

2004 Ocean Sciences Meeting
Search Results

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HR: 15:00h
 AN: **OS32I-05 INVITED**
 TI: **Acoustic Remote Sensing of Large-Scale Temperature Variability in the North Pacific Ocean**
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 AB: Long-range acoustic transmissions from an acoustic source north of Kauai to U.S. Navy receivers distributed throughout the North Pacific Ocean resumed in January 2002. The source previously transmitted for about two years (1997-1999) as part of the Acoustic Thermometry of Ocean Climate (ATOC) project. Both the source and receivers are connected to shore by cable, providing near-real time

data. It is anticipated that transmissions will continue for five years, as part of the North Pacific Acoustic Laboratory (NPAL) project. At these ranges acoustic methods give integral measurements of large-scale ocean temperature variations that provide the spatial low-pass filtering needed to observe weak, gyre-scale signals in the presence of a much stronger mesoscale variability. Long-term trends in large-scale ocean temperature are readily visible in the acoustic time series. The paths to the east, particularly those paths to the California coast, show cooling (longer travel times) relative to the earlier data. A path to the northwest showed modest warming (shorter travel times) until early 2003, when a cold event caused the longest travel times observed during the five-year period. Data obtained from ARGO drifters in the vicinity of the acoustic path at the time of the cold event are not inconsistent with the acoustic observations, but the variability in the ARGO data is too great to permit definitive conclusions. Travel times can be readily computed from modern high-resolution ocean general circulation models (OGCM). Comparisons between measured travel times and those computed from OGCMs that assimilate altimetric and other data show (not surprisingly) similarities and differences. Travel times are found to have good signal-to-noise ratios relative to the differences between two implementations of the same basic OGCM developed by the ECCO (Estimating the Circulation and Climate of the Ocean) Consortium, but assimilation of measured travel times into OGCMs is needed to objectively assess the value of acoustic data relative to other measurements. [This research is supported by the Office of Naval Research.]

DE: 4259 Ocean acoustics

DE: 4275 Remote sensing and electromagnetic processes (0689)

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