

Introducing an international ocean climate program, PACSWIN, and using submarine cable for cost-effective long-term climate monitoring.

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Abstract

The UN Climate Change Conference - recently held in Bali, Indonesia - has set up a road map to replace the Kyoto Protocol by 2012. Strong messages from the conference were the high level of governmental awareness of global warming and its consequences, the critical need for effectively monitoring climate change, and provision of accurate information to society. But adequate ocean monitoring for climate change is still lacking, and will hinder our ability to forecast and provide that accurate information. Nowhere is this more evident than in the critical Indonesian Throughflow region between the Pacific and Indian Oceans. Here we propose a new international coordinated ocean climate program: Indonesian ThroughFlow: PACific Source Water Investigation (ITF:PACSWIN; hereafter we simply call PACSWIN) dedicated for that purpose.

PACSWIN has set the submarine cable as one of its priority monitoring components along with moorings and floats. Submarine cable is a cost-effective ocean current observing tool (a voltage recorder and a computer are all that is needed to make it work for monitoring a particular strait for net transport of currents except for calibration costs; note that the cable base and ground facility are very expensive) and is most practical for satisfying present and future needs for implementing a long-term ocean climate monitoring network other than the Argo array. Indeed the technique is complementary to Argo because Argo leaves most of straits and marginal seas and deep water (below 2000 m) unobserved, as, for example, over the Indonesian seas. Submarine cable has been applied to monitoring the Florida Current transport since 1980s and has also been used in other parts of the world oceans. A first submarine cable workshop has been endorsed by CLIVAR on April 23, 2008. The workshop fully satisfies the agenda and objective of CLIVAR for long-term monitoring of climate change.