20th anniversary of the PINRO-IMR cooperation in the investigations of fish feeding in the Barents Sea – results and perspectives

Andrey V. Dolgov, Natalia A. Yaragina, Emma L. Orlova (PINRO)

Bjarte Bogstad, Edda Johannesen and Sigbjørn Mehl (IMR)

The joint Russian-Norwegian project started in 1987

- PINRO
- Alexander Glukhov
- Natalia Yaragina

- IMR
- Sigurd Tjelmeland
- Sigbjørn Mehl

Main objectives of the project

- Organize the sampling and quantitative analysis of demersal fish stomachs (mainly cod)
- To calculate the food consumption (including the commercially important prey species) by cod
- To create the basis for the development of multispecies models of the Barents Sea

Methods

Sampling:

☐ Sampling of stomachs on Russian and Norwegian scientific cruises and Russian commercial vessels

☐ Number of stomachs sampled per station and number of stations sampled has changed over the time period

Sampling coverage by quarter
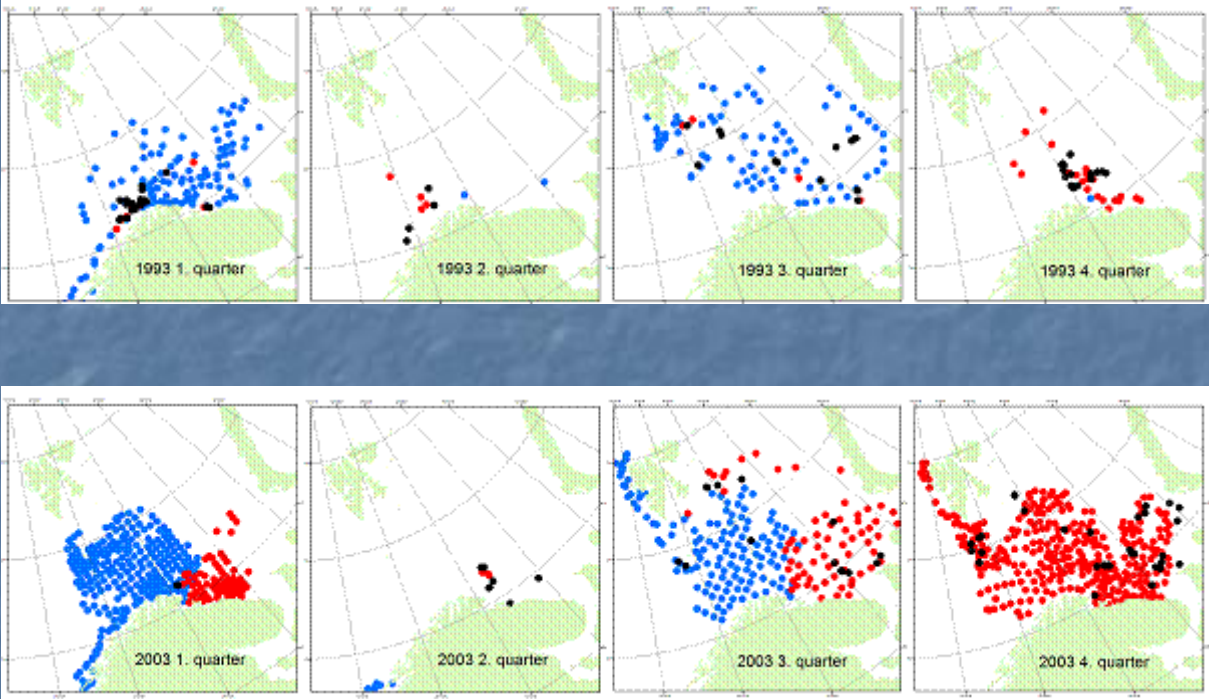
Methods
Stomach content Analysis

- Until 1995 – standard quantitative analysis
- Since 1995 – additionally SVKAP (PINRO)
- IMR- analysis onboard for some years in 1990s

Methods
Data base (software)

- MAGE - main software until 2003
- Since 1993 – STUVW (IMR)
- Since 2003 – BIOFOX (PINRO)
- MAGE still used for joint data base and diet calculations
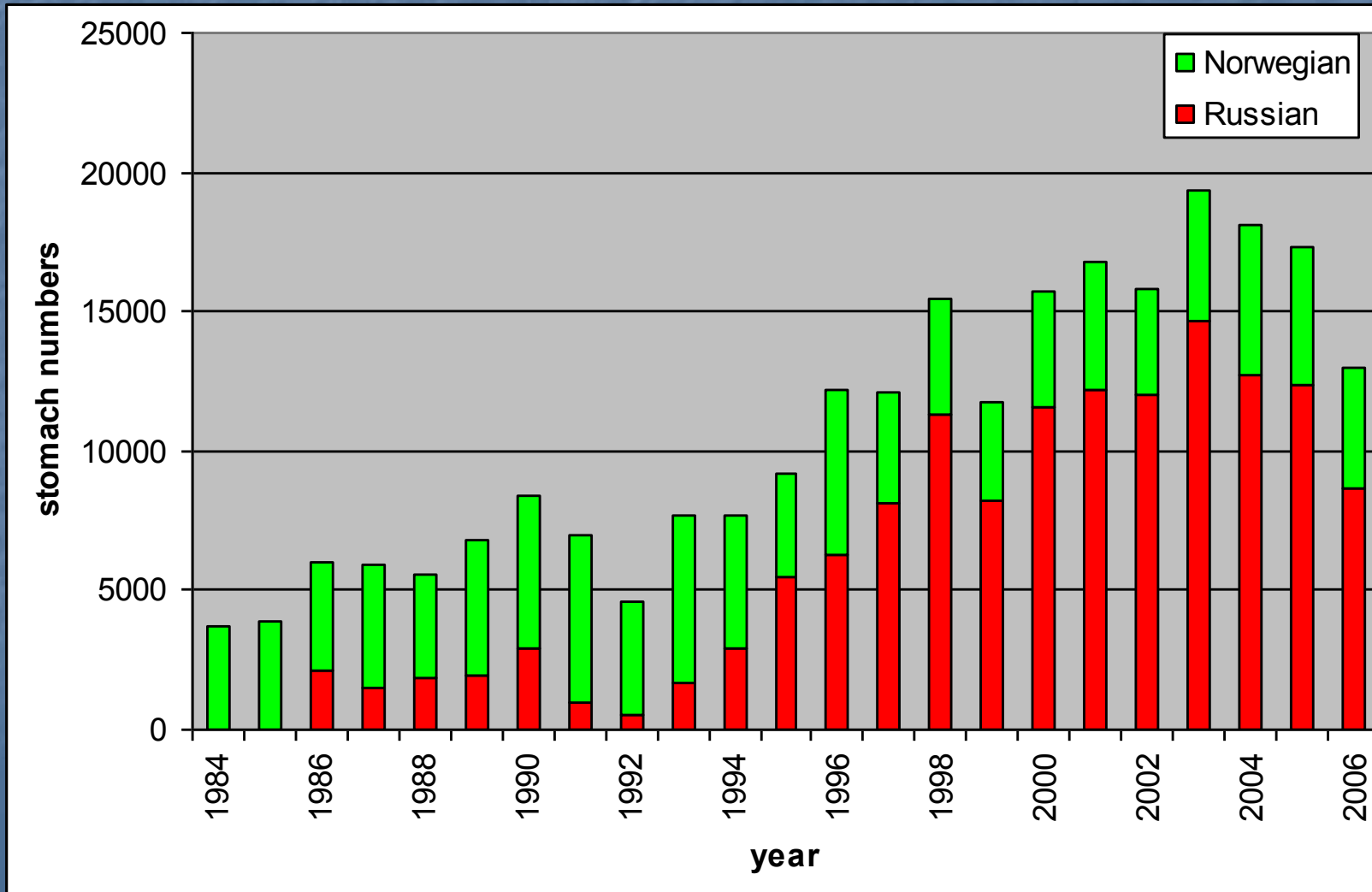
Important milestones

- 1987- first calculation of total prey consumption by cod
- 1990- stomach data used in joint capelin assessment
- 1991- 5th joint symposium: Interrrelationships between fish populations in the Barents Sea (Murmansk, Russia)
- 1995- stomach data used in cod and haddock assessment (ICES Arctic Fisheries Working Group)
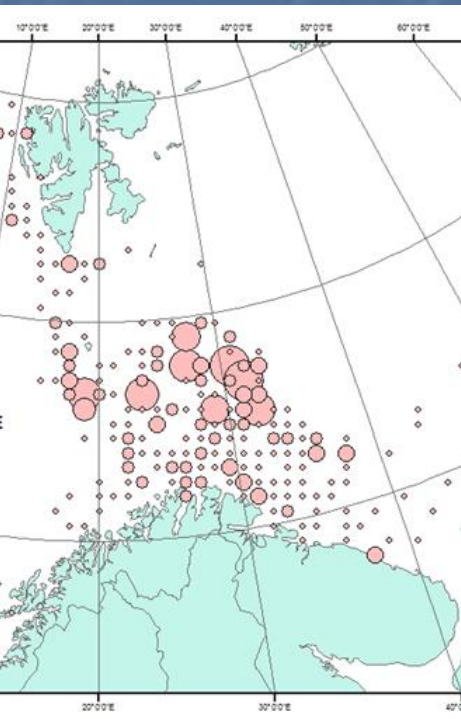- 2003- calculation of food consumption by other predators (PINRO)

Stomachs

- Joint data:
  - mostly cod
  - Prior to 1995 also haddock
  - Last two-three years: also exchange of capelin and 0-group (cod and haddock) stomach data
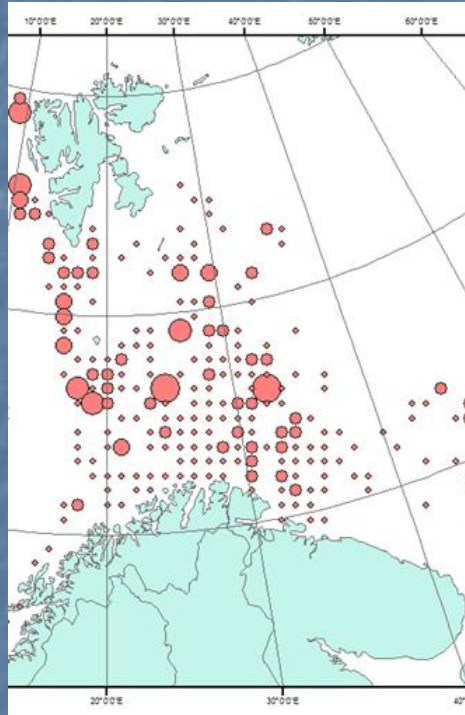
All stomachs
totally – 16 main species - >380 thousands

Cod stomachs
(totally appr. 244 thousands)

Consumption by cod 1984-2006

Consumption by NEA cod (1000 tonnes)

Legend:
- Blue whiting
- Redfish
- Haddock
- Cod
- Polar cod
- Herring
- Capelin
- Shrimp
- Krill
- Amphipods
- Other

Frequency of occurence of redfish in cod stomachs
1984-2005

1984-1988

1989-1993

1994-1998

1999-2005
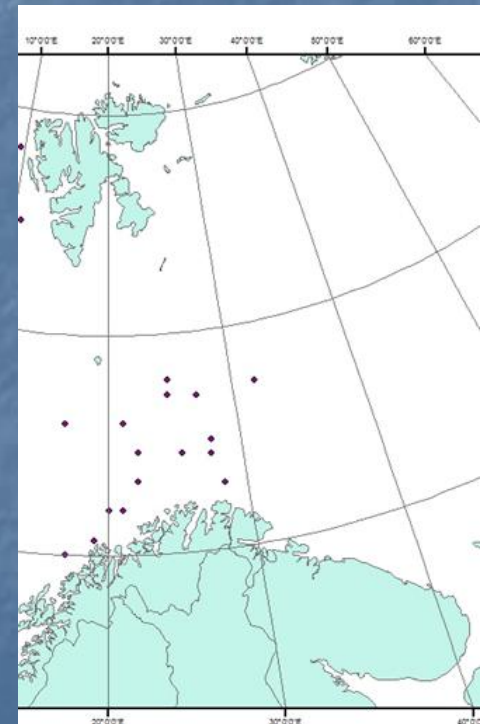
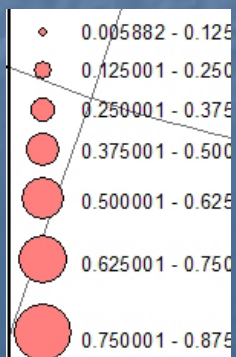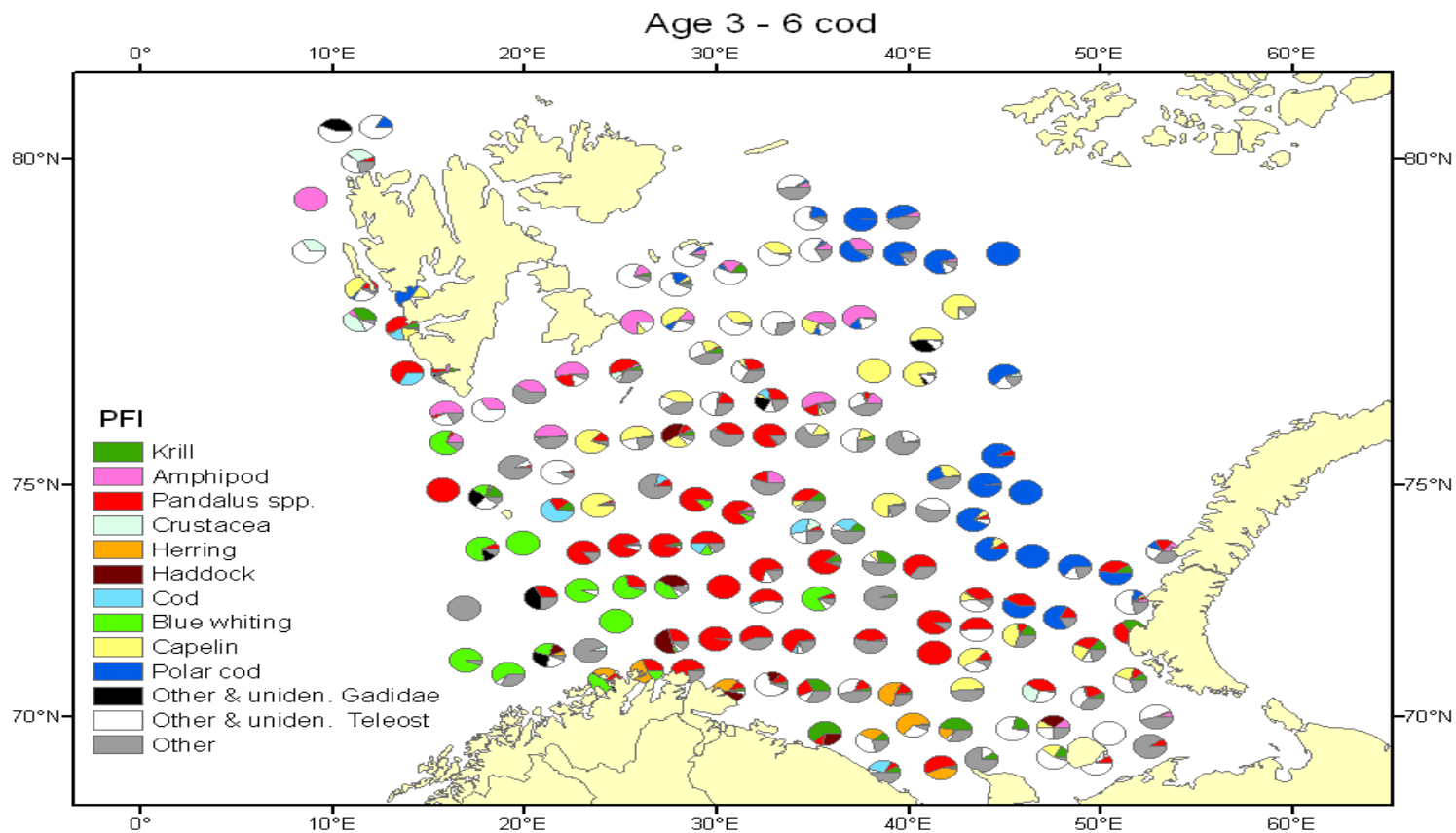|	
◇	0.005882 - 0.125
○	0.125001 - 0.250
●	0.250001 - 0.375
●	0.375001 - 0.500
●	0.500001 - 0.625
●	0.625001 - 0.750
●	0.750001 - 0.875

Diet composition age 3-6 cod autumn 2005

Results – models

- Russian:
- MS VPA
- Bormicon
- Concod
- Straficod
- Stockobar

- Norwegian:
- MULTSPEC
- SeaStar
- Systmod
- Bifrost
- Gadget

Results –papers

- Papers on diet, feeding and biology
- Russia – 33 (1996-2000)
- Norway - 38

- Papers on models
- Russia – 17 (1996-2000)
- Norway - 22

Perspectives

- New species (pelagic and demersal)
- More detailed spatial-temporal coverage of the stomach sampling
- Food consumption by other fish species