Received:December,16.2008 Accepted:January,9.2009

Abstract

A large volume *in situ* filtration and concentration system (LV-FiCS) was developed to measure the activity concentrations of radionuclides in dissolved and particulate forms in seawater. It consists of a filtration and concentration module (FC module), an electromechanical cable (EM cable), and a pump control unit. The main FC unit enables collection of large (>70 m) and small particles (1–70 m). At the same time, dissolved radionuclides are concentrated onto adsorbents just downstream of the filtration unit. Several kinds of adsorbents are used depending on the radionuclides to be collected. Eight FC modules can be simultaneously attached to the EM cable to collect samples from the surface to depths of either 350 m or 2000 m, depending on the cable used. The LV-FiCS was operated during several cruises in Japanese coastal waters and in the Pacific Ocean. The FC module successfully filtered 4–11 m^3 of seawater over 3–5 h. Vertical profiles of the size-fractionated particulate and dissolved forms of radionuclides such as ^{234}Th, $^{239,240}Pu$, $^{32,33}P$, ^{7}Be, ^{99}Tc, and ^{137}Cs were obtained.