Executive Summary

The 2012 ICES-IOC Working Group on harmful algal bloom dynamics was held in Oban, Scotland, United Kingdom, on 24–27 April hosted by the Scottish Association for Marine Science (SAMS). The meeting was successful with 20 scientists from 12 countries attending. This includes participants from the IOC Member States Egypt, Kuwait and South Korea. In addition one person participated in part of the meeting using video conference. A full schedule of terms of reference were worked through and this report is a summary of the deliberations of the group.

There is an extensive overview on the impacts of HAB's on marine mammals and birds in the report. An overview on the use of Solid Phase Adsorption Toxin Tracking - a monitoring tool for marine biotoxins is also included. A new way of categorizing Paralytic Shellfish Poisoning outbreaks in the Gulf of Maine is presented. The reader will find information on the Harmful Algal Event Database (www.iode.org/haedat) and overviews of the HAB situation in Egypt and in the ROPME area (www.ropme.org), approximately the Gulf of Oman and the Persian Sea. There are severe HAB problems in both areas and they seem to be increasing.

Fish killing algae is addressed in a separate section of the report and plans for two workshops are also included. One in 2013 on HAB’s in a changing world addressing e.g. climate change impacts on HAB’s, and one in 2014 on new technology for observing HAB’s in situ.

National Reports

The National Reports for 2011 were presented to the group on the status of HABs from all ICES countries that participated in this year’s meeting (9), reports of presentations are given in this document. Year 2011 included some unusual Harmful Algal Bloom Events in the ICES region and blooms in new geographic locations.

During 2011, the testing of shellfish for the presence of lipophilic shellfish toxins changed from the mouse bioassay to chemical LC-MS methods during July in many European countries. Several countries have used both methods for a few years.

Canada reported the first documented occurrence of Diarrhetic Shellfish Poisoning on the West coast. Sixty persons became ill in British Columbia. The causative organism is likely to be dinoflagellates from the genus Dinophysis. Also Paralytic Shellfish Toxins (PST) was found in mussels (causative organism Alexandrium spp.) and salmon mortalities caused by Heterosigma akashiwo occurred in fish farms. On the East coast Paralytic Shellfish Toxins (PST) was high in some areas a large part of the year.

Denmark reported no DSP, ASP or PSP. An extreme spring bloom of the fish killing alga Pseudoachattonella ct. farcimen delayed the release of trout to fish cages. There were a few reports of dead wild sea trout.

Ireland had minor problems from Amnesic Shellfish Toxins caused by the diatom genus Pseudo-nitzschia. Diarrhetic Shellfish Toxins in mussels caused closures of harvesting mainly in June and Aug.-Sep. Paralytic Shellfish Toxins were limited to Cork harbour where it occurred for a short period in June.

The Netherlands Toxin levels were below the regulatory limit for all marine biotoxins monitored. Trace levels of DST were observed. Dinophysis acuminata was observed in low abundances. Also Pseudo-nitzschia spp. were found in low concentrations.
Poland A short episode of toxic *Nodularia spumigena* was recorded 29–30 June in coastal waters. Accumulations of scums in coastal areas resulted in beach closure in Gdynia. The concentration of nodularin in two classes of blue mussels (*Mytilus trossulus*) was measured. The smaller mussels accumulated higher concentration of the toxin than bigger mussels. Also fin fish was investigated for nodularin content. Generally, round goby accumulated higher amounts of the toxin than flounder. In some fish muscles, the toxin content exceeded the tolerable daily intake value (TDI) for a human.

Spain Between May and November 2011, *Lyngbya majuscula*, a benthic filamentous toxigenic cyanobacteria, formed a bloom covering hundreds of square kilometers on the eastern coast of Fuerteventura Island. This is the first record of this type of bloom in the Canarias archipelago. Andalucia suffered severe DSP outbreaks on the Atlantic sites and PSP outbreaks on the Mediterranean sites during 2011. Five persons were affected by Ciguatera Fish Poisoning (CFP) in the Canary Islands. A combination of DSP and PSP outbreaks led to very lengthy harvesting closures in Galicia. Andalucia suffered severe DSP outbreaks on the Atlantic sites and PSP outbreaks on the Mediterranean sites during 2011.

Sweden Diarrhetic Shellfish Toxins were observed in high concentrations in blue mussels in autumn on the Swedish Skagerrak coast. This coincided with high abundances of the dinoflagellate *Dinophysis acuta*. The potential fish killer *Pseudochattonella farcimen* was abundant in March-April in the Kattegat but no harmful effects were observed. An unusual high biomass bloom of *Ceratium* spp. caused brown water in November in the Kattegat. In the Baltic proper the intensity of the cyanobacteria bloom was moderate and it was found off shore. In the Bothnian Sea both coastal and off shore blooms of cyanobacteria were observed.

UK (Northern Ireland) A large bloom of *Dinophysis* spp. occurred in Belfast during July and August causing high levels of DST in blue mussels (*Mytilus edulis*). In England and Wales PST was breaching the action levels on 14 occasions. DST above regulatory levels were recorded in 12 shellfish samples. In Scotland *Alexandrium* spp. was observed on several occasions. On two occasions there were closures because of PST. There were also closures because of DST.

USA PSP On the U.S. west coast, Alaska, Washington, Oregon and California all recorded PSP toxicity during 2011. Eight confirmed and 13 probable PSP cases occurred in Alaska. New England experienced “normal” closures due to PSP. Also New York state had closures due to PSP. Florida experienced *Pyrodinium bahamense* blooms on the west coast. AST California experienced closures due to domoic acid. NSP Florida and Texas experienced *Karenia brevis* blooms on both the east and west coasts. At one point during the bloom, discoloured water and dead fish could be found along over 250 miles of Gulf beach. DSP For the first time, DSP toxins were detected in Washington state. DSP toxins were also detected in New York state. Brown tide Long Island, NY experienced a significant brown tide bloom, which began in June and ended in July.