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Abstract
The attempt to establish the relationship between current temperature conditions in fishing areas of the Northeast Atlantic (The Norwegian and Barents Seas) and the management of capelin fishery was made. The capelin stock depends on abundance of its predators, as well as on hydrological and climatic conditions, which affect the spawning success, the egg hatching, duration and direction of the larval drift, availability of micro and macrozooplankton food to capelin at its various life stages. Taking into account all these points and importance of capelin for Norwegian and Russian fisheries, we can easily understand an heightened interest in cause of the observed variations in capelin stocks. We are still inclined to see hydrology as the driving force of these variations. Hydrological conditions in concrete year influence on capelin directly, as well as its prey stocks and predators, which, in their turn, affect capelin. The sea surface temperature (SST) is the most suitable index of annual and seasonal variations in hydrological conditions. The temperature data were derived from satellite monitoring basically. Continuous long-term database on the sea surface temperature (SST) comprising results of regional satellite monitoring (the NOAA satellite data) is used to resolve several applied problems particularly for prognosis of fish recruitment strenght. The maps of SST were created with the satellite data, as well as information of vessels, buoies and coastal stations. Here we use the maps of SST in fishing areas of the Norwegian and Barents Seas to clarify impact which duration of warm and cold seasons has on successful survival of capelin during its first year of life. The identified relation between onset of these seasons and their duration can allow us to forecast strength of the next capelin year-classes. Seasonal dynamics of heat content water in areas of young capelin presence were analyzed by the time when the 5ºC isotherm passed the 35ºE meridian (from the shore till 72ºN). The 35ºE meridian and the 5ºC isotherm were chosen as reference points because there was a more vivid relationship between the time when the 5ºC isotherm passed the 35ºE meridian (shifting eastward and back) and duration of warm and cold seasons at sea. Methodologically, this study was based on analysis of main stages of the Barents Sea capelin life history aimed at identifying stages which are most sensitive to changing environment. Peculiarities of these (warm and cold) seasons in the current year affect indirectly influence abundance of new generations of fish species (capelin). Our attempts to identify such relationship yielded quite promising results. With the date of onset and duration of cold season as a predictor, we can forecast abundance of not yet the coming generation of capelin.
Key words: sea surface temperature, satellite data, maps of SST, capelin, prognosis.