## Biomonitoring at Kwajalein Atoll

A biomonitoring program developed by the U.S. Army Center for Health Promotion and Preventive Medicine evaluated the bioavailability of potential contaminants near marine discharges from the U.S. Army Kwajalein Atoll, Republic of the Marshall Islands. "Mussel Watch" methods traditionally used to assess regional status and trends were adapted to meet reef area conditions at Kwajalein Atoll. Hatchery-reared juvenile giant clams (*Tridacna maxima)* of a uniform size were air shipped to Kwajalein, acclimated for several days, and then deployed in anchored predator exclusion cages at seven sites off three islands within Kwajalein Atoll. Vessel mooring methods that reduce collateral damage to coral reefs were modified and scaled down to deploy caged clams at the shallow and high energy stations. After a three month exposure, clams were retrieved and shipped to a lab for contaminant analysis. Results identified several sites with elevated levels of some metals and these have been targeted for further impact evaluation. This type of biomonitoring approach may be useful at other coral reef sites. In this case, the selected genus Tridacna is symbiotic, like coral, and can also be used to help monitor coral reef health. The biomonitoring approach was more cost-effective and time-integrated than traditional water quality monitoring. Furthermore, the results provide information about the contaminant bioaccumulation potential, useful in assessing human health and ecological risk.

There are several species of giant clams found on Pacific reefs. *Tridacna crocea* is pictured on both pages. The differing colors are caused by symbiotic zooxanthellae and tissue pigments which vary among individuals. Giant clams are threatened because they grow slowly and have been overharvested as food. An aquaculture industry started with the intent of producing giant clams for food, found it more profitable to sell small clams to the aquarium trade. Giant clams are also being used as biomonitoring tools, as mussels are used in the Mussel Watch Program, to measure bioavailability of contaminants at polluted sites.