NORTHCOAST PLANKTON IDENTIFICATION AND MONITORING PROGRAM

B.A. Shaw

Northwest Community College, 130 1st Avenue W.,
Prince Rupert, BC, Canada V8J 1A8

The Northcoast Plankton Identification and Monitoring Program was designed to meet the following community needs of the Northcoast: (1) increased knowledge of marine plankton as they relate to mariculture; and (2) community participation and increased capacity in plankton monitoring. The purpose of the Northcoast Plankton Identification and Monitoring Program was to train local mariculture operators in the techniques of monitoring the location, density, species composition, and timing of phytoplankton and zooplankton populations in Northcoast waters in order to assist them in making informed decisions regarding harmful algal blooms, site locations, and timing of remote setting, grow-out, and harvesting operations. Additionally, the project collected plankton data for a period of one year at several sites in the Northcoast area, and attempted to correlate this data with PSP and domoic acid assays carried out simultaneously at the same sites.

A vertical haul was taken from 20 m to the surface using a 80 micron hand-held plankton net. The collected plankton were rinsed from the net into a labelled sample bottle and preserved using 2 mL of formalin for analysis in the laboratory. A one mL subsample was taken and examined microscopically using a Sedgewick-Rafter counting chamber. All organisms in the sample were enumerated, photographed, and identified to species where possible. Species densities integrated over the top 20 m depth were calculated from these data.

Ten study sites were selected in the Northcoast region: (1) Prince Rupert Harbour, (2) Humpback Bay Site 1, (3) Humpback Bay Site 2, (4) Holland Rock, (5) Rachel Island, (6) Metlakatla Bay, (7) Bernie Island, (8) Freeman Pass, (9) Hartley Bay, and (10) Rennell Sound. A year-long study was completed at three sites (sites 1, 2, and 3). PSP and domoic acid testing were performed at 6 sites (sites 2, 6, 7, 8, 9, and 10).

This study initiated a baseline for phytoplankton and zooplankton populations in the waters around Prince Rupert. To date, approximately 225 species of plankton have been identified in the study area. Although there was a great deal a variability among the study sites as a result of differences in oceanographic conditions, the following generalizations for the 2000 season could be made:

(1) A bloom of *Actinoptychus senarius* was seen between January and March at most sites (Fig. 1).
(2) Most diatom blooms occurred between May and August (Fig. 1).
(3) A small bloom of *Actinoptychus senarius* was seen in October at most sites (Fig. 1).
(4) The Shannon diversity index for diatoms ranged from 0 to 1.4. Some monospecific diatom blooms were observed at several stations.

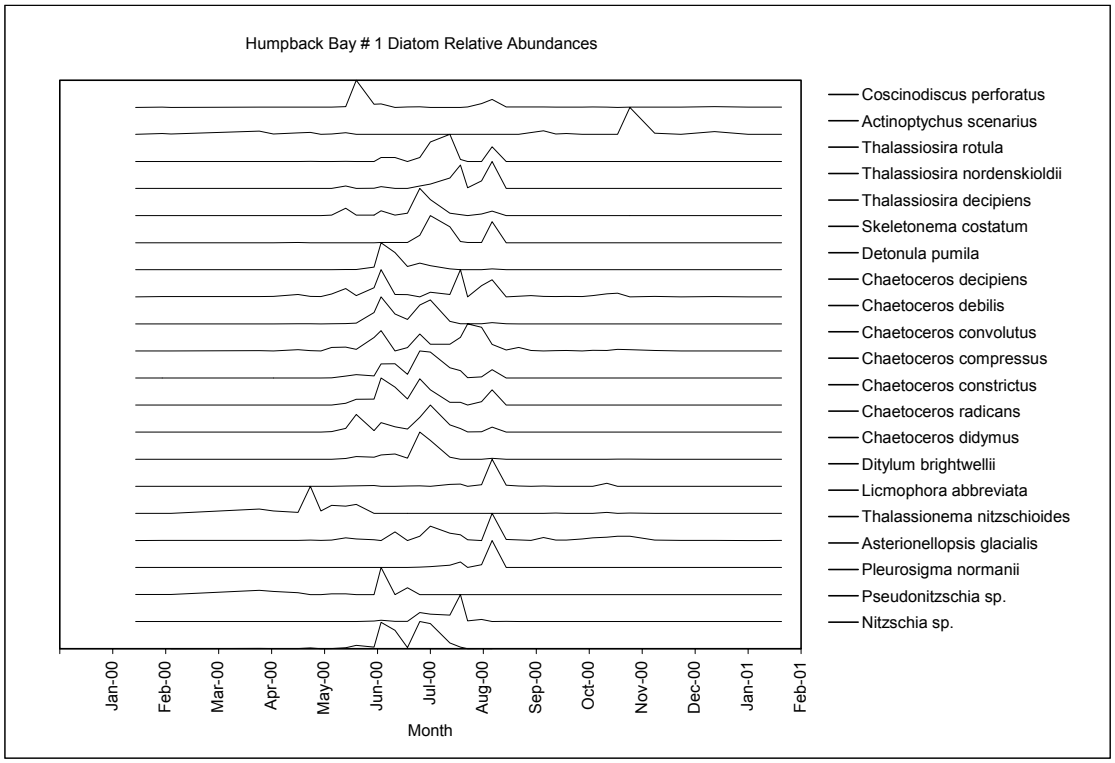

Fig. 1. Relative abundances of the dominant diatom species at Humpback Bay during the year 2000.

(5) The dinoflagellate season was initiated with *Gymnodinium lacustre* in April (Fig. 2).
(6) Most dinoflagellate species increased in abundance between June and November (Fig. 2).
(7) At most sites, the dinoflagellate season ended with the heterotrophic *Noctiluca scintillans* in November (Fig. 2).
(8) *Alexandrium tamarense* was present at significant densities from April through August (Fig. 2). Populations of *Alexandrium* spp. peaked 23.6 d, on average, before a response was observed in the mouse bioassay, and the threshold concentration of *Alexandrium* cells necessary to generate a measurable response in the mouse bioassay ranged between 3000 and 6000 cells/m^3 (Fig. 3). Both *Alexandrium tamarense* and *Alexandrium catenella* were present in the study area; however *Alexandrium tamarense* was the dominant species. Three sites in the study area had PSP results higher than 80 mouse units (shellfish closure limit) during the study: Bernie Island, Metlakatla Bay, and Humpback Bay. At Bernie Island, high toxicity occurred in May. At Metlakatla Bay and Humpback Bay, high toxicity occurred in August (Fig. 3).
(9) Both *Chaetoceros convolutus/concavicornis* and *Pseudo-nitzschia* spp. were present from June through August with maximum abundance during July (Fig. 1).
(10) All test results for domoic acid were negative.

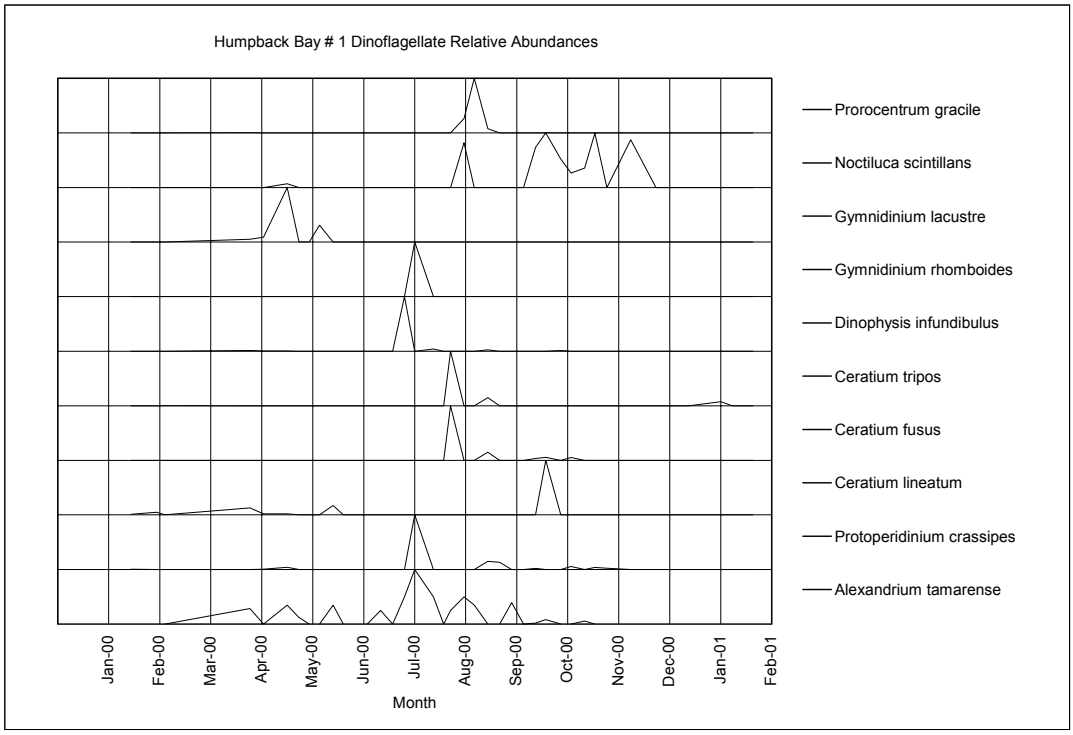

Fig. 2. Relative abundances of the dominant dinoflagellate species in Humpback Bay during the year 2000.

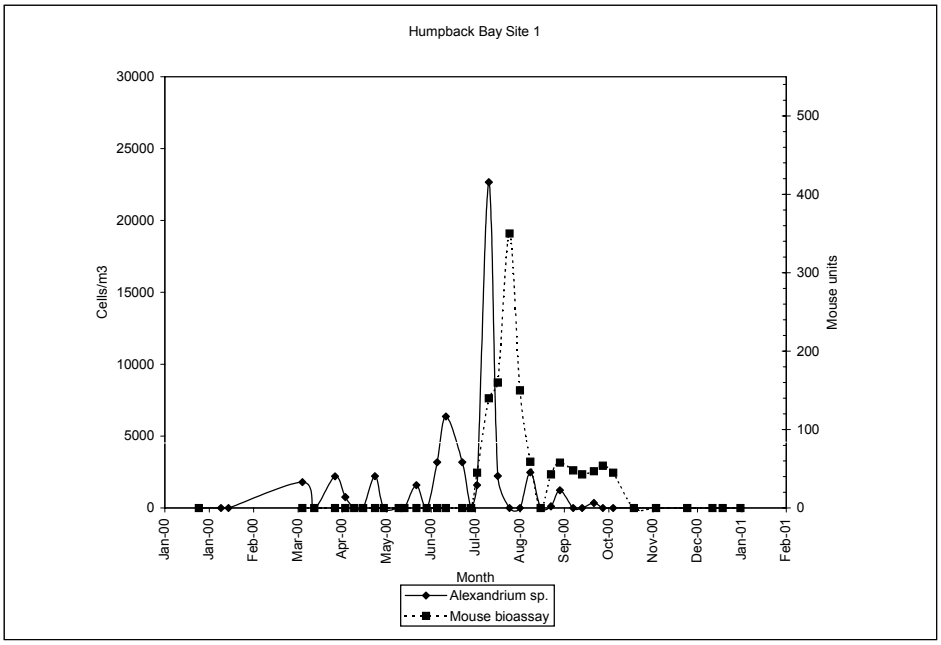

Fig. 3. *Alexandrium* spp. abundance and PSP mouse bioassay test results for Humpback Bay during the year 2000.

As a result of this project, twelve local people were trained in plankton sampling and preservation, and two were trained in plankton enumeration and identification. An interactive CD ROM for plankton identification was partially developed during this study, and will be used as a tool in further training offered by Ocean Ecology to people in the Northwest.