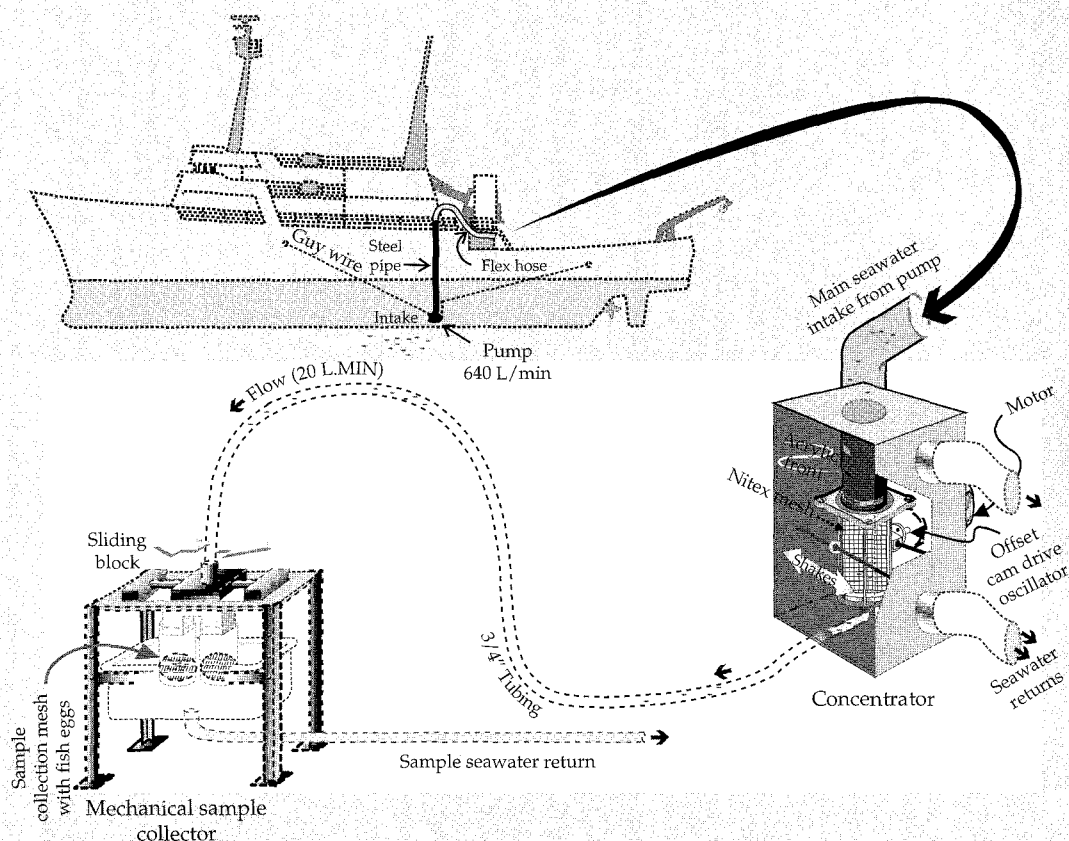


Box 6.4 Continuous, Underway Fish Egg Sampler

The Continuous, Underway Fish Egg Sampler (CUFES) was developed during the 1990s to improve sampling of the typically highly patchy distributions of pelagic fish eggs, and was first applied to test the hypothesis that spawning by Atlantic menhaden (*Brevoortia tyrannus*) occurs during storms along the western wall of the Gulf Stream. Over the past decade the CUFES has been used in many regions, principally to study the distribution of eggs of small pelagic fishes such as anchovy and sardine. The CUFES has now become the standard sampling tool for mapping spawning habitat used by participants in the Small Pelagic Fishes and Climate Change (SPACC) regional

programme of Global Ocean Ecosystem Dynamics (GLOBEC), which ensures compatibility for inter-ecosystem comparisons.

A CUFES system consists of a high-volume (ca. $0.5 \text{ m}^3 \text{ min}^{-1}$), submersible pump either fixed rigidly to the ship's hull or pumping through the hull via a sea-chest; a sample concentrator; and a mechanical sample collector. Water is pumped from pump depth (around 3 m for the external configuration or 6 m for the through-hull configuration) to the concentrator, where particles retained by a $500 \mu\text{m}$ mesh (or occasionally smaller) are concentrated in a reduced flow. This flow is then directed to the mechanical sample collector, which allows for



Box 6.4, Figure 1 Schematic of the CUFES system (David Checkley).

continues