Theme Session H
Harmful Algal Blooms in Aquaculture and Fisheries ecosystems: prediction and societal effects

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Harmful Algal Blooms (HABs) represent a major hazard for the exploitation of coastal resources in ICES countries. Toxin producing HABs are recurrent phenomena leading to prolonged shellfish harvesting closures when algal toxins are accumulated in commercial bivalves and exceed regulatory levels. The most important syndromes are amnesic (ASP), diarrhetic (DSP), azaspiracidic (AZP) and paralytic (PSP) shellfish poisoning. DSP outbreaks caused by *Dinophysis* spp., previously unreported in the Atlantic coasts of USA, have emerged in the last years as a new hazard in various places in North America ranging from New York to the Gulf of Mexico as well as in Pacific coasts of Canada and northwest US. High biomass blooms of fish-killing HABs are noticed mainly in areas of intensive caged-fish aquaculture, e.g. in Scandinavia and Scotland. Emerging toxins from species of benthic HABs (Gambierdiscus, *Ostreopsis*) traditionally reported from tropical areas have caused isolated events of Ciguatera Fish Poisoning (CFP) in Macaronesia (Canary, Madeira Islands) and outbreaks of respiratory irritation in the Spanish and French Mediterranean coasts. Blooms of benthic HABs were recently (2011) reported in tourist resorts from the Algarve (southern Portugal). In the Baltic Sea, and recently also in the Canary Islands, blooms of cyanobacteria have resulted in surface scums, which were a nuisance when accumulated in bays and on beaches. Some species are toxic.

Improved monitoring and predictive capabilities constitute the main tools to prevent or mitigate the negative impacts of HABs in coastal commodities. Increased monitoring efforts, technological developments for in situ detection of harmful algae and new analytical tools for toxins, together with international programmes and projects promoting species-specific research in the last two decades have led to a considerable advance in our capabilities for early warning detection and for understanding of the mechanisms underlying initiation, maintenance and decay of the blooms. Additionally, the application of operational oceanography principles to forecast HAB events has improved the flow of information from research and monitoring agencies to the end-users (health and environmental authorities, shellfish growers, tourist industry). Some mitigation practises have started to be implemented in restricted areas, e.g. direct chemical treatment of ballast and semi-enclosed water bodies. A combination of information from in situ HAB management programs, remote sensing and derived information from models may be made to analyse HAB events and their trends within a broader framework in an effort to minimize societal impacts.