

Two commercial and invasive species of crabs

in the Barents Sea

Red king crab



Scientific classification

Kingdom:	Animalia
Phylum:	Arthropoda
Subphylum:	Crustacea
Class:	Malacostraca
Order:	Decapoda
Infraorder:	Anomura
Family:	Lithodidae
Genus:	<i>Paralithodes</i>
Species:	<i>P. camtschaticus</i>

Binomial name

Paralithodes camtschaticus

(Tilesius, 1815) ^[1]

Snow crab



Scientific classification

Kingdom:	Animalia
Phylum:	Arthropoda
Subphylum:	Crustacea
Class:	Malacostraca
Order:	Decapoda
Infraorder:	Brachyura
Family:	Oregoniidae
Genus:	<i>Chionoecetes</i>
Species:	<i>C. opilio</i>

Binomial name

Chionoecetes opilio

(O. Fabricius, 1788)

KEY FACTORS FOR CONSIDERATION ABOUT THE POPULATION OF THE SNOW CRAB AND DISTRIBUTION OF THE STOCK IN THE BARENTS SEA

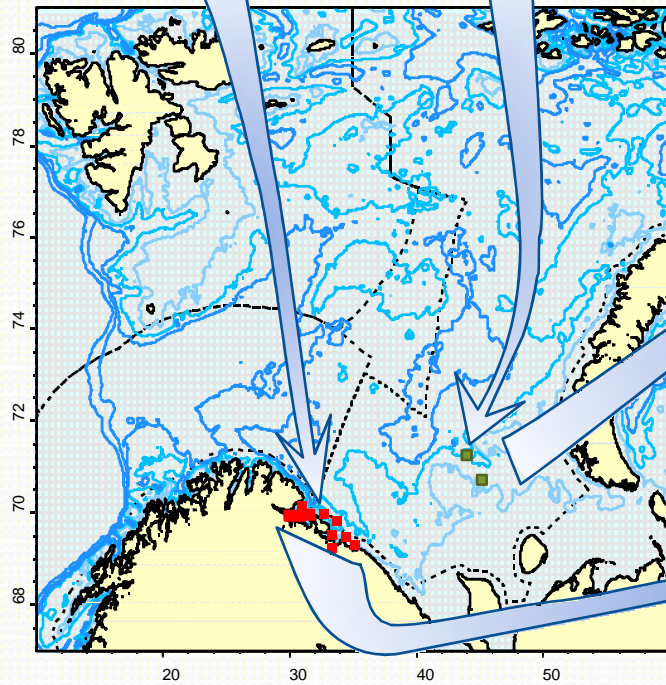
- “Snow crab (*Chionoecetes opilio*) – is a new invasive crab species becoming an important player in the Barents Sea ecosystem,
- It is cryptic how it entered the Barents Sea.
- The snow crab, today a self-producing population in the Barents Sea, is expected to increase to over 291 million specimens.
- Estimated carrying capacity of the Barents Sea is 436 million legal males.
- The majority of crabs have been recorded in waters below 2°C and small-sized crabs are exclusively found at the Goosebank, indicate a recruiting area.
- Warming can push the snow crab further north and are likely to establish in Svalbard and Franz Josef Land. “

Occurrence of commercial crabs in the Barents Sea

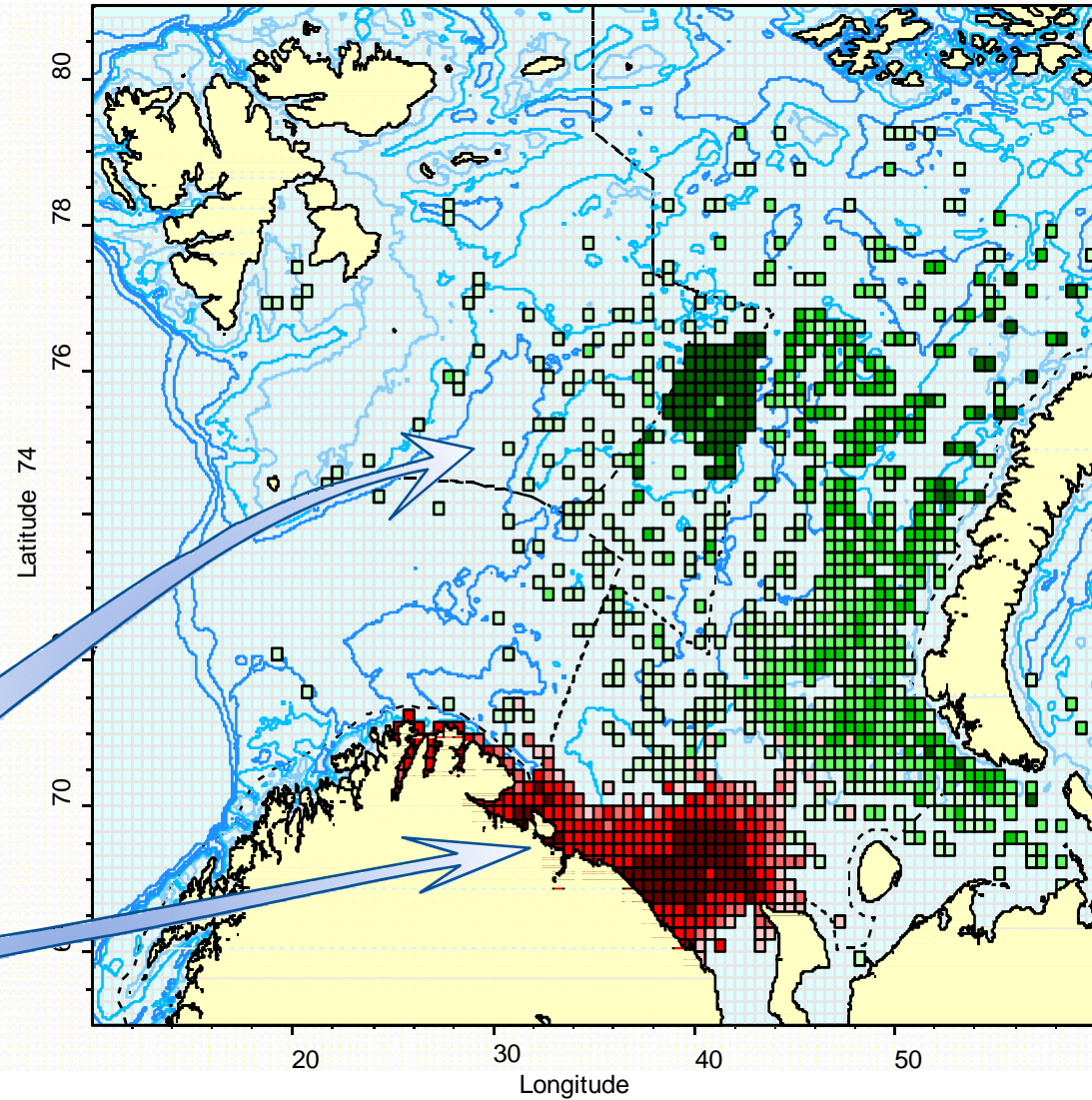
No crabs before 1965

Red king crab was introduced deliberately from the Pacific Region in the 1960s.

The origin of snow crab are still unclear and may be associated either with an incidental transport of larvae in the ballast water or with the natural migration.



Data 1992 - 1996



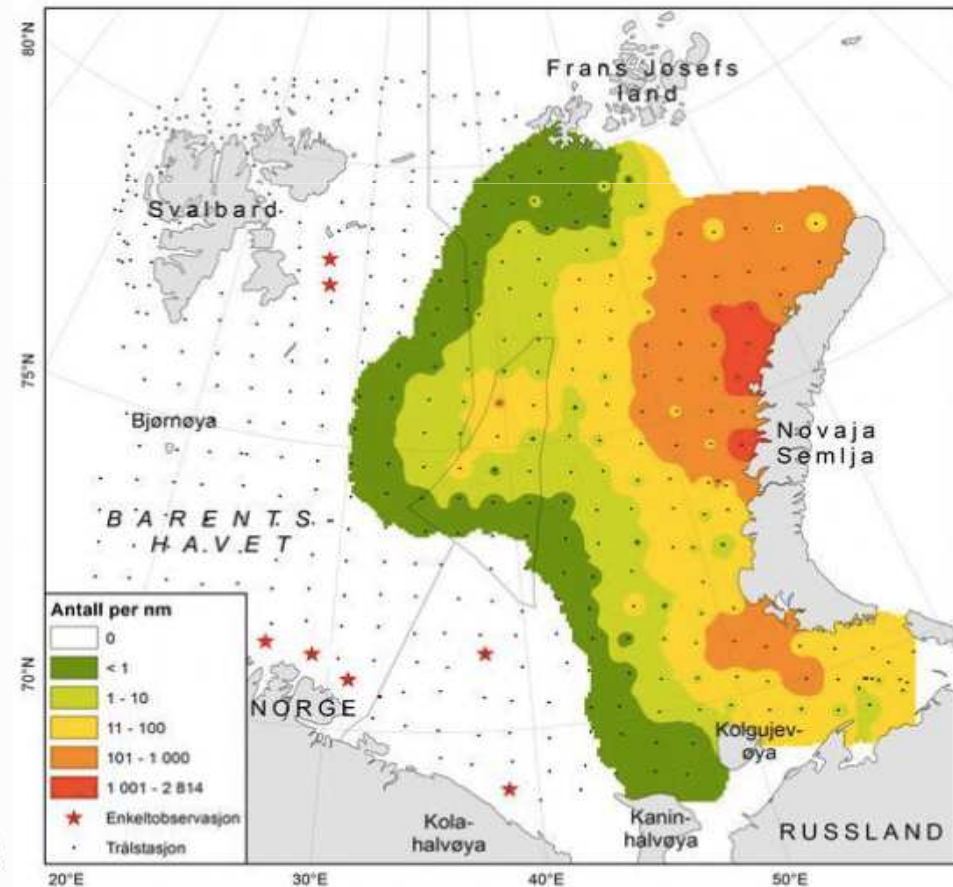
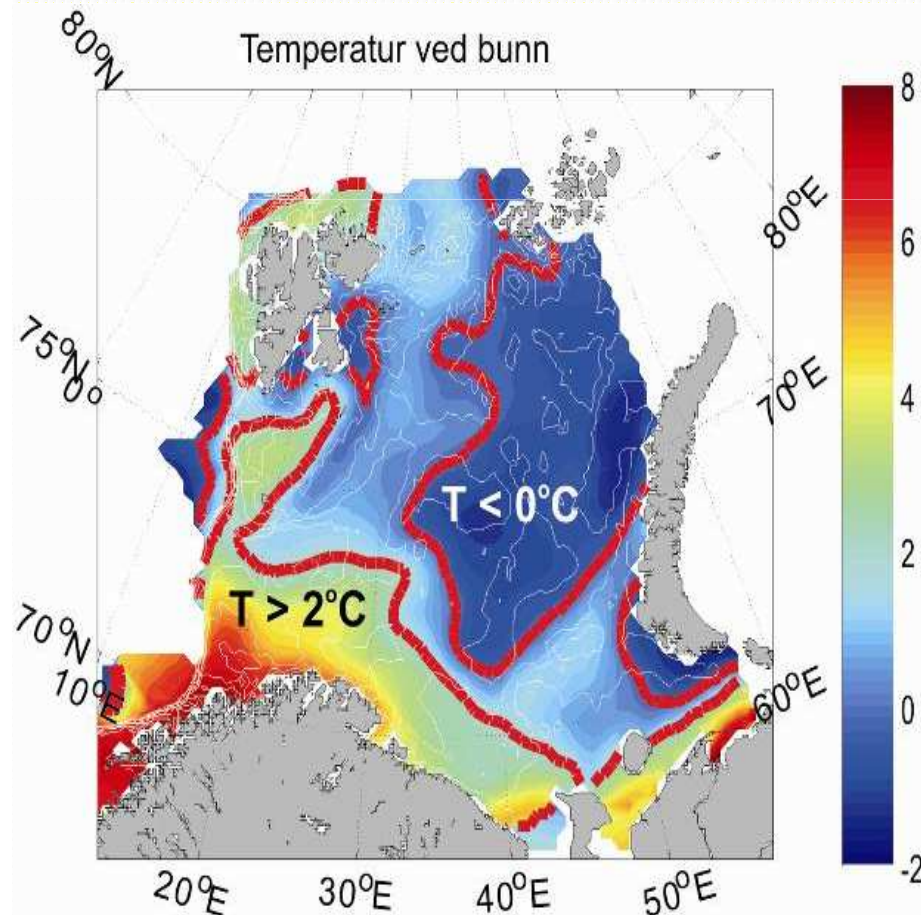
Data 2005 - 2014

Snow crab - Environmental factors of spreading

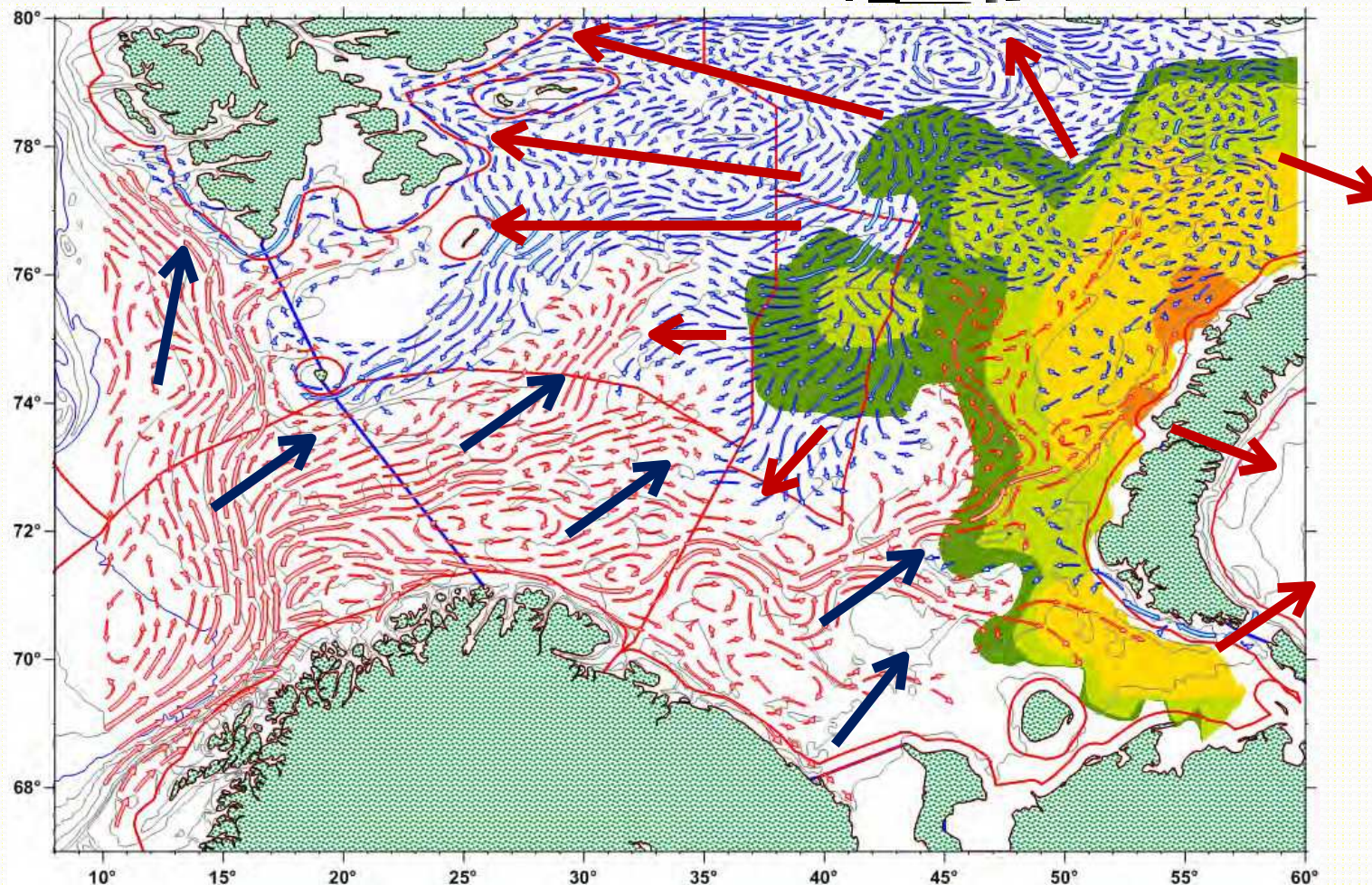
The bottom temperature in the Barents Sea, showing temperatures lower (blue) and higher (red) than 2°C
(Source: MAREANO book – Dr. Randi Ingvaldsen)

Snow crab distribution (ecosystem survey data 2013) and Russian fishery in 2014,

The most likely future distribution of this Arctic cold water species suggests that most of the catches will be in the east part of the Svalbard zone which still probably will be rather cold even in times of global warming (Hvingel and Sundet, 2014).



Snow crab - Environmental factors of spreading



Possible directions and limiting factors of further expansion

Positive factors:

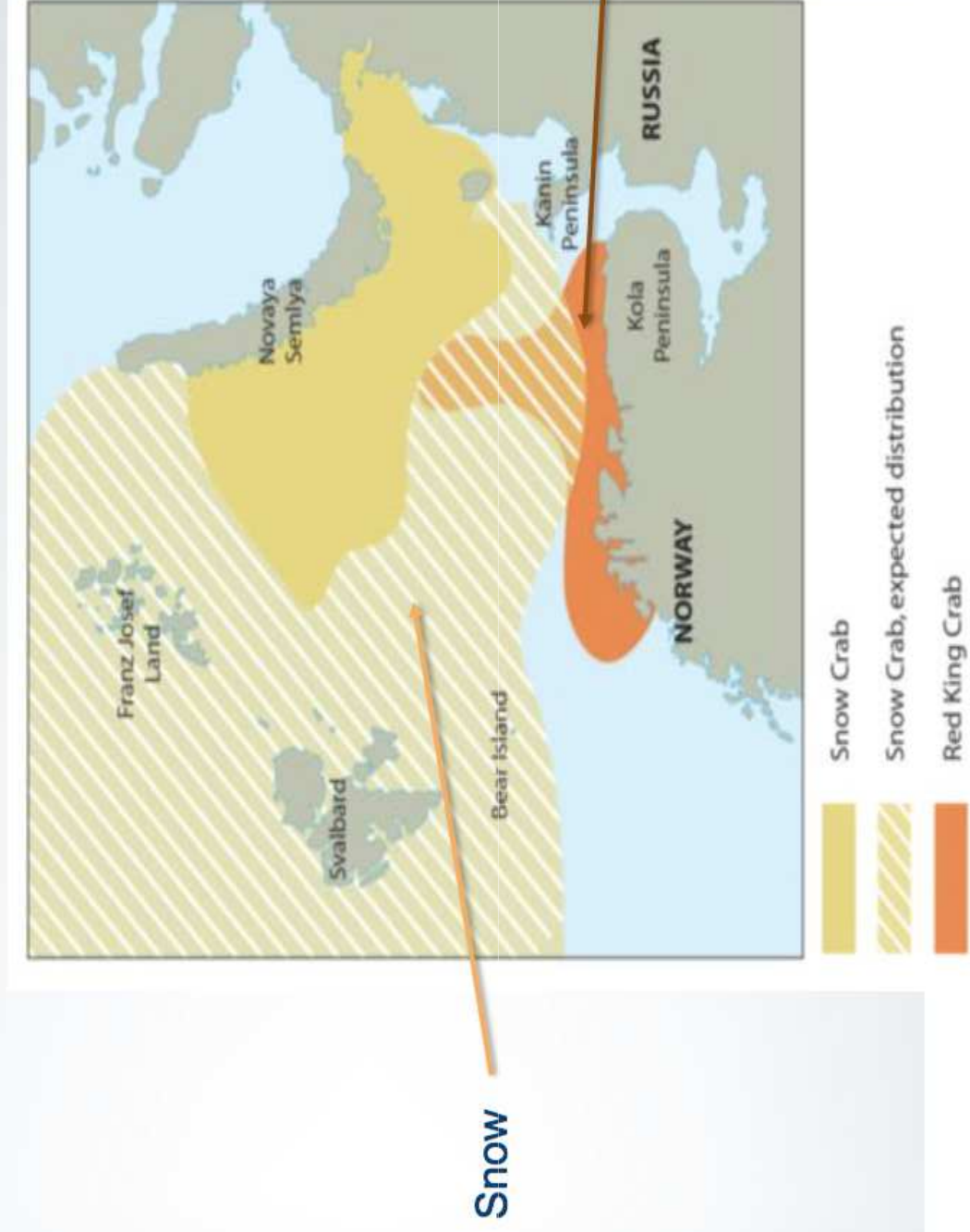
- 1) Depth range;
- 2) Currents system;
- 1) Temperature of north and north-east parts
(Area of Cold Water <math>< 2^{\circ}\text{C}</math>);
- 4) Food availability.



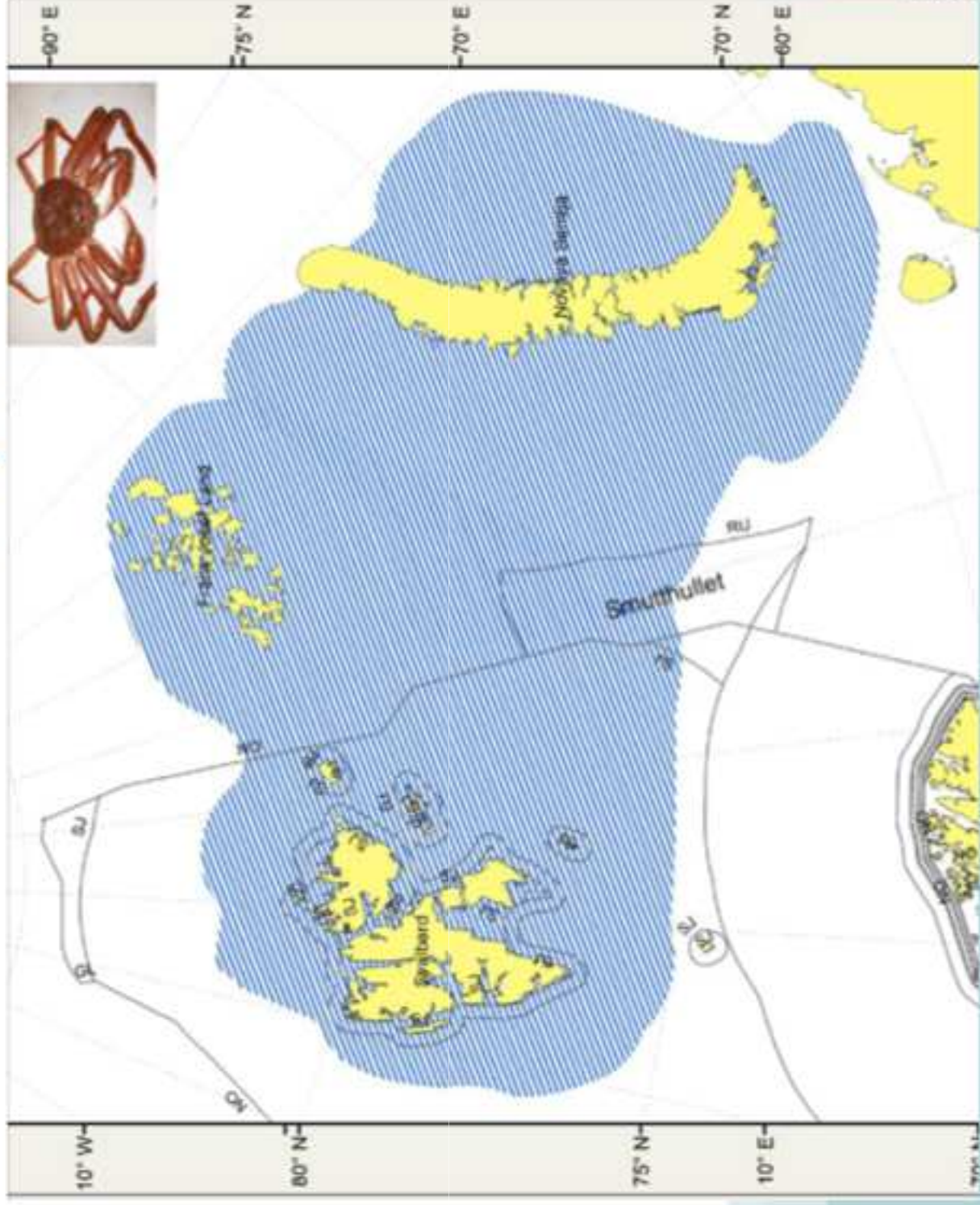
Positive factors:

- 1) Temperature of south and west parts;
- 2) Red king crab distribution.

Snow- and King Crab are Well Established in the Barents sea

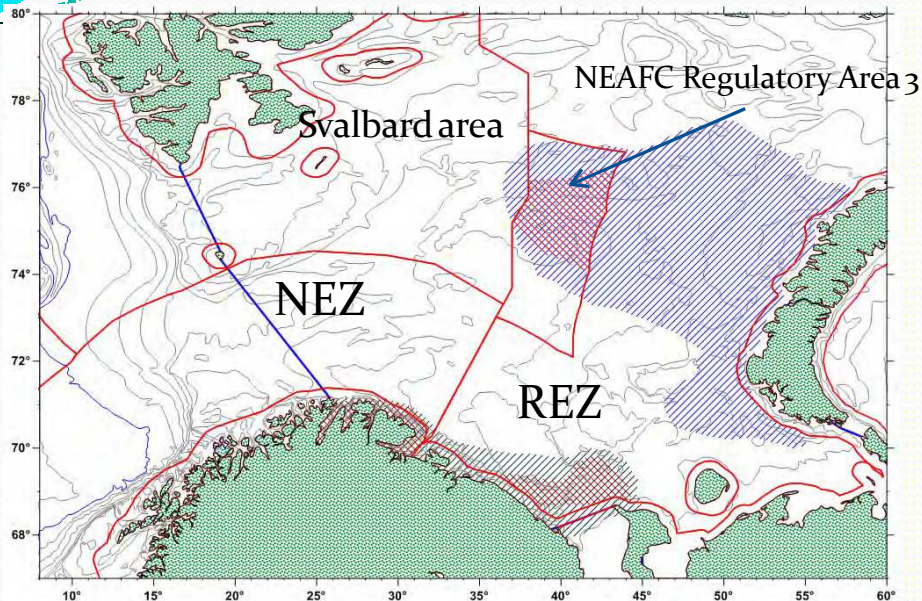


Future expansion



Snow and king crab commercial stock distribution and fishery in the Barents Sea in 2013-2014 and nearest future

2013-2014



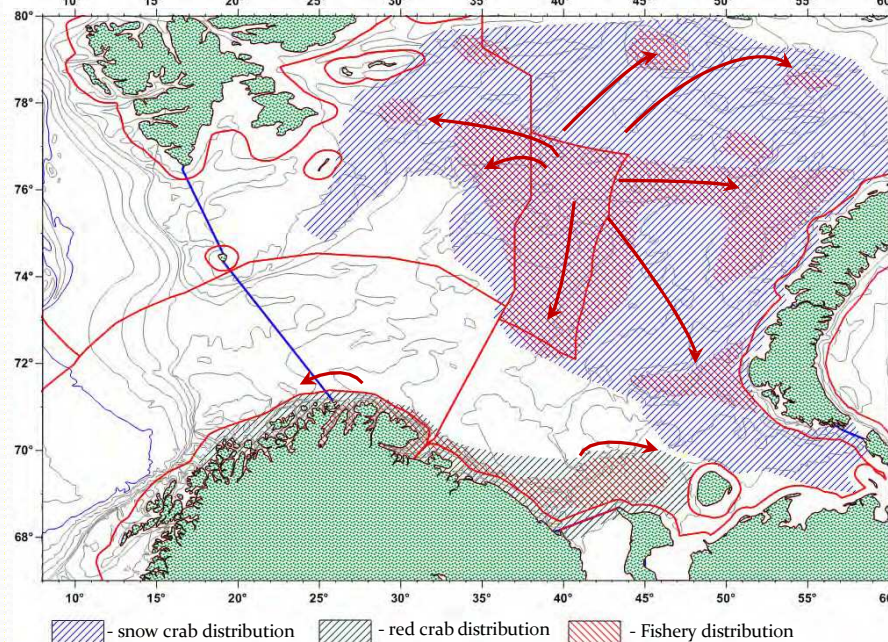
Snow crab

1. Snow crab population in the Barents Sea is in active phase of acclimatization;
2. Increasing of area and abundance;
3. Increasing of fishery activity
4. Different area of management (free fishing, closed);

Red king crab

1. Positive population dynamic and moderate (reasonable) level of exploitation ;
2. Stable area of distribution and low probability of further expansion;
3. Different area of management (free fishing, TAC regulated, closed);
4. Different spatial allocation of fishing intensity;

2023-2024






Snow crab

1. Further expansion, increasing of area and abundance are expected;
2. Largest potential habitat (most expansive cold water area, even in a warm period in the Barents Sea);
3. Different area of management (REZ, NEZ, etc.);
4. International fishery. Annual catch can be around 50-100 ktons

Red king crab

1. No significant changing in area of distribution;
2. Possible expansion in east and west directions;
3. Increasing of fishery activity is not so considerable as for snow crab. Annual catch can be around 10 ktons.

 - snow crab distribution
  - red crab distribution
  - Fishery distribution

The allowable catch

- The scientific forecasts predict further spread of snow crab westward in Svalbard zone with increase of biomass and density.
- Available, for public, model simulations, provided by Russian and Norwegian marine research institutions indicate potential annual catches to reach the 25.000-75.000 tons range within the next 10 years.
- Likely up to 50. 000-100. 000 tons- if the stock continues to grow, and if an optimal harvest strategy applied.

Norwegian Commercial fishery in the Svalbard Fisheries Protection zone

- Norwegian vessels are engaged in commercial fishing of snow crab from 2014 in NEAFC and SFPZ, but starting July 2015 nearly all fishing efforts by Norwegian crabbers are in Svalbard zone.
- Only 5 boats are catching on regular basis in 2016. Until October their average catches are approx. 841,4 tons per vessel. By the end of this year it should reach the level of 1000 tone per vessel.
- By now Norwegian boats do not have any limit.

The catching effort

- There is no science-based recommendation for any catch limitation of the snow crab catches in Svalbard.
- In two following years Norway, has extended the number of the licenses from 11 in year 2015 up to 20 in year 2016.

How should this new EU fishery and the EU catching effort be established and managed?

The management of the snow crab fishery in the Svalbard

- So far, no management plans, based on scientific advice, have been developed,
- There is no precedence for distribution of rights of new resources- by Norway in Svalbard.
- Several issues need to be addressed when designing a management regime

At first a goals need to be put in place

Would the goals for the management be the same or different for the EU and Norway?

- The goals of the management of the snow crab could be related to the goals of the Norwegian management of the red king crab – another invasive species in the Barents sea:
- The Norwegian objective, formulated , during 13 years, in three following stages:
 1. Beginning of investigation and fishery (1993-2001)
 2. Developing management and fishery (2002-2006)
 3. Separate management and current fishery (since 2007)

is to limit, by eventually adopted technical measures, further spreading of king crab in Norwegian waters and maintain lowest possible stock outside quota regulated area and thus reduce risk for damaging effects on the ecosystem.

- At the same time the king crab stock inside the quota regulated area is managed in a way that enhances employment and activity in the industry in the area.
- The management objectives should be evaluated after five years.

The EU access to snow crab fishery in Svalbard – the key factors:

- No EU Member States has the historical track record of the commercial catches of the snow crab in Svalbard.
- The access must be considered from the conditions of the Svalbard Treaty only- with respect to the Treaty of Paris' non-discriminatory regime- then:
- EU vessels must not have limits on number of vessels, TAC or number of pots- if Norwegian vessels do not have such either.
- Fishing for snow crab in the Svalbard FPZ must be separated from the EU/Norway Fisheries Agreement,
- It has to be non-discriminatory, and can't be the subject of neither any quota exchange nor any cod equivalent compensation with Norway.
- The EU operators, in cooperation with scientific institutes, will carry a scientific data collecting programs.
- In addition; it has to be noted that:

Latvian and Polish fishery operators, have already invested in the landing and processing infrastructure in Finnmark (in Batsfjord and Kongsfjord) contributing to the local society and local economy in Norway.

Such investments in the Arctic are promoted objectives of the EU's cohesion policy for the Arctic, as stated in the document "An integrated European Union policy for the Arctic".

General catching method (description of the fishing gear)

- The fishing gear, used by the EU crabbers, is defined as a conical crab pots, made with steel and polypropylene of weight of 18kg, height 650 mm.
- Crab vessels have pots (catching gear) on bottom all the time. Scientific research was made to address ecological concerns.
- Crab pot fishery is one of the gear that can minimize interactions with sea bed including VMS. Such research were presented to Commission on the occasion of considering bottom fishing in RA NEAFC:
- *“Fishing with pots using chains for anchoring, and restricting fishing to level soft-bottom areas where VMEs are unlikely, are probably the most significant measures reducing the likelihood of significant adverse impacts.”*

Norwegian “Notes regarding EU letter of intent for exploratory fishery 2015 “ provided to the NEAFC secretariat

Conclusion



Committee on Fisheries
The Chair

D 202243 13.09.2016

IPOL-COM-PECH D (2016) 39874

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Commission européenne
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Belgique

Objet: projet de note verbale de la Commission relatif à la pêche au crabe des neiges dans les îles Svalbard

Monsieur le Directeur général, *ch. João*

Lors de la réunion des Coordinateurs de la commission de la pêche du 8 septembre 2016, j'ai porté à la connaissance des Membres le projet de note verbale des services de la Commission relatif à la pêche au crabe des neiges dans les îles Svalbard.

La commission de la pêche du Parlement souhaite vous faire part de son soutien quant au contenu de cette note et vous renouveler sa confiance à mener à bien ces négociations.

Nous estimons que les dispositions du Traité de Paris de 1920 doivent être respectées. Les navires européens devraient ainsi avoir accès à la zone de pêche autour des îles Svalbard.

En vous remerciant de l'attention et des moyens que vous mettez en œuvre pour résoudre ce différend, je vous prie d'agréer, Monsieur le Directeur général, l'expression de ma haute considération.

Alain CADEC

Alain CaDEC

1. The EU snow crab industry expects prompt notification of Union crab vessels to Norway in accordance with the position presented in the Note verbale.

The text of the Note Verbale has received the support from the Committee on Fisheries of the EU Parliament.

1. Extremely difficult present situation of the EU crabbers requires taking urgent steps to allow the EU crabbers fleet, to start to operate immediately- while it is now generating high costs of the stay in port

References:

- (ICES CM 2014/F:04)
- *MAREANO book – Dr. Randi Ingvaldsen*.
- Jørgensen L.L., and Spiridonov V., 2013. Effect from the king- and snow crab on Barents Sea benthos. Results and conclusions from the Norwegian-Russian Workshop in Tromsø 2010. *Fisken og Havet* nr. 8/2013. Institute of Marine Research, Bergen, Norway, 41 pp. http://www.imr.no/publikasjoner/andre_publicasjoner/fisken_og_havet/nb-no
- Hvingel and Sundet, 2014). *Misund, O.A., et al., Norwegian fisheries in the Svalbard zone since 1980. Regulations, profitability and warming waters affect landings, Polar Science (2016), <http://dx.doi.org/10.1016/j.polar.2016.02.001>*
- *Assessment and management of invasive crab stocks in the Barents Sea. Workshop, Stockholm, 3-6 September 2014, Spatial issues in Arctic Marine Resource Governance, Sergey Bakanev Polar Research Institute (PINRO), Murmansk, Russia*
- *Norwegian College of Fishery Science Snow crab (Chionoecetes opilio) in the Barents Sea Diet, biology and management , Harald Sakarias
Brøvig
Hansen
Master thesis in International fisheries management (30 ECTS) May 2015*