Russian-American Long Term Census of the Arctic (RUSALCA)

Overview

T. E. Whitledge
U of Alaska Fairbanks

RUSALCA PI Meeting
Kotor, Montenegro
9-12 October 2010

NOAA's Arctic Vision and Strategy (April 2010)

Priority Goals (Selected)

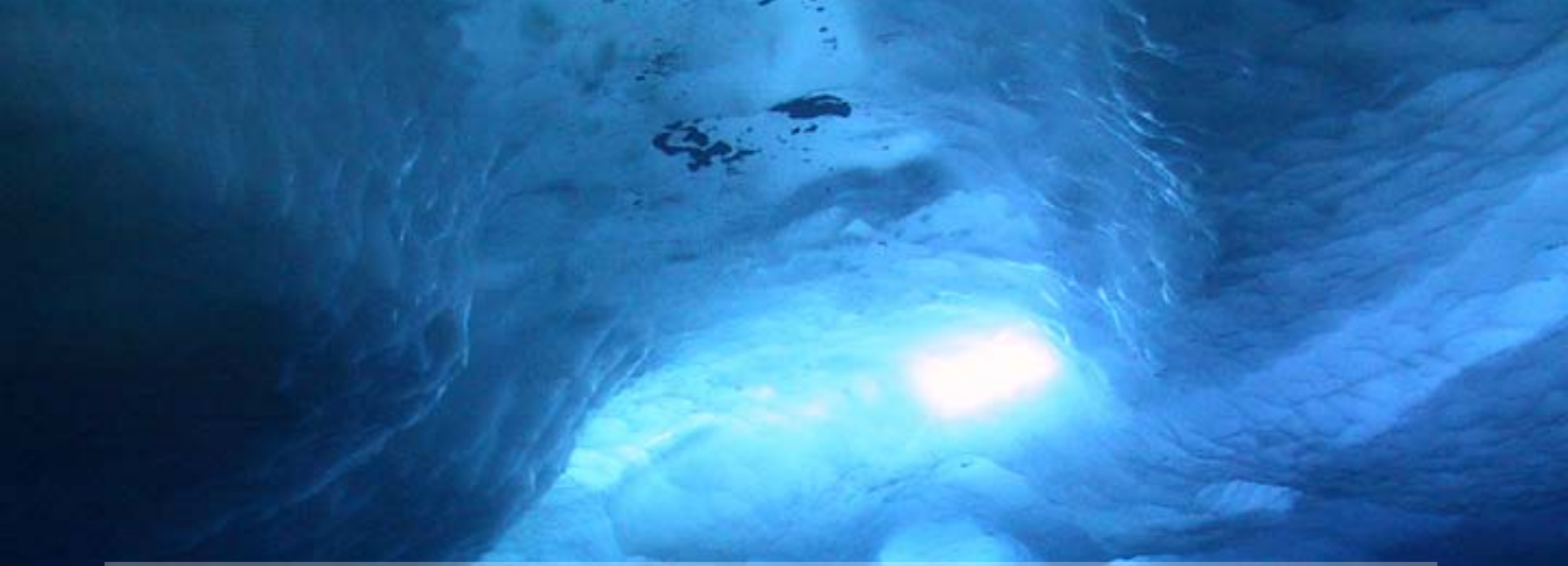
1. Forecast Sea Ice

2. Strengthen Foundational Science to Understand and Detect Arctic Climate and Ecosystem Change

4. Enhance International and National Partnerships

Expand existing programs:

1. BASIS (Bering-Aleutian Salmon International Survey) and RUSALCA
2. NOAA's Ocean Acidification program



RUSALCA GOALS:

1. Take Observations Where Arctic Sea Ice Reduction is a Maximum
2. Monitor Fresh Water and Nutrient Fluxes and Transport Pathways Through the Pacific Gateway.
3. Monitor Ecosystem Indicators of Climate Change.
4. Improve Russian-U.S. Arctic Climate Science Relations
5. Explore the Unknown Arctic

General Goal

Understand and ultimately predict the effects of climate change in the northern Bering and Chukchi Seas that are related to changes in physical processes, change of rates of critical biogeochemical processes and alteration of biomass and/or productivity of organisms and their associated marine food webs.

Objectives

- Biophysical moorings in western Bering Strait
- High speed CTD transects across Herald shelf valley
- Enhance the knowledge of faunal distributions for the census of marine life
- Assess potential productivity changes accompanying global climate change in the subarctic/Arctic

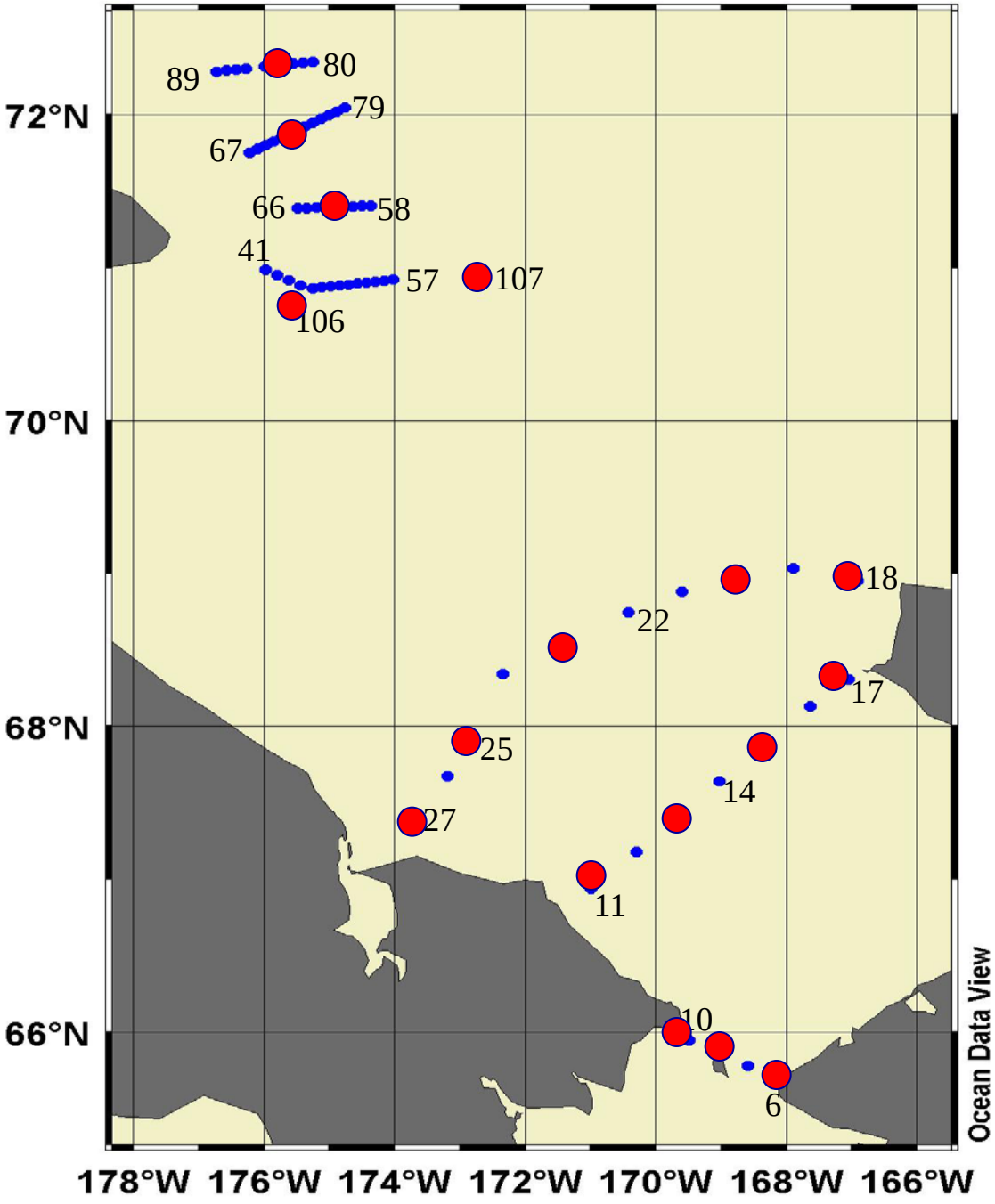
Shipboard Projects

Benthic Infauna
Benthic Epifauna
Census of Arctic Zooplankton
Biodiversity of Adult Fish
Biodiversity and Ecology of Juvenile Fish
Nutrient and Primary Productivity Studies
CTD and Video Plankton Recorder
Physical Oceanography-Bering Strait, Regional
Microbial reactions and fluxes
Subbottom sonar and ROV video
Paleoceanography
Atmospheric Contaminants
Inorganic/Organic Carbon Cycles

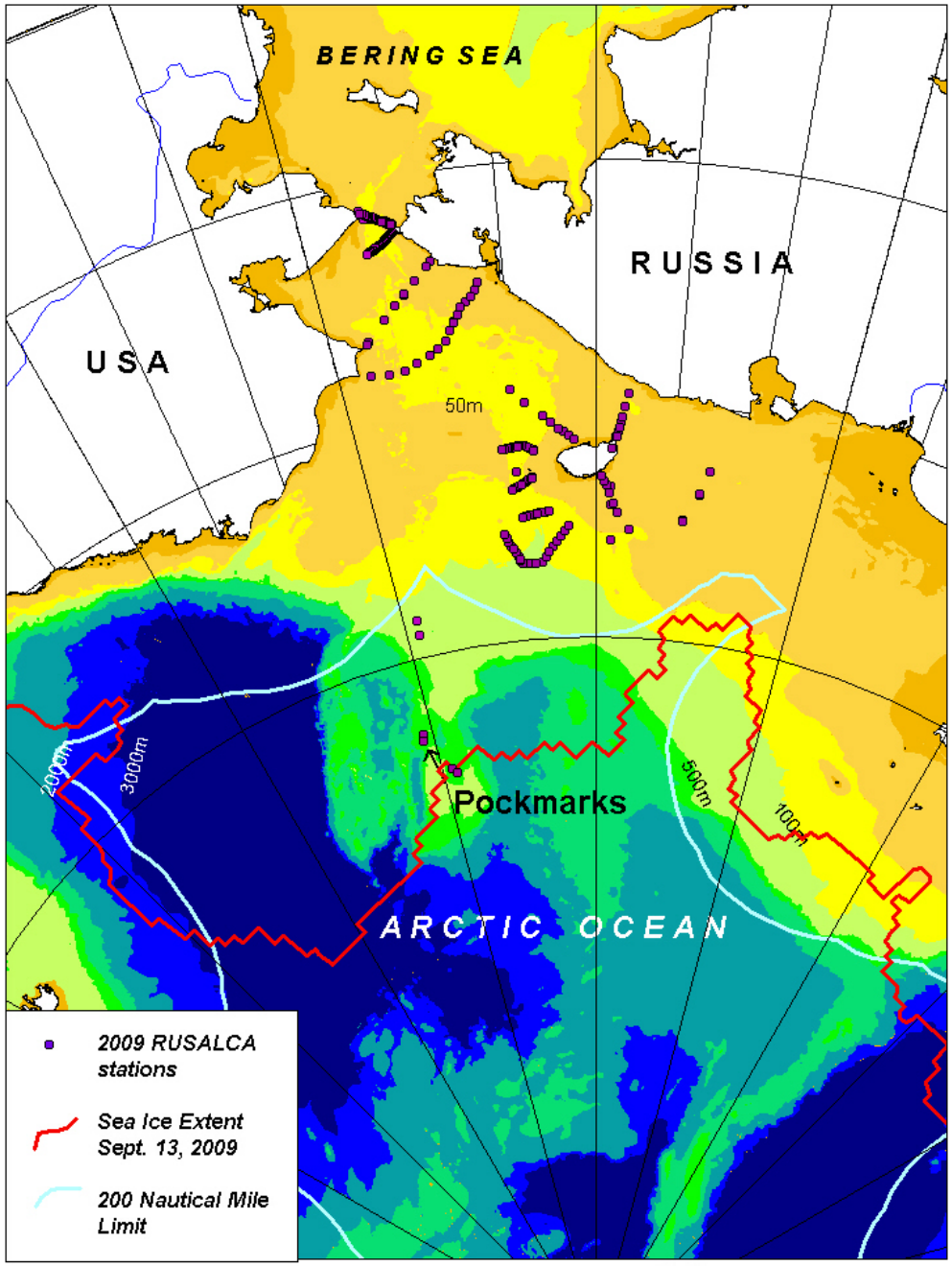
RUSALCA 04

CTD Stations

CTD plus Biological Stations



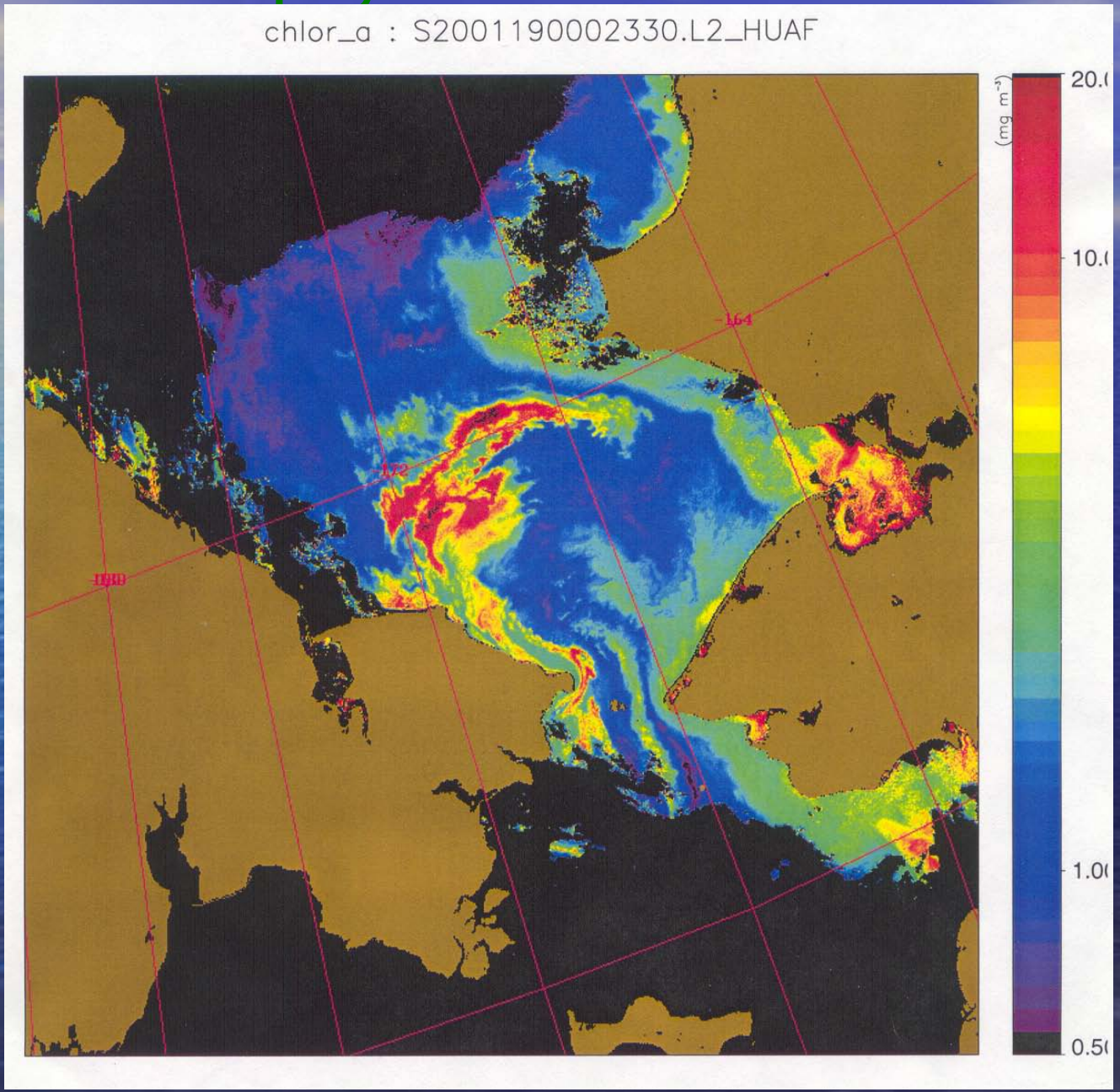
RUSALCA 2009 Sampling Stations

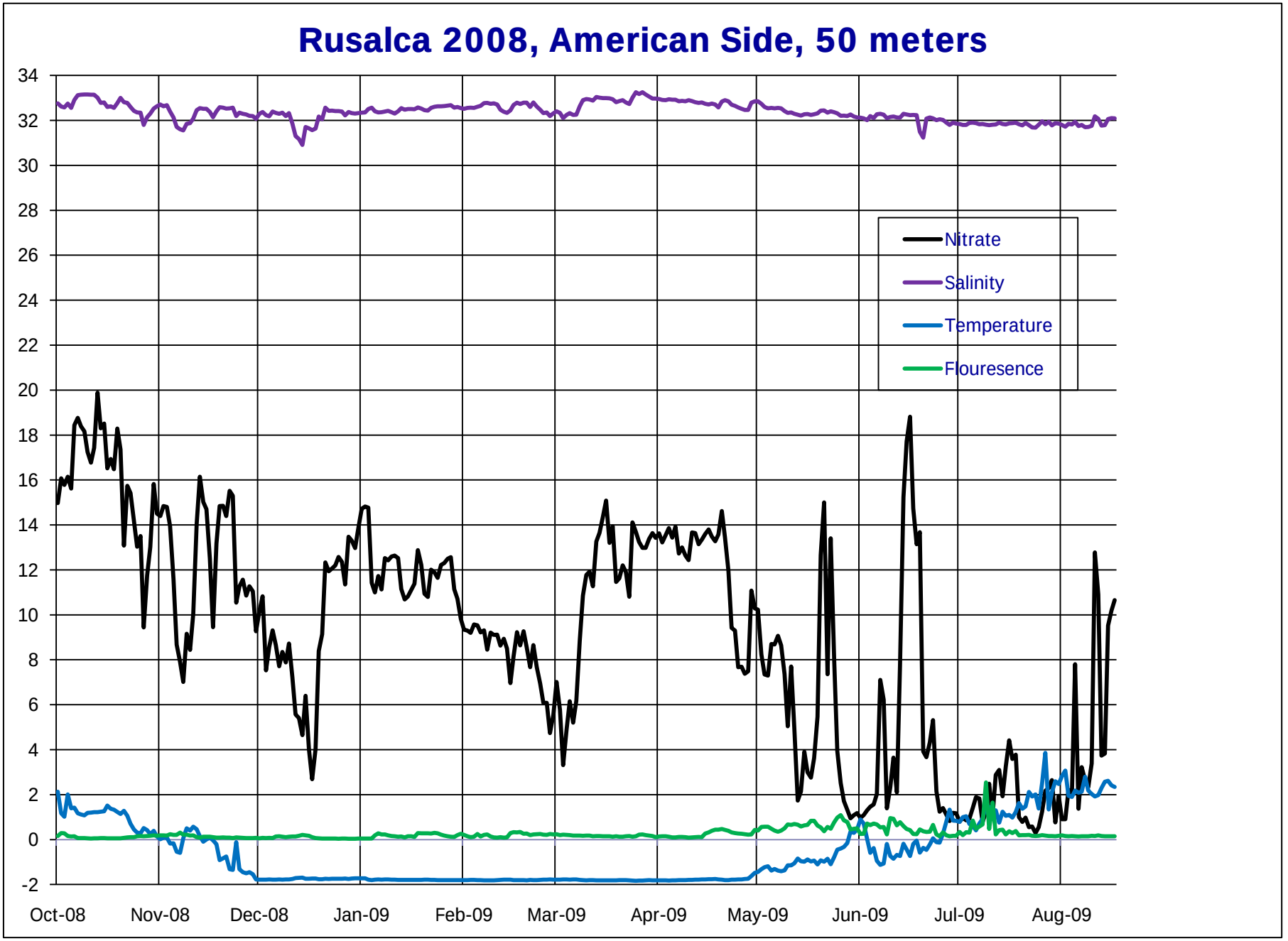


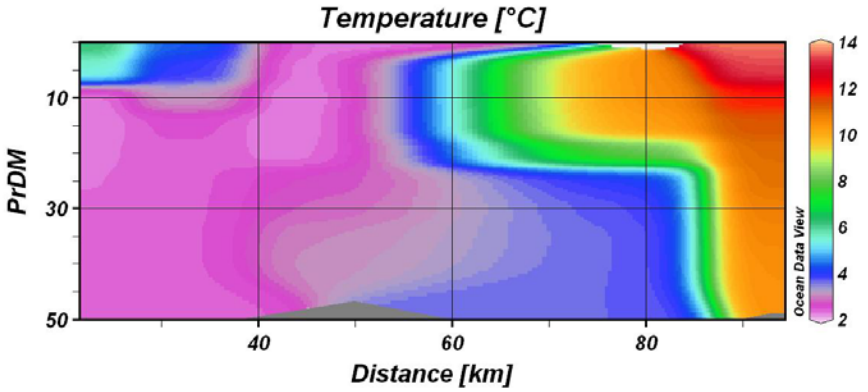
RUSALCA 2009 stations, bathymetry in meters

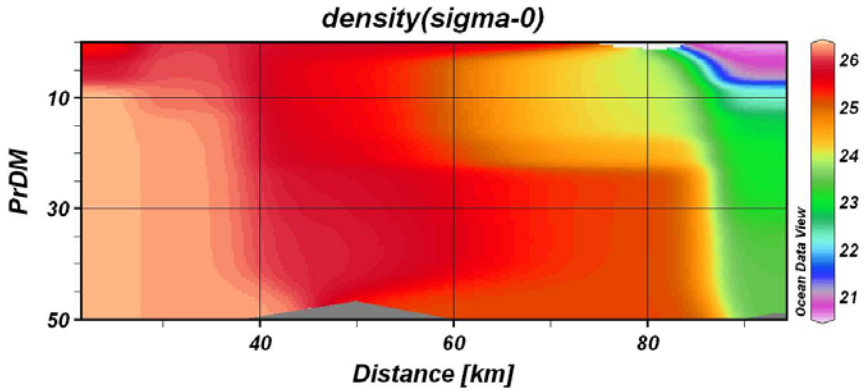
K. Crane NOAA

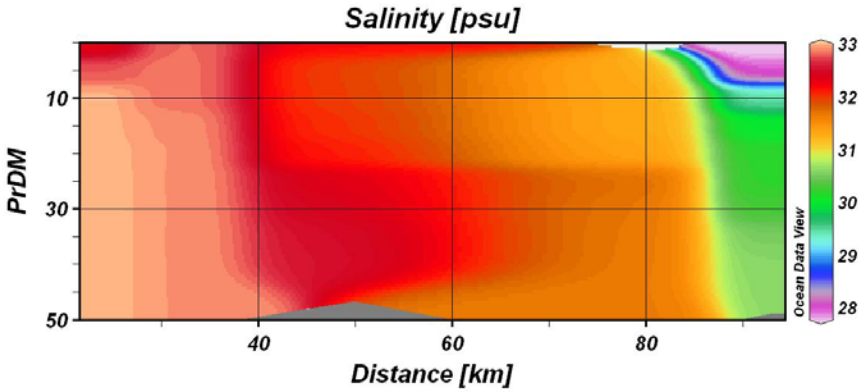
Chlorophyll in Chukchi Sea

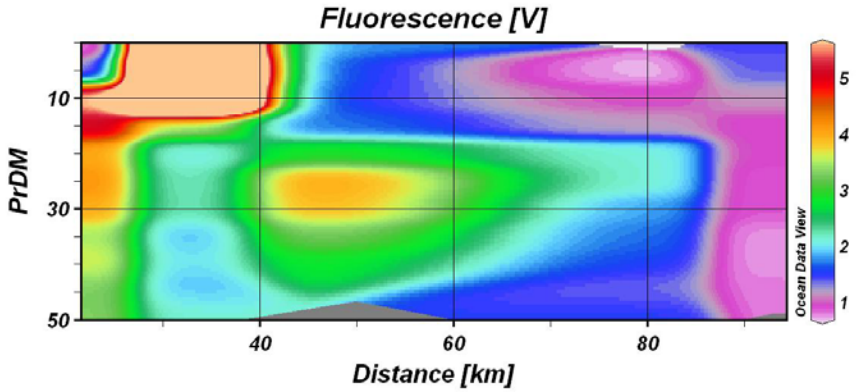


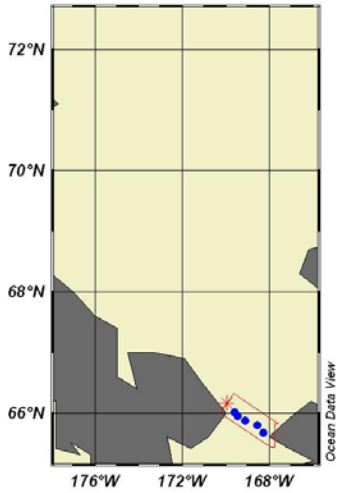

Rusalca 2008, American Side, 50 meters
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Nitrate
Salinity
Temperature
Flouresence

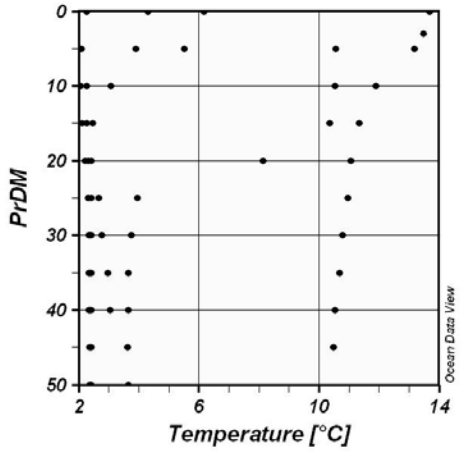

Temperature [°C]
PrDM
10
30
50
40
60
80
Distance [km]
14
12
10
8
6
4
2
Ocean Data View

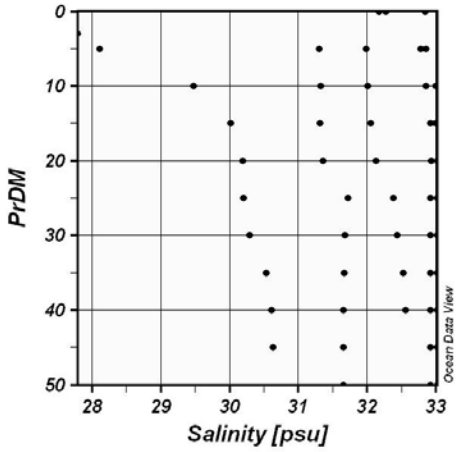

density(sigma-0)
PrDM
10
30
50
40
60
80
Distance [km]
26
25
24
23
22
21
Ocean Data View

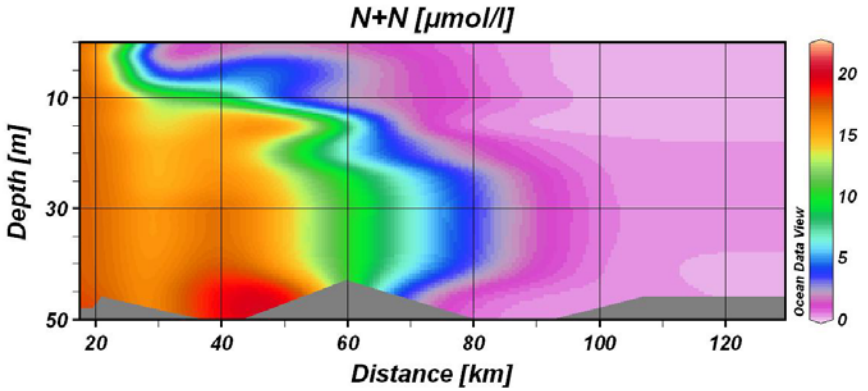

Salinity [psu]
PrDM
10
30
50
40
60
80
Distance [km]
33
32
31
30
29
28
Ocean Data View

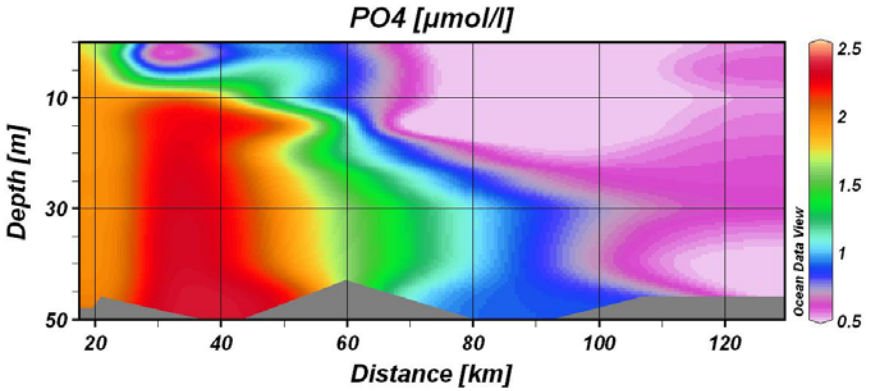

Fluorescence [V]
PrDM
10
30
50
40
60
80
Distance [km]
5
4
3
2
1
Ocean Data View

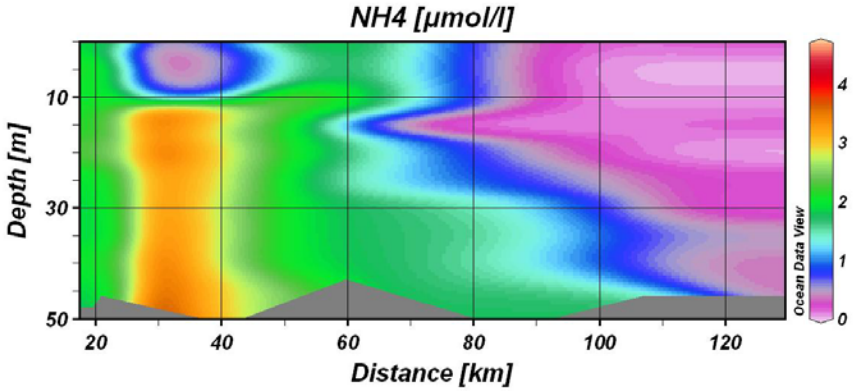

72°N
70°N
68°N
66°N
176°W
172°W
168°W
Ocean Data View

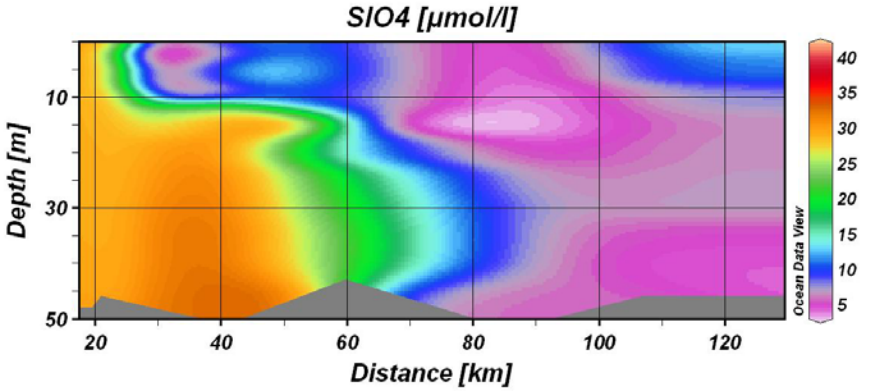

PrDM
0
10
20
30
40
50
2
6
10
14
Temperature [°C]
Ocean Data View

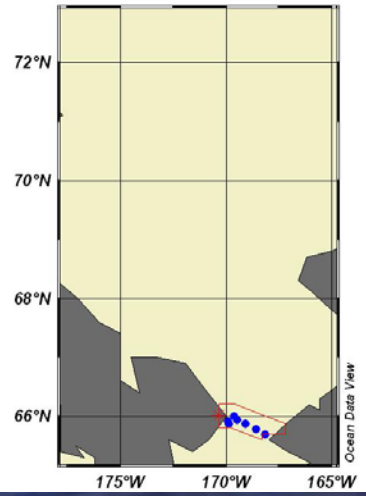

PrDM
0
10
20
30
40
50
28
29
30
31
32
33
Salinity [psu]
Ocean Data View

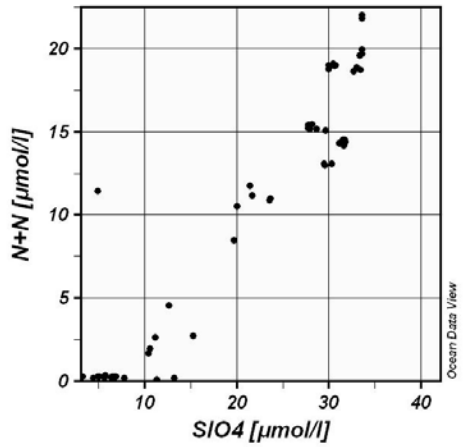

N+N [µmol/l]
Depth [m]
Distance [km]
Ocean Data View

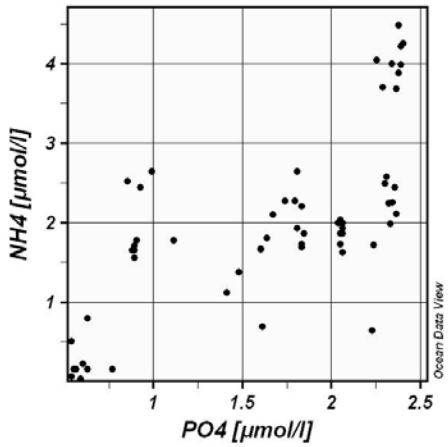

PO4 [µmol/l]
Depth [m]
Distance [km]
Ocean Data View


NH4 [µmol/l]
Depth [m]
Distance [km]
Ocean Data View


SIO4 [µmol/l]
Depth [m]
Distance [km]
Ocean Data View


72°N
70°N
68°N
66°N
175°W
170°W
165°W
Ocean Data View


N+N [µmol/l]
SIO4 [µmol/l]
Ocean Data View


NH4 [µmol/l]
PO4 [µmol/l]
Ocean Data View


Thank you
Sunrise over Big Diomede, Russia