NON-PROFIT ENVIRONMENTAL PROJECTS OF “SCANEX” GROUP

Specialists of “SCANEX” Holding has been conducting a number of environmental protection projects and explore unique territories of Russia. Activities are based on the use of satellite technology and geportal solutions. Integrated maps are being drawn using the geportal, which allow combining the results of the satellite images analysis and AIS data, which in near-real-time provide full information about the ship, its location and course line. Multilevel geoinformation approach allows for the synthesis of new information about the monitoring target and for its quick transfer to all interested persons.

Satellite-based ships navigation control in the White Sea, bypassing harp seal whelping areas

One of the unique regions of our country is the White Sea, where between March and April are the harp seal whelping areas. Since 2003 the number of the White Sea harp seal population started to reduce sharply. Among the main reasons are: global climate change, fishing for seals, the uncontrolled passage of ships through the whelping areas. In March 2009 a series of events took place aimed at the preservation of species, including the decision to change the itinerary of vessels bypassing seals whelping areas. To organize and control the movement of ice breakers along new routes a technique of satellite-based monitoring of ship and ice situation in the waters of the White Sea has been developed by the specialists of “SCANEX” Holding. Maps of harp seal rookeries and schemes of recommended ship traffic and routes were drawn up based on satellite imagery data, given the rapid drift of ice fields within this area. Information about the vessels that crossed the harp seal rookeries was tracked by AIS signals and quickly reported to the Ice Operations Headquarters of AMP Arkhangelsk and to FSUE Rosatomflot.

Taking images of the Atlantic walrus population habitats in the Arctic

Relying on the experience of determining whelping areas based on very high resolution optical imagery data, specialists of “SCANEX” Holding together with WWF and Marine Mammal Council activities to study the population of the Atlantic walrus species are ongoing since 2011. Project goal: detection of the new and verification of the known rookeries of animals (fig. 1), estimating the rookeries existence periods and their spatial dynamics. Probable places of the Atlantic walrus rookeries are provided by the specialists of WWF and Marine Mammal Council. The numbers of animals are evaluated based on the method, developed by “SCANEX” Holding specialists, based on a comparison of the image and the expedition data about the actual number of walruses at rookeries. This information allows you to refine the boundaries of the rookeries that shift as a result of the ice drift. Updated and unbiased information, obtained with the use of modern technologies of the aerospace monitoring, the coordinated work of concerned organizations and companies enabled to prevent in spring 2009 the uncontrolled passage of ships through the harp seals rookeries.

The information about the vessels that crossed the harp seal rookeries was tracked by AIS signals and quickly reported to the Ice Operations Headquarters of AMP Arkhangelsk and to FSUE Rosatomflot. Using optical images of the Israeli EROS satellite (spatial resolution of 70 cm/pixel) and aerial photography data has enabled to develop a method for identifying seal whelping sites based on very high resolution satellite images (fig. 1).
Ships navigation control within the Marine Protected Natural Areas boundaries

Another important aspect of environmental preservation of the biodiversity of the planet is the control of the human activity impact on the specially protected natural areas. As a rule, for the effective operation of a reserve it must be big, however it is difficult to protect large spaces. This is particularly true about marine protected natural areas, where the boundaries of a protected area are roughly defined, and the damage to the ecosystem as a result of a human impact is almost beyond calculation. Therefore, to protect a Marine Protected Natural Area it is necessary to apply new technologies.

In the year of 2012 “SCAnEX” Holding has conducted a demo project on identification of illegal navigation within the boundaries of marine protected natural areas. To assess the effectiveness of the use of satellite information in monitoring ships navigation situation within the boundaries of the nature reserves a few test areas were chosen: Far Eastern, Komandorsky, Kronotsky nature reserves, the South Kamchatka strictly protected nature reserve and Franz Josef land. AIS signals of sensors were used to identify ships that cross the boundaries of marine protected natural areas, whereas the satellite imagery data helped reveal a number of violations of small-size boats not equipped with AIS sensors (fig. 2).

After the successful completion of a demonstration project between “SCAnEX” Holding and the Komandorsky State Natural Biosphere Reserve after S. Makarov an agreement was signed whereby “SCAnEX” shall monitor illegal ships navigation within its boundaries. A prompt SMS and e-mail notification of the nature reserve security officers is set up in case of ships entering the territories of marine protected natural areas. Received information about violations encouraged initiation of prosecutions and bringing of administrative actions against ship-owners and captains. Since 2012, there has been a steady trend towards reduction in number of vessels violating conservation area regulations[6].

References

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