Newly established Commission on marine stations and specially protected nature areas: a network for long-term monitoring of Arctic marine and coastal biodiversity in Russia

Vassily A. Spiridonov

(P. P. Shirshov Institute of Oceanology of Russian Academy of Sciences; senior adviser of GEF/UNDP project “Strengthening of marine and coastal protected areas of Russia”)

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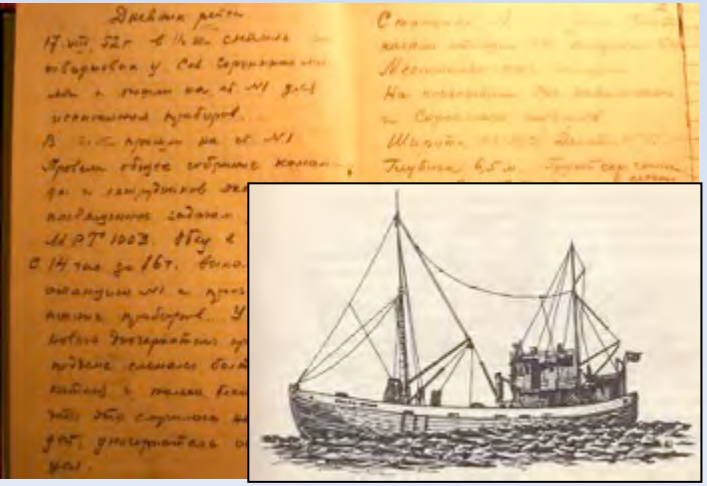
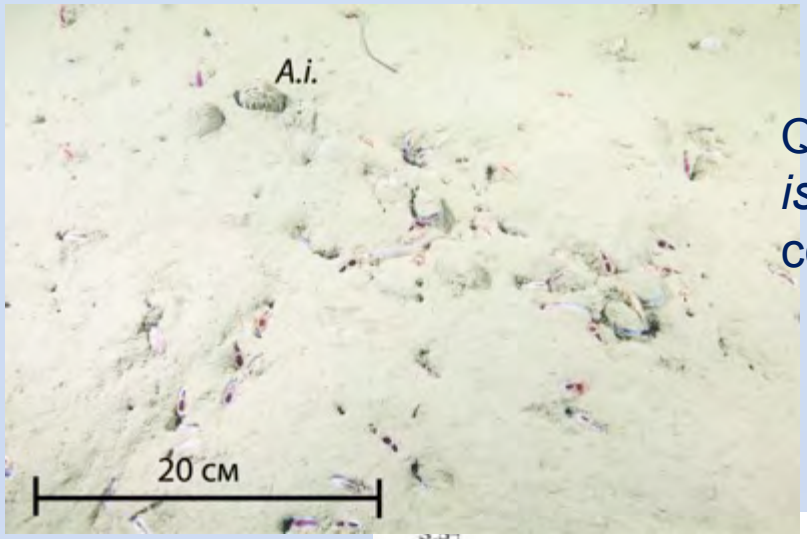
УКРЕПЛЕНИЕ МОРСКИХ И ПРИБРЕЖНЫХ ООПТ РОССИИ

Tradition of marine stations – important part of marine heritage of Russia

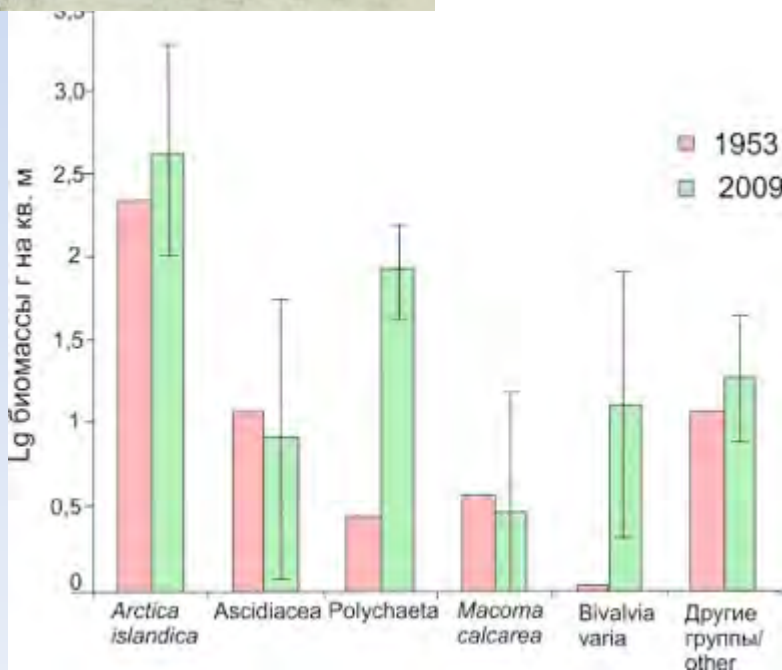


Using of historical station data

Historical data of the Biological Station of the Karelian Branch of Academy of Science of USSR (predessor of the Kartesh Station on the White Sea) made baseline for studies of long term variation in clam and horse mussel dominated communities



Quahog, *Arctica islandica* community



From Chikina, Spiridonov, Mardashova, 2014, Oceanology, 54(1)

Russian scientific tradition and development of strictly protected reserves (zapovedniks)

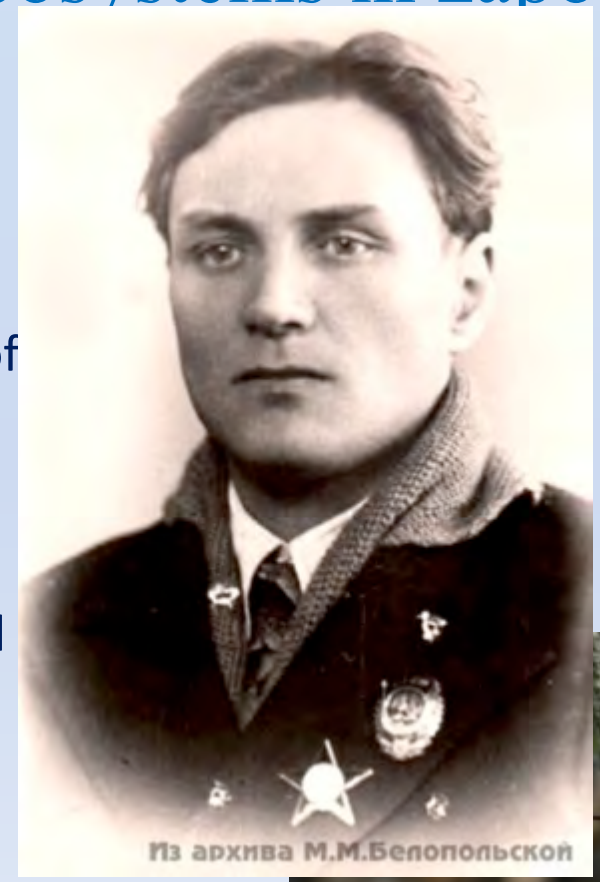
- « I consider the study of gradual changes of organisms in relation to environmental changes to be the most important for science tasks of zapovedniks. The basis is a precise description of the state of nature in a given time. .. This work will take decades but we should not be constrained by time when planning for the strictly protected reserve because generations of scientists have to work on the same subject in the same place. This is a peculiarity of working in zapovedniks, not feasible in other institutions» (Kozhevnikov, 1928)

Grigory A. Kozhevnikov, director of Zoological Museum of Moscow University,
the author of the national scientific concept of
strictly protected nature reserves (zapovedniks)

Development of the principle of long term monitoring of ecosystems in zapovedniks

- When establishing zapovednik “Seven Islands” (now part of the Kandalaksha zapovednik) in late 1930s Lev O. Belopolsky began a programme of annual censuses of colonial seabirds

- This laid a foundation of longest time series in seabird studies and document large scale changes in the Barents Sea ecosystems in the 1980s (Krasnov et al., 1996)



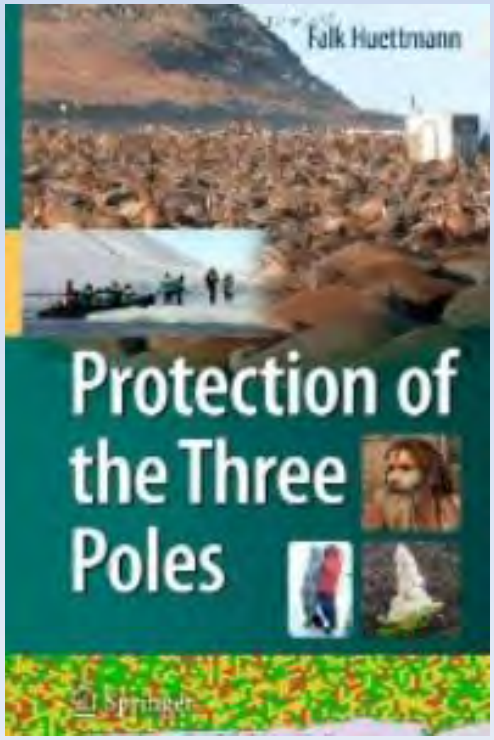
Federal marine and coastal protected areas

- **Biosphere reserves (zapovedniks – IUCN category I) with marine areas 5**
- **Strictly protected reserves (zapovedniks - 8**
- **Zapovedniks with marine buffer zones - 6**
- **National parks (IUCN category II) with marine areas – 3 (two just established); coastal – 2.**
- **Federal reserves (zakazniks – IUCN category IV-V) with marine areas - 5**
- **Federal nature monuments (IUCB category III) with marine habitats - 2**

Arctic: 7 zapovedniks, 3 federal zakazniks (reserves), + 2 new national parks

Chapter 8
Toward the New Role of Marine and Coastal Protected Areas in the Arctic: The Russian Case

Vassily Spiridonov, Maria Gavrilo, Yury Krasnov, Anton Makarov, Natalia Nikolaeva, Ludmila Sergienko, Andrei Popov, and Elena Krasnova



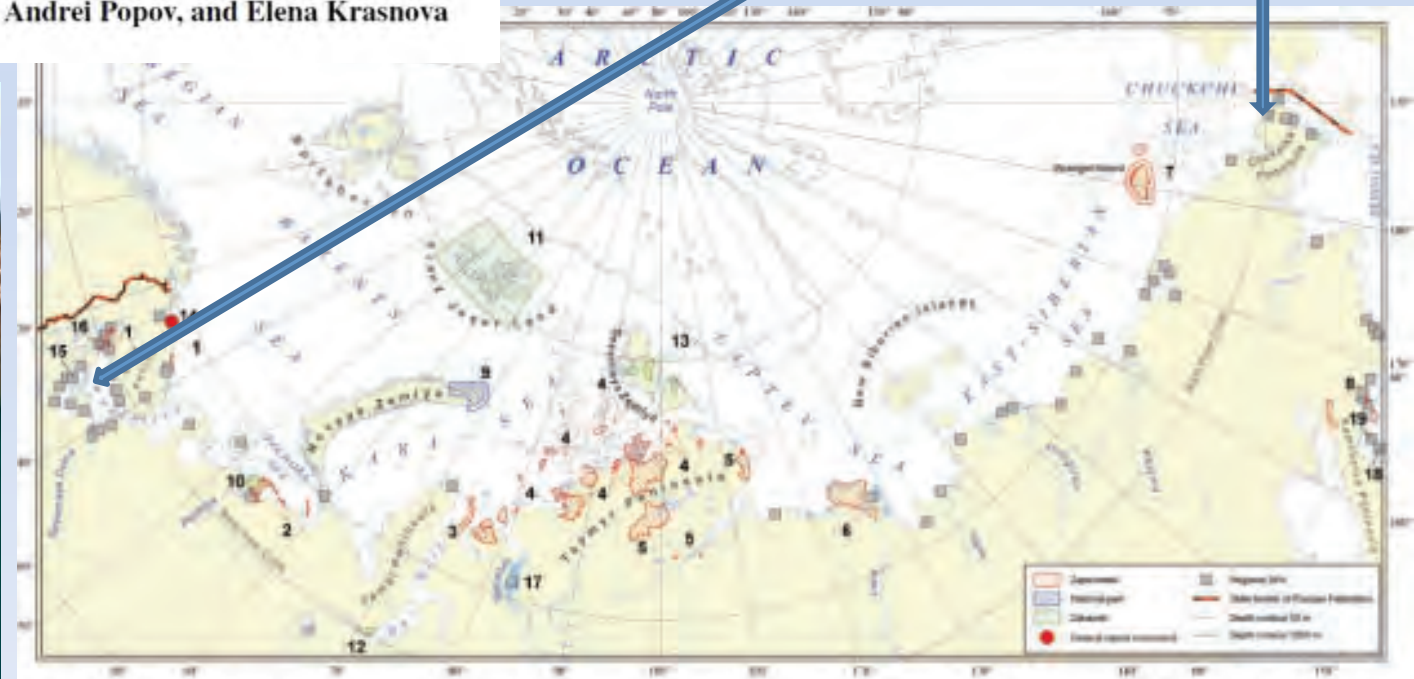
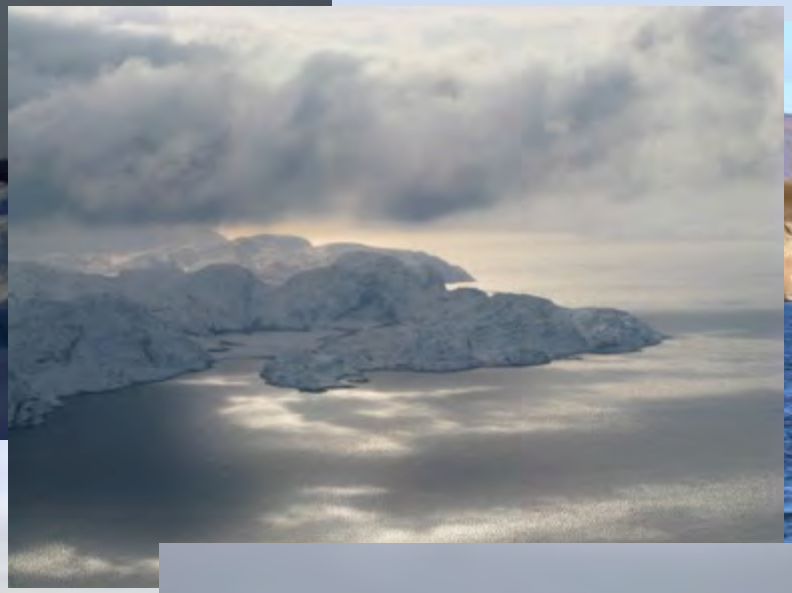
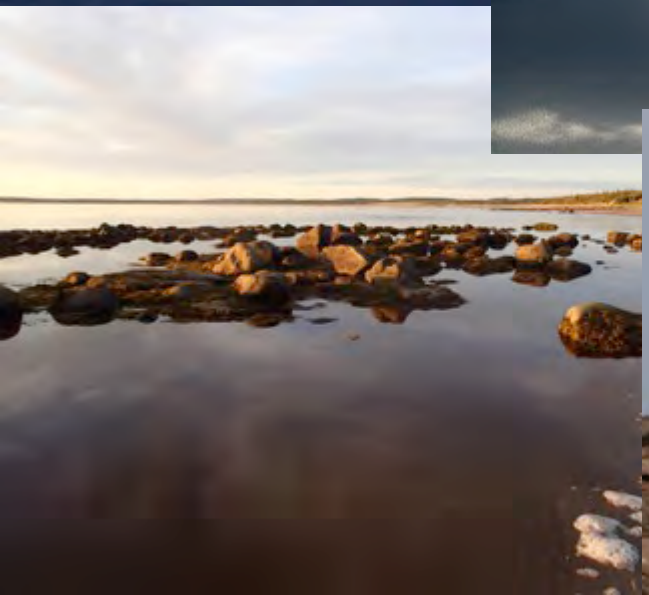


Fig. 8.1 Map of marine and coastal specially protected area (SPA) in the Russian Arctic. Zapovedniks (strictly protected nature reserves): *1*, Kandalakshskiy; *2*, Nenetskiy; *3*, Gydanskiy, *4*, Great Arctic; *5*, Taymyrskiy; *6*, Ust'-Lenskiy; *7*, Wrangel Island; *8*, Koryakskiy. National parks: *9*, Russian Arctic. Zakazniks: *10*, Nenetskiy; *11*, Franz Josef Land; *12*, Nizhne-Obskiy; *13*, Severozemelskiy. Nature monument: *14*, Mogilnoe Lake. Ramsar or other international conventions sites having a status of regional SPA: *15*, Kuzova Islands; *16*, Poliarnyi Krug; *17*, Brekhovskie Islands; *18*, Karaginskiy Island; *19*, Verkhotourov Island (see Tables 8.2 and 8.3)

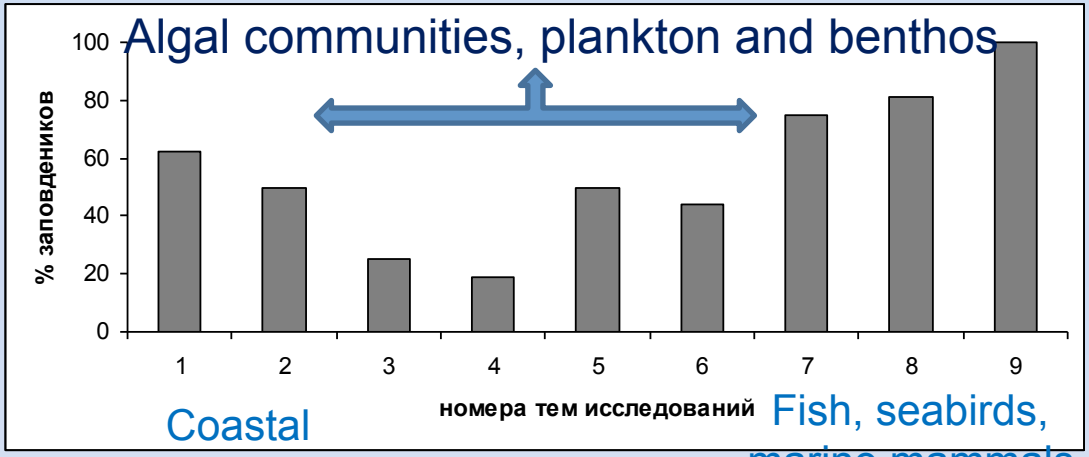
Variety of coastal condition within marine stations and PAs in the Russian Arctic





Marine and coastal zapovedniks and national parks could be perfect coastal monitoring network BUT

- MPA with few exception does not have traditions and capacity for marine science
- Most studies are devoted to sea birds and marine mammals
- Real governmental support of these studies is minimum



Per cent of zapovedniks with offshore areas and seashores where in 2001-2010 studies were conducted on partciular marine topics
(Nikolaeva and Mokievsky, 2012)

Cooperation with Association “Marine Heritage of Russia”: marine stations & marine protected areas & associated traditions and knowledge are regarded as part of marine heritage

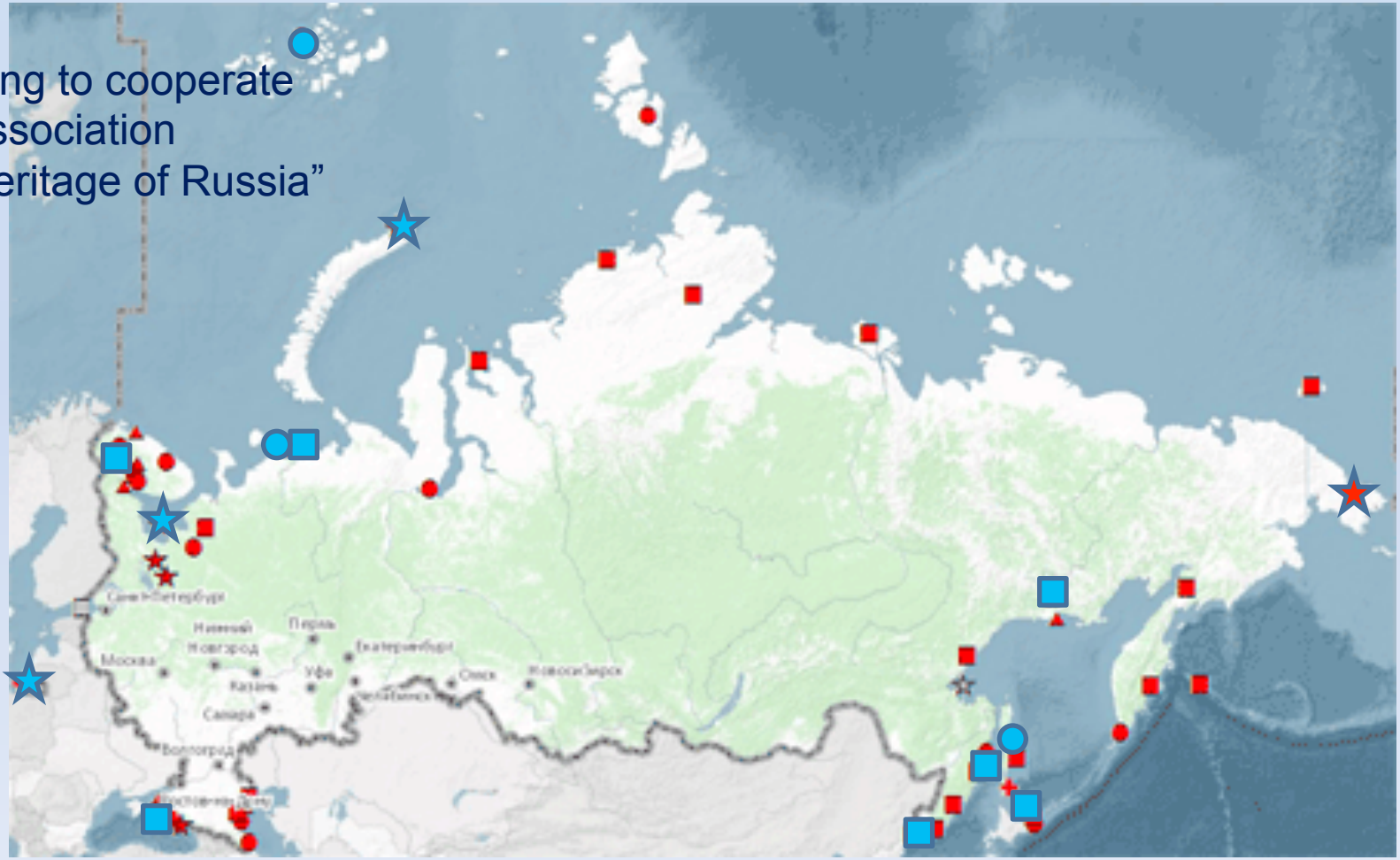
Maria Gavrilo presenting concept of marine natural heritage
at the conference “Marine Heritage of Russia”, St. Petersburg, 2010

Commission on marine stations and marine protected areas

- Aim: development of institutional inter-sectoral basis to support nation-wide inventory, monitoring and protection of marine biodiversity and marine heritage
- Tasks:
  - effectively use existing and involve new resources for studies, monitoring and protection of marine biodiversity
  - integrate information resources on marine biodiversity relevant to marine stations and MPAs
  - support marine research in marine protected areas
  - preserve marine stations, zapovedniks and their traditions as cultural heritage

Zapovedniks (■), national parks(★) and zakazniks (●)

So far willing to cooperate
with the association
“Marine Heritage of Russia”



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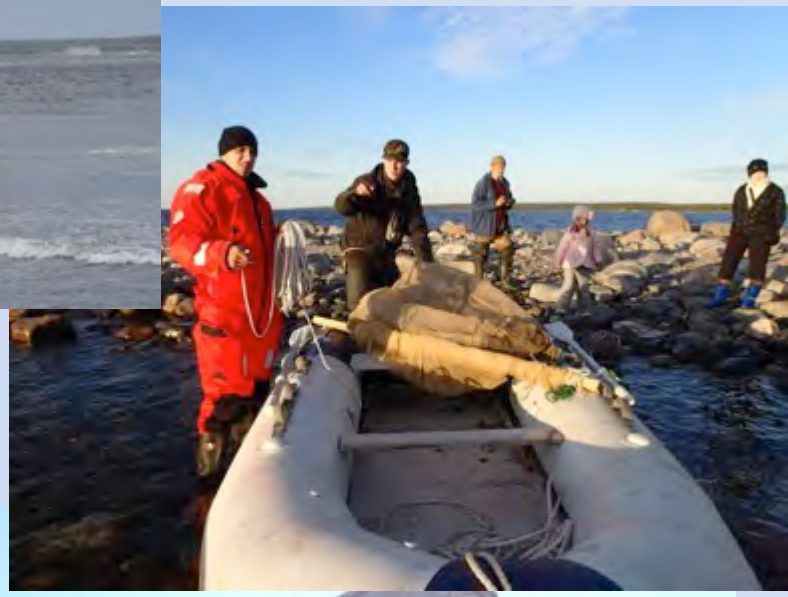
Pilot project of the association: Magadansky zapovednik (strictly protected reserve)

A group of scientists from 4 different institutions made intrertidal inventory and helped reserve to establish its own marine research programme

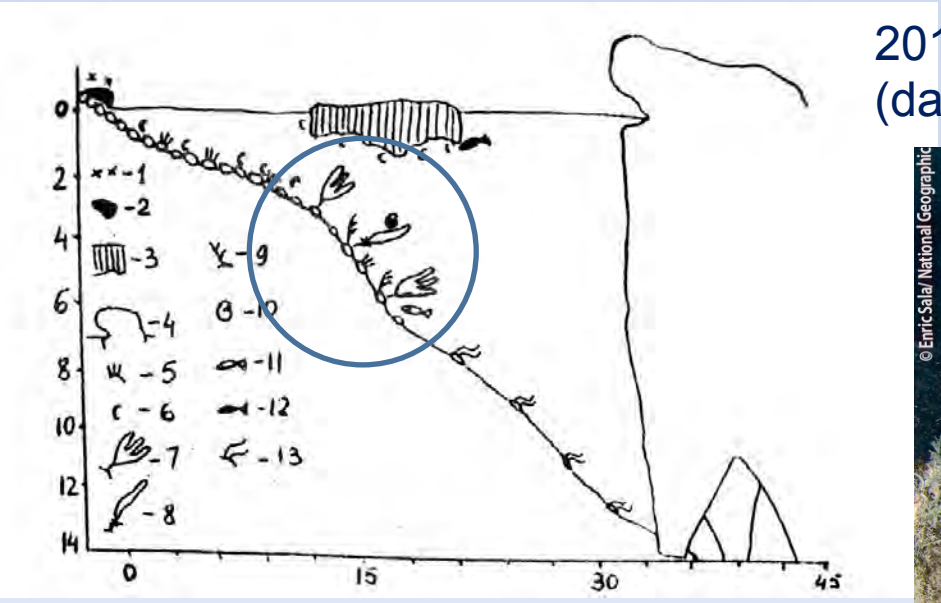
New national park“Onezhskoe Pomorie”, 2014

New national park“Onezhskoe Pomorie”, 2014:
1).further development of organization principles of joint projects;
2). justification for marine buffer zone as a result



National Park “Russian Arctic”/ Federal Reserve Franz Josef Land: active cooperation with research organizations in 2012-2013

Sublittoral transect
by A.N. Golikov and V.G. Averintsev revealed the high-latitude kelp forest in 1970



2013: kelp is present but not as continuous belt (data are preliminary)

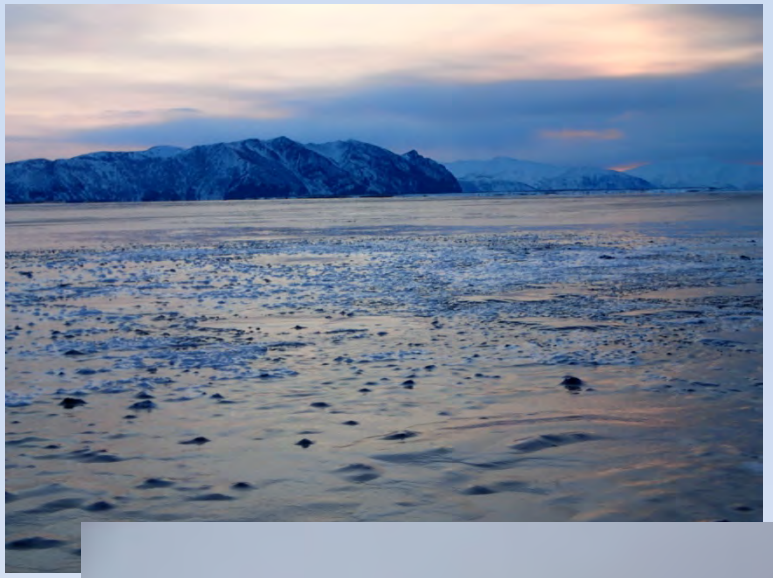
Constraints for coastal monitoring in federal PAs

- Limited human resources in science divisions of zapovedniks and national parks
- Lack of training, guidelines and standards
- Lump funding: PA select priorities and these are not science
- Initiative causes panishment: PAs should be very careful when suggesting new (i.e. marine/ coastal) indicators for mandatory programme

Training course for research staff of PaC on marine science and monitoring methods, Kartesh Station, White Sea,

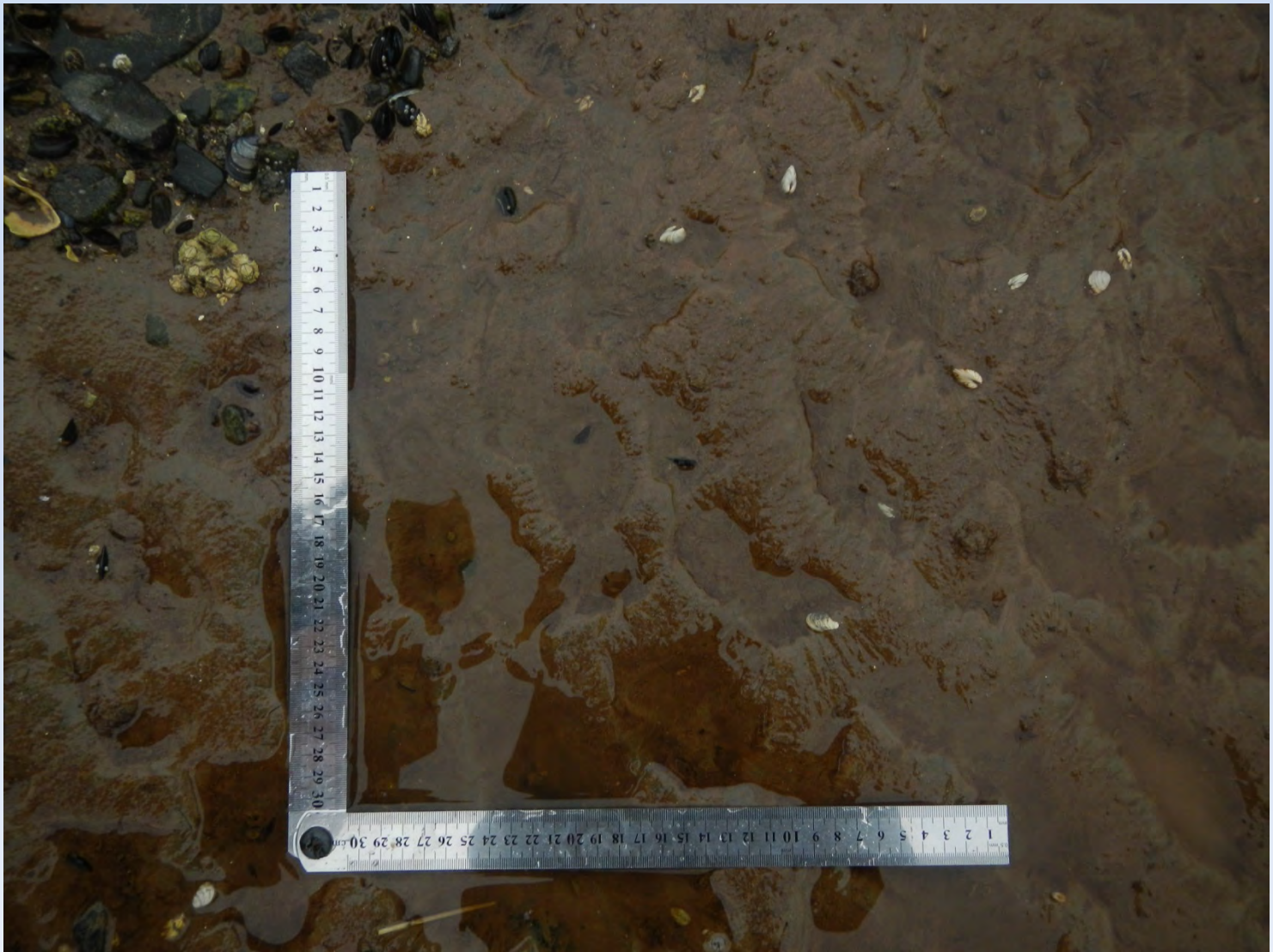
Potential minimum contribution of marine/ coastal PAs and stations to the coastal component of CBMP

- Dynamics and phenology (establishing, breaking etc.) of landfast ice (satellite data and direct observations)
- Extreme events (storms, rainfalls, extreme heating of coastal waters in inlets, lagoons etc



USING OWN PAs CAPACITY

Macoma clams getting to the surface of sediments after extreme rainfall, Gaertner Inlet, northern Sea of Okhotsk, July 2014

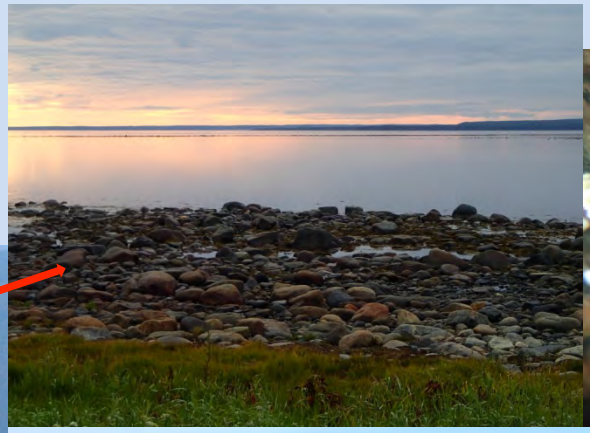


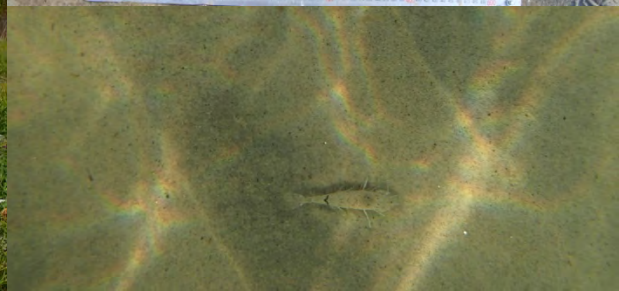
Periodic inventory of taxonomic, genetic and habitat diversity

- Coastal (supratidal, intertidal, shallow subtidal; water column; sea ice) biota inventory
- Genetic monitoring
- Types of intertidal communities and their distribution

USING EXTERNAL CAPACITY!

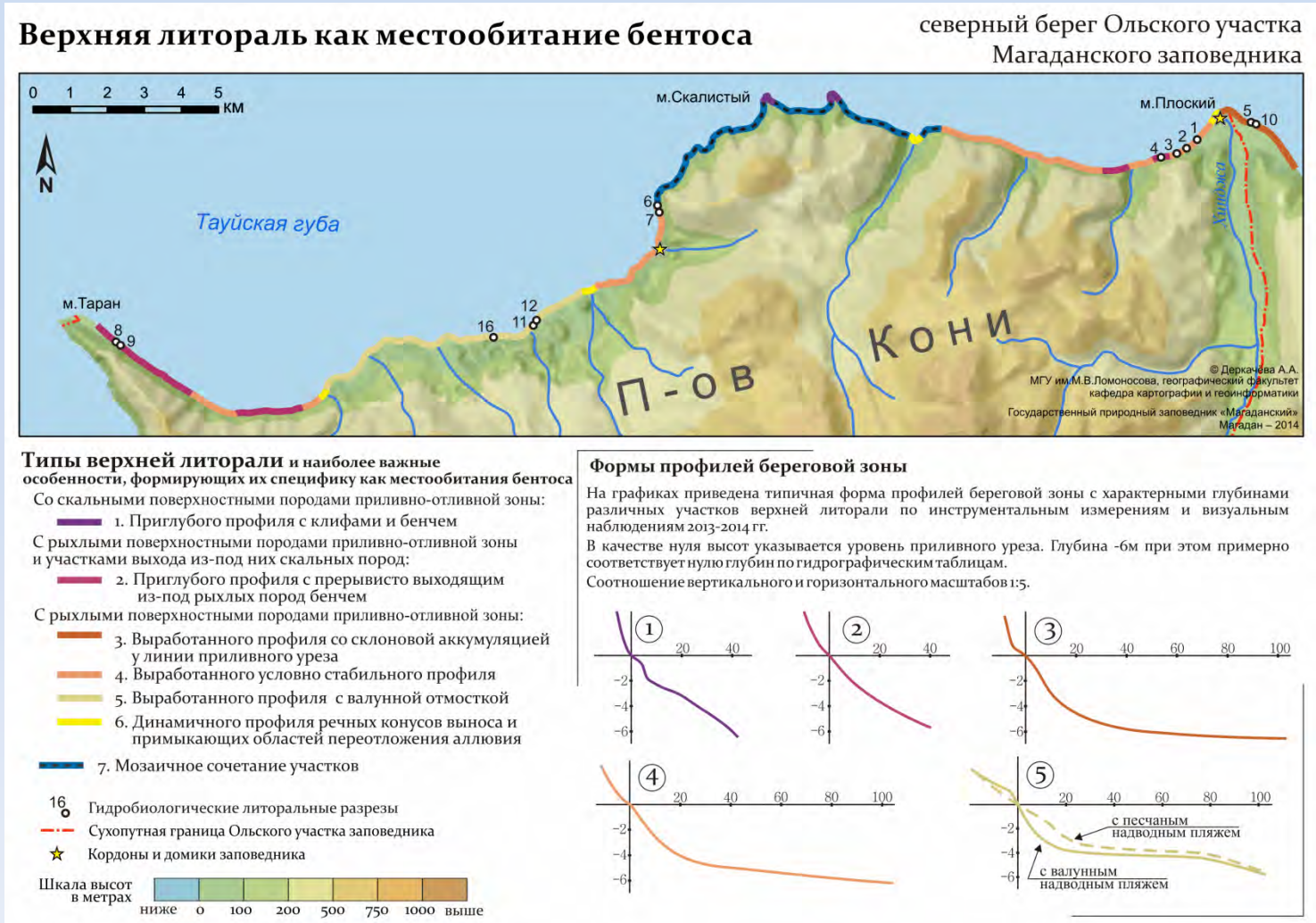
Habitat inventory: Onezhskoe Pomorye, 2014





Structure of salt marsh communities

Map of intertidal habitats of NW coast of Koni Peninsula, Magadan State Strictly Protected Reserve, 2013-2014

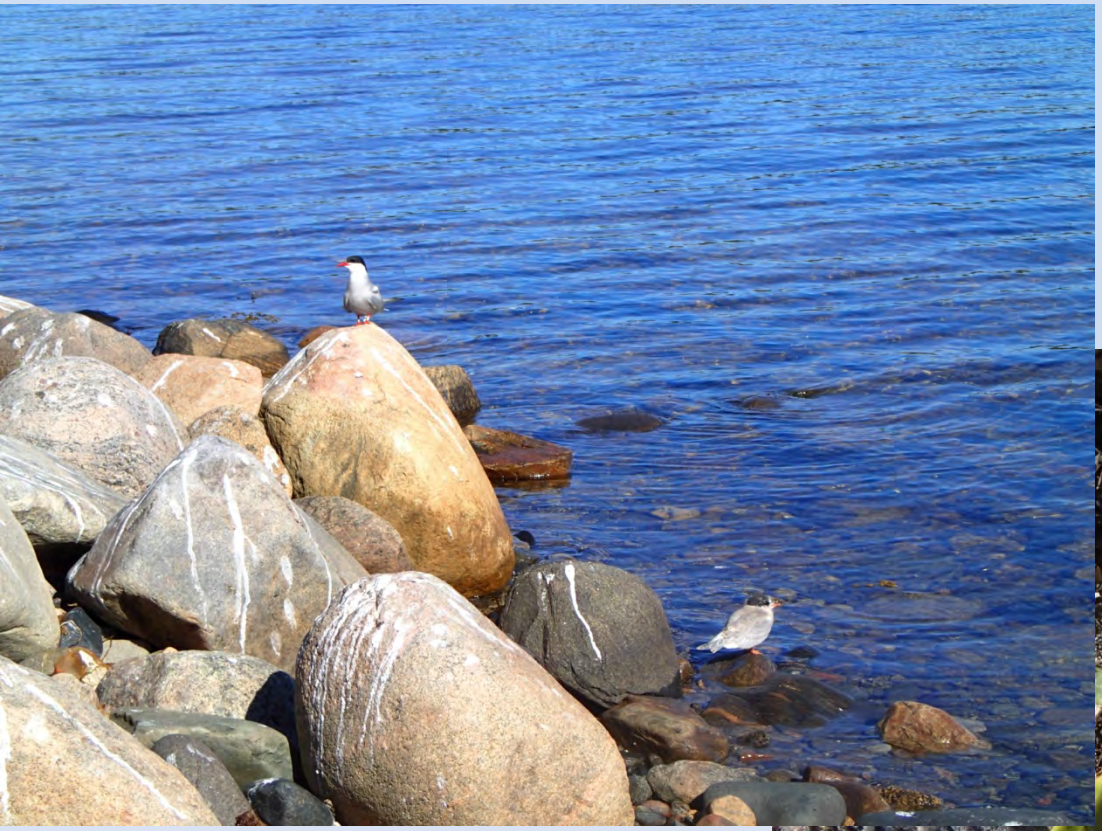


Monitoring of populations of important intertidal/ shallow water species

- Eelgrass (*Zostera marina*)
- Blue mussel (*Mytilus edulis*)
- Baltic clams (*Macoma balthica*); Arctic clams
- Three spined stickleback (*Gasterosteus aculeatus*) and sand eel (*Ammodites* spp.)
- ?

PARTLY USING Pas CAPACITY

Seabird colonies



OFTEN USING OWN Pas CAPACITY

Opportunities for new large scale projects: marine mammals

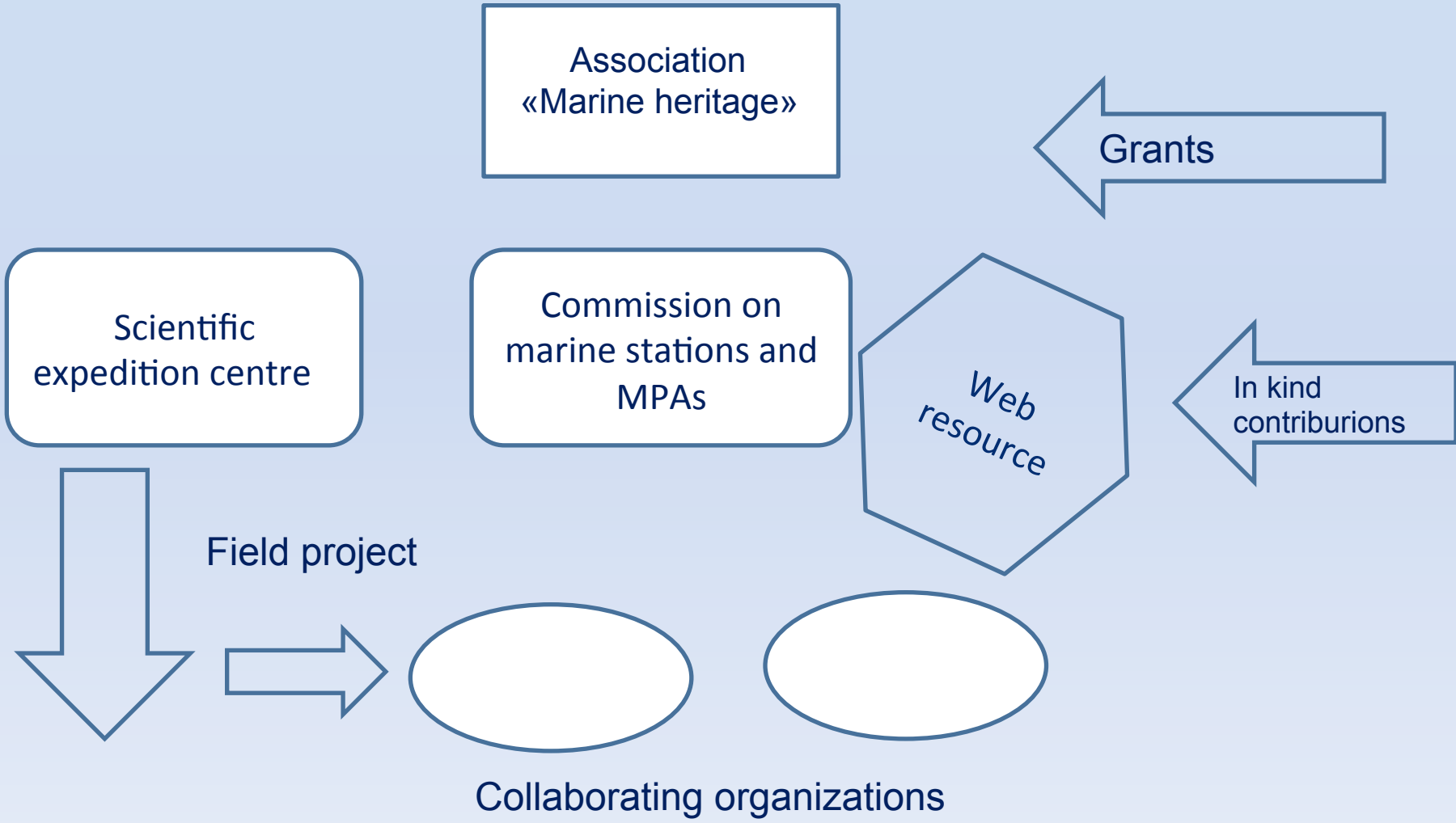
- Monitoring of important and ubiquitous in the Arctic but poorly known species, i.e. bearded seal
- Beluga whales migration and reproductive sites

Invasive or extending their range species: special cases

- **Snow crab (*Chionoecetes opilio*)**

- **Pink salmon (*Oncorhynchus gorbuscha*)**

How will the Commission work



Structure of Commission's web resource (expected launch January 2015

- **Information on collaborating stations, protected areas and other organizations and links to their websites**
- **Methodological literature and guidelines**
- **Library on the marine biodiversity within stations and zapovedniks**
- **Ongoing joint projects**
- **History of marine research at research stations and in zapovedniks**
- **Information exchange platform; offer for volunteers**
- **CBMP link**

CIRCUMPOLAR BIODIVERSITY MONITORING PROGRAM

Thank you for your attention!

vspiridonov@ocean.ru

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