



## **SAR satellite - airborne technology as a new tool for monitor of biological hot spots in the aquatic environment**

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Results of multidisciplinary hydro-biological investigations of marine and inland water ecosystems in the Arctic and sub-Arctic with using SAR satellite and multi-spectral airborne sensors are presented. Shipborne in situ observations and measurements were used for validation of multi-level data.

SAR/ASAR images are applied as a basic tool for bio-monitor of polytypic waters and as a document for decision making authorities aiming on aquatic environment management and protection. As it proved the marine and inland water bodies can look a large and boundless but biological activity is concentrated in separate isolated zones - so-called biological hot spots.

As it was established in frame of our instrumental airborne and satellite studies biological hot spots are represented the specific area that has a distinct thermal anomaly or distinguishable hydrological features contrasting with contiguous waters. Different aquatic species including ecologically significant pelagic fish, sea birds, ice form of marine mammals (seals, walruses, grey and white whales) are selected these areas for temporal or continuous habitat. Overwhelming majority of these zones are possessed much high primary production and this is a reason why predators use them for feeding and foraging. But another type of biological hot spot zones is existed also that allows to aquatic species to save or protect a new-born generation from mass mortality - reproduction hot zones.

Examples of remotely detecting and monitoring of the foraging as well reproduction hot spots zones situated in the White Sea and Norwegian Sea, as well in the Baltic and

Bering Sea and Ladoga Lake will be demonstrated. Results of monitor of behavioral changes of marine mammals owing to climate change and anthropogenical press are used for the assessment of environment stability and ecological safety.