2. TRACE METALS IN INDICATOR ORGANISMS (*Tridacna crocea* and *Polymesoda erosa*)

BACKGROUND

The objectives of the biota program of the Pilot Study of the Torres Strait Baseline Study (TSBS) were to (1) investigate a number of potential indicator organisms, and recommend species for use in the Main Study; and (2) develop a preliminary analysis of the distribution of trace metals throughout the Torres Strait and their source(s).

The results from a number of organisms indicated complex spatial and seasonal patterns in the levels of many trace metals. There was little seasonal variation in the levels of most metals at locations in the central Torres Strait; however, at more northerly locations the levels of many metals were elevated in the post-monsoon season, probably under the influence of coastal runoff from Papua New Guinea (Dight and Gladstone 1993). Cadmium levels in Torres Strait biota were consistently greater than those found in the same species from the Great Barrier Reef, while copper levels were elevated at the most northern locations during the post-monsoon season.

The Pilot Study recommended two species as being particularly suitable as indicators of variations in trace metal levels throughout the Torres Strait marine environment. These species were the burrowing clam (*Tridacna crocea*) and the mangrove cockle (*Polymesoda erosa*). The Pilot Study also recommended an expanded sampling program for these indicators, including sampling during the monsoon season, rather than the post-monsoon season.

The principal objectives of the Main Study were to use the indicator organisms and sampling strategies recommended in the Pilot Study to:

(1) assess the levels of trace metals over a much greater area of the Torres Strait, and thereby to;
(2) identify the area of influence of the Fly River in the Torres Strait;
(3) provide a data set of trace metal levels in the Torres Strait which can be used as a baseline for comparison in future monitoring programs; and
(4) where necessary, suggest modifications to the sampling strategy in the light of the results gathered during the Main Study.

The results of these objectives will be reported in this chapter.

METHODS AND MATERIALS

Pre-Collecting Preparations

Prior to field trips all lab and field collecting equipment, and storage vials, were washed in 10% nitric acid, rinsed in Reverse Osmosis Polished (ROP) water and stored in clean plastic bags until used. The metal content of a sub-sample of the bags which were to be used for sample storage was determined and found to be low for all metals.

Sample Collection

Burrowing clams (Tridacna crocea)

Samples of the burrowing clam (*T. crocea*) were collected from the twelve stations shown in figure 2.1 during the pre-monsoon (October-November 1992) and monsoon (February-March