METHODS FOR ASSESSING THE STATE OF FISH REPRODUCTION AREAS IN THE ARCHIPELAGO SEA, SW FINLAND

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Background
A good state of fish reproduction areas is necessary to ensure fishery productivity. Fish species use reproduction areas for spawning, breeding, feeding, growth, and shelter. These functions are often endangered in coastal areas, where human impact causes deterioration of fish habitats.

Close to harbours and navigation routes aquatic habitats are adversely affected by various human activities e.g. ship traffic, and dredging and dumping of sea floor sediments.

Excess nutrient load from municipal sewage plants, agriculture, and fish farming enhance eutrophication of coastal waters, which will result in enhanced algal blooms and oxygen depletion in bottom sediments and near-bottom waters.

Reliable methods are needed to assess the state of fish reproduction areas and the human impact on fish habitat function. We are studying the state of fish reproduction areas in the Archipelago Sea, SW Finland in a project funded by Varsinais-Suomi TE-Centre.

Methods
Characteristics of water column, sea floor deposits, and submerged vegetation are mapped e.g. by CTD-sonde equipped by turbidity and oxygen sensors, acoustic doppler current profiler (ADCP), acoustic sub-bottom profiler, sediment samples, underwater camera, aerial photographs, and by scuba diving.

Grain size distribution, contents of organic matter, and phosphorus fractions are analysed from sediments to determine the typical bottom characteristics for different fish reproduction grounds.

Phosphorus components in anoxic surficial sediments. Concentrations of solid phase-associated and authigenic P forms are low and levels of refractory organic P high. Enriched detrital P component reflects the input washed away from adjacent shores.

An acoustic profile across a main shipping route adjacent to a dumping area. The dredged waste has slid into the channel and is moved by near-bottom water currents towards the herring spawning areas in the northern Archipelago Sea.