ON PROSPECTS OF A NEW «SARDINE EPOCH» IN THE NORTHWEST PACIFIC

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The results of present and previous studies have shown that favorable conditions for Japanese sardine reproduction in the Northwest Pacific were observed in periods with predominance of negative winter sea surface temperature anomalies associated with establishment of the «subarctic hydrometeorological regime» in the Kuroshio−Oyashio ecosystem waters. The increase in Japanese sardine abundance in 2010−2015 noted after a decades-long pause, is explained by formation of rather strong year classes as a result of surface water cooling caused by strengthening of cyclonic activity in the KOE area during the winter periods of 2009−2015. In summer, 2016 the sardine biomass was assessed in 1.7 mln t. However, the deterioration of reproduction conditions in winter season of 2016, which may continue also in winter of 2017, suggest a sharp decrease in sardine biomass during the next years. Apparently, a new “sardine epoch” will begin not earlier than 10 years from now, taking into account its 55−60-year repeating pattern.

Keywords: Japanese sardine *Sardinops melanostictus*, Kuroshio−Oyashio ecosystem, biomass, sea surface temperature anomalies.

COMMERCIAL SHELLFISH OF THE BARENTS SEA: CURRENT STOCK STATUS AND FISHERIES

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This paper provides information on stock status of the shellfishes in the Barents Sea. The author describes distribution peculiarities and stock dynamics of crustaceous and mollusks available for domestic fish fleet. The article gives details about the history of stock development. There is a brief description of the problems of shellfish stock assessments and its rational exploitation in the article as well as technical measures for fisheries regulation. Prospects of further stock development are examined in the article. Currently, the massive part of the shellfish national catch in the Barents Sea is belonging to invasive crabs: red king crab and snow crab. The fishery importance of traditional species (northern shrimp and Icelandic scallop) is gradually reduced.

Keywords: commercial shellfish, the Barents Sea, stock status, fisheries.

MORPHOECOLOGICAL CHARACTERISTIC OF TUGUN C*OREGONUS TUGUN* FROM WATER BODIES OF THE KHATANGA'S BASIN

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The paper provides the data about morphometry and ecology of tugun from the Khatanga river. Analysis of tugun's morphometric characteristics from various water bodies in Siberia has revealed some negligible interpopulation differences. Tugun's range has specified. For the first time provides the data about tugun's food spectrum during the spawning period.

Keywords: tugun *Coregonus tugun*, migration, Khatanga basin, the Khatanga river, the Kheta river, the Kotuy river.

MODEL ANALYSIS OF STOCK DYNAMICS OF THE BARENTS SEA COD UNDER THE DIFFERENT SCENARIOS OF LONG-TERM TEMPERATURE CHANGE

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Results from the simulation of cod stock dynamics in the Barents Sea in 2015–2050 under the three alternative scenarios of temperature change are presented. According to the model evaluation, the long-term trend of temperature raise will not lead to a significant increase of population of the Barents Sea cod, unless food supply remains unchanged. The cannibalism will be the main factor limiting the growth of cod abundance. The stock biomass would increase due to acceleration of cod growth rate induced by water temperature warming. If the water temperature becomes the same as the temperature regime of the second half of the XX century, then the cod stock will decrease while maintaining the current fishing strategy. The features of the interannual dynamics of the cod stock under the various temperature scenarios are considered.

Keywords: cod, Barents Sea, temperature scenario, STOCOBAR model, cannibalism, growth rate, long-term prognosis.

TRIANGLE TANNER CRAB *CHIONOECETES ANGULATUS* (BRACHYURA, MAJIDAE) IN THE TINRO BASIN: BIOLOGY FEATURES AND FISHERY

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The paper presents data on commercial resources, morphological and biological characteristics of the triangle Tanner crab *Chionoecetes angulatus* Rathbun in one of the new areas of its fishing in the Northern Okhotsk subzone –TINRO basin. The triangle Tanner crab formed dense aggregation providing high catches in the designated area. The size composition of the male crab was characterized by a significant prevalence in the catches of large-sized individuals. The first data obtained on the triangle Tanner crab disease within the designated area. Disease prevalence was 5.5%. Localization sites of shell disease is marked. The latter supposed to be associated with intraspecific competition. Studies of 2014–2015 allow to increase the volume of recommended catch quotas in 3 times.

Keywords: triangle Tanner crab *Chionoecetes angulatus*, Okhotsk Sea, Northern Sea of Okhotsk subzone, TINRO basin, fishing traps, shell disease.

JOINT RUSSIAN-NORWEGIAN FISHERY COMMISSION: FROM ORIGIN THROUGH CONFIDENCE INTO FUTURE (PERSONAL VIEW OF INVOLVED PARTY)

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In 1974–1976, the author was involved in development of intergovernmental agreements on creation of the Joint Russian-Norwegian Fishery Commission (JRNFC) and on bilateral relationships in the area of fisheries. In 1976–1991, he joined 10 JRNFC meetings, mostly as an official Governmental Representative of the USSR – Head of the Soviet delegation. Later, in 1992–1996, working in the Russian Federal Agency for Fisheries, he supervised the materials for the Russian delegation at annual JRNFC meetings. In 1979–1987, the author was the USSR Governmental Representative to the Joint Russian-Norwegian Fishery Commission.

Keywords: Joint Russian-Norwegian Fishery Commission, intergovernmental agreements of 1975, and 1976, Treaty between the Russian Federation and the Kingdom of Norway on Maritime Delimitation 2010, Spitsbergen Treaty 1920, TAC, regulating measures for fisheries, control on fisheries.

SOME ASPECTS OF THE JOINT RUSSIAN-NORWEGIAN FISHERIES COMMISSION ACTIVITY (VIEW FROM INSIDE)

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The author was fortunate to participate at the Joint Russian-Norwegian Fisheries Commission (JRNFC) annual meetings since 1995 as a member of the scientific group. Due to this, over the past two decades he was one of the advice developers of scientific recommendations to the Commission on the regulation of fisheries in the Barents Sea. Most of the fisheries analysts regards fisheries management regime and the cooperation between national research Institutes adopted and implemented by the JRNFC in the Barents Sea as one of the best example of bilateral cooperation between the countries in the network of similar fisheries commissions. The author also believes that the JRNFC fishing activity deserves a high assessment, as evidenced by, inter alia, the recovery and growth of the Barents Sea cod stock since 2000. Whereas 2016 year is anniversary from beginning of JRNFC work so interest to history its formatting is logical and it is appropriate even if short review of some aspects of the Commission activity. In author opinion some fisheries management measures adopted and implemented by the JRNFC, including strategically important ones, not fully take into account the biological features of the of exploited populations and their place and role in the Barents Sea ecosystem. The article gives a brief analysis of the 40-year period of the JRNFC activity, examines its successes and failures. At the same time on basis of made analysis in some areas of the Commission's work the ways of more effective vindicating and realization of the Russian fishing interests are proposed.

Keywords: bilateral cooperation, NEA cod, haddock, greenland halibut, king crab, discards, catch quite, TAC, harvest control rule.

HISTORY OF DEVELOPMENT OF THE ALLOCATION KEY FOR THE BARENTS SEA GREENLAND HALIBUT

© 2016 y. K.V. Drevetnyak, A.A. Grekov, Yu. A. Kovalev, E.A. Shamray, N.A. Yaragina

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Management of fisheries in the Barents Sea and adjacent waters by the Joint Russian- Norwegian Fisheries Commission (JRNFC) over the past 40 years can by right be regarded as one of the best in the world. Despite some problems on which work is still in progress it can be stated that the JRNFC has resolved major strategic issues that allowed achieving such a success. The work of the

Commission receives massive media coverage, however, aspects of no small importance often remain off-screen and can be known only from memoirs years later.The authors of this article along with O.V. Smirnov were directly involved in scientific research on Greenland halibut, work of JRNFC and its Working Groups and consider it important to pay due attention to this important species targeted by the Russian fisheries. Having known Oleg Smirnov very well, his love of life, dedication and sense of humor the authors in some cases divert intentionally from strict and matter-of-fact description of events so that to highlight the multifaceted nature of solution to the question under consideration.The article describes relatively unknown facts in the work of the Joint Russian-Norwegian Fisheries Commission (JRNFC) relating to the regulation of the Greenland halibut fishery in the Barents Sea. Particular attention is given to the history of developing the quota allocation key for Greenland halibut and the role of scientific research in this process.

Keywords: Joint Russian-Norwegian Fisheries Commission, Greenland halibut, scientific research, TAC allocation key, fisheries regulation.