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Draft Supplemental SAB Bibliography
(12/4/2006)

The following is a draft bibliography being developed to supplement the bibliography submitted to the SAB Hypoxia Advisory Panel. The citations are sorted into the three general areas listed in the charge to the panel and, with few exceptions, cover the period 2000 – present (2006). Recent additions thought to be of interest to groups working on cross-cutting topics have been listed separately, and a list of relevant web sites is also included. This supplemental will be updated as information relevant to this review becomes available.

The following Table of Contents is provided to assist the user:

	<u>Pages</u>
Characterization of the Cause(s) of Hypoxia	1 - 28
Characterization of Nutrient Fate, Transport, and Sources	29 - 51
Scientific Basis for Goals and Management Options	52 - 56
Cross-Cutting Topics: Subgroups 2 & 3 (Effects of Ag Practices)	57
Cross-Cutting Topics: Subgroups 1 & 2 (Modeling)	58
Relevant Web Sites	59

Supplemental Information Related to:

Characterization of the Cause(s) of Hypoxia

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Abstract: Deep water oxygen concentrations in the Baltic Sea are influenced by eutrophication, but also by salt water inflows from the North Sea. In the last two decades only two major inflows have been recorded and the lack of major inflows is believed to have resulted in a long-term stagnation of the deepest bottom water. Analyzing data from 1970-2000 at the basin scale we show that the estimated volume of water with oxygen <2 ml l⁻¹ was actually at a minimum at the end of the longest so-called stagnation period on record. We also show that annual changes in dissolved inorganic phosphate water pools were positively correlated to the area of bottom covered by hypoxic water, but not to changes in total phosphorus load, thus addressing the legacy of eutrophication on a basin-wide scale. The variations in phosphorus pools that have occurred during the last decades do not reflect any human action to reduce inputs. The long residence time and internally controlled variation of the large P pool in the Baltic Sea has important implications for management of both N and P inputs into this eutrophicated enclosed basin.

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Abstract: A 38-year record of bottom water dissolved oxygen concentrations in coastal marine ecosystems around Denmark (1965-2003) and a longer partially reconstructed record of total nitrogen (TN) inputs (1900-2003) were assembled to describe long-term patterns in hypoxia and anoxia. Interannual variations in bottom water oxygen concentrations were analyzed in relation to various explanatory variables (bottom temperature, wind speed, advective transport, TN loading). Reconstructed TN loads peaked in the 1980s with a gradual decline to the present, commensurate with a legislated nutrient reduction strategy. Mean bottom water oxygen concentrations during summer have significantly declined in coastal marine ecosystems, decreasing substantially during the 1980s and were extremely variable thereafter. Despite decreasing TN loads, the worst hypoxic event ever recorded in open waters occurred in 2002. For estuaries and coastal areas, bottom water oxygen concentrations were best described by TN input from land and wind speed in July-September, explaining 52% of the interannual variation in concentrations. For open sea areas, bottom water oxygen concentrations were also modulated by TN input from land, however, additional significant variables included advective transport of water and Skagerrak surface water temperature and explained 49% of interannual variations in concentrations.

Reductions in benthic species number and alpha diversity were significantly related to the duration of the 2002 hypoxic event. Gradual decreases in diversity measures (species number and alpha diversity) over the first 2-4 weeks show that the benthic community undergoes significant changes before the duration of hypoxia is severe enough to cause the community to collapse. Enhanced sediment-water fluxes of NH_4^+ and PO_4^{3-} occur with hypoxia, increasing nutrient concentrations in the water column, and stimulating additional phytoplankton production. Repeated hypoxic events have changed the character of benthic communities and how organic matter is processed in sediments. Our data suggest that repeated hypoxic events lead to an increase in susceptibility of Danish waters to eutrophication and further hypoxia.

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Supplemental Information Related to:

Characterization of Nutrient Fate, Transport, and Sources

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Relevant Web Sites

Link to U of MD (Don Boesch) site on Hypoxia:

<http://www.umces.edu/president/hypoxiapubs/>

USGS Information on Mississippi River and Gulf Hypoxia:

<http://toxics.usgs.gov/hypoxia/>

http://toxics.usgs.gov/hypoxia/usgs_activities.html

USGS Flux calculations:

<http://co.water.usgs.gov/hypoxia/html/nutrients.html>

USGS SPARROW Modeling:

<http://water.usgs.gov/nawqa/sparrow/>

USGS NASQAN Program:

<http://water.usgs.gov/nasqan/publications/index.html>

Carbon Research:

<http://water.usgs.gov/nrp/proj.bib/sundquist.html>

Nutrient Task Force (Link to “Science Strategy...”):

http://toxics.usgs.gov/hypoxia/task_force_workgroup.html

LUMCON – list of technical references – see Library

<http://www.gulfhypoxia.net/erf/>

Links to Basin and Gulf Workshops on Hypoxia:

Upper Miss Sub-basin committee – Ames IA Workshop – 9/26-28/05

<http://www.umrshnc.org/>

Lower Miss Sub-basin committee – New Orleans, LA Workshop – 6/1-2/06

<http://www.epa.gov/gmpo/lmrsbc/index.html>

Gulf Workshop – New Orleans, LA Workshop – 4/25-27/06

http://www.tetrattech-ffx.com/hypoxia_ngm/

Science to Support Nutrient Mgmt Decisions – Workshop

http://toxics.usgs.gov/hypoxia_mmr_workshop/workshop_agenda.html