Bering Sea Research

- North Pacific Climate Regimes and Ecosystem Productivity (NPCREP)
- LOss of Sea iCe (LOSC)
- Coordinated Investigations of the Bering Sea Ecosystem

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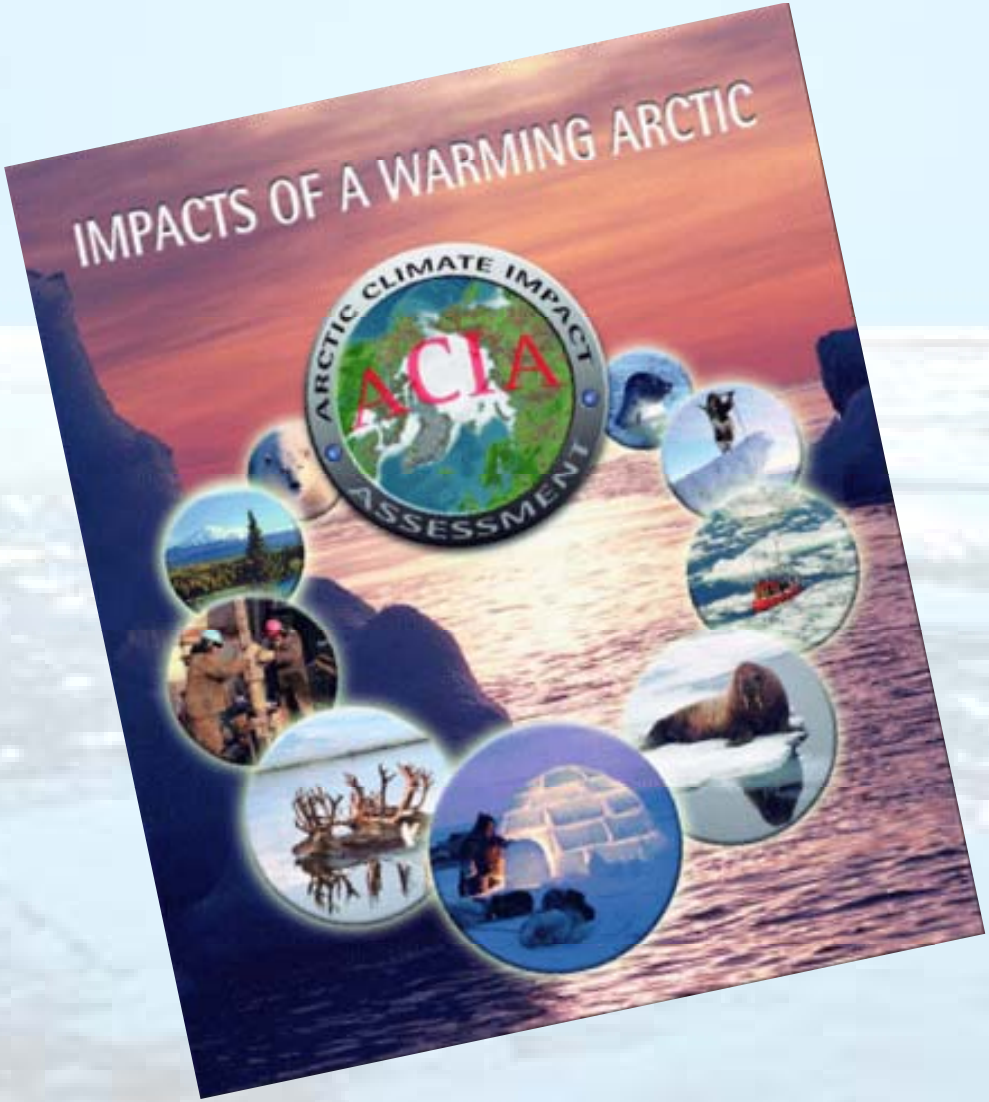
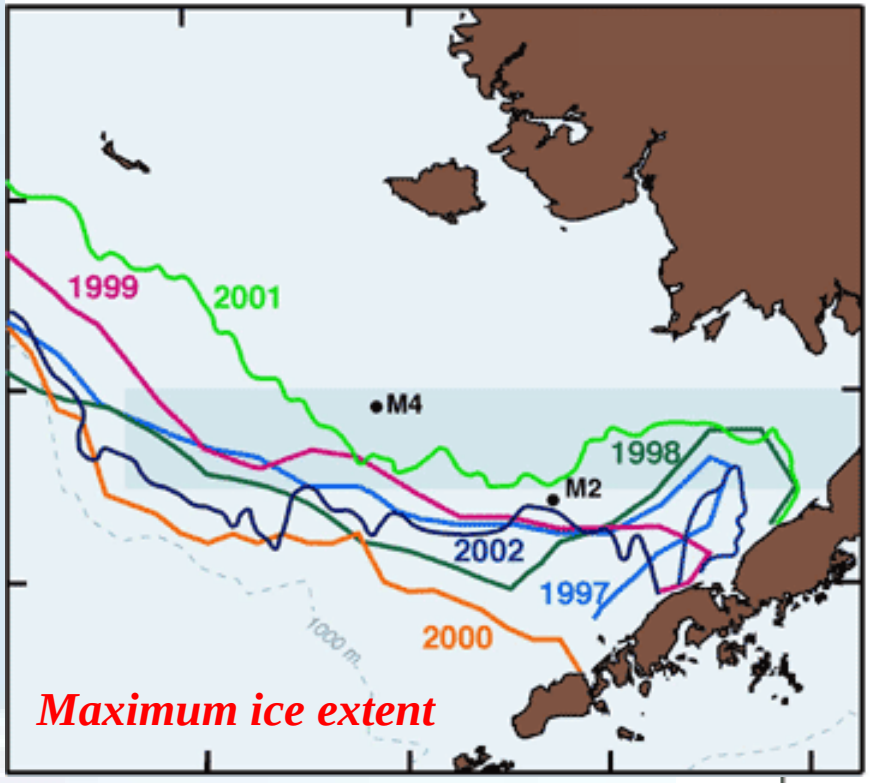
Is it Only the Arctic?

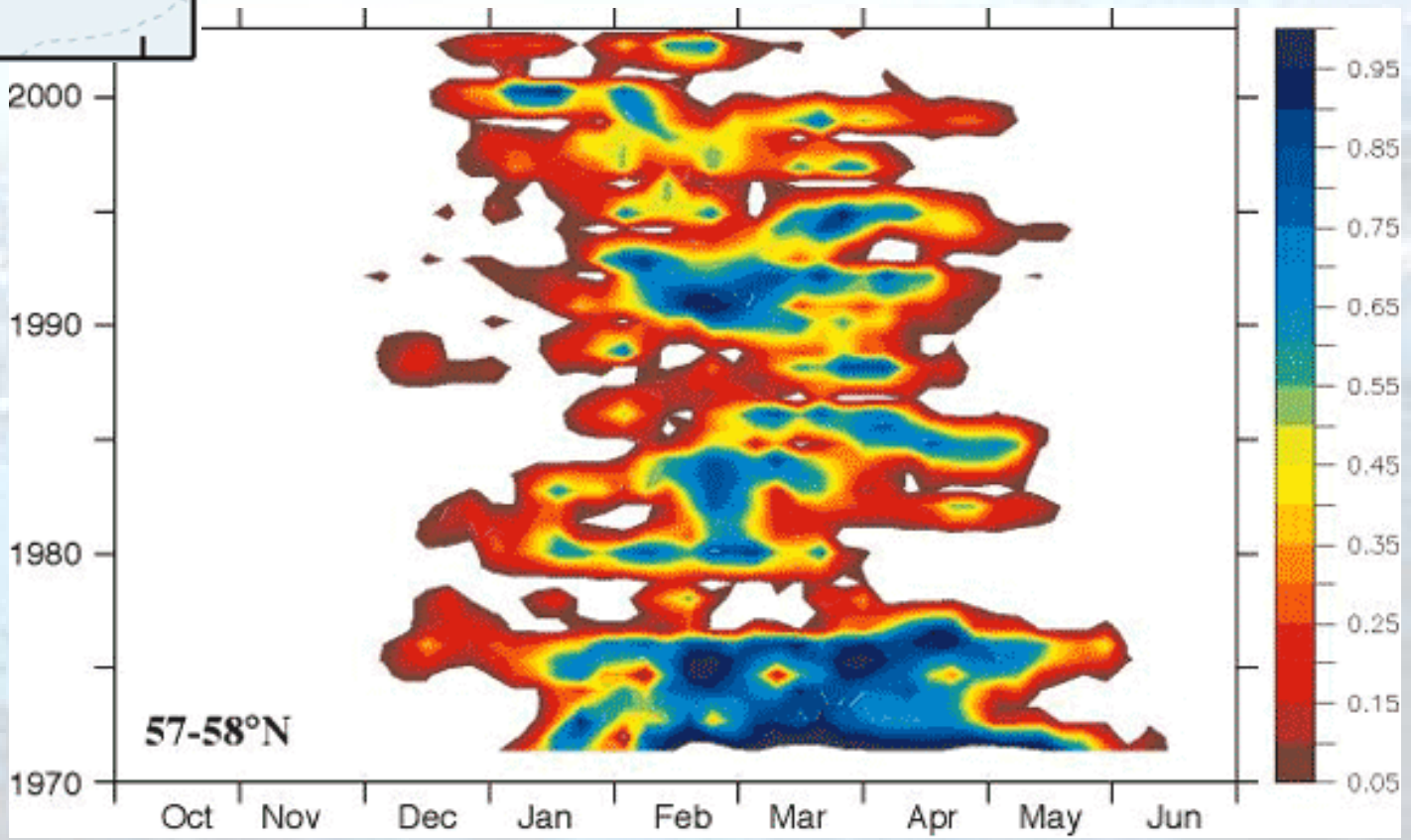


Changing climate: Bering Sea ice has retreated over the last two decades



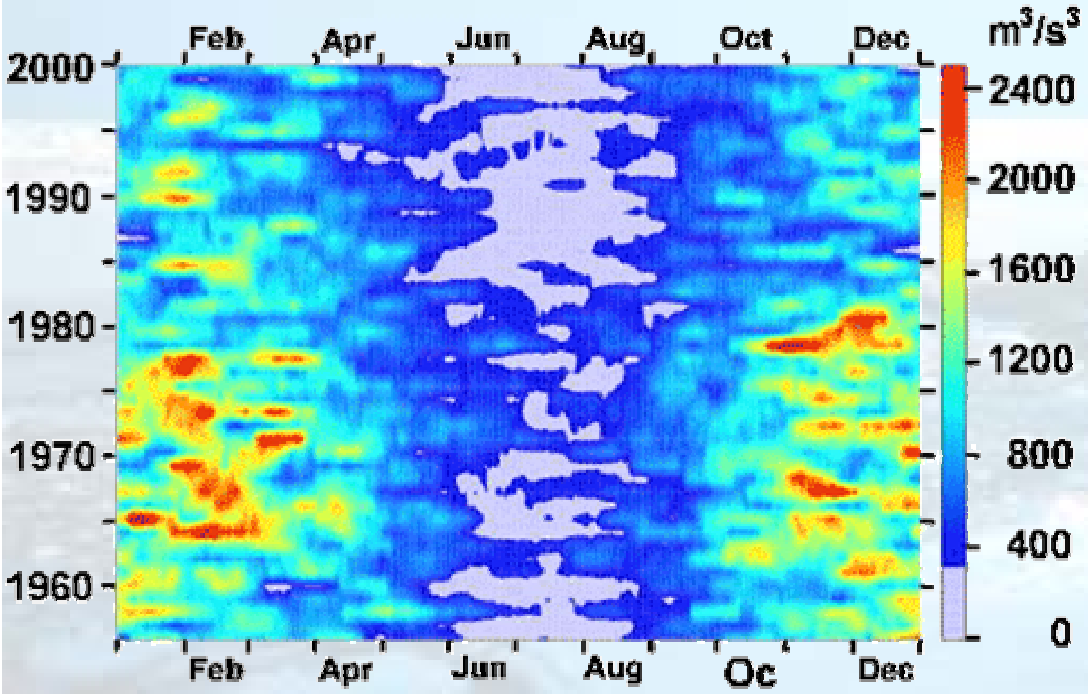
Maximum ice extent

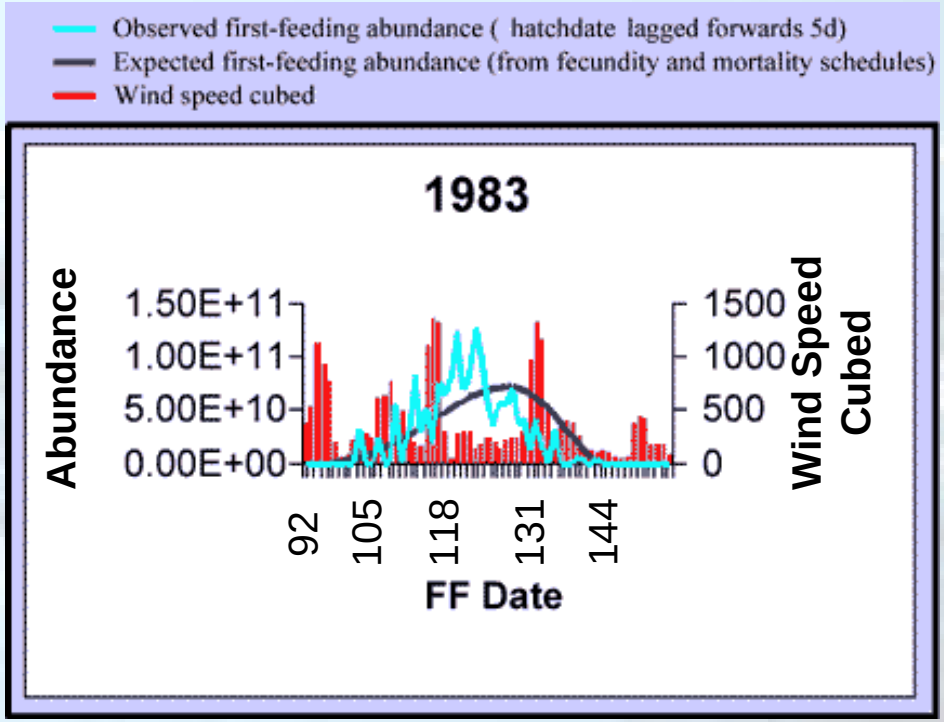
Percent ice coverage in gray box on map above



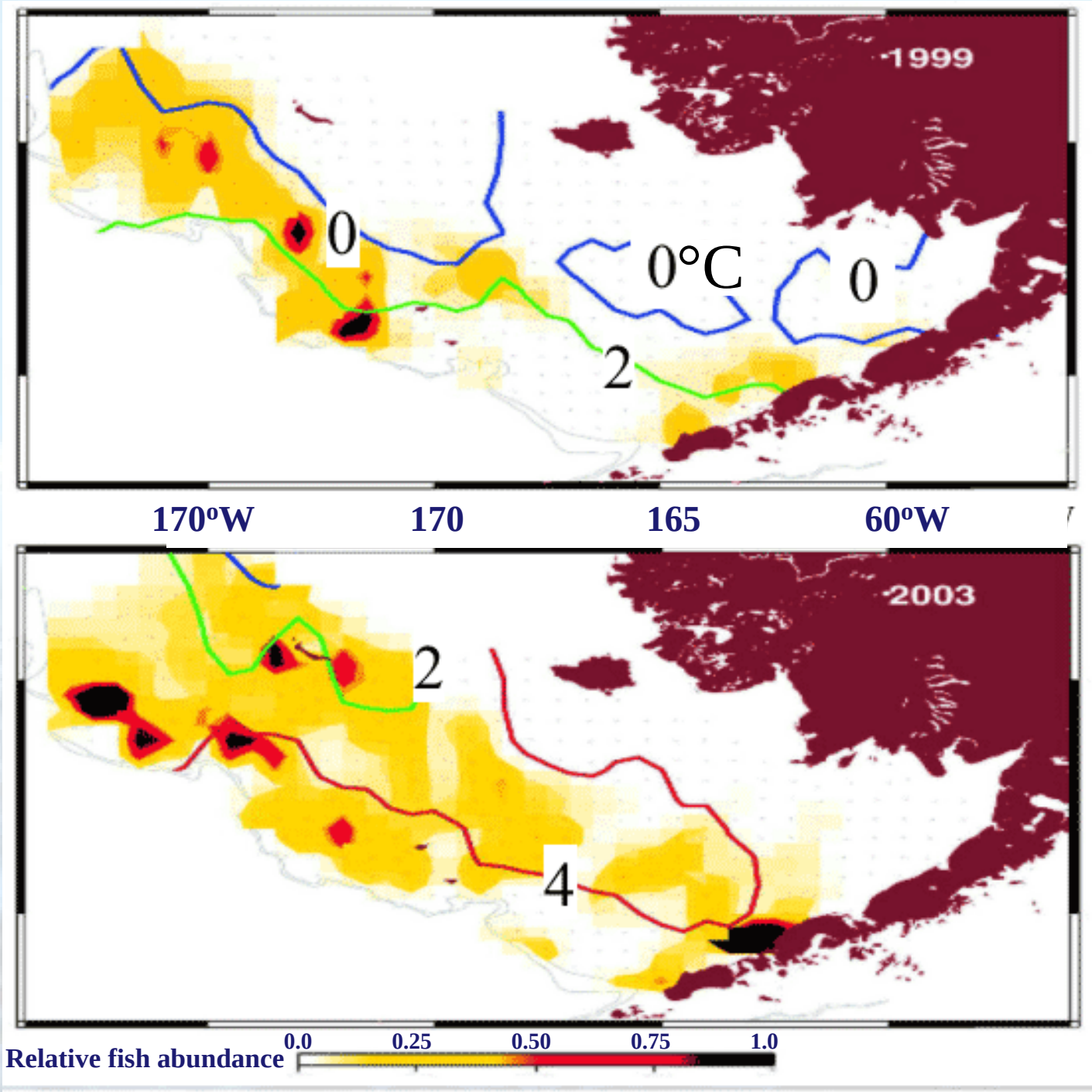
P. Stabeno

Climate Impacts on Local Atmospheric Forcing: Wind Mixing



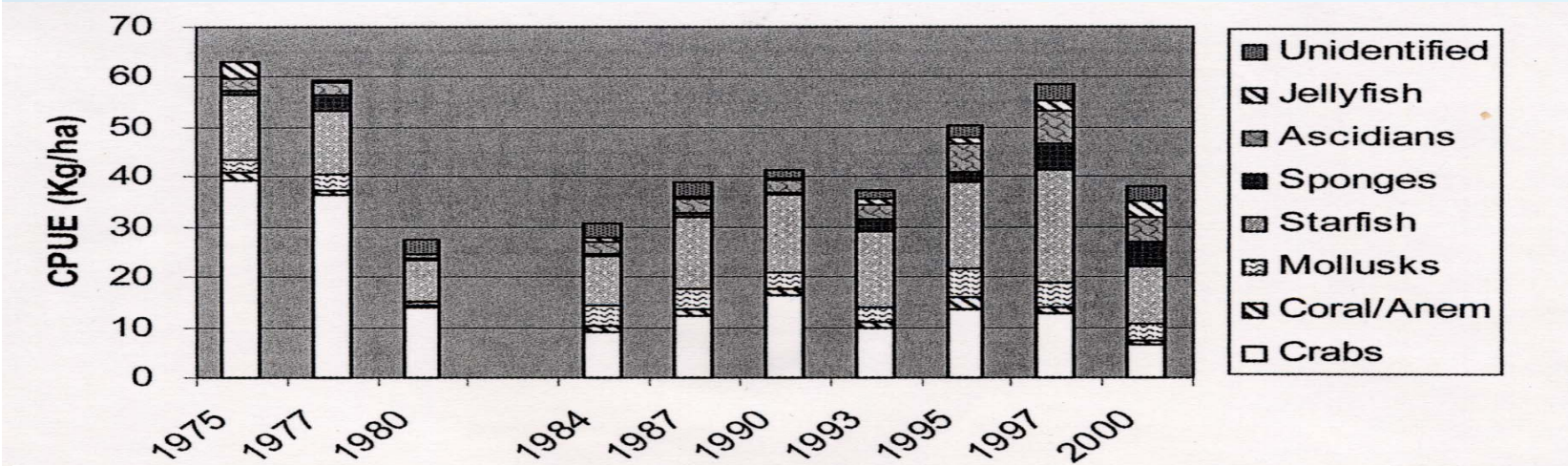


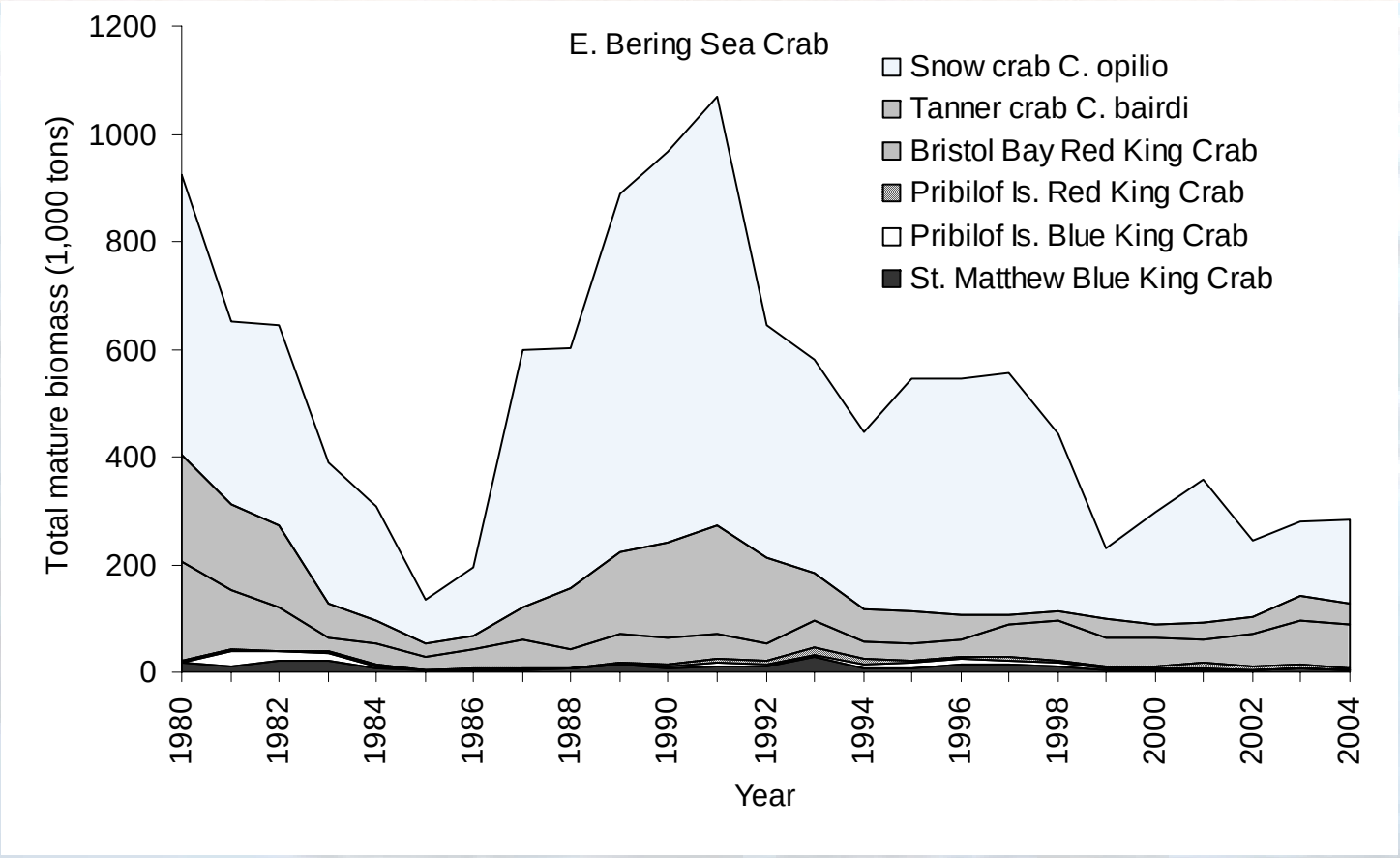
Ocean temperature determines distribution of fish



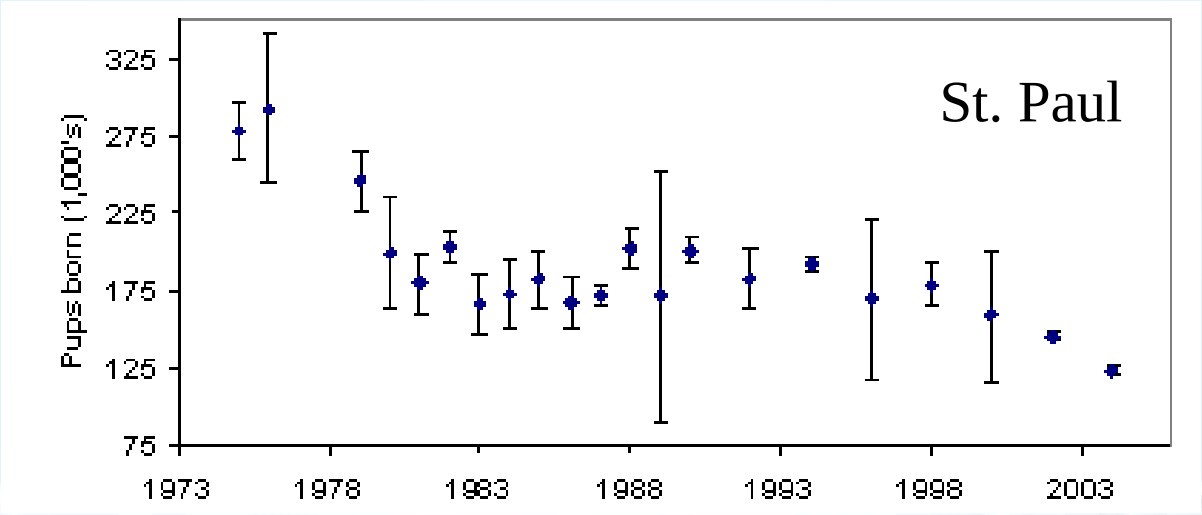
J. Ianelli

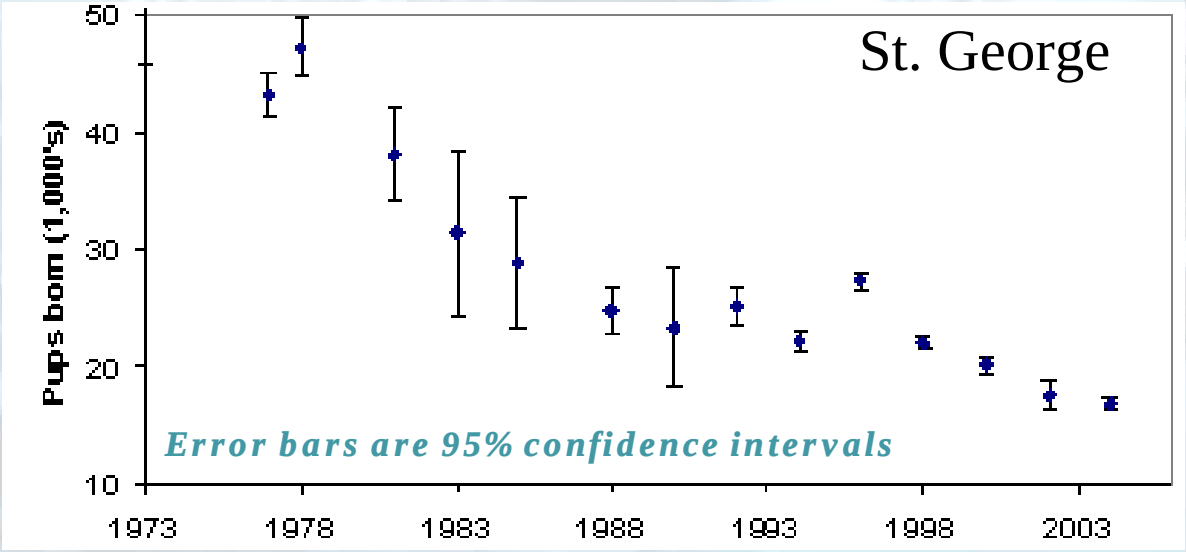
Changes in the Benthic Community





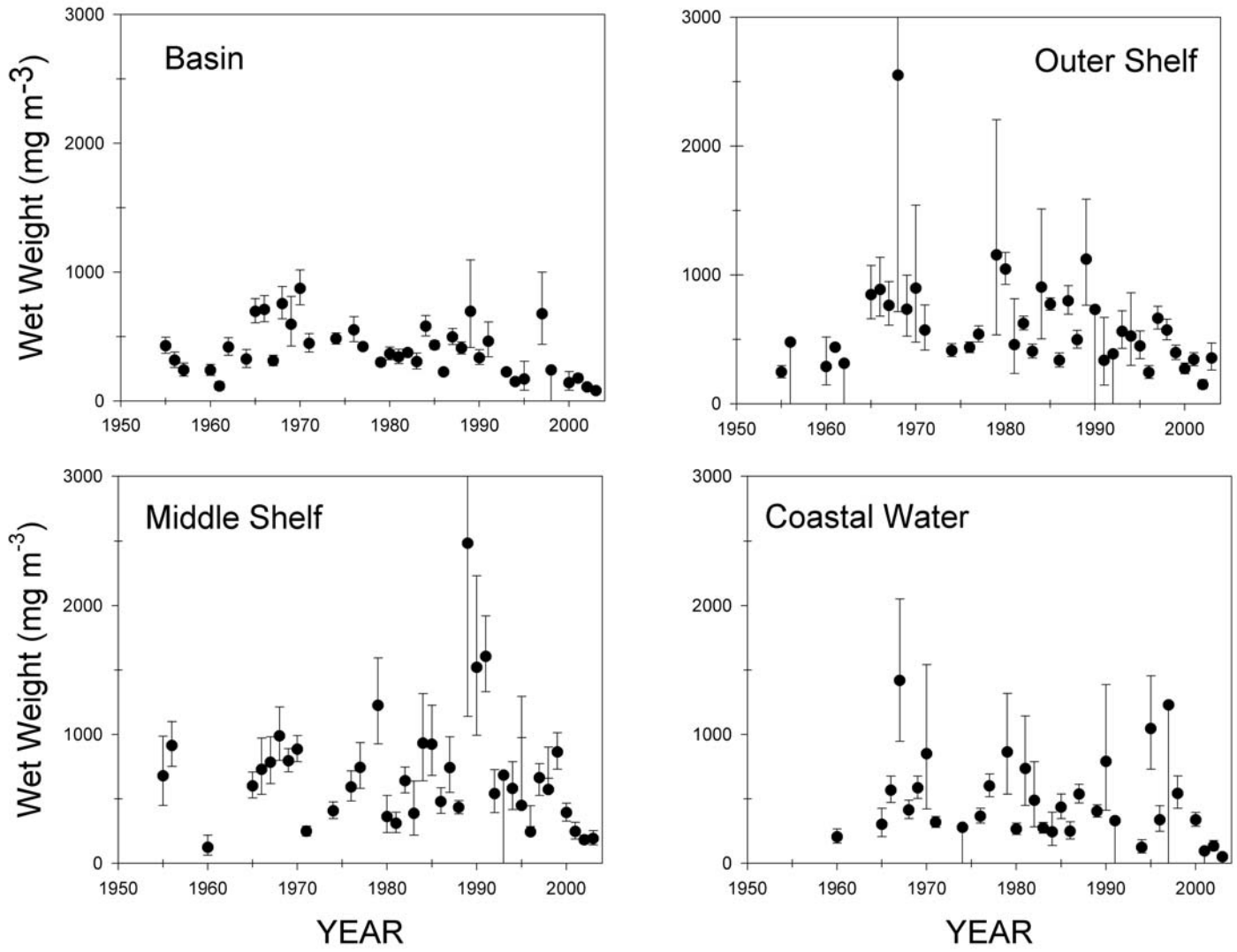
Declines in the Number of Northern Fur Seal Pups





http://nmml.afsc.noaa.gov/alaskaecosystems/nfshome/survey2004pribpups.htm

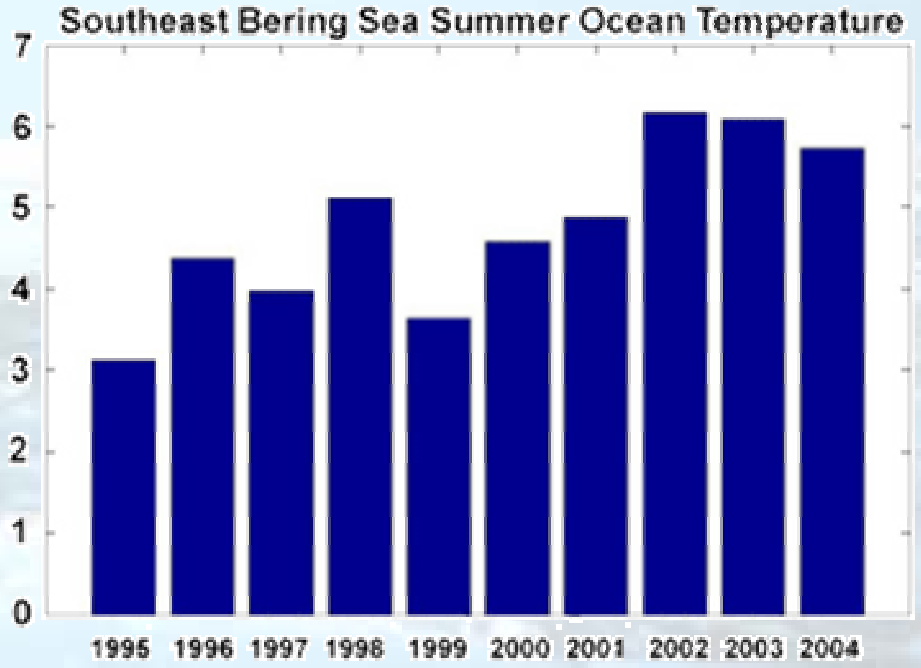
Recent Declines in Summer Zooplankton



Napp & Shiga, unpublished

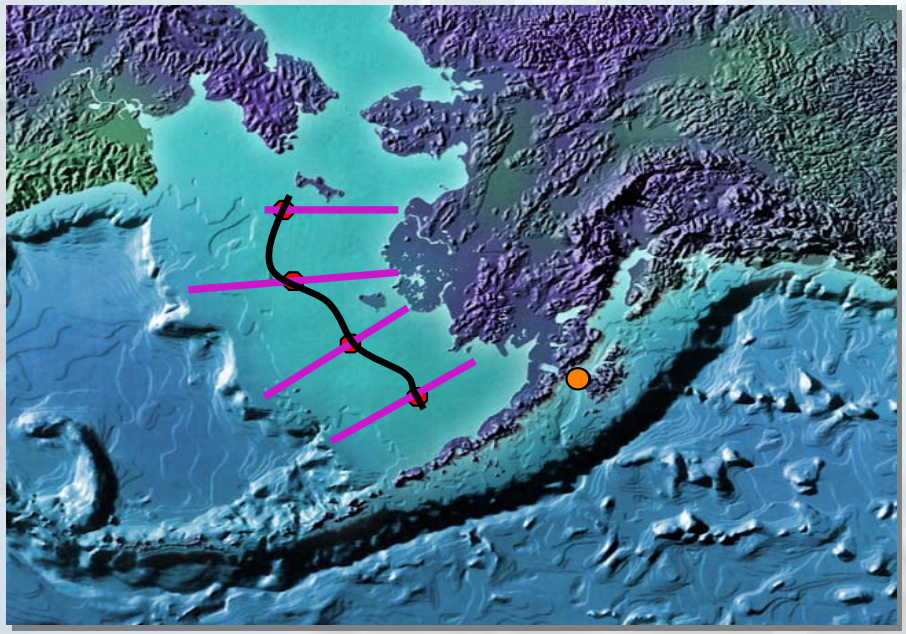
North Pacific Climate Regimes and Ecosystem Productivity

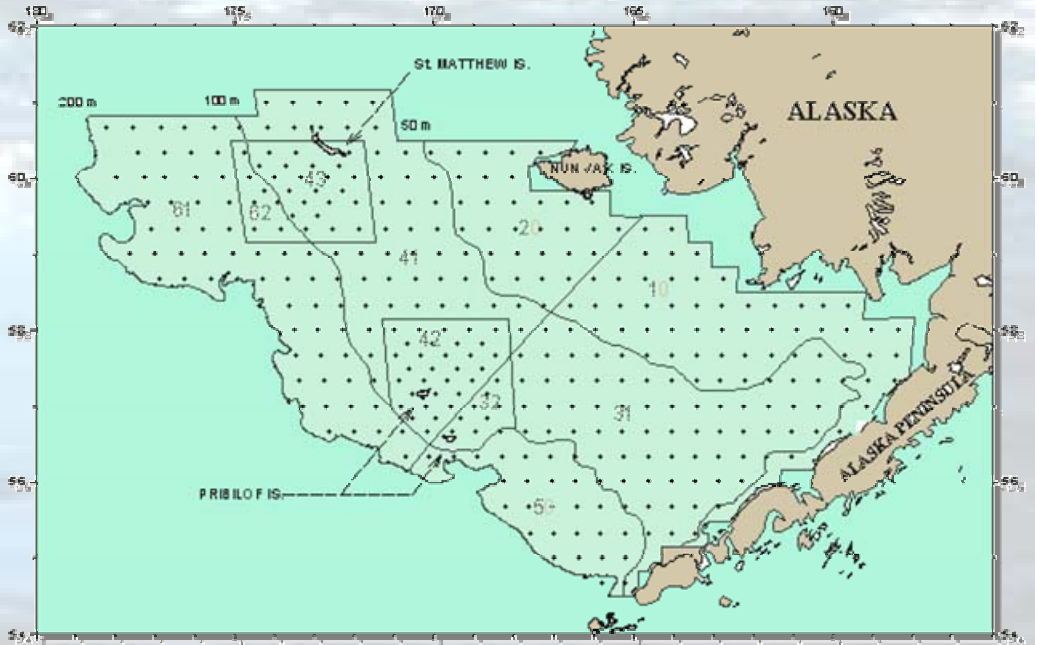
Understanding and forecasting ecosystem response to changing climate of the North Pacific



North Pacific Climate Regimes and Ecosystem Productivity

- Preserve and expand NOAA's biophysical observing system to detect climate impacts.
- Achieve a mechanistic understanding of climate-ecosystem interactions.
- Develop an ecosystem approach to management that includes climate.
- Provide essential information on climate and ecosystems to stakeholders.





- Continue and expand biophysical shelf moorings
- Initiate a spring biophysical survey of the Bering Sea shelf
- Conduct summer plankton survey using NMFS groundfish charter boats
- Study transport of larvae on the shelf
- Explore the role of eddies in cross-shelf flux
- Build conceptual and numerical models for the eastern Bering Sea
- Develop and refine ecosystem indicators
- Incorporate climate into ecosystem and population modeling
- Improve climate-ecosystem advice to the North Pacific Fishery Management Council
- Support the Bering Climate web site *http://www.beringclimate.noaa.gov/.*

LOss of Sea iCe (LOSC)

NOAA Fisheries

noaaresearch

Loss Of Sea iCe (LOSC)

- Redistribution of commercial fishes
- Redirection of larval fish transport
- Reduction of prey resources around rookeries
- Establishment of new biological interactions
- Establishment of new host-parasite relationships

LOss of Sea iCe

- Northern expansion annual groundfish surveys & predator-prey studies
- Northern expansion of biennial hydroacoustic surveys
- Conduct annual assessments of ice-dependent seals & spatially-explicit foraging studies
- Construct spatially-explicit models of fish distributions relative to temperature & ice
- Increase environmental data collection from charter survey vessels and fishing fleet
- Estimate economic impacts of loss of ice to fishing industry & local communities

Climate Change and the Bering Sea Ecosystem: An Integrated, Interagency / Multi-Institutional Approach

Alaska Ocean Observing System (AOOS)

Bering Ecosystem Study (BEST)

NOAA Alaska Fisheries Science Center (AFSC)

NOAA Pacific Marine Environmental Laboratory (PMEL)

North Pacific Research Board (NPRB)

U.S. Arctic Research Commission (USARC)

U.S. Fish and Wildlife Service (FWS)

U.S. Geological Survey (USGS)

University of Alaska Fairbanks (UAF)

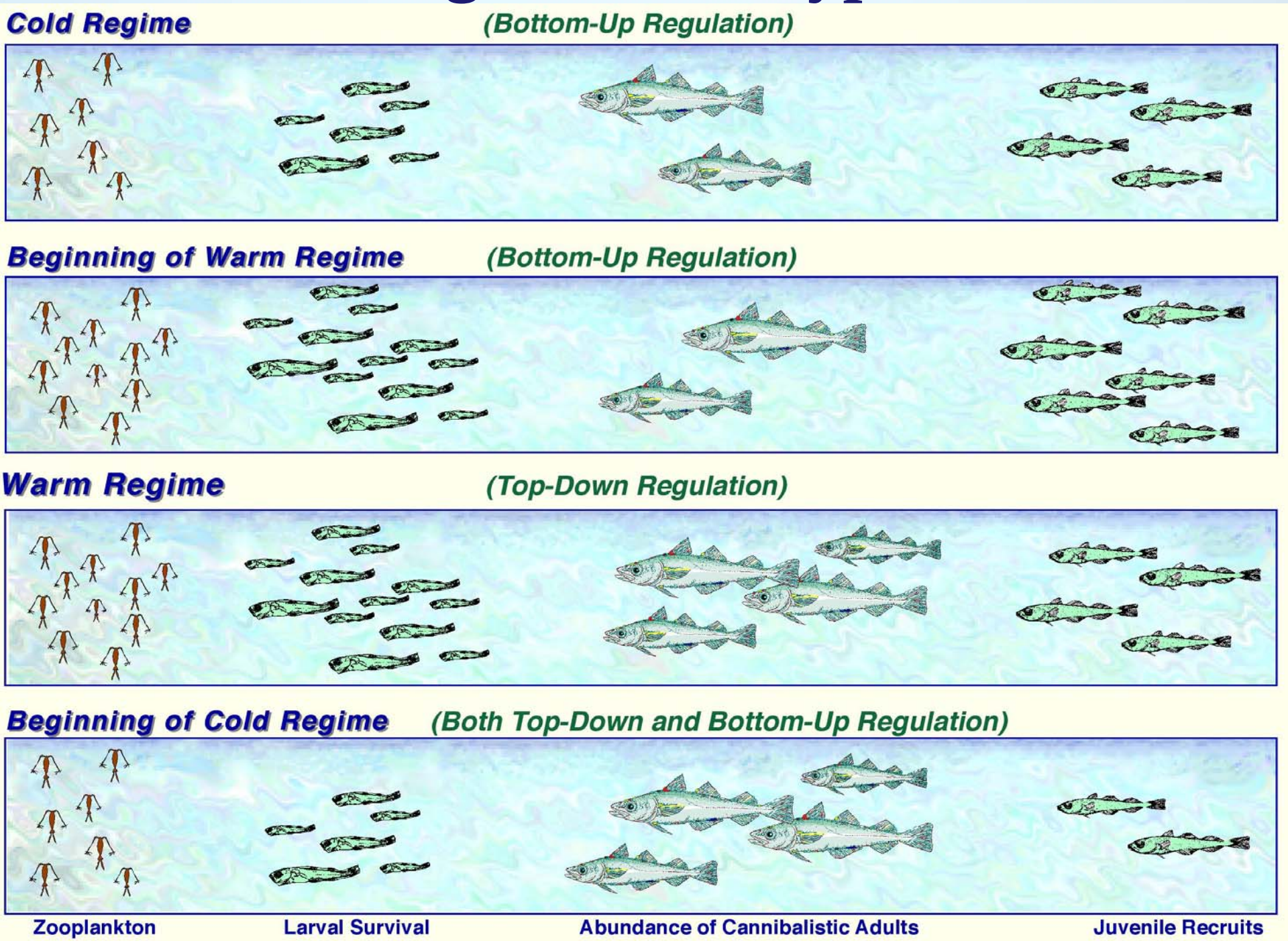
Climate Change and the Bering Sea Ecosystem:

An Integrated, Interagency/Multi-Institutional Approach

A Draft Planning Document

13 May 2005

Oscillating Control Hypothesis



Hunt et al., 2002