

# PROTOCOL

## of the Annual Meeting between Norwegian and Russian Scientists Hamn i Senja, 12-16 March 2012

According to the Joint Russian-Norwegian research program on living marine resources in 2012, approved by the 40<sup>th</sup> Session of the Joint Russian-Norwegian Fisheries Commission (further referred to as the Commission), the Annual Meeting between Russian and Norwegian scientists was held at Hamn, Senja, on 12-16 March 2012.

The list of participants is given in Appendix 1 and the agenda is attached in Appendix 2. The suggested working group and terms of reference (see 9.1) is attached in Appendix 3.

### 1. Plenary on main areas of cooperation

#### ***Ecosystem surveys in the northern waters: A common goal for the IMR-PINRO Barents Sea Ecosystem Survey (BES)***

The matter has been discussed, and the following aim has been agreed upon: This survey should have the aim of making us operational on all trophic levels in the Barents Sea.

The aim of BES today is to monitor the state of the Barents Sea Ecosystem to support scientific research and management advice.

The meeting agreed that a joint PINRO/IMR group should be formed to elaborate on these matters.

The scientists agreed to continue BES as usual until a new goal has been agreed upon, by identification and quantification of as many species as possible, and the conduction of all other disciplines as usually done in BES (climate, pollution, etc). If necessary, the survey area will be extended northwards.

### 2 Marine environment

#### ***2.1 Hydrographic conditions in the Barents and Norwegian Seas***

The conditions of the Barents and Norwegian Seas environment in 2011 were presented and discussed.

The Atlantic Water temperature in the Barents Sea was 0.1–1.1°C higher than the average throughout 2011. Since 2009 the Atlantic Water temperatures have decreased while the volume flux of Atlantic Water into the Barents Sea has weakly increased. Throughout the year of 2011, the ice coverage of the Barents Sea was less than the long-term average. The water temperature in the Barents Sea in 2012 is expected to be typical of warm years and similar to that in 2011.

## ***2.2 Exchange of oceanographic data for 2011***

In accordance with the decision of the 40th Session of the Commission, the scientists exchanged oceanographic data from BES in the Barents Sea conducted in autumn 2011 and the data on the average temperature and salinity on standard oceanographic sections. PINRO also provided data from the 2012 winter survey, while IMR will provide the same data by correspondence within April 2012. The scientists agreed to continue the exchange of data from the joint Russian-Norwegian surveys in the future.

## ***2.3 Discussion of the results from research on the standard sections***

The preparation of a joint scientific paper was discussed. The further work will be conducted by correspondence.

## ***2.4 IPY project BIAC, discussion of possibilities for equipment and data transfer***

PINRO has met its obligations under the contract with IMR concerning the BIAC project 2007/2008.

The problem with releasing the data and equipment will be brought to the Norwegian Ministry of Foreign Affairs for assistance.

## ***2.5 Other business***

The scientists agreed to optimize the hydrographic presentations in a plenary session during the March meeting. For the future there will be only one presentation held by the host country.

The scientists discussed the participation of PINRO oceanographers in the IMR scientific cruises. IMR will provide information about the possibilities of such participation and cruise dates within the following month.

## **3 PLANKTON**

### ***3.1. Exchange of biomass data from BES***

Since 2004, PINRO and IMR have produced common biomass distribution maps from BES. Zooplankton biomass in the autumn will give us estimates of the potential zooplankton production the following year, and thus feeding conditions for capelin and other fish. Data on total plankton biomass from BES in 2011 were exchanged and the map was prepared for 2011. Such collaboration will continue in the future.

### ***3.2. Exchange data on mesozooplankton on standard sections***

Since 2008 IMR and PINRO have agreed to exchange species composition data from two standard transects. This year IMR transferred data on mesozooplankton on the Fugløya - Bjørnøya section in 2010 and PINRO transferred similar data on the Kola transect in 2011.

### ***3.3. Further cooperation***

Joint cooperation of plankton investigations carried out in the Barents Sea is difficult due to use of different gears by PINRO and IMR (WP2 and Juday net). Despite of two different works on methodology, carried out in 2007, where Norwegian and Russian sampling gears were compared, no further changes in sampling methods have taken place (e.g. a hauling speed).

A more detailed analysis of the plankton samples is conducted at PINRO, while such analyses at IMR is restricted to determination of the most important species.

At PINRO there exist undigitized historical mesozooplankton data. IMR will make an effort in 2012 to raise financial support for digitizing these data. The work will take place at PINRO if financial support is achieved.

Some exchange of specialists on zooplankton for discussion and possible unification of methods may be held in 2012-2013 under available financial support.

## **4 FISH RESOURCES**

### ***4.1 Report from the Russian autumn survey on demersal fish 2011 and preliminary report from the joint winter survey of demersal fish in the Barents Sea in February 2012***

Russian scientists gave a short report on the autumn bottom survey while Norwegian scientists briefly reported on the joint winter survey.

### ***4.2 Discussions on the consequences of performing surveys every second or third year***

The discussion about the consequences to /conduct surveys at other frequencies than every year because of limited financial resources has been continued during this year. A study on quality of NEA cod assessment was made by PINRO. The study was presented in order to evaluate the consequences of possible reductions in surveys. The analysis of retrospective patterns (assessment runs with cutting data for most recent years one by one widely used by ICES) was taken as criteria of assessment quality. It was shown that the chosen reductions of survey amount led to an increased instability in the assessments. The largest interannual changes in terminal estimates were observed for periods when stock dynamics are changing from growth to decline or vice versa. The inclusion of indexes from BES into assessment does not improve the retro pattern. A number of additional problems related to possible reductions in surveys amount were highlighted in the presentation:

- The reduction of surveys creates problems because of reduction of indexes for model tunings as well as well as complicating estimation of mean weights and maturity ogives. It was observed that using both (Russian and Norwegian) surveys makes these parameters less sensitive to measurement errors. The exclusion of surveys in some years will demand the use of some adjustment method to calculate these parameters in order to compensate the data absence, an additional source of possible errors.
- If the NEA cod assessment becomes less stable the errors in the prediction is supposed to be even bigger than errors in the assessment itself. Consequently, it leads to over/underestimation of TAC.
- NEA cod recruitment prediction needs data on young fish abundance (indexes for ages 1-3) and if the number of surveys will be reduced, the quality of recruitment prediction is supposed to be reduced.
- The reductions in surveys will reduce the amount of cod stomachs collected. Hence, cod consumption estimates become less reliable. This will have a negative influence on the quality of cod, haddock and capelin TAC estimates.
- Decrease of NEA cod assessment quality will influence the quality of capelin TAC estimation since cod is taken into account in capelin catch prediction.
- A possible decrease in the quality of NEA haddock assessment and prediction, as haddock assessment depends on cod assessment through taking into account cod consumption on haddock.

- A possible decrease of the quality of Greenland halibut indexes.

It was decided to continue the evaluation of possible consequences of reduction of survey numbers. Such an evaluation should then be presented and evaluated in the ICES AFWG.

#### ***4.3 Exchange of information on capelin fishery and research activities in winter-spring 2012***

The scientists exchanged information on their research activities on capelin as well as on the development of the capelin fisheries during spring 2012.

#### ***4.4. Exchange of preliminary catch statistics***

The scientists exchanged preliminary catch statistics for some important commercial fish species from ICES areas I, IIa, and IIb for 2011 and 2012. It was agreed that there is no need for further exchange of catch statistics during the March meetings because an exchange and analysis of these is carried out in the Permanent Committee of the Commission. The scientists also submit catch statistics to the relevant international organizations such as ICES and FAO, and they are readily available. The catch statistics can also be found on the official website of the Commission ([http://www.fisheries.no/resource\\_management/International\\_cooperation/Fisheries\\_collaboration\\_with\\_Russia/](http://www.fisheries.no/resource_management/International_cooperation/Fisheries_collaboration_with_Russia/)).

#### ***4.5 Harmonization of PINRO and IMR age reading of beaked redfish and Greenland halibut using the ICES protocol - annual exchange of otoliths and age readers***

In order to achieve the most accurate age estimates, ICES recommends methods and best practice for age reading of both redfish and Greenland halibut. Still there continue to be differences in opinion between PINRO and IMR regarding age reading methods for these species. It is recommended to start annual or bi-annual exchange of otoliths and age reading experts on these species in order to identify the differences in interpretation and to discuss possibilities for a common approach. The first meeting should be held during autumn 2012 and should include both age reading technicians and scientists involved in the development of the methods. This meeting should recommend if subsequent meetings should preferably be combined with the cod and haddock exchange meetings or held separately.

#### ***4.6 Data requirements for revision of Greenland halibut assessment***

A PINRO/IMR working group should be established to make preparation work for ICES benchmark meeting for Greenland halibut that is planned in 2013. The assessment of the NEA Greenland halibut stock is uncertain due to age-reading problems and lack of contrast in the data, as also reflected in recent ICES arctic fisheries working group (AFWG) reports. AFWG 2011 recognized the need to facilitate work toward accepted analytical assessment for this stock. In the preparation for the benchmark meeting there is a need for a joint effort by Russia and Norway to prepare and make available necessary data in good time in advance. This way it is possible to do exploratory analysis with a variety of methods using models which can be structured in various ways (by biomass/age/length/sex), and allow for exploration of the consequences of various assumptions about growth patterns. The data needed are:

Catch in tons (by quarter)

Length distribution in the catch (preferably for each quarter, but one each year would do)

Length distribution in the survey(s)

Survey index from the survey(s)

Length-weight relationships

Data should be prepared in adequate spatial and temporal resolution. It would be highly preferable if the data are available as soon as possible.

#### ***4.7 Genetic analysis of fish in the Barents Sea***

Following recommendations of Joint Russian-Norwegian Fisheries Commission the scientists discussed the details of bilateral cooperation in genetics. The main goal of the joint project is to explore the genetic polymorphism of Atlantic cod and to compare samples from different areas of the Barents Sea and adjacent waters. Investigations will be performed in parallel in two institutes – VNIRO (Moscow, Russia) and – IMR (Tromsø, Norway). The most effective mode of cooperation is to analyze same samples in both institutes using different sets of genetic markers and to pool the results. Thus mutual exchange of cod tissue samples will be required. A visit of geneticist from IMR to Moscow in August-October 2012 is recommended. The scientists also decided to start collection of polar cod and capelin genetic samples for further investigation of genetic structure of these species. The samples will be collected during BES 2012.

#### **4.8 Development of Manual for the Barents Sea 0-group fishes**

A Joint Manual for identification of 0-group Barents Sea fishes was discussed. The manual would help technicians on species identification on board and secure quality of collected data. The manual will include species biology and distribution, photos, identification keys etc. The first edition of the manual will be available for technicians during BES 2012. Scientists have also discussed the necessity to prepare joint manuals for other groups of organisms.

#### **4.9. Issues relating to harmonisation of technical regulations**

The Commission has agreed on several technical control measures for common stocks in the Barents and Norwegian Seas. These are listed in Appendix 7 of the Protocol of the Commission. However, there are a number of technical measures that need to be harmonized. The Commission agreed that the Working group on technical regulations for joint fish stocks in the Barents and Norwegian Seas should continue their work on further harmonization of technical measures. Scientists from Russia and Norway have agreed to compile a list of all the technical measures – both agreed and others. This list should be completed by June this year by correspondence, and should be considered by the WG on technical measures in September 2012. In the event that the WG cannot find a way to harmonize measures it should consult scientists to supply the necessary scientific basis.

##### **4.9.1. Bycatch in the capelin fishery**

In 2012, bycatches of cod have been observed in some areas of capelin fishery. The bycatch ranged from a few specimens to several tons. As a result, fishing vessels had to leave the productive areas. The Commission has agreed on allowed bycatch of juvenile cod during capelin fishery, while for adult fish there are certain differences between regulations in Russia and Norway. Scientists note that these differences are managerial, associated with different national regulations. Therefore, scientists believe that this issue (harmonization of permitted bycatch) should be considered at the next Working group on technical regulations for joint fish stocks in the Barents and Norwegian seas.

##### **4.9.2. Discards in the cod and haddock fisheries**

Discards of cod and haddock during the fishery may reach significant amounts. These discards are due to different reasons, but primarily it depends on the preferences of the market. However, there may occur “unintentional” discards, e.g. escapement of fish from fishing gear or by fishing gear damage. Scientists agreed that first, the Working group on technical regulations for joint fish stocks in the Barents and Norwegian seas should analyse

which types of discards are present and suggest possible solutions of the problem to the Commission.

#### **4.9.3. Joint technical regulations for species of lesser commercial value**

The Commission considered and agreed on the technical measures only for the joint stocks in the Barents and Norwegian Seas, whereas other species are regulated on a national level. In addition, during fishery the bycatches of species are not commercially attractive, but are an important part of the ecosystem, are present. Discards of non-commercial species may occur. Scientists agreed that the Working group on technical regulations for joint fish stocks in the Barents and Norwegian seas should analyse what technical measures exist in both countries for non-commercial species and suggest possible solutions of this problem to the Commission.

#### **4.10 Other business**

Capelin, cod and haddock otoliths will continue to be exchanged, according to the agreed plans. The next age reading workshop will take place in Bergen in 2013. Details will be decided by correspondence.

## **5. BENTHOS, CRABS AND SHRIMP**

### **5.1. Benthos**

#### **5.1.1 Exchange of data and coordination of plans**

PINRO and IMR have exchanged information from the benthic studies conducted in 2011.

PINRO informed that during 2011 the following activities have been carried out:

- The investigation of mega-benthos was carried out within the framework of BES in the eastern part of the Barents Sea.
- Monitoring of benthic communities along the Kola transect was been continued and 10 standard stations were covered by the grab sampling. In cooperation with the Murmansk marine biology institute (MMBI, Murmansk) the materials, collected in the Kola Section in 2010, are being processed.
- Monitoring of the red king crab impact to the benthic communities was continued and the grab sampling in 5 standard stations in the Motovsky Bay of the Barents Sea was carried out.
- Within the framework of total benthic survey of the Barents Sea 2003-2008, the taxonomical identification of the materials collected in 2005 and 2006 were in process.

– PINRO continued to work on the collection and formation of an international version of the electronic atlas, initiated in 2006

IMR informed that during 2011 the following activities have been carried out:

- The collection of mega-benthos was carried out within the framework of BES in the western part of the Barents Sea. This was made due to Russian experts participating and identifying the fauna to species level
- Within the framework of total benthic survey of the Barents Sea 2003-2008, the processing of the material collected in 2006 – 2008 is still in process.

#### The benthic research in 2012

In 2012, PINRO and IMR will continue the identification of the megabenthos from the demersal fish trawl on all vessels participating in BES. PINRO will also continue grab sampling of macro-zoobenthos in the Kola transect. PINRO will continue processing of the material collected in 2010 and 2011 in the Kola Section, samples collected in 2011 in the Motovsky Bay and material collected in the Barents Sea in 2005 and 2006 in the frame of the total benthic survey 2003-2008. Only PINRO experts will participate in taxonomic identification of mega-benthos.

#### **5.1.2 Atlas of the Barents Sea benthos**

PINRO and IMR consider it necessary to continue the multilingual form of the PINRO electronic atlas of benthos. This electronic atlas will make up the basis from where it is possible to produce a paper printed version of an atlas similar to the “Atlas of the Barents Sea fish” made by: Wienerroither R., et al., 2011. Atlas of the Barents Sea Fishes. IMR/PINRO Joint Report Series 1-2011, ISSN 1502-8828.

#### **5.2 Red king crab and snow crab**

The red king crab and snow crab issues will be discussed in May at the WGCRAb – meeting, and a supplementary report made on these issues as an appendix to the main report from the scientist meeting in March.

#### **5.3 Shrimp**

The northern shrimp issues will be discussed in October at the ICES/NAFO NIPAG–meeting.

## **6 MARINE MAMMALS**

### ***6.1 Joint Research Program on Harp Seal Ecology***

The Joint Norwegian-Russian Research Program on Harp Seal Ecology was initiated and adopted by the 35<sup>th</sup> Commission in 2006. Although both BES and abundance estimation of harp seals are in progress, the core activities of the program have not yet been properly started, as satellite tags have not been deployed on harp seals in the period 2007 – 2012 either due to lack of funding or due to Russian authorities refusing to permit deployment of satellite tags on harp seals in the White Sea.

#### **6.1.1 Current estimation of recruitment and abundance**

Harp seal pup production estimates, based on data collected during traditional Russian multispectral aerial survey (infrared [IR] and digital RGB imageries), were obtained in the White Sea between 20-23 March 2010. The total estimate (163 022; SE=32 342) is slightly higher than in 2009 and higher than in 2005 and 2008, but still less than observed in 2004 and in 2000-2003. For the West Ice population IMR is conducting a survey for abundances estimation of harp seals in March 2012. PINRO scientists are participating on this survey.

#### **6.1.2 Tagging of harp seals with satellite tags and its prospects for 2012-2014**

PINRO and IMR scientists regret that tagging of harp seals in Russian waters was not obtained in 2012. However, permission to tag harp seals in the White Sea was given by the Russian Authorities, but lack of funding hampered the tagging of seals this year.

PINRO and IMR scientists reaffirm that tagging of seals in the White Sea is the most preferable approach. In 2012 it was the intention of PINRO to do both aerial pup abundance estimation surveys and satellite tagging experiments with adult harp seals in the White Sea, but due to economical constraints none of these projects could not be carried out. In 2013 PINRO will do a new attempt to obtain funding for and carry out both aerial surveys and satellite tagging in the White Sea – if only one of the projects proves feasible, tagging will be given priority over the aerial surveys. Both PINRO and IMR scientists strongly recommend that Russian Fisheries and Funding Agencies support this very important project. During the tagging experiment, PINRO will provide the necessary logistics required for helicopter- or boat-based live catch of seals in April-May 2013. IMR will, as before, be responsible for the satellite tags, including providing all necessary technical details, as well as for providing experienced personnel and equipment for anaesthetizing seals and tag deployment. All data obtained from the tags will be available for both PINRO and IMR scientists. For proper planning and budgeting on both institutes, PINRO scientist must obtain the necessary permissions from Russian authorities before December 2012. The permission from Russian authorities is not dependent on the origin of the transmitters, both US and Russian transmitters

can be used. The transmitters cannot collect geographically positioned temperature and salinity data.

After the 2013 tagging season future seal tagging will be decided upon following an evaluation of both the tagging methods and the obtained seal movement data set. Due to low pregnancy rates and decline in pup production it will be important to focus on harp seal ecology and demographics in the coming years.

### **6.1.3 Harp seal diet and consumption studies: current work and prospects for the future**

IMR harp seal diet data (contents from gastrointestinal tracts and faeces) have been collected in summer 2008 and 2010 in the Fram Strait. These data are now being analysed by a master student at the University of Tromsø. The student will also compare these results with data collected in the same area in 2004 – 2006. Samples to analyse stable isotopes in harp seals and relevant prey species are collected from the Barents Sea, and will be analysed in collaboration with the Norwegian Polar Institute this year.

IMR is also analysing time series of harp seal condition in relation to ocean climate and abundance of key prey species. The analyses will be finished in 2012 and published.

It is assumed that future tagging data will reveal major foraging areas used by the harp seals throughout the annual feeding migration. Diet studies should be carried out in these areas, together with measures of resource availability within the foraging areas to estimate prey selection. Furthermore, foraging areas in geographic regions/seasons that have not been sampled in previous stomach sampling programs should be prioritized. The first combined resource / diet sampling survey may be conducted in September / October in 2013, and a second cruise possibly in spring 2014.

## **6.2 Marine mammals observations during the annual BES**

The PINRO and IMR scientists acknowledge the importance of BES in the research of the ecology of marine mammals in the Barents Sea. During BES in 2011 one marine mammals observer participated on the PINRO research vessel, while two observers participated on the IMR research vessels. Numbers of baleen whales and white beaked dolphins observed were slightly lower than in previous years. Few harp seals were observed. The harp seals have, since the start of BES, likely been foraging outside the Barents Sea ecosystem in late summers. In 2012, two marine mammal observers will be on board research vessel Johan Hjort. One marine mammals observer will participate onboard PINRO research vessel. With restrictions in funding, it should be discussed whether it would be better to have full coverage every second year rather than a poor coverage every year. That discussion will be raised in the

BES planning group. A coverage every other year implies that PINRO and IMR scientists a) cannot provide annually updated indicators for the marine mammal community as committed in the Barents Sea management plan, and b) reduce information on key predators in this ecosystem. Furthermore, the PINRO and IMR scientists discussed the harmonization of effort on PINRO and IMR vessels. However, using two marine mammal observers rather than one combined marine mammal and seabird observer on PINRO vessel is difficult due to limited space. The PINRO and IMR scientists will combine the marine mammal data from the PINRO and IMR research vessels collected since 2003 into joint publication on marine mammal distributions in the Barents Sea, and through this work assess the possibilities of combining these data despite different effort. The PINRO and IMR scientists recommend that analyses of joint data will be presented during the meeting in March 2013.

The PINRO and IMR scientists agreed on the necessity to continue aerial observation of marine mammals and environmental conditions from Russian research aircraft, which was carried out annually from 2003-2005 as part of BES. Aerial surveys are particularly efficient for obtaining high quality results from a large area over a short time period.

### ***6.3 Aerial and coastal investigations, observations and surveys***

#### **6.3.1 Plans for new aerial surveys to assess harp seal pup production and the harp seal population in the White Sea**

PINRO plans to do aerial harp seal pup abundance estimation surveys in the White Sea in 2012 had to be cancelled due to economical constraints. If possible, a survey will be conducted in 2013.

#### **6.3.2 Reconnaissance surveys to determine if significant harp and hooded seal whelping outside traditional areas (at Greenland and in the Barents Sea)**

A reduction in extent and concentration of drift ice, and thus of harp and hooded seal breeding habitat, has occurred in recent years. Both PINRO and IMR scientists recommend to do aerial surveys to investigate whether a southward relocation of breeding has occurred for parts of the harp and hooded seal populations in the Greenland Sea, and to assess possible new harp seal whelping areas in the northern parts of the Barents Sea, between Svalbard and Franz Joseph Land, and further east to Cape Zhelaniya on the Novaya Zemlya Archipelago.

Data for pup production estimation from harp and hooded seals in the Greenland Sea will be obtained for the West Ice in March 2012. However, time is not available for reconnaissance flights during this survey.

### **6.3.3 Joint research program on grey seals (abundance, stock identity, spatial distribution, feeding and conflicts)**

In Norway grey seal pup production surveys aimed to cover all the breeding colonies along the entire coast were conducted in 2006-2008 using boat based as well as aerial surveys. There are large breeding colonies of grey seals located on the Murman Coast in Russia. Previous tagging experiments have shown that there is exchange of seals between these colonies and feeding areas in North Norway. Abundance estimation, using pup counts, in the Russian colonies has not been performed since 1991. For this reason, both PINRO and IMR scientists recommend that the Russian grey seal breeding colonies at the Murman Coast should be covered again. Ideally each colony should be visited three times (minimum twice) during the breeding period. A proposal for funding for a joint PINRO and IMR survey was submitted to the Norwegian Ministry of Foreign Affairs, but the proposal was rejected. The PINRO and IMR scientists discussed possibilities of multispectral surveys carried out by PINRO using a smaller aircraft. Norwegian participation in the grey seal surveys in Russia is highly recommended. Traditionally the Russian grey seal colonies have been surveyed by Murmansk Marine Biological Institute (MMBI), and continued cooperation with MMBI is encouraged.

PINRO and IMR scientists agreed that this task could most effectively be solved within the frames of a future joint research program, developed within the frames of the JRNFC. Such a research program was agreed upon during the 2011 JRNFC meeting. The research program addresses

- Stock identity: do the Murman Coast grey seal colonies constitute isolated stocks, or are they part of the stock distributed in North Norway, north of Vesterålen? This question will be addressed using genetic analyses.
- Spatial distribution and habitat use, e.g., what are the feeding areas for the Russian grey seals? This question will be addressed using satellite tags.
- Feeding habits and conflicts with fisheries and fish farming, through diet studies.

### **6.4 Monitoring of biological parameters in harp and hooded seals**

New reproductive samples from harp seals were collected in Barents Sea moulting patches in 2006. Observed high value of mean age at maturity and low pregnancy rate may suggest low per capita resource levels. During this same period, pup production appears to have been reduced by about 50%. According to the recommendations from ICES, data on reproductive rates should be updated at least every 5 year and the next regular sampling should therefore have been in 2011. However, this activity will be postponed to 2013, as most effort will be put into the West Ice pup production in 2012. If possible, also a PINRO scientist will participate in the IMR data collection in 2013.

Available life history data from Greenland Sea hooded seals are from the early 1990s. New sampling were completed with a dedicated research cruise to the West Ice, where approximately 150 hooded seals of all ages were be taken for scientific purposes, in July 2010. The material is being analyzed.

## **6.5 Other issues**

Diet studies of minke whales in the Barents Sea will be explored using stable isotope analyses based on samples that are collected from both minke whales and key prey species. Also, hooded seal diet studies based on stomach and fecal samples is analysed by a master student at University of Tromsø.

IMR and PINRO scientists agree that the harp seal stocks and the seal harvest are sustainably managed. A recent ban of harp seal products in EU areas has been implemented, based on animal welfare considerations. A veterinary is now being employed at the IMR, and one of the main tasks will be to document the efficiency of methods used in the seal harvest.

## **7 FISHERIES TECHNOLOGY**

### **7.1 Low impact trawling**

The impact of demersal trawling on the benthic community has caused considerable international concern. Research has therefore been undertaken to explore the possibility of diverting fishing effort from bottom to pelagic trawling. The Russian and Norwegian Scientists have collaborated closely on this research since 2008, including several joint research cruises on board both Russian and Norwegian vessels. Various trawl designs have been tested, including a new 4-panel extension and codend design. The extension was made of knotless, square-mesh netting and included a commercial sorting grid system. To improve sorting capacity, the system was made with twin extensions and codends.

Fishing experiments, including several fishing trials on board commercial trawlers have shown that the system has selectivity properties on a par with that of present-day demersal trawls. During most of the cruises availability of cod and haddock to pelagic trawling was sporadic and fishing the trawl in a semi-pelagic mode was needed to obtain commercial catches. Continued research efforts to reduce negative impacts of trawling will therefore focus on semi-pelagic designs. Due to the large opening of pelagic trawls, excessively large catches were occasionally taken during short towings. In addition codend catch sensors do not function well when selection grids are used. Research efforts have therefore been undertaken by Norwegian scientists to design catch limiting devices.

At IMR, the CRISP centre for research-based innovation has been established as a cooperation between the institute and industry partners. One of the research pillars of the centre is the development of energy efficient, selective trawls with low bottom impact. Russian scientists will be invited to participate during research cruises run by the centre (the first during 24 May to 6 June 2012) and otherwise be informed of developments. Closer cooperation between PINRO and the centre will also be discussed.

## ***7.2 Further development of methodology for king crab stock assessment surveys.***

The Scientists discussed the results of previous experiments. The Norwegian experiments compared pot and trawl catches with density estimates based on video observation in order to estimate the catch efficiency for the beam trawl and the effective fishing area of pots. The Russian experiments estimated the catching efficiency of their survey otter trawl by the use of an underwater camera attached to the headline of the trawl. The estimates for the two types of trawl were similar, 29% for the beam trawl and 37% for the otter trawl. IMR will carry out new experiments in 2012 with a towed sledge for video transect surveys. Observations will also be made on the performance of the beam trawl to explore the reasons for its low catching efficiency.

## ***7.3 Identification of methods to investigate selectivity in the crab fishery.***

Russian scientists carried out experiments to estimate the size selectivity of conical pots fitted with a circular escape windows of different diameters. The installation of the window reduced the catch of undersized crabs by approximately more than 50% for a soak time of four, three and seven days. These experiments will continue in 2012.

## ***7.4 Selective technologies to reduce bycatch of crabs in fisheries for bottom fish.***

The PINRO scientists gave an account of their experiments with a bycatch reduction device for king crabs in the trawl fishery for gadoids. The device consisted of a guiding panel and a sorting panel made of parallel ropes. Bar distance between ropes was decreased from 200 to 100 mm. With this modification, 83% of the crabs entering the trawl are now excluded it is more in 13% than with 200 mm bar distance. Loss of cod was estimated at approximately 20% and haddock 15%. The work will continue in 2012. In 2011, IMR scientists carried out experiments on king crab bycatch reduction in the gillnet fishery for cod. Comparisons were made between standard set gillnets and similar nets fitted on top of a 1 m high small-meshed panel. Initial studies of a similar design has proven successful to reduce bycatch of king crabs in the gillnet fishery for lumpsucker. Further sea trials are planned for the lumpsucker fishery.

## ***7.5 Other business***

IMR will in 2012 start a project aimed at designing a species-selective trawl. The aim is to selectively fish for either cod or haddock. Russian scientist will be invited to join in sea trials.

## **8 INVESTIGATION OF INTERSPECIFIC INTERACTIONS**

### ***8.1 Exchange of data on cod stomach content***

The exchange of data for the joint stomach content database is continued. Prior to the meeting, IMR scientists delivered data from 3807 cod stomachs from 2011 and additionally 208 ones from 2009 to PINRO, and PINRO scientists delivered data from 7825 cod stomachs from 2011 to IMR.

### ***8.2 Results from studies of pelagic fish diet (capelin, polar cod) and exchange of their stomach content data***

Results of joint PINRO-IMR investigations of capelin and polar cod diets were presented and discussed on the meeting. Since 2005 IMR and PINRO started exchange of data on diet of pelagic fishes in the Barents Sea (capelin and polar cod). This year PINRO submitted 153 polar cod stomachs from 2010 to IMR. IMR submitted 250 capelin stomachs from 2010 and 182 polar cod stomachs from 2010 to PINRO. Russian data on capelin stomachs for 2010-2011 will be transferred to IMR later during 2012.

### ***8.3 Cooperation on capelin consumption by cod from measurement to spawning to improve the capelin assessment – preparing a working document to AFWG***

Preparation of a joint working document (WD) for the Arctic Fisheries Working Group (AFWG) was discussed. The main goal of this WD is to improve capelin stock assessment by including mature capelin consumption by the mature part of the cod stock. Preliminary analysis showed that the assumption of mature cod not eating mature capelin during January-March might be considerably violated. Due to this, a modification of CapTool might be needed. This WD will be prepared and presented for the AFWG meeting in April 2012.

### ***8.4 Methodology for sampling and analysis of cod stomachs***

Methodology for sampling and analysing of cod stomachs was discussed during the meeting. Decreasing of collected cod stomachs samples and subsequently worse spatial and temporal coverage of diet data were noted by Russian and Norwegian scientists. It may result to decreasing of reliability of food consumption calculations used by Arctic Fisheries Working Group for estimations of capelin, cod and haddock stocks.

## **8.5 Other business**

Possibility of joint presentation(s) on the thematic session “Subarctic-Arctic interactions: Ecological consequences” on fish species and communities distribution for the 2012 ICES annual conference was reviewed and discussed during the meeting. Theme and participants will be defined later by correspondence.

## **9 Matters related to practical cooperation between IMR and PINRO**

### **9.1 Follow-up on meetings in February 2012**

If funding from the Norwegian ministry of foreign affairs is obtained, the relevant agreement between IMR and PINRO will be produced.

The scientists considered the protocol from the meeting held at PINRO 20-24 February on renewed cooperation on databases and ecosystem models, and decided to agree on the following points, suggested by that protocol.

#### **9.1.1 Cooperation on databases**

A Working Group should be formed with participants from PINRO and IMR, to clarify the needs for coordination of databases at PINRO and IMR, and to do the practical work needed to fulfil these needs. A proposal for the composition of the working group and terms of reference for the group are given in Appendix 1.

#### **9.1.2 Cooperation on long term modelling of effects of fishery pressure and climate change**

*Task 1: Create compatible data sets for the multispecies models*

*Task 2: Base case comparison*

*Task 3: Scenario runs*

##### Contributions

The STOCOBAR model system (STOCOBAR, Codcap and EFIBAR), Ecocod and three models from IMR (Atlantis, GADGET and BIFROST) along with two IMR databases (Sjømil and FishExchange) will be used.

##### Responsibilities

### Task 1:

Atlantis will provide time series of temperature, salinity and sea ice extent in the Barents and Nordic Seas, derived from ROMS hindcast simulations.

The option for including data from the Atlantis model database to the STOCOBAR database will be developed. Methods for downloading data from the SJØMIL database to the STOCOBAR database will be implemented. All data from the STOCOBAR database will be accessible to all project participants.

### Task 2:

All involved models will be adapted to perform comparative runs with other models in the project (possibilities for using agreed input data for the long-term model runs, change of model parameters, access to model calculations at all its stages and delivering model results). All models will run for a predefined hindcast period, and then compared to observations and each other.

### Task 3:

The approach for creating stochastic ecosystem scenarios using the SJØMIL database will be developed and implemented in STOCOBAR. Dynamic scenarios for temperature, salinity and sea ice extent by Atlantis polygons in the Barents Sea will be produced in STOCOBAR. Climate and ecosystem scenarios that are produced in STOCOBAR will be accessible to all project participants and may be used for performing comparative model runs. The scenarios for Atlantis runs will depend on the availability of physical fields, as it needs temperature, salinity, ice and fluxes as input. Gadget and Bifrost can be run with compatible physical input, these will also be available for other models in the project.

As the project also includes exploring the combined effect of fisheries and climate, the effect of different types of gear will be simulated. For this part of the cooperation, available information at PINRO and IMR on functionality and selectivity of different fishing gears (e.g. trawls, long line and nets) and catches divided by fleet/gear will be used in the models and management scenarios.

### Expected results

The following scenarios will be explored: warming climate, large fluctuations in physical conditions, changes in type of gear or areas, changes in harvest control rules/management decisions or combinations of these.

### Meetings

If funding allows, a workshop on model comparisons and climate scenarios will be held in Svanhovd in June 2012, with a follow-up during winter 2012/2013.

## ***9.2 Report from ICES WGISUR (Working Group on Integrating Surveys for the Ecosystem Approach)***

The meeting was informed about the last two meeting of ICES WGISUR (Working Group on Integrating Survey for the Ecosystem approach). The ICES WGISUR has suggested evaluation of 4 surveys, including BES. The scientists from both institutes (IMR and PINRO) agreed to make all needed information available to the workshop, which will be held in Bergen in November 2012.

## ***9.3 Organising and planning of BES in autumn – methods, vessels, exchange of personnel and operation areas for each country***

The scientists discussed the preliminary plan of BES for 2012, which will be completed by correspondence. IMR plan to invite a PINRO scientist to one of the Norwegian vessels.

## ***9.4. Field activity using instruments by each institute – formal and practical approaches***

The scientists decided to wait with the discussion of possible changes in field activities until the Ecosystem Goal has been discussed and possibly agreed upon.

## ***9.5 Development of an international trawl-acoustic survey for deep-water resources and in particular redfish, in the Norwegian Sea***

The benchmark assessment for redfish (WKRED-2012) recommended a coordinated international trawl-acoustic pelagic survey in the Norwegian Sea to be regularly conducted, particularly to support the assessment on beaked redfish. The conduction of the survey has been requested by NEAFC and agreed on by NEAFC members. The survey was carried out with international coordination in 2008, but not since then. ICES has the structure to coordinate the survey in WGRS (working group on redfish surveys), and the survey is suggested to run every second or third year. There is a need that two of the major participants, Russia and Norway, show commitment to this survey to allow for monitoring of the considerable component of the beaked redfish stock that is found in the Norwegian Sea.

## **10 MATTERS RELATED TO RUSSIAN AND NORWEGIAN ENVIRONMENT REPORTING**

### ***10.1 Joint Russian-Norwegian Environment Commission***

#### **10.1.1 Development of framework for the Barents Sea resources management plan (HAV-1)**

The participants reaffirmed their mutual interest in participating in the development within the framework of the Barents Sea resources management plan (HAV-1). PINRO scientists participation depends on funding from the Russian authorities concerned.

#### **10.1.2 Ecosystem monitoring in the Barents Sea (HAV-3)**

Scientists from PINRO and IMR have been involved in developing a program of joint Russian-Norwegian ecosystem monitoring in the Barents Sea (HAV-3). At the meeting, a list of indicators for monitoring was discussed and adopted. The list of indicators that was agreed by Norwegian and Russian scientists will be presented at the workshop on joint Russian-Norwegian monitoring, 20-22 March 2012, Tromsø.

#### **10.1.3 Joint genetic database for Atlantic salmon populations (BIO-9)**

During the March Meeting in 2009 Russian and Norwegian scientists agreed to begin developing a joint genetic database for Atlantic salmon.

In 2009-2010 a pilot project “Establishing a genetic baseline of northern salmon populations across the Russian – Norwegian border for management purposes” was carried out. In 2009 IMR and PINRO joined the project ”Sea salmon fishery – resources and potential” to increase the knowledge of adult Atlantic salmon migrations along the Finnmark coastal area, where a mixed-stock Atlantic salmon sea fisheries operate. The results illustrated that by developing a genetic baseline for Atlantic salmon populations in North-Norway and Russia, it is possible to document the genetic origin of salmon caught in the sea along the coast.

In 2011 PINRO and IMR became partners in a new project - Kolarctic KO197 (2011-2013) – “Trilateral cooperation on our common resource; the Atlantic salmon in the Barents region (Kolarctic salmon)”, where an improved baseline will be finalized, salmon migration patterns in coastal waters of North-Norway and Russia better identified, recommendations for future adaptive sustainable and knowledge-based harvesting regime developed.

The work on the development of joint genetic database for Atlantic salmon populations will be continued in 2012 under the Joint Russian-Norwegian Scientific Research Program on Living Marine Resources (Appendix 10 of the 40 JRNC). The data will also be used by a

relevant partner for constructing a genetic baseline for Atlantic salmon populations on a region-by-region level.

A brief interim progress report on cooperation is contained in Appendix 4.

#### ***10.1.4 Cooperating in mapping of the Barents Sea biocenoses (HAV5-bilateral RU-NO Environmental Commission)***

PINRO workshop 8-9 November 2011 (financed by the Norwegian Environmental Council) on Biological – Geological Seabed Mapping and Monitoring in the Barents Sea was successfully finalized and report is published in IMR-PINRO report series 1 2012.

A next geological workshop in St Petersburg (at Sevmorego) 2012 will be arranged in the case on continued financing.

#### ***10.2 Joint Russian-Norwegian Report on the status of the Barents Sea ecosystem. Working document to ICES AFWG.***

The brief variant of the updated environmental status report (NR-report) will be done. The content of this update will follow the structure of the full report in 2009 (chapter 4) on the current state of the meteorological and oceanographic conditions, phytoplankton, zooplankton, benthos, fish and fisheries. The updated report will be printed in the IMR-PINRO report series and presented at the Barentsportalen ([www.barentsportal.com](http://www.barentsportal.com)). The funding for the updating environmental status report is derived from the Norwegian polar institute.

Ecosystem information is important for AFWG because it provides the basis for the development and implementation of ecosystem approach to fisheries management. PINRO and IMR are the major institutes that provide such information. Therefore, IMR and PINRO have delivered a joint working document (WD) on the state of the Barents Sea ecosystem to AFWG yearly since 2004. This year the WD will also be a preliminary version of the brief variant of the updated environmental status report (NR-report).

#### ***10.3 Inclusion of Russian data on fish and benthos from BES and winter surveys to Circumpolar monitoring program (Arctic council).***

Circumpolar Biodiversity Monitoring Program (CBMP), a part of Conservation of Arctic Flora and Fauna (CAFF), a working group like PAME and AMAP, under Arctic Council (AC) was presented. CBMP has several expert groups with representatives from all members states of AC. From Norway, two members are appointed from IMR, Lis Lindal Jørgensen (benthos), and Edda Johannesen (fish). The inclusion of PINRO data from joint IMR PINRO surveys in the Barents Sea has to go through the Russian delegate in CBMP (currently Vadim Mokievsky, Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow). The head of CBMP in Norway (Reidar Hindrum, The Norwegian Directorate for Nature Management) will be contacted and asked to contact the head of CBMP in Russia (Vadim Mokievsky), and suggest that he write a letter to the Federal Agency of Fisheries in Russia asking for permission to include PINRO data in the CBMP work.

## 11. Russian-Norwegian Symposium

### 11.1 Report of the 15<sup>th</sup> symposium

The 15<sup>th</sup> symposium was held in Longyearbyen, Svalbard, at 7-8 September 2011. The title of the symposium was “Climatic change and effects on the Barents Sea marine living resources”. Fifty-three persons participated, and contributed with 3 opening addresses, 4 keynote talks, 31 oral presentations and 13 posters.

A proceeding has been published (*Joint IMR/PINRO Report series no 2 2011*) where all contributions are printed. In addition, some selected papers will be published in a special issue of the journal “Marine Biology Research”, which is now being prepared.

### 11.2 Program for the 16<sup>th</sup> symposium

According to the protocol from the 40<sup>th</sup> session of the Commission, the next symposium will be held in Russia during September 2013, and the title of the symposium is “Assessments for management of living marine resources in the Barents Sea and adjacent waters - a focus on methodology”. A symposium program committee has been appointed: Harald Gjørseter, Espen Johnsen and Knut Sunnanå from IMR, Norway. Yuri Lepesevich and Yuri Kovalev from PINRO and Dimitry Vasiliev from VNIRO, Russia. The symposium should include three theme sessions, all starting with an invited keynote speaker:

Theme 1: Survey strategy and methodology

Theme 2: Index calculations

Theme 3: Assessment methods

During the 2012 March Meeting, this information was considered, and it was agreed to continue the planning of the symposium by correspondence among the program committee members, with the aim to send out invitations not later than 15 June 2012.

Signed on 15 March, 2012

For PINRO

For IMR

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Yurij Lepesevich

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Reidar Toresen

## Appendix 1

	<b>Participant</b>	<b>Title</b>	<b>Affiliation</b>
1	Reidar Toresen	Research director	HI/Bergen
2	Harald Loeng	Research director	HI/Bergen
3	Harald Gjørseter	Researcher	HI/Bergen
4	Ole Thomas Albert	Head of research group	HI/Tromsø
5	Dagfinn Lilleng	Adviser	Fi.Dir./Bergen
6	Edda Johannessen	Researcher	HI/Bergen
7	Randi Ingvaldsen	Researcher	HI/Bergen
8	Elvar Hallfredsson	Researcher	HI/Tromsø
9	Elena Eriksen	Researcher	HI/Bergen
10	Terje Jørgensen	Researcher	HI/Bergen
11	Mette Skern-Mauritzen	Researcher	HI/Bergen
12	Lis L Jørgensen	Researcher	HI/Tromsø
13	Cecilie Hansen	Researcher	HI/Bergen
14	Thomas Wenneck	Chief engineer	HI/Bergen
15	Tore Jakobsen	Researcher	HI/Bergen
16	Petter Fossum	Head of research group	HI/Bergen
1	Jurij Lepesevich	Research director	Pinro/Murmansk
2	Jevgenij Shamraj	Head of research group	Pinro/Murmansk
3	Dimitrij Prozorkevich	Researcher	Pinro/Murmansk
4	Jurij Kovaljov	Researcher	Pinro/Murmansk
5	Oleg Titov	Research director	Pinro/Murmansk
6	Aleksandr Pavlenko	Researcher	Pinro/Murmansk
9	Anatoly Filin	Researcher	Pinro/Murmansk
10	Vladimir Zabavnikov	Researcher	Pinro/Murmansk
11	Alexandr Trofimov	Researcher	Pinro/Murmansk
12	Tatjana Prokhorova	Researcher	Pinro/Murmansk
13	Andrej Dolgov	Researcher	Pinro/Murmansk

## Appendix 2

### Meeting between Russian and Norwegian scientists

(Hamn in Senja, Norway, 12-16 March 2012)

#### DRAFT AGENDA (third draft)

1. **Plenary on main areas of cooperation** (*Yu.Lepesevich, O.Titov, H. Gjøsæter, H Loeng, R.Toresen*)
  - 1.1. General talks by H. Loeng and Yu. Lepesevich
  - 1.2. Eco system surveys in northern waters: A common goal for the IMR-PINRO Ecosystem Survey (L L Jørgensen).
  - 1.3. Marine mammals (?)
  - 1.4. Fisheries technology (?)
  - 1.5. Joint Russian-Norwegian Commissions (?)
  - 1.6. Russian-Norwegian Symposiums (?)
  
2. **Marine environment** (*A.Trofimov, R. Ingvaldsen*)
  - 2.1. Hydrographic conditions in the Barents Sea and the Norwegian Sea;
  - 2.2. Exchange of oceanographic data for 2010;
  - 2.3. Discussion of results from observations at standard sections;
  - 2.4. IPY project BIAC, discussion of possibilities for equipment and data transfer;
  - 2.5. Other business.
  
3. **Plankton** (*A Dolgov , P Fossum*)
  
4. **Fish resources** (*A. Russkikh, E. Shamray, D.Prozorkevich, A.Filin, Yu.Kovalev, T Prokorova, E Eriksen, H Gjøsæter, E Hallfredsson, O T Albert, T Johansen, E Johannessen, T. Jakobsen*)
  - 4.1. Report from the Russian autumn survey on demersal fish 2011 and preliminary report from the joint winter survey of demersal fish in the Barents Sea in February 2012. ;
  - 4.2. Talks on the need of performing surveys every second or third year.
  - 4.3. Exchange of information on capelin fishery and research activities in winter-spring 2012
  - 4.4. Exchange of preliminary catch statistics
  - 4.5. Harmonization of PINRO and IMR age reading of *S. mentella* using the ICES protocol – annual exchange of otoliths and age readers
  - 4.6. Data requirements for revision of Greenland halibut assessment
  - 4.7. Genetic analysis of fish in the Barents Sea (Torild Johansen, Elena Eriksen, Daria Zelanina, Vidar Wennevik, Marina Chelak )
  - 4.8. Development of Manual for the Barents Sea 0-group fishes (*E. Eriksen, T. Prokhorova*);
  - 4.9. Issues relating to harmonisation of technical regulations:
    - 4.9.1. Bycatch in the capelin fishery

- 4.9.2. Discards in the cod and haddock fisheries
  - 4.9.3. Joint technical regulations for species of lesser commercial value
  - 4.9.4. Other relevant issues
  - 4.10. Other business
- 5. Benthos, crabs and shrimp** (P Lyubin, L L Jørgensen)
- 5.1. Benthos
    - 5.1.1. Exchange of data on benthos studies in 2010 and coordination of plans for 2011: studies of by-catch in the ecosystem survey, sampling of benthos on the Kola Section, and processing of samples from the total 2003-2008 Barents Sea benthos survey.
    - 5.1.2. Discuss possibility to develop an Atlas of the Barents Sea benthos (based on ecosystem survey data for 2004-2011)
  - 5.2. Red king crab and snow crab
    - 5.2.1. Exchange of data from red king crab surveys in REZ and NEZ in 2010;
    - 5.2.2. Plans for red king crab studies in 2011;
    - 5.2.3. The next 3-year joint research program – update on objectives and problems;
    - 5.2.4. Discussion of the next symposium on crabs scheduled for 2012;
    - 5.2.5. Exchange of data from snow crab research in the Barents Sea in 2010 and coordination of plans for 2011.
  - 5.3. Shrimp
    - 5.3.1. Plans for shrimp research in 2011.
- 6. Marine mammals** (V. Zabavnikov, , M. Mauritzen )
- 6.1. Joint Research Program on Harp Seal Ecology
    - 6.1.1. Current estimation of recruitment and abundance
    - 6.1.2. Tagging of harp seals with satellite tags and its prospects for 2012-2014
    - 6.1.3. Harp seal diet and consumption studies: current work and prospects for the future
  - 6.2. Marine mammals' observations during the annual Russian-Norwegian ecosystem survey
  - 6.3. Aerial and coastal investigations, observations and surveys
    - 6.3.1. Current status and plans for new aerial surveys to assess harp seal pup production in the White Sea;
    - 6.3.2. Reconnaissance surveys to determine if significant harp and hooded seal whelping takes place outside traditional areas (at Greenland and in the Barents Sea)
    - 6.3.3. Joint research program on grey seals (abundance, stock identity, spatial distribution, feeding and conflicts);
  - 6.4. Monitoring of biological parameters in harp and hooded seals
  - 6.5. Other business
- 7. Fisheries technology** (A Pavlenko, E. Shamray, O T Albert, E Hallfredsson, T Jørgensen)
- 7.1. Pelagic trawls for gadoids;
  - 7.2. Further development of methodology for king crab stock assessment surveys;
  - 7.3. Identification of methods to investigate selectivity in the crab fishery;
  - 7.4. Selective technologies to reduce by-catch of crab in fisheries for bottom fish;
  - 7.5. Other business.
- 8. Investigation of interspecific interactions** (A. Dolgov, D. Prozorkevich, E. Johannessen )

- 8.1. Exchange of data on cod stomachs
- 8.2. Results from studies of pelagic fish diet (capelin, polar cod) and exchange of their stomach content data
- 8.3. Cooperation on capelin consumption by cod from measurement to spawning to improve the capelin assessment- preparing a working document to AFWG. (*E. Johannesen, A. Dolgov and D. Prozorkevich*)
- 8.4. Methodology for sampling and analysis of cod stomachs
- 8.5. Discussion and exchange of data on zooplankton in the Barents and Norwegian Seas
- 8.6. Other business
  
9. **Matters related to practical cooperation between IMR and PINRO** (*Yu.Lepesevich, O.Titov, E.Shamray, A. Filin, R Toresen, H Gjøsæter, C. Hansen, M. Mauritzen , L. L. Jørgensen, T. Wenneck*)
  - 9.1. Follow up on meeting in February 2012 on cooperation on databases and ecosystem models
  - 9.2. Report from ICES WGISUR (Working Group on Integrating Surveys for the Ecosystem Approach) (*E.Eriksen*)
  - 9.3. Organising and planning of ecosystem survey in autumn – methods, vessels, exchange of personnel and operation areas for each country
    - 9.3.1. How to increase the efficiency and results gain by adjusting sailing-routes of IMR-PINRO ships, station coverage, and equipments
  - 9.4. Field activity using instruments by each party – formal and practical approaches
  - 9.5. Development of an international trawl-acoustic survey for deep-water resources, and in particular redfish, in the Norwegian Sea.
  
10. **Matters related to Russian and Norwegian Environment reporting** (*O.Titov, A.Filin, P. Lyubin, L.L. Jørgensen, E. Johannessen*)
  - 10.1. Joint Russian-Norwegian Environment Commission
    - 10.1.1. Development of framework for the Barents Sea resources management plan (HAV-1);
    - 10.1.2. Ecosystem monitoring in the Barents Sea (HAV-3);
    - 10.1.3. Joint genetic database for Atlantic salmon populations (BIO-9);
    - 10.1.4. Cooperation in mapping of the Barents Sea biocenoses (HAV-5)
  - 10.2. Joint Russian-Norwegian Report on the status of the Barents Sea ecosystem. Working document to ICES AFWG.
    - 10.2.1. Prospects for further work
    - 10.2.2. Practical application
  - 10.3. Inclusions of Russian data on fish and benthos from the ecosystem and winter surveys to Circumpolar monitoring program (Arctic council).
  
11. **Russian-Norwegian Symposium** (*Yu.Lepesevich, O.Titov, M. Mauritzen, H.Gjøsæter*)
  - 11.1. Report on the 15<sup>th</sup> symposium
  - 11.2. Program for the 16<sup>th</sup> symposium in Russia on “Assessment for management of living marine resources in the Barents Sea and adjacent waters – a focus on methodology”.
    - 11.2.1. Suggestion for theme sessions
    - 11.2.2. Session chairs and editorial board for the proceedings
    - 11.2.3. Venue and meeting dates

## Working Group on joint databases

A Working Group is formed with participants from PINRO and IMR, to clarify the needs for coordination of databases at PINRO and IMR, and to do the practical work needed to fulfil these needs.

The working group will work by correspondence, and if funding allows, by meetings and/or exchange of personnel for longer periods.

Suggested participation (the actual participation will be clarified at both institutes before the March Meeting)

Institution	Name	Expertise
PINRO	Alexey Gordov (coordinator from PINRO)	Administration, computer dept
PINRO	Andrey Dolgov	Biodiversity, stomach content database
PINRO	Tatyana Prokhorova	Fish, taxonomy, survey work
PINRO	Alexey Karsakov	Oceanography
PINRO	Natalya Anisimova	Benthos
PINRO	Alexey Russkikh	Fish
PINRO	Sergey Egorov	Marine mammals
PINRO	Valery Ignashkin	Acoustics
IMR	Harald Gjøsæter (coordinator from IMR)	Sea2Data project, fish, survey work
IMR	Edda Johannesen	Biodiversity
IMR	Randi Ingvaldsen	Oceanography
IMR	Lis Lindahl Jørgensen	Benthos
IMR	Geir Odd Johansen	Sea2Data, acoustics
IMR	Trond Westgård	Databases
IMR	Bjarte Bogstad	Stomach content database
IMR	Mette Skern-Mauritzen	Marine mammals
IMR	Padmini Dalpadado	Plankton

Suggested terms of reference

1. Joint data

- a. To make a list of all historical joint surveys
  - b. To make a list of all joint datasets from these surveys and other sources, that should exist in the databases of both institutes
2. Reference data
  - a. To clarify to what extent identical reference data (code lists e.g. maturity stages for fish) can be used in the databases (raw data) of both institutes
  - b. To clarify structural changes needed in the databases in cases where identical code lists are not feasible
  - c. To suggest mapping of codes where identical code lists are not feasible, to facilitate interpretation during transfer of data between the databases
3. Quality checking of data
  - a. To clarify how identical criteria for quality assurance of data can be used at both institutes
  - b. To make any software or structural changes to the databases to secure that identical quality checks are made to all joint field data at both institutes, before the data are exchanged
  - c. To apply these common quality checks to all joint historical data before re-exchange are made (see tor 4c).
4. Future exchange of joint data and re-exchange of historic data
  - a. To clarify the methods to use in the future for easy exchange of joint datasets
  - b. To make any software needed to undertake this task
  - c. To suggest a plan for how joint data sampled in the past are re-exchanged (after thorough quality checks with common methods are applied to the data – see tor 3c) in a format specified in tor 4a
5. Agreed methods for making data products (e.g. stock size indices or estimates of food consumption by cod)
  - a. To identify data products where common methods of calculations are needed
  - b. To improve these methods

## Appendix 4

### **Interim report on cooperation between Norway and Russia in developing joint genetic database for Atlantic salmon populations**

During the March Meeting in 2009 Russian and Norwegian scientists agreed to begin developing a joint genetic database for Atlantic salmon.

Under the pilot 2009-2010 project “Establishing a genetic baseline of northern salmon populations across the Russian – Norwegian border for management purposes” a comprehensive genetic baseline for northern populations of Atlantic salmon has been developed. Samples from 51 rivers from the White Sea to Troms county in Norway have been analyzed for variation in 18 microsatellite markers.

To increase our knowledge of adult Atlantic salmon along the Finnmark coastal area, where a mixed-stock Atlantic salmon sea fisheries operate, the Institute of Marine Research (IMR-Bergen) and the Polar Research Institute of Marine Fisheries and Oceanography (PINRO-Murmansk) in 2009 joined the Kolarctic project “Sea salmon fishery – resources and potential”. The project was initiated in 2008 and was a co-operation between Norwegian Institute for Nature Research (NINA-Tromsø), Finnish Game and Fisheries Research Institute (RKTL), The County Governor of Finnmark and the three sea-fishery organizations in Finnmark.

More than 3 000 salmon captured (hook net and keyway) by local sea-fishermen along the Finnmark coast were analyzed for microsatellite genetic markers, in an attempt to define country, region and/or specific river origin of each salmon. All fish were also measured and weighed, their sex and maturity defined, the number of sea lice counted, scales were sampled from all fish.

To determine the origin of the salmon caught in the sea fisheries, the genetic data of individuals were compared to a database of genetic profiles from 51 rivers in north Norway and Russia, using statistical assignment methods. These methods assigned each fish with a given probability to possible source populations. The precision of the assignment depends both on the coverage of the genetic baseline and the number and variability of the genetic markers used.

The results of the project were published in 2011 in the report *Martin-A. Svenning, Vidar Wennevik, Sergei Prusov, Eero Niemelä og Juha-Pekka Vähä. Sjølaksefiske i Finnmark: Ressurs og potensial Del II. Genetisk opphav hos atlantisk laks (Salmo salar) fanga av sjølaksefiskere langs kysten av Finnmark sommeren og høsten 2008. Rapport: Fisken og Havet. Nr. – År 3-2011.*

The results illustrate that by developing a genetic base line for Atlantic salmon populations in North-Norway and Russia, it is possible to document the genetic origin of salmon caught in the sea along the coast. By expanding the number of baseline rivers and increasing the number of genetic markers, we will be able to not only confirm from which home region or country the salmon originate, but also determine the home river for each salmon caught.

The work on the development of joint genetic database for Atlantic salmon populations will be continued under Joint Russian-Norwegian Scientific Research Program on Living Marine Resources in 2012 (Appendix 10 of the 40 JRNC). The data will also be used by a relevant

partner for constructing a genetic baseline for Atlantic salmon populations on a region-by-region level.

In 2013, during the new Kolarctic project KO197 – Trilateral cooperation on our common resource; the Atlantic salmon in the Barents region (“Kolarctic salmon”) an improved baseline will be finalized, giving the management authorities a new tool to ensure a future viable exploitation of the northernmost Atlantic salmon populations in Europe.