

Satellite-airborne integrated studies of behavior ecology of ice form of seals (harp seals as example)

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Seals represent high level of marine fodder chains and in order to estimate population number biologists performs ice reconnaissance. Accomplish seals computations more precisely could be done only in general. Aerial inspection is difficult, masking coloration obstructs the problems: sometimes mammals couldn't be quite founded. Using satellite SAR signatures of ice and studying ice as abiotic factor of ecology of *Pagophilus groenlandicus* and other ice-associated forms of seals is new interdisciplinary approach in marine biology. First experience of such SAR study has been undertaken in the White and contiguous seas in 1996. Sub-satellite experiments onboard nuclear icebreaker allows providing validation program, ice parameters were evaluated in connection with seal' behavior patterns. Since then aircraft Antonov-26 «Arktika» provided ice and seals investigations systematically. Specific objectives of these integrated investigations are the following: a) satellite, airborne and shipborne synchronous surveys, studying environmental and biological objects in Arctic, b) SAR signatures systematization (open water, pack and drift ice, sea, brackish-water, saltish and fresh-water ice, coastal zones, shores), c) study the behavior ecology of ice associated forms of seals, using SAR for classification and dividing rookeries and unfit zones, d) charting of water masses: arrangement, e) study of ice dynamics (ice as tracer hydrology and weather conditions), e) enumeration of population and revealing of migration tendency. Integrated comprehensive studies allow retrieving SAR signatures of different types of ice and fix that whelping floe arrangement is close related on certain type of ice and alboristic type of water masses. It was identified, that ice most commonly used by harp seals is thin second stage FY ice with thickness 30 - 70 cm. Originated from brackish-waters this ice is solid, strong and most strengthened for any mechanical impact: pressing, breaking and abrasion. As freshly salted and snow less, it has special electrical and radio physical parameters, mirror-like dark signatures. Whelping rookeries have contrast with surrounding waters. Ice unfits for whelping has grey and grey-white signatures. Bright white signal corresponds to wavy waters and broken floes where harp seals are wrecked.