

In situ monitoring of oxygen depletion in hypoxic ecosystems



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Observatories: Location and Status

Observatories in Land-locked Water Bodies

Kolke Fjord | Sweden

Rationale: effect of exchange and benthic activity on oxygen dynamics in a fjord system
Task: deployment of two cabled benthic observatories (real time data transfer) in the fjord & adjacent waters
Status: observatories under construction, deployment planned in Oct. / Nov. 2009

Loch Etive | Scotland

Rationale: effect of bottom water renewal on climate-driven hypoxia in a Sea Loch with limited exchange
Task: deployment of two cabled benthic observatories with real time data transfer
Status: observatories under construction, deployment planned in Nov. 2009

Lake Zurich & Lake Rotsee | Switzerland

Rationale: lake oxygenation affected by climate-driven changes of thermal stratification and wind forcing
Task: frequently monitor lake chemocline with improved probes that resolve oxygen at trace levels
Status: Probe design established. Field testing underway in different lakes

Ionian Sea Lagoons and Embayments | Greece

Rationale: effect of gas seepage and hydrography on oxygen dynamics in fjord-like & coastal systems
Task: Areal surveys and long-term monitoring by towed and moored multiparametric modules
Status: set-up and upgrade of existing modules. Deployment in early summer 2010



Observatories in Coastal and Open Seas

HAUSGARTEN deep sea observatory | Fram Strait

Rationale: potential decrease in bottom water oxygen as climate change affects deep water formation
Task: adding oxygen sensors to long-term moorings and benthic observatories
Status: Two benthic observatories equipped with oxygen optodes (Aug. 2009)

Gotland Basin | Baltic Sea

Rationale: resolving fast changes in mid water oxygen concentrations and redoxcline position
Task: deployment of a stationary profiling observatory
Status: observatory construction underway, deployment in May 2010

North-western shelf off Crimea | Black Sea

Rationale: benthic processes under oscillating oxygen concentrations
Task: deployment of a benthic observatory
Status: observatory under development, deployment planned in Apr. 2010

North-western shelf off Romania | Black Sea

Rationale: impact of climate patterns & anthropogenic nutrient supply on shelf hypoxia dynamics
Task: deployment of a benthic observatory
Status: survey of oxygen availability and benthic fauna distribution in May 2009, observatory under development, deployment planned in Apr./May 2010

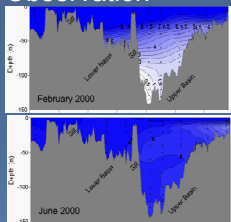
Bosporus area | Black Sea

Rationale: effect of lateral intrusions of oxic Mediterranean waters on anoxic Black Sea waters
Task: deployment of a drifting profiling observatory
Status: observatory construction finished, deployment planned in Apr. 2010

Integration in GEO /GEOSS

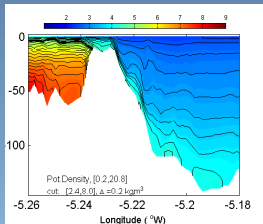
Example
Land-locked water bodies:
Loch Etive

Observation



Courtesy of REES programme 1999/2000, Scottish Association for Marine Sciences (SAMS), Dmitry Aleynik

Assimilation & Modeling



Courtesy of REES programme 1999/2000, Scottish Association for Marine Sciences (SAMS), Dmitry Aleynik

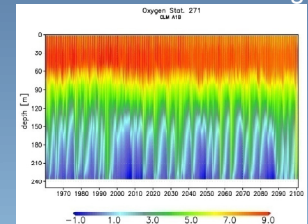
Example
Open and coastal Seas:
Gotland Gasin

Observation



Fig. from C. Bernes, Monitor 19, 2005

Assimilation & Modeling



Courtesy of T. Neumann, IOW, unpublished

