

Harmful Algal Blooms in Cardigan Bay (Prince Edward Island, Canada)

The first reported occurrence of shellfish poisoning from blue mussels (*Mytilus edulis*) cultured in Cardigan Bay, eastern Prince Edward Island (Canada) occurred in the fall of 1989. The neurotoxin domoic acid was identified as the responsible agent, and was traced to a diatom *Pseudo-nitzschia multiseriis*, which occurred in bloom concentrations at the time of the incidence. The incidence led to tragic loss of human lives and to substantial commercial losses to the aquaculture industry. Initial response to the incidence relied on conventional *in situ* sampling, which was led to the identification of the causative agents. However, such *in situ* surveys do not have extensive spatial and temporal coverage, for logistical reasons. Therefore, when there was another occurrence of blooming of the toxigenic diatom species, a remote-sensing experiment was organised on an emergency basis by the scientists who responded to the new crisis. The remotely-sensed data and locally-developed algorithms were used successfully in this case to map the extent of the bloom and its progression in time (see Figure). However, the optical studies that accompanied the remote-sensing experiment also demonstrated that the remotely-sensed data did not contain any signal that might be used to distinguish toxic blooms of diatoms from non-toxic blooms. In the absence of such a signal, *in situ* observations would remain an integral part of the monitoring programme, with remote sensing providing a means for spotting the onset of blooms and for establishing the spatial extent of the blooms and their changes with time. Such judicious combinations of *in situ* and remote-sensing observations have to be essential components of an observing system designed to respond efficiently and in a timely fashion to occurrences of harmful algal blooms.

