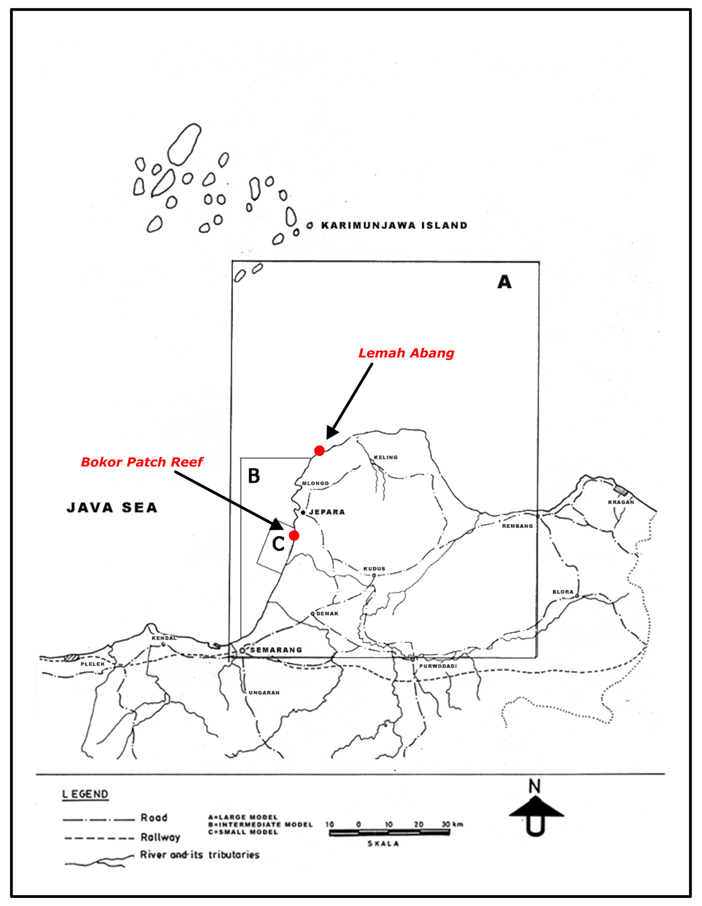


Model study area
A = the coarsest grid model
B = the finer grid model
C = the finest grid model.
(Source: Mihardja, et al., 1996).

Verification of organic nitrogen concentrations

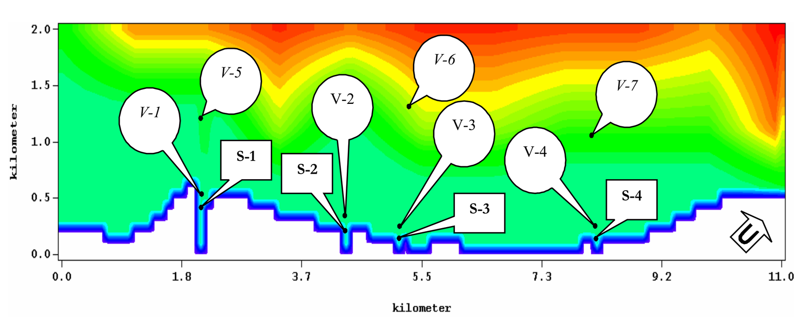
STATION	ORGANIC NITROGEN (mg/l)	
	OBSERVATION	SIMULATION
1.	0,072	0.072
2.	0,060	0,061
3.	0,066	0,066
4.	0,044	0,044
5.	0,044	0.043
6.	0,072	0,062
7.	0,056	0.040

Verification of Ammonium concentrations

STATION	AMMONIUM (mg/l)	
	OBSERVATION	SIMULATION
1.	0,002	0,003
2.	0,019	0,024
3.	0,011	0,015
4.	0,012	0,014
5.	0,024	0,023
6.	0,015	0,017
7.	0,012	0,015

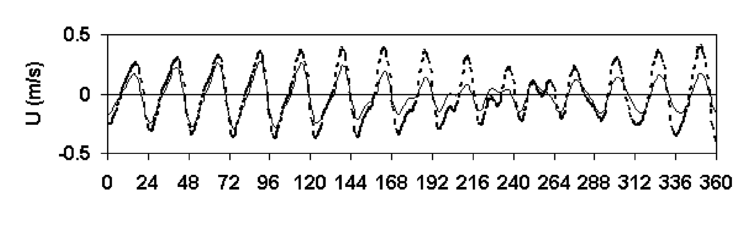
Verification of Nitrate concentrations

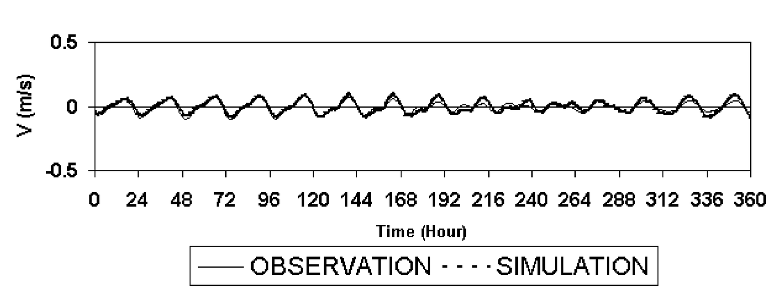
STATION	NITRAT (mg/l)	
	OBSERVATION	SIMULATION
1.	0,880	0,881
2.	0,360	0,366
3.	0,255	0,265
4.	0,320	0,327
5.	0,773	0,883
6.	0,390	0,217
7.	0,840	0,238



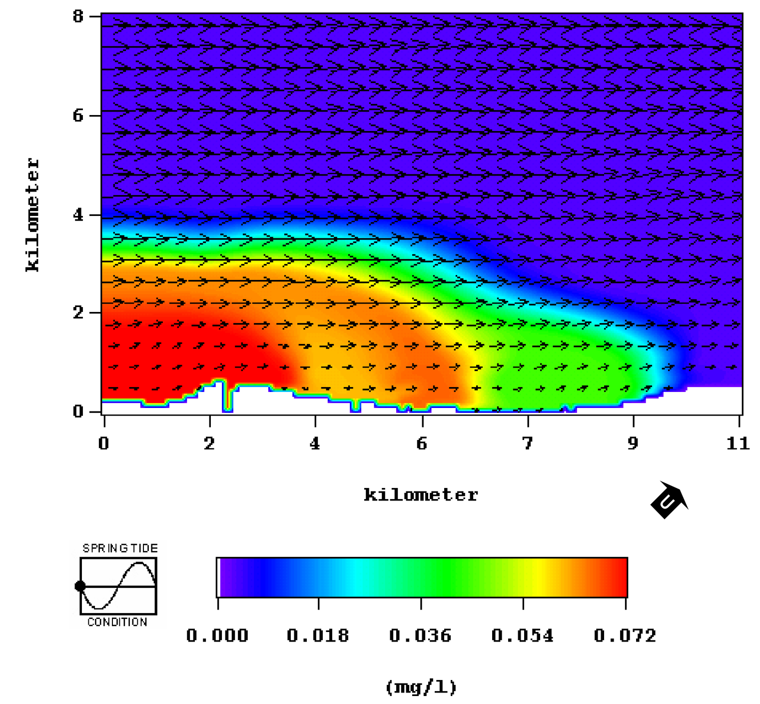
The Stations are for verifications and point sources of nitrogen compounds. Sketch in the finest grid model area.

S-1 = Source of Serang river
S-2 = Source of Kenceng canal
S-3 = Source of Gawe canal
S-4 = Source of Langgar canal
V-1 = Station 1 for Verification
V-2 = Station 2 for Verification
V-3 = Station 3 for Verification
V-4 = Station 4 for Verification
V-5 = Station 4 for Verification
V-6 = Station 5 for Verification
V-7 = Station 6 for Verification

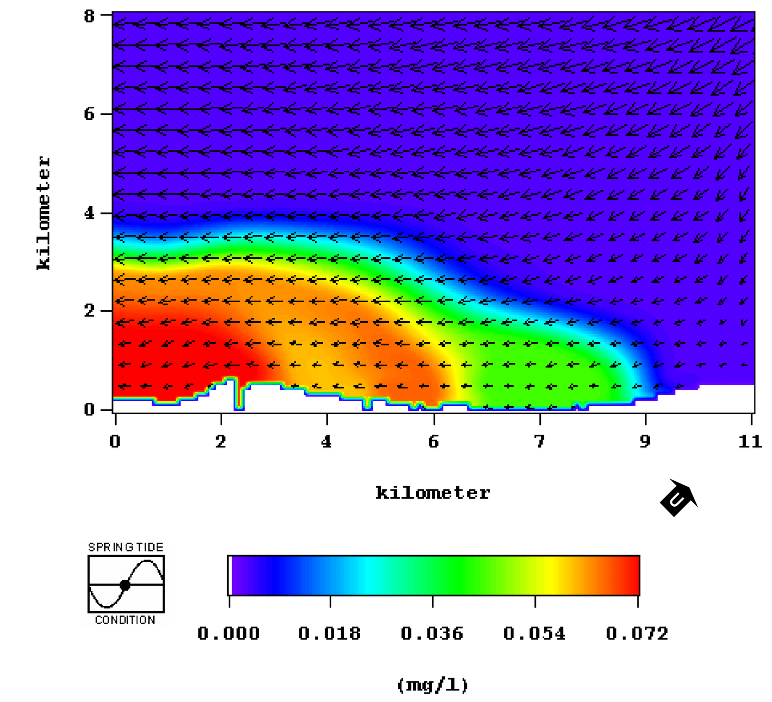




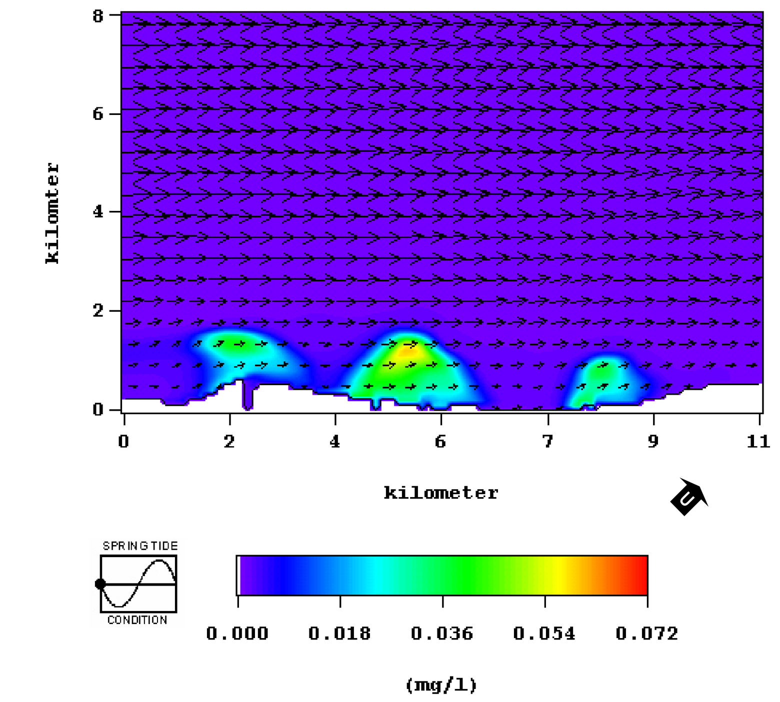
Model verification of the components of current in x- and y-direction, namely u and v respectively.



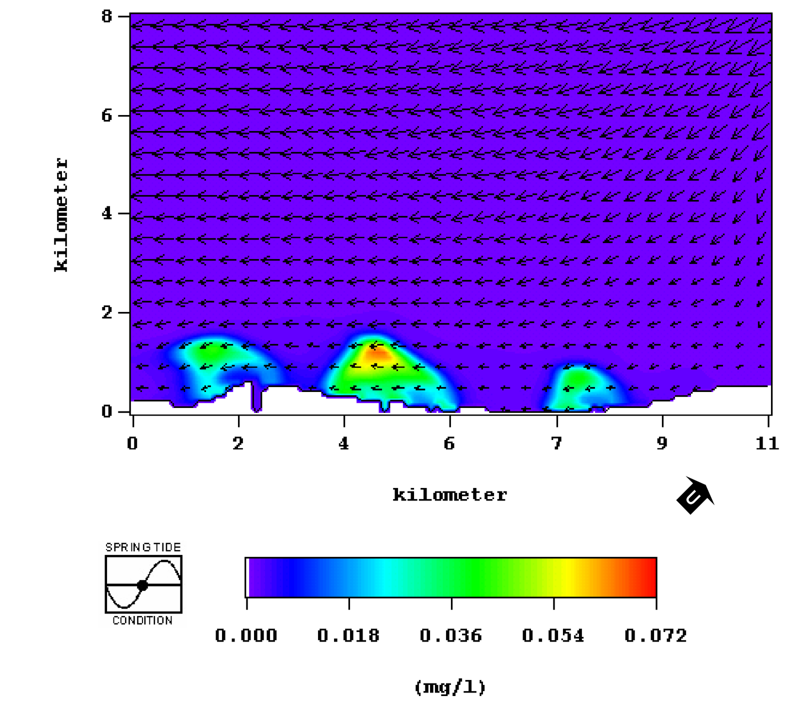
Distributions of organic nitrogen during spring ebb tide.



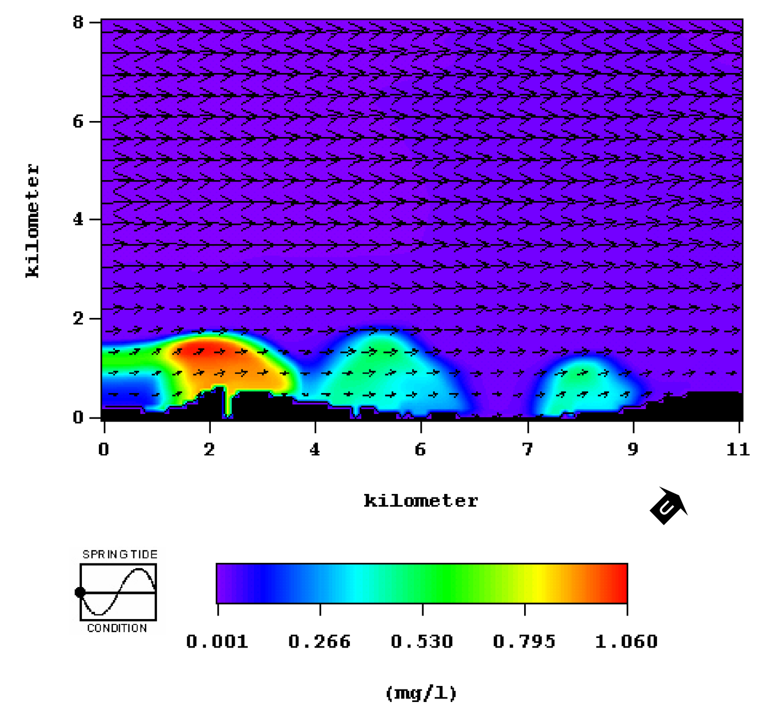
Distributions of organic nitrogen during spring flood tide.



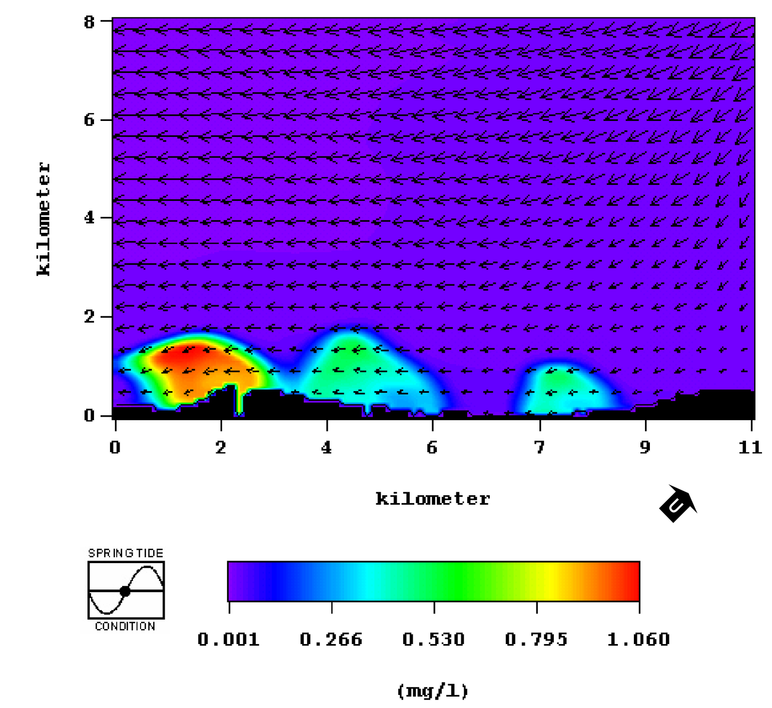
Distributions of organic nitrogen during spring ebb tide.



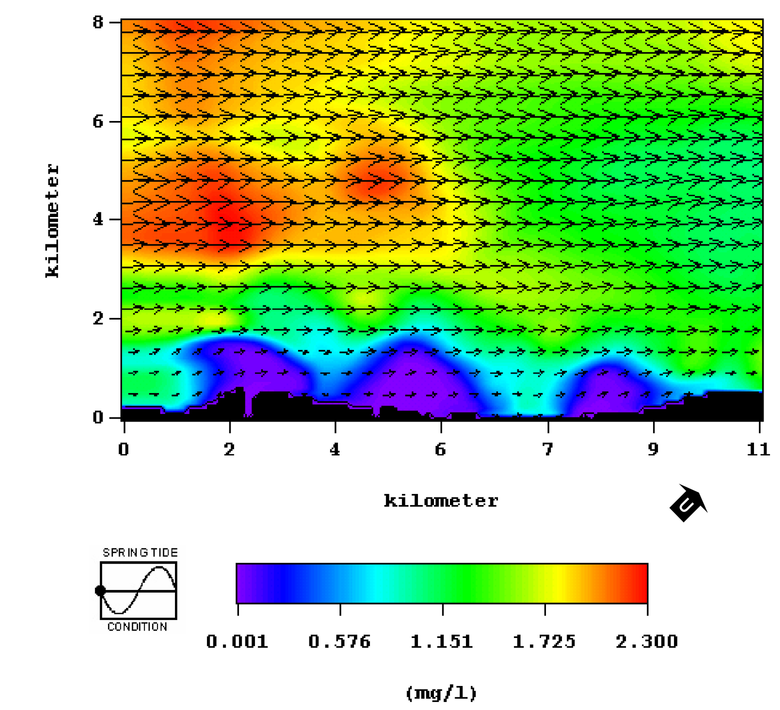
Distributions of ammonium during spring flood tide.



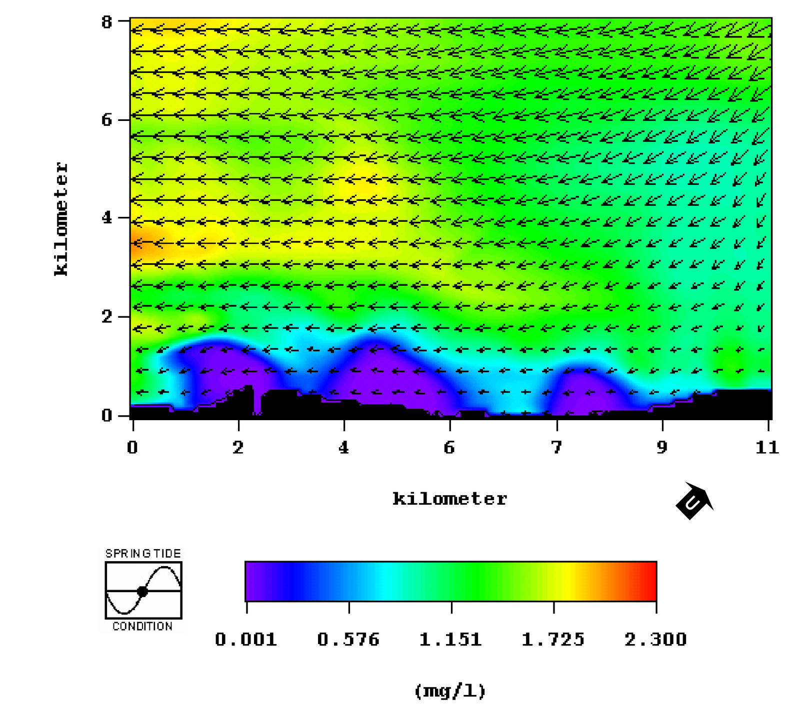
Distributions of nitrate during spring ebb tide.



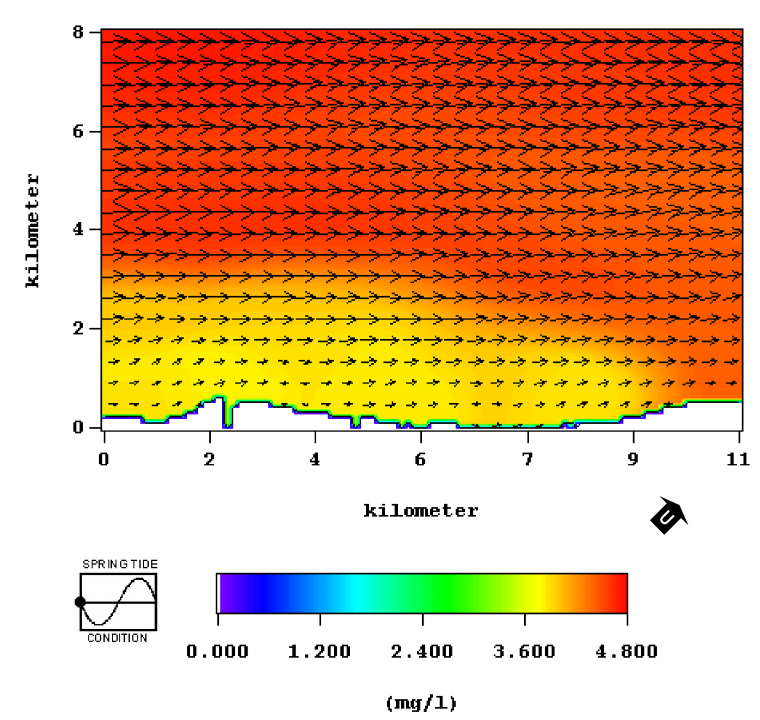
Distributions of nitrate during spring flood tide.



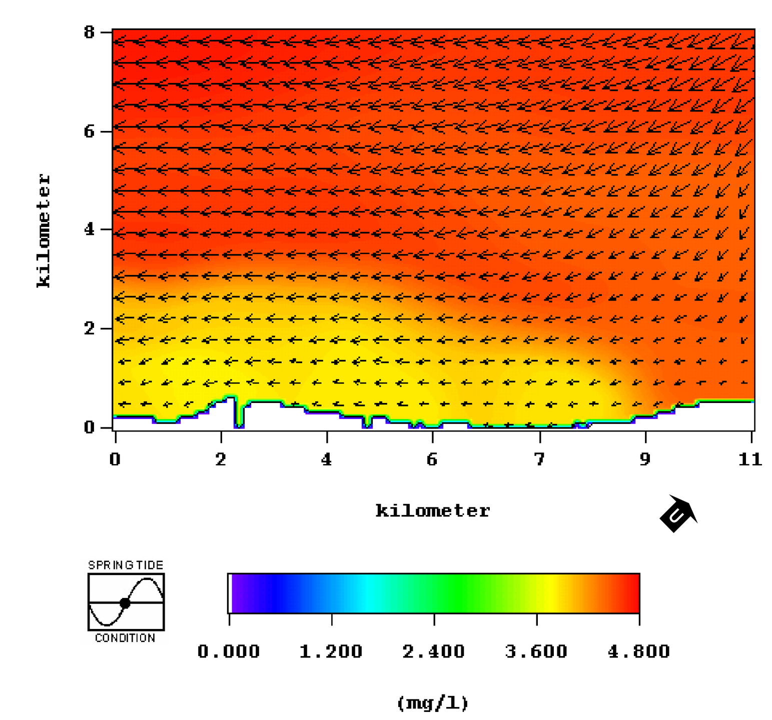
Distributions of microplankton-N during spring ebb tide.



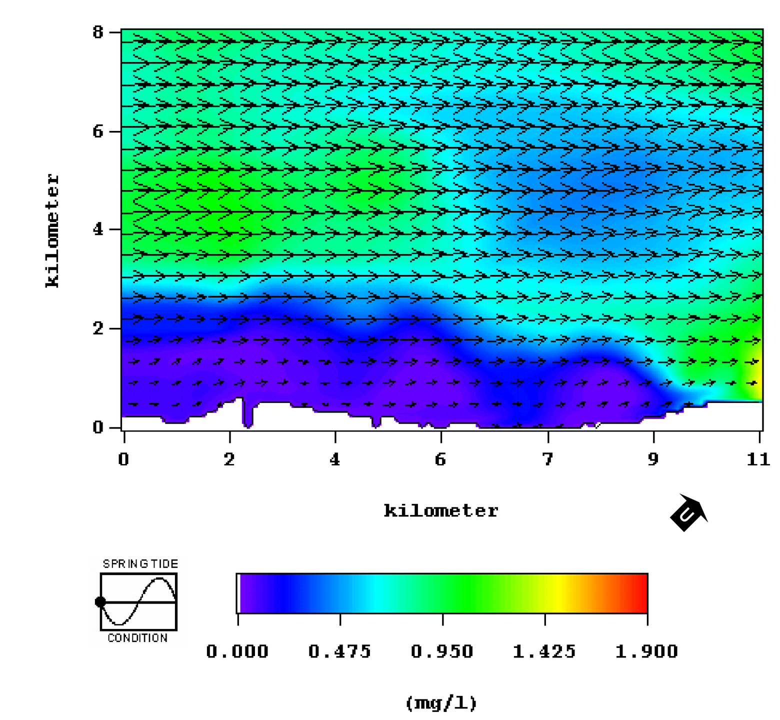
Distributions of microplankton-N during spring flood tide.



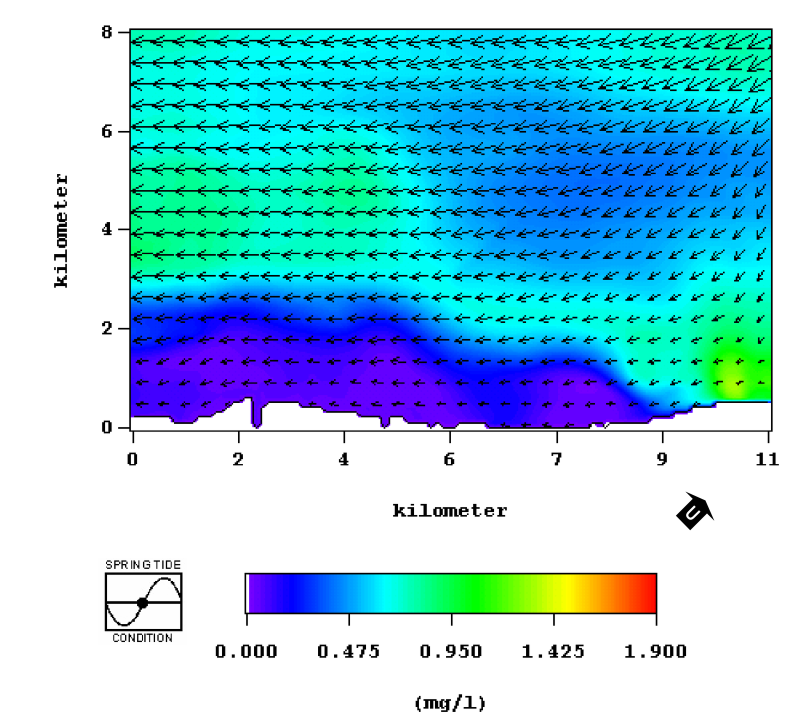
Distributions of zooplankton-N during spring ebb tide.



Distributions of zooplankton-N during spring flood tide.



Distributions of detrital-N during spring ebb tide.



Distributions of detrital-N during spring flood tide

Fourth World Fisheries Congress
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DISTRIBUTIONS OF NITROGEN COMPOUNDS TO SUSTAIN AQUACULTURE ACTIVITIES IN JEPARA WATERS - CENTRAL JAVA, INDONESIA

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Jepara is a part of North Java coastal region that has aquacultures as one of its major economic activities (Hartoko, 2000). Geographycally, this region is located between the latitudes 06°39'30" S - 06°44'40" S, and longitudes 110°34'40" E - 110°38'20" E. Along the coast lines, there are fish and shrimp pond cultures about 805.717 ha with 9 canals used as both for inlet and outlet of sea water.

To meet the domestic demand, the aquaculture farm products are also exported to other countries, especially Japan. Therefore, the fishing industry has provided thousands of jobs and significant revenue for Indonesia, especially for the Jepara region. Unfortunately, the harmful effects of society on this resources such as marine pollution and poor control of aquatic environment and of fisheries management have resulted in documented cases of reduced yields in some of the major commercial fisheries (Annual report of Fisheries in Jepara regency, 1996-1999). To overcome this problem, an understanding of relationships between the physical environment and marine ecology is required.

Marine pollution and poor control of fisheries management around aquatic environments have resulted in decreasing of the quality and quantity of the fishing products. In addition, if the level of toxicity of specific pollutants exceeds an acceptable level, the fishing products will be dangerous to be consumed. In this study, we address to investigate the effects of accumulation and diminution of organic matters, and also by making clear their final fate in the fish and shrimp pond culture environment. Here, we focuses on the prediction of organic waste distributions related with nutrient cycling in Jepara waters, especially along the coast of Serang River and Bokor Patch Reef where many fish and shrimp pond cultures exist in the region.

The nutrient cycling considered in this study is nitrogen both as inorganic and organic compound. A coupled hydrodynamical-ecological model for regional and shelf seas called 'COHERENS' from Luyten et al., (1999) was used to predict the water dynamics and distribution of nitrogen in the Jepara Waters.

The study of nitrogen compound distributions in the Jepara waters, Indonesia, especially along the coast of Jepara and Bokor Patch Reef, was carried out using the COHERENS model.

Result of this study showed that the range of the simulated concentrations of organic nitrogen and ammonium are 0.003 - 0.072 mg/l and 0.002 - 0.066 mg/l, respectively. They are about 0.002 - 1.055 mg/l for nitrate and 0.001 - 2.290 mg/l for microplankton-N. Meanwhile, range of the simulated concentrations of zooplankton-N and detrital-N are 3.814 - 4.710 mg/l and 0.035 - 1.498 mg/l, respectively. The concentrations of nitrogen compounds simulated by the model still meet the water quality standard for marine organism recommended by Indonesian government. Therefore, the Jepara waters are still suitable regions for fish and shrimp pond cultures.

Acknowledgements

The investigations supported by ASSAHI GLASS FOUNDATION Overseas Research Grant 2000. The authors would like to thank to John Eric Jones (Proudman Oceanographic Laboratory, UK) for the discussion about COHERENS.