

**Proposed Cruise Plans of Russian Research Vessels for Pacific Salmon Marine  
Life Period Studies in 2020**

by

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# **Proposed Cruise Plans of Russia Research Vessels for Pacific Salmon Marine Life Period Studies in 2020**

**Keywords:** Pacific salmon, cruise activity, trawl survey, Okhotsk Sea, Bering Sea, Pacific Ocean.

## **ABSTRACT**

Two Russian research vessels are scheduled to conduct salmon surveys in summer and fall 2020. R/V “Professor Kaganovsky” will carry out a summer monitoring survey in the Pacific waters off Kuril Islands in June–July. The primary objectives are to collect biological information on plankton and nekton communities, and describe the physical and biological oceanographic conditions in this region. The major purpose of these studies is the estimation of anadromous Pacific salmon abundance and biomass for short-term forecasting of their returns and possible catches on the coasts of the Sea of Okhotsk. R/V “TINRO” and R/V “Professor Kaganovsky” will operate in the western Bering Sea and then in the southern Okhotsk Sea. The major purpose of these studies is the estimation of postcatadromous Pacific salmon abundance for forecasting of their returns and possible catch in the next years.

## **INTRODUCTION**

Surveys plan for Pacific salmon research in 2020 is a logical continuation of previous studies on salmon marine ecology. According to the national research plan, Russia will continue monitoring of the state of the Okhotsk and Bering Seas and Pacific waters off Kuril Islands ecosystems. The studies on salmon distribution, food habits, dependence of salmon feeding on biomass and composition of plankton and nekton communities, changes of biological condition of fishes during the foraging, salmon spatial differentiation, structure of stocks contributing to the mixture and the influence of abiotic environment upon the salmon quantitative allocation and migrations are planned. The major purpose of these studies is improving of forecast of the salmon returns.

## **METHODOLOGY OF STUDIES**

Trawlings are carried out by the standard midwater trawl, model RT/TM 80/396 m fished with four 120 m bridles. Heavy orbicular midwater trawl doors, each one of 6 sq.m, are used. Depending on towing speed the vertical spread of the trawl is 32–42 m and horizontal spread is 30–34 m. At each station the net is towed for 1 hour. The net is towed at about 4.5–5.0 kts with the headrope located at the surface (fixed layer – 0 m), particularly at night. The length of warps is 250–310 m. Each trawling is accompanied (before or after) by the collection of plankton samples using the Jedy net. Samples for fish and squid diet studies are taken from the catch of every trawling and these samples undergo on-board processing. The processing of all samples is carried out by means of express methods of analysis that were developed by TINRO.

Hydrological studies are conducted during the whole period of the survey by means of hydrological probe Neil-Brown and ICTD. The data is recorded for the fixed layer 0–1000 meters and for the areas with the depth less than 1000 meters – down to the bottom.

## **CRUISE PLAN FOR PACIFIC SALMON MARINE PERIOD OF LIFE RESEARCH DURING THEIR SUMMER MIGRATIONS**

### **SURVEYS OBJECTIVES AND TASKS**

Studies during Pacific salmon anadromous migrations are planned in the Pacific waters off Kuril Islands. The major purpose of these studies is the estimation of anadromous Pacific salmon abundance for short-term forecasting of their returns and possible catch. The studies on salmon distribution, salmon food habits, dependence of salmon feeding on biomass and composition of plankton and nekton communities, changes of biological condition of salmon during the anadromous migrations and foraging, salmon spatial differentiation, structure of stocks contributing

to the mixture and the influence of abiotic environment upon the salmon quantitative allocation and migrations are planned.

Achievement of these objectives will be accomplished through the fulfillment of the following tasks:

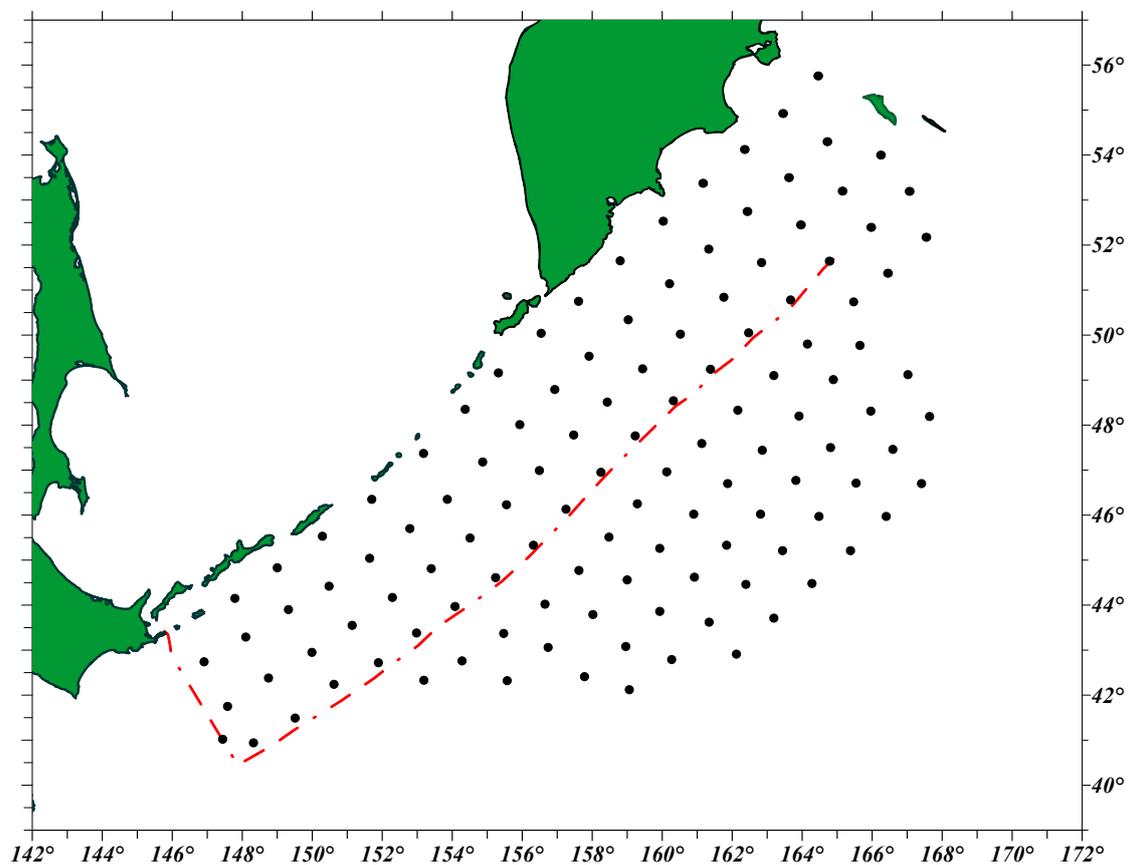
1) carrying out of trawl survey of epipelagic zone in the Pacific waters off Kuril Islands for estimation of mature and immature Pacific salmon and other nekton species abundance and biomass, assessment of their biological condition and spatial distribution patterns, size and age composition of stocks, sampling for feeding studies;

2) carrying out of plankton survey of epipelagic zone for collection of data on plankton communities composition and structure, salmon and other nekton species forage base; description and development of nektonic communities trophic structure models;

3) carrying out of hydrological survey for evaluation of climate-oceanic conditions of the Pacific waters off Kuril Islands.

### LOCATIONS AND PERIOD OF SURVEY

The salmon studies of research vessel “Professor Kaganovsky” will begin in the Pacific waters in June and end by the middle July (tentatively June 01–July 10, 2020) (Fig. 1).



**Figure 1.** Station locations to be sampled during the comprehensive survey of the upper epipelagic layer of the Pacific waters off Kuril Islands by R/V “Professor Kaganovsky” in June 01–July 10. Line is the border of Russian EEZ.

# CRUISE PLAN FOR PACIFIC SALMON MARINE PERIOD OF LIFE RESEARCH DURING THEIR FALL MIGRATIONS

## SURVEYS OBJECTIVES AND TASKS

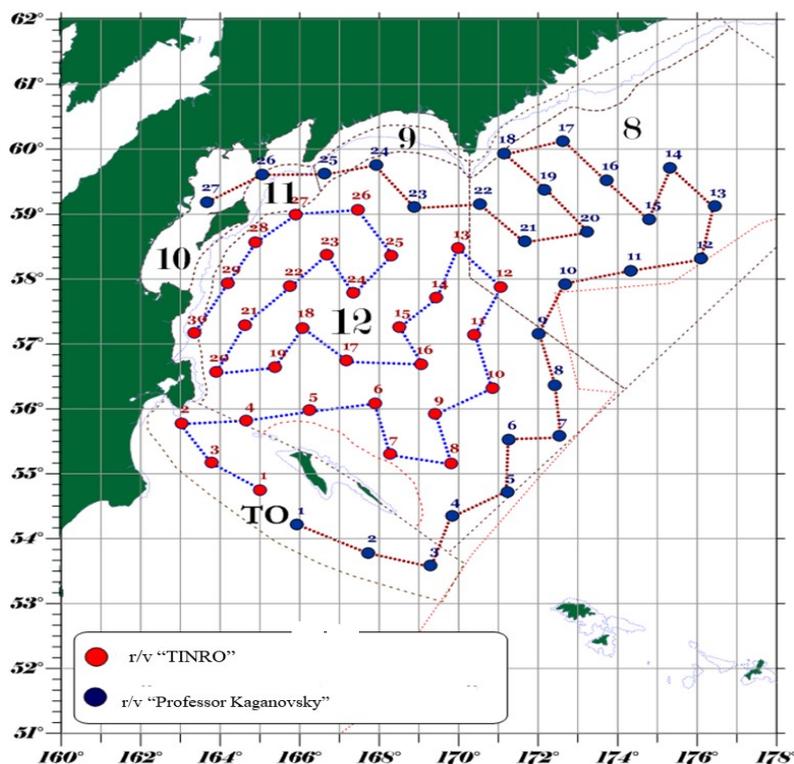
Studies during Pacific salmon postcatadromous migrations are planned in the western Bering Sea and the Sea of Okhotsk. The major purpose of these studies is the estimation of juvenile Pacific salmon abundance and biomass for forecasting of their returns and possible catch in the next years. The studies on salmon distribution, salmon food habits, dependence of salmon feeding on biomass and composition of plankton and nekton communities, changes of biological condition of salmon during the postcatadromous migrations and foraging, salmon spatial differentiation, structure of stocks contributing to the mixture and the influence of abiotic environment upon the salmon quantitative allocation and migrations are planned.

Achievement of these objectives will be accomplished through the fulfillment of the following tasks:

- 1) carrying out of trawl survey of epipelagic zone in the western Bering Sea, Okhotsk Sea and adjacent Pacific waters for estimation of juvenile and immature Pacific salmon and other nekton species abundance and biomass, assessment of their biological condition and spatial distribution patterns, size and age composition of stocks, sampling for feeding studies;
- 2) carrying out of plankton survey of epipelagic zone for collection of data on plankton communities composition and structure, salmon and other nekton species forage base;
- 3) carrying out of hydrological survey for evaluation of climate-oceanic conditions of the southern Okhotsk Sea and western Bering Sea.

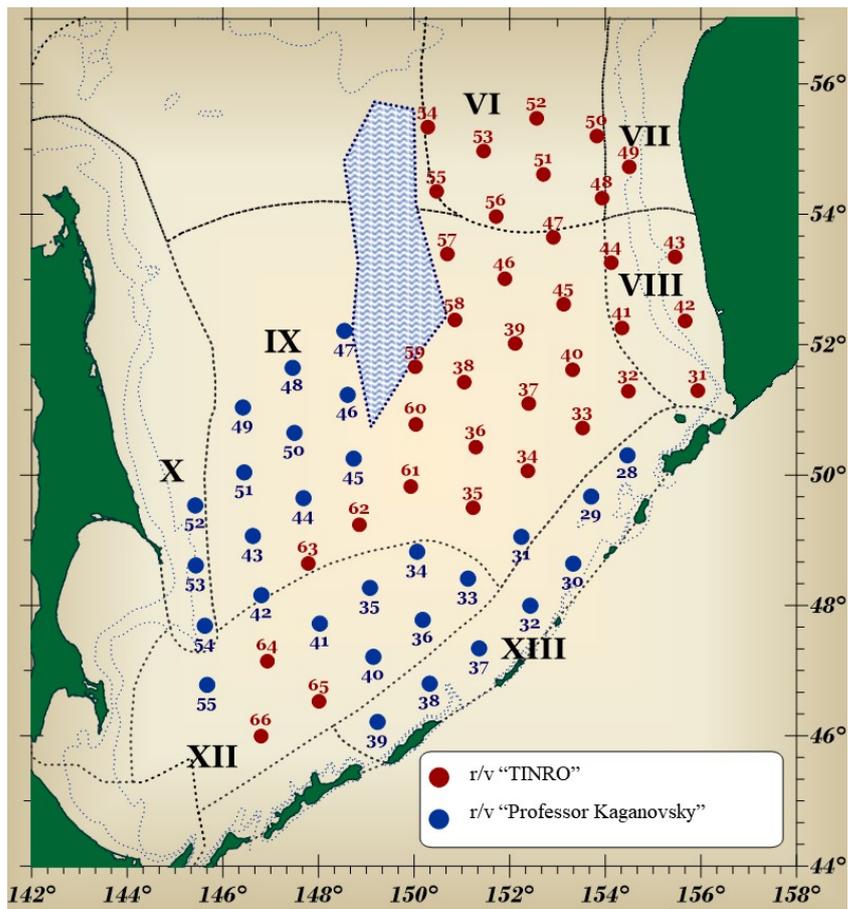
## LOCATIONS AND PERIOD OF SURVEY

Studies of Pacific salmon during their fall migrations will be conducted by R/V “TINRO” and R/V “Professor Kaganovsky” in the western Bering Sea during September (Fig. 2).



**Figure 2.** Station locations to be sampled during the comprehensive survey of the upper epipelagic layer in the western Bering Sea (September 15–October 20). Figures - designations of statistical areas

After the survey in the Bering Sea, research vessels R/V "Professor Kaganovsky" and R/V "TINRO" are planned to conduct survey in the Okhotsk Sea in October–November 2020 (Fig. 3).



**Figure 3.** Station locations to be sampled during the comprehensive survey of the upper epipelagic layer in the southern Okhotsk Sea (October–November, 2020). Roman figures - designations of statistical areas