Geophysical Research Abstracts, Vol. 8, 04360, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04360

Comparison of satellite images of the *Emiliania huxleyi* bloom in the Skagerrak and the Kattegat during 2004 to modeled surface currents.

P. Andersson (1), K. Eilola (1)

(1) Swedish Meteorological and Hydrological Institute, Oceanographic Department, Gothenburg, Sweden (Pia.Andersson@smhi.se / Phone: +46-(0)31-751-8973)

The Skagerrak and the Kattegat can get a slight turquoise colouring of the ocean water in May-June. This is caused by a harmless coccolithophoride called *Emiliania huxleyi*. The algae are a form of unicellular flagellates that have shell plates of calcium oxide. These shells reflect the incoming sunlight and colour the ocean turquoise. There are many qualities that make *Emiliania huxleyi* an interesting species. It is possible to trace the blooms by satellite images and it is also a freely drifting species that follows the currents. Those two qualities are in this case the most important and form the basis for this study. Since the species follows the currents and is visible from space, there is a visible connection between biology and hydrography. We can use biology to trace the physics of the ocean. Another interesting aspect is to compare satellite images to validate oceanographic model results of surface currents. The aim of the study is to compare the path of the bloom to the modelled currents and to the general circulation and to find the origin of the bloom in the study area.

A time series of satellite images were combined with figures describing the modelled surface currents by the use of tracers. From the start of the time series, a number of areas were marked with tracer dots of different colours. For each following time step, the dots are transported the corresponding distance and direction of the modelled currents, leaving traces of where the currents would have transported real water parcels on the map.

In 2004, the first observations of the bloom in the open Skagerrak was around the 20th of May and the satellite image time series start on the 21st of May and end on the 5th of June. The bloom entered the western parts of the Skagerrak and spread along the

Danish coast, to Skagen, and onward to the Swedish west coast.

There was a good correlation when comparing the model results to the general surface current systems.

Several features indicated good correlation between the bloom pattern and the modelled currents hence there was also a good correlation to the general current systems. Since there is a good correlation between the bloom pattern and the model results, when a bloom occurs, the course of events can be forecasted.

Since the paths and the spreading of the *Emiliania huxleyi* bloom in May 2004, is controlled by the main surface currents, conclusions of the origin of the bloom can be made. The bloom was probably transported in and out of the Skagerrak area by the surface water that enters between Scotland and Norway going south along the western side of Norway, passing through Skagerrak and then returns north along the Norwegian coast.