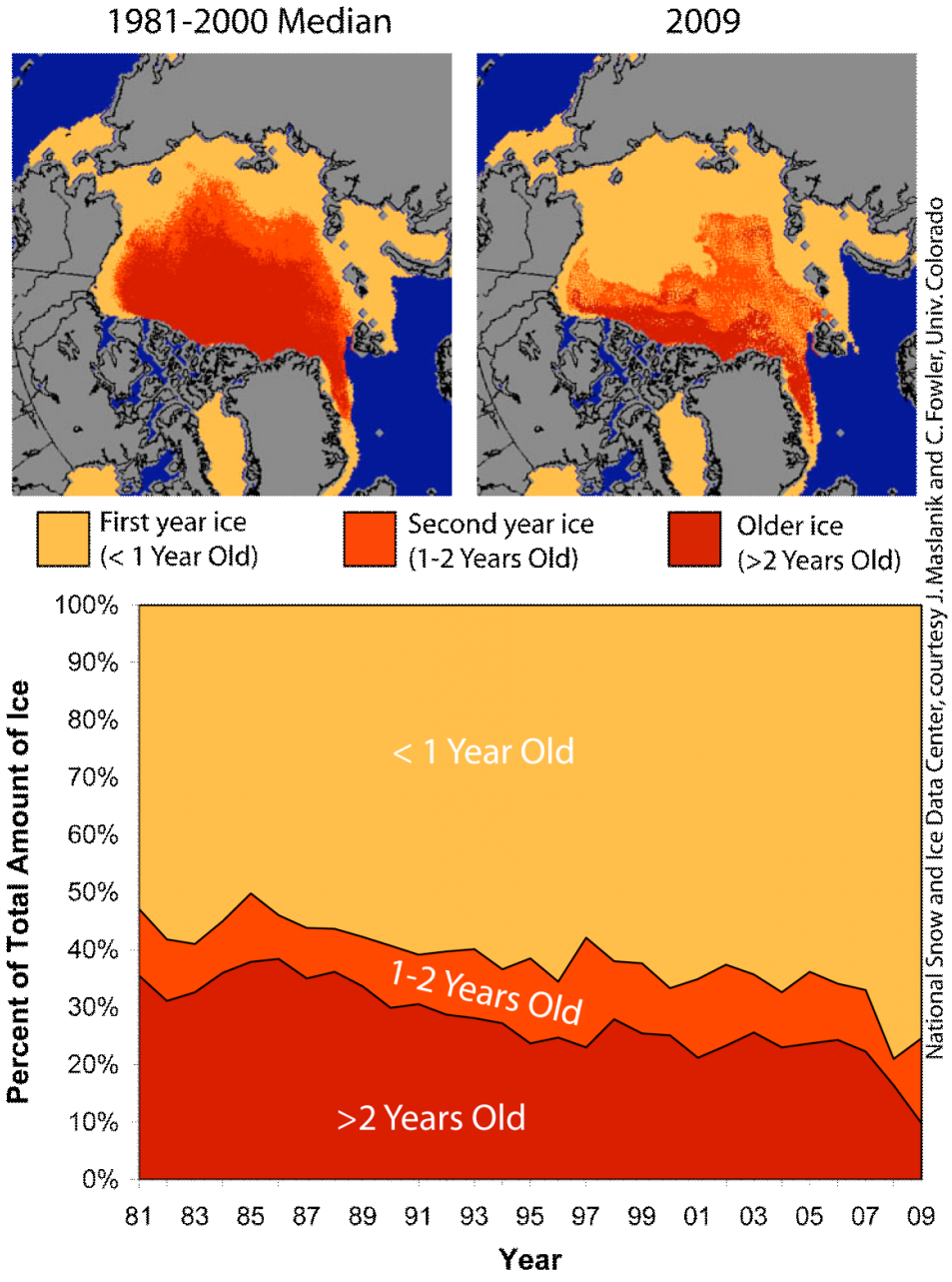
Observations show that the unprecedented warming of the Arctic Ocean observed in the 2000s has passed its maximum level in the Eurasian Basin.




Sea Ice Extent
Mar 2009
National Snow and Ice Data Center, Boulder, CO
median
ice edge
Total extent = 15.2 million sq km


Average Monthly Arctic Sea Ice Extent
March 1979 to 2009
Extent (million sq km)
17.0
16.5
16.0
15.5
15.0
14.5
14.0
13.5
13.0
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
Year
National Snow and Ice Data Center, Boulder, CO

End of February Arctic Sea Ice Age



Potential shipping lanes across the Arctic Ocean

Some consequences

<u>In the region:</u>

- Access (transportation, fisheries, oil/gas, tourism)
- Changes to the marine ecosystem
- Energy and CO_2 uptake (with global effects)

<u>Long-range effects:</u>

- Northern hemisphere weather patterns (”atmosperic memory”)

  - reduced winter precipitation in Scandinavia (hydropower)
  - reduced precipitation in southeast and western U.S. (drought)