

CLIVAR/CliC/SCAR Southern Ocean Region Panel SORP-11: Sept. 17-18, 2016

National activities report

Country ___Russia_____

Contributor(s) (writer(s)) _Alexander Klepikov__

Date ___14 September 2016_____

Receipt of material prior to Sept. 5, 2016 will ensure inclusion in meeting discussion. Receipt of material prior to Oct. 10, 2016 will ensure inclusion in meeting report and contribute to future SORP discussions, as well as input to the SOOS and other CLIVAR/CliC/SCAR activities.

Purpose of material gathered for the SORP: To build an overview of
- observational, modeling, state estimation initiatives relevant to the SORP

(This can include a list of activities, maps showing where work has been done, major international project involvement, etc.)

A. Recent and ongoing activities

Does your country have a national committee tasked with oversight of Southern Ocean climate science?

What major activities have been carried out in the last several years or are in progress now? Contact information for the projects would be useful.

1. Observational (2012 – 2016)

**Arctic and Antarctic Research Institute (AARI)
38, Bering Street
199397 Saint-Petersburg**

Project: Oceanographic program of the Russian Antarctic Expedition (RAE)

PI: Alexander Klepikov (klep@aari.ru)

In January 2012 three CTD/O₂ transects were made from r/v *Akademik Fedorov* in the area to the west of Prydz Bay. Transects include 18 soundings along 70° E (at the same station's positions as in 2011 survey), 14 soundings along 69° E and 14 soundings along 71° E. Additionally 9 stations were made along the Amery Ice Shelf front and several stations were made from the fast ice of the Sadnefjord Bay.

In January 2013 during the CTD/O₂ transect was made from r/v *Akademik Fedorov* in the area to the west of Prydz Bay. Transect includes 18 soundings along 70° E (at the same station's positions as in 2011 and 2012 surveys). High

spatial resolution of the section along 70° E at the shelf break and above the upper steep detailing of mesoscale peculiarities of the near-slope convective plumes.

In February 2013 during the testing cruise of the new ice class r/v *Akademik Treshnikov* the transect of 36 CTD stations was made in Margaret Bay starting from the front of George VI Ice Shelf.

In January – February 2014 more than 40 CTD/O2 stations were made from r/v *Akademik Fedorov*, including 7 soundings in the vicinity of the Balleny Islands (~68° S, 162° E), 17 soundings – in the poorly sampled area near the Russian coastal station *Russkaya* in the Pacific sector (74° -74.5° S, 132° -136° W), and 17 soundings – in the Marguerite Bay, Bellingshausen Sea (66° -68° S, 70° -72° W). Additionally 34 XBT soundings were made in different areas.

In January – February 2015 three CTD/O2 transects were made from r/v *Akademik Fedorov* in the Prydz Bay area. First transect included 18 soundings along 70° E (at the same station's positions as in 2011, 2012 and 2013 surveys). High spatial resolution of the section along 70° E at the shelf break and above the upper steep detailing of mesoscale peculiarities of the near-slope convective plumes. Section along 70° E was part of the slope has allowed repeated eight times during the period 2004 – 2015. Second section (22 stations) was made in the central part of the bay. Third section (12 stations) was situated along the Amery Ice Shelf edge. Oceanographic stations were performed by "Sea Bird 911+" probe with water sampling to determine the nutrients on the particular horizons. Two additional sections with 21 stations were made in the northern part of Bransfield Strait and on the continental slope of the South Shetland Islands in the southern Drake Passage.

In January – February 2016 nine CTD/O2 transects (106 stations) were made from r/v *Akademik Fedorov* in the Prydz Bay area. Oceanographic stations were performed by "Sea Bird 911+" probe with water sampling to determine the nutrients on the particular horizons. Two additional sections with 23 stations were made in April in the northern part of Bransfield Strait and on the continental slope of the South Shetland Islands in the southern Drake Passage.

Maps of AARI oceanographic stations during RAE see below (Fig. 1 – 4)

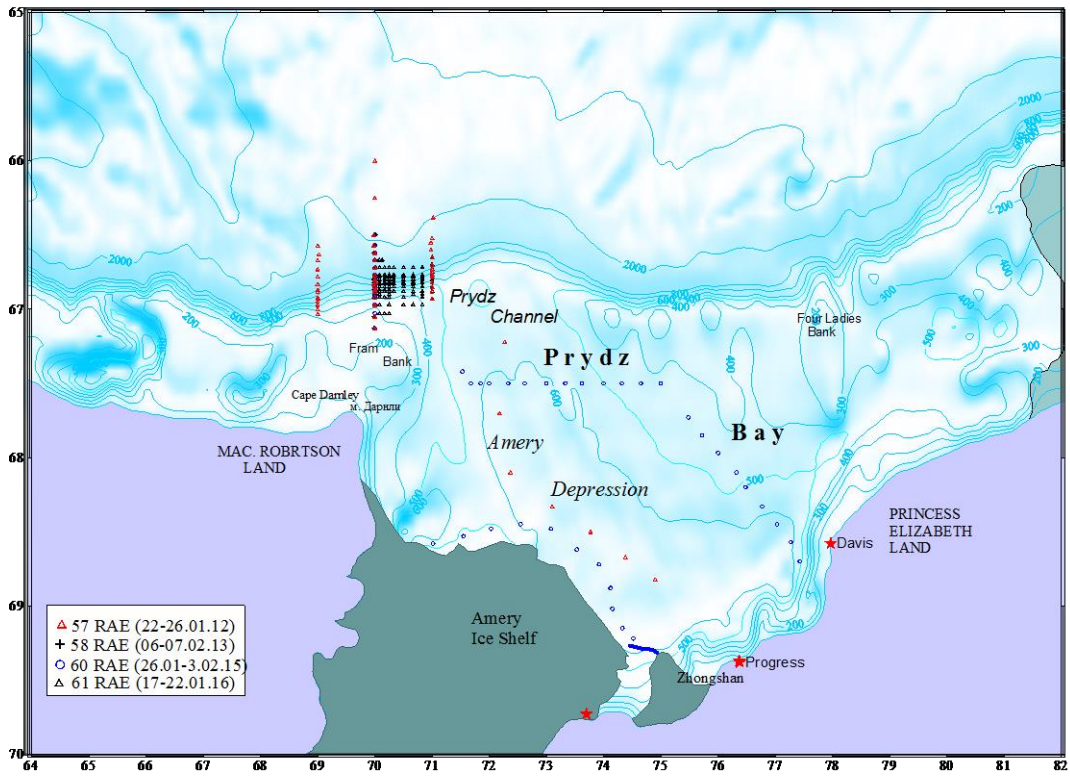


Fig. 1. AARI oceanographic stations in Prydz Bay area during the annual Russian Antarctic Expeditions

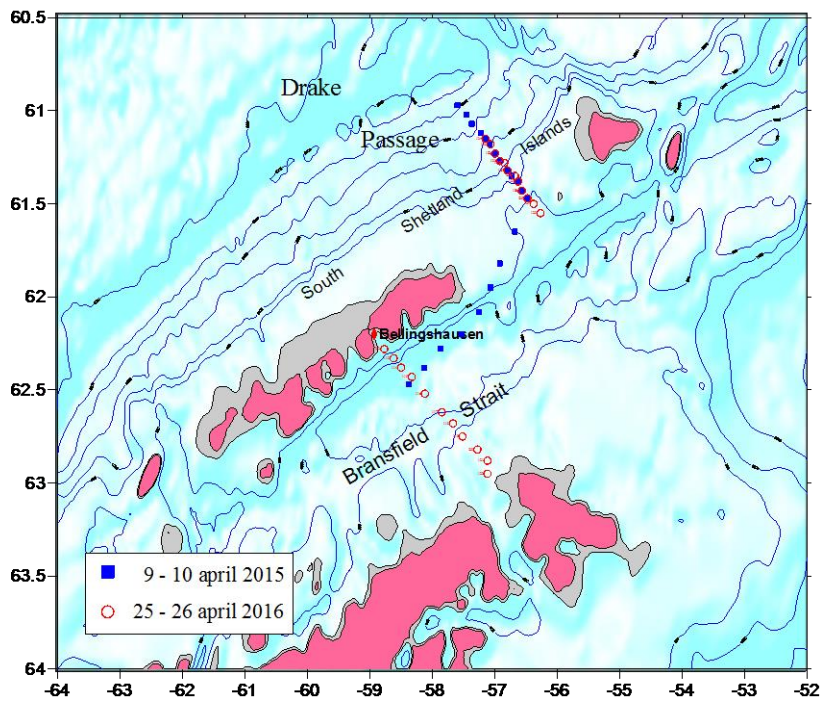


Fig. 2. AARI oceanographic stations in Bransfield Strait during the annual Russian Antarctic Expeditions

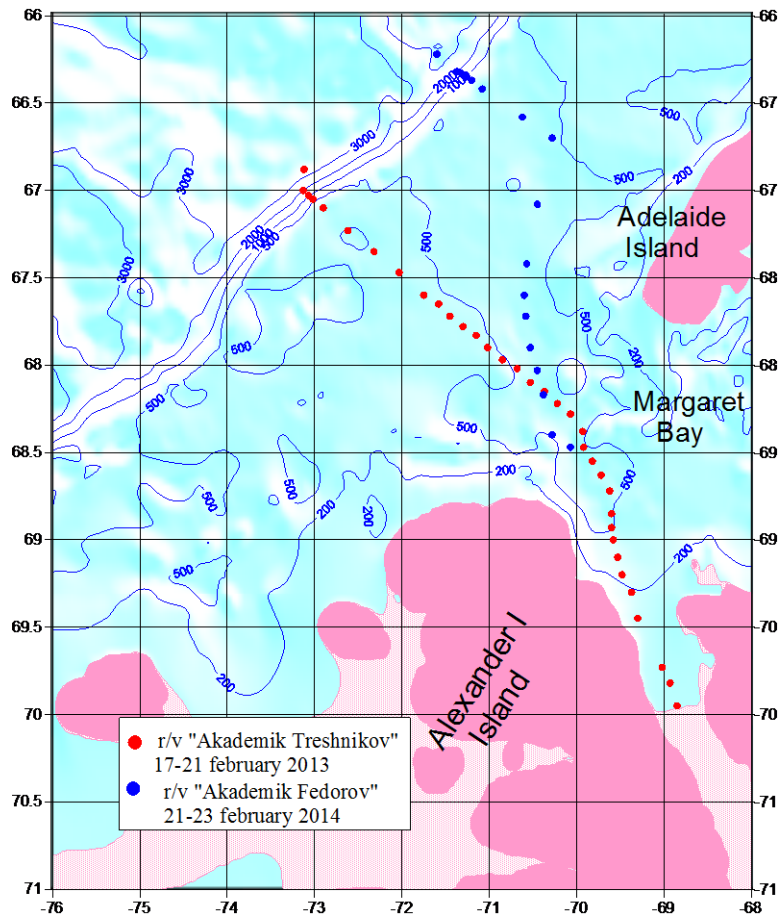


Fig. 3. AARI oceanographic stations in Bellingshausen Sea during the annual Russian Antarctic Expeditions

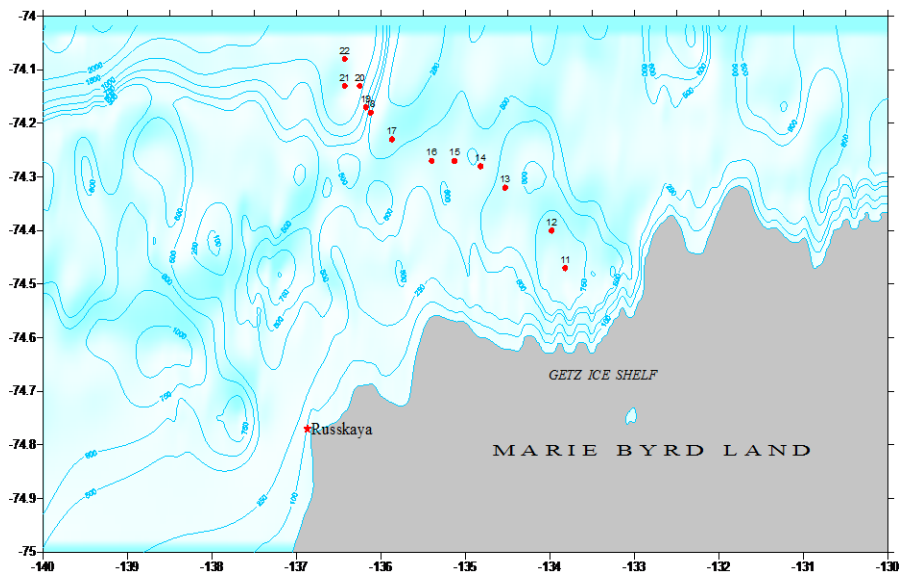


Fig. 4. AARI oceanographic stations near Russkaya station in January 2014

**P.P. Shirshov Institute of Oceanology of the Russian Academy of Sciences (IO RAS)
36, Nakhimovski prospect, 117997, Moscow**

Research Vessel	PI	Region	Project
r/v <i>Akademik Ioffe</i> (January – March 2012)	O.V. Levchenko Ioran@atlas.baltnet.ru	Drake Passage, Scotia Sea (see Fig. 5)	Antarctic Circumpolar Current monitoring Program of RAS
r/v <i>Akademik Ioffe</i> (October – December 2012)	O.V. Levchenko Ioran@atlas.baltnet.ru	Drake Passage	Antarctic Circumpolar Current monitoring Program of RAS
r/v <i>Akademik Sergei Vavilov</i> (January – March 2012)	Alexei Sokov sokov@ocean.ru	Drake Passage, Scotia Sea	Antarctic Circumpolar Current monitoring Program of RAS
r/v <i>Akademik Sergei Vavilov</i> (October – December 2012)	Evgene Morozov egmorozov@mail.ru	Drake Passage	Antarctic Circumpolar Current monitoring Program of RAS
r/v <i>Akademik Ioffe</i> (January – March 2014)	Alexei Sokov sokov@ocean.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)
r/v <i>Akademik Ioffe</i> (November – December 2014)	O.V. Levchenko Ioran@atlas.baltnet.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)
r/v <i>Akademik Sergei Vavilov</i> (January – March 2014)	Alexei Sokov sokov@ocean.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)
r/v <i>Akademik Sergei Vavilov</i> (October – December 2014)	Alexei Sokov sokov@ocean.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)
r/v <i>Akademik Ioffe</i> (January – March 2015)	O.V. Levchenko Ioran@atlas.baltnet.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)
r/v <i>Akademik Ioffe</i> (September – December 2015)	Elena Ivanova e_v_ivanova@ocean.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)

r/v <i>Akademik Sergei Vavilov</i> (January – March 2015)	Alexei Sokov sokov@ocean.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)
r/v <i>Akademik Sergei Vavilov</i> (September – December 2015)	Evgene Morozov egmorozov@mail.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)
r/v <i>Akademik Ioffe</i> (January – March 2015)	O.V. Levchenko Ioran@atlas.baltnet.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)
r/v <i>Akademik Sergei Vavilov</i> (January – March 2015)	Alexei Sokov sokov@ocean.ru	Drake Passage, Scotia Sea	Hydrological structure and circulation of the Southern Ocean (Program of RAS)

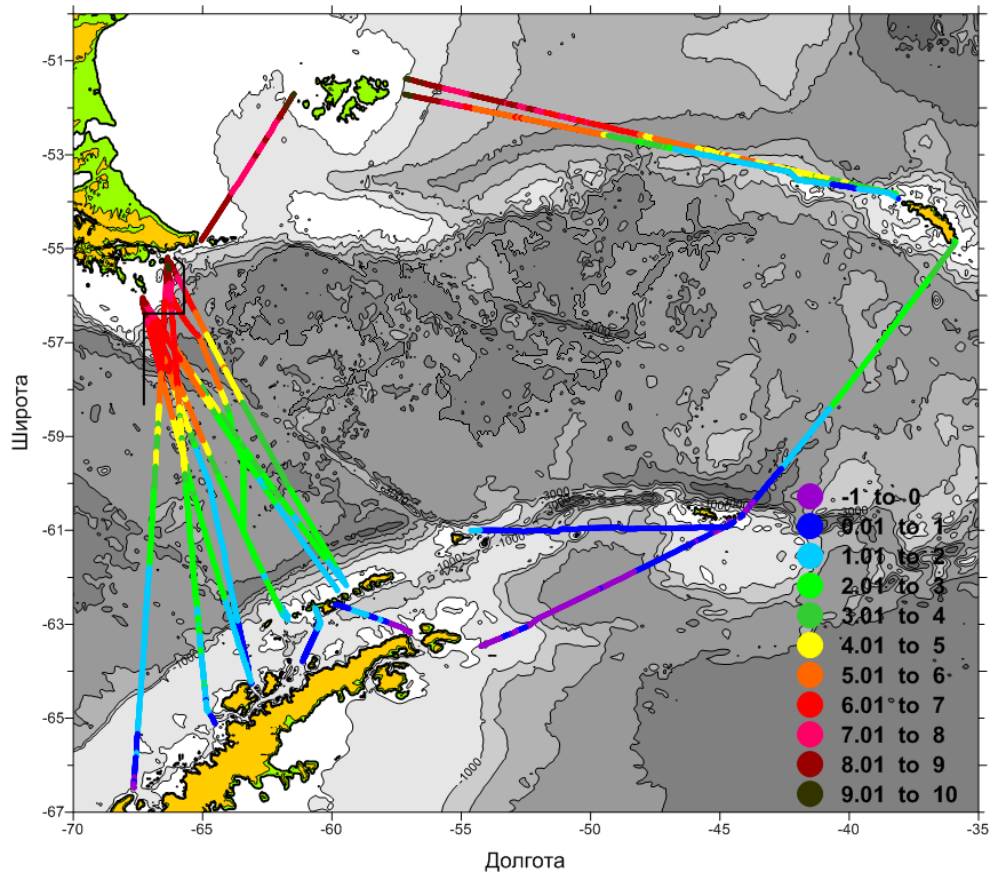


Fig. 5. R/V *Akademik Ioffe* oceanographic sections in Drake Passage and Scotia Sea (January – March 2012). Surface temperature is given by different colors.

2. Modeling?
No activity

3. State estimation?
No activity

B. Planned activities

1. Observational?

Arctic and Antarctic Research Institute (AARI) – 2016/2017

i) Repeated section along 70° E (January 2017, r/v *Akademik Fedorov*)

Project: Oceanographic program of the Russian Antarctic Expedition (RAE)

PI: Alexander Klepikov (klep@aari.ru)

ii) Circumantarctic cruise (December 2016 – March 2017, r/v *Akademik Treshnikov*)

Project: Antarctic Circumnavigation Expedition (ACE)

PI: Alexander Makarov (makarov@aari.ru)



Fig. 6. Planned cruise map for ACE on r/v *Akademik Treshnikov* (20 December 2016, Capetown – 18 March 2017, Capetown).

P.P.Shirshov Institute of Oceanology of the Russian Academy of Sciences (IO RAS) – 2016/2017

- iii) Drake Passage studies (March – April 2017, r/v *Akademik Sergei Vavilov* , r/v *Akademik Ioffe*)

Project: Hydrological structure and circulation of the Southern Ocean (Program of RAS)

PI: Alexei Sokov (sokov@ocean.ru)

- iv) Drake Passage studies (October 2017 – March 2018, r/v *Akademik Sergei Vavilov* , r/v *Akademik Ioffe*)

Project: Antarctic Circumpolar Current monitoring Program of RAS

PI: Sergei Gladyshev (sgladyshev@ocean.ru)

2. Modeling?

No activity

3. State estimation?

No activity

SORP terms of reference <http://www.clivar.org/clivar-panels/southern>

"To serve as a forum for the discussion and communication of scientific advances in the understanding of climate variability and change in the Southern Ocean. To advise CLIVAR, [CliC](#), and [SCAR](#) on progress, achievements, new opportunities and impediments in internationally-coordinated Southern Ocean research."

Specific Activities:

1. Facilitate progress in the development of tools and methods required to assess climate variability, climate change and climate predictability of the ocean-atmosphere-ice system in the Southern Ocean.
2. Identify opportunities and coordinated strategies to implement these methods, spanning observations, models, experiments, and process studies.

3. Provide scientific and technical input into international research coordination, collaborating as required with other relevant programs, including the [Southern Ocean Observing System \(SOOS\)](#).
4. Monitor and evaluate progress in Southern Ocean research, and identify gaps.
5. Enhance interaction between the meteorology, oceanography, cryosphere, geology, biogeochemistry and paleoclimate communities with an interest in the climate of the Southern Ocean.
6. Work with relevant agencies on the standardization, distribution and archiving of Southern Ocean observations.