Shipboard Acoustic Doppler Current Profiler (ADCP) from R/V Roger Revelle KIWI6, KIWI7, KIWI8, KIWI9 cruises in the Southern Ocean, 1998 (U.S. JGOFS AESOPS project)

Website: https://www.bco-dmo.org/dataset/2770
Version: December 12, 2001
Version Date: 2001-12-12

Project
» U.S. JGOFS Antarctic Environment and Southern Ocean Process Study (AESOPS)

Program
» U.S. Joint Global Ocean Flux Study (U.S. JGOFS)

Contributors	Affiliation	Role
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Dataset Description

Shipboard acoustic doppler current profiler (ADCP)

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Parameters

Parameter	Description	Units
yrday	Julian Day plus fractional day; for reference: Jan 1 noon = 1.5 and Jan 1 midnight = 2.0	decimal days (UTC)
depth	Depth of the bin center	meters
lat	Latitude (- for S)	decimal degrees
lon_360	Longitude (0-360 scale)	decimal degrees
u_velocity	East velocity	meters/second
v_velocity	North velocity	meters/second

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Instruments

Dataset-specific Instrument Name	Acoustic Doppler Current Profiler
Generic Instrument Name	Acoustic Doppler Current Profiler
Dataset-specific Description	Shipboard Acoustic Doppler Current Profiler
Generic Instrument Description	The ADCP measures water currents with sound, using a principle of sound waves called the Doppler effect. A sound wave has a higher frequency, or pitch, when it moves to you than when it moves away. You hear the Doppler effect in action when a car speeds past with a characteristic building of sound that fades when the car passes. The ADCP works by transmitting "pings" of sound at a constant frequency into the water. (The pings are so highly pitched that humans and even dolphins can't hear them.) As the sound waves travel, they ricochet off particles suspended in the moving water, and reflect back to the instrument. Due to the Doppler effect, sound waves bounced back from a particle moving away from the profiler have a slightly lowered frequency when they return. Particles moving toward the instrument send back higher frequency waves. The difference in frequency between the waves the profiler sends out and the waves it receives is called the Doppler shift. The instrument uses this shift to calculate how fast the particle and the water around it are moving. Sound waves that hit particles far from the profiler take longer to come back than waves that strike close by. By measuring the time it takes for the waves to bounce back and the Doppler shift, the profiler can measure current speed at many different depths with each series of pings. (More from WHOI instruments listing).

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Deployments

KIWI6

Website	https://www.bco-dmo.org/deployment/57724
Platform	R/V Roger Revelle
Report	http://usjgofs.whoi.edu/aesops/RRs1.html
Start Date	1997-10-20
End Date	1997-11-24
Description	Polar Front Survey I **Methods & Sampling** PI: Tim Cowles of: Oregon State University dataset: Shipboard acoustic doppler current profiler data (ADCP) dates: October 20, 1997 to November 24, 1997 location: N: -43.6078 S: -62.3832 W: 192.4004 E: 172.7194 project/cruise: Southern Ocean JGOFS/KIWI6 - Polar Front Survey 1 ship: R/V Roger Revelle PI methodology notes

KIWI7

Website	https://www.bco-dmo.org/deployment/57725
Platform	R/V Roger Revelle
Report	http://usjgofs.whoi.edu/aesops/RRp1.html
Start Date	1997-12-02
End Date	1998-01-03
Description	Polar Front Process I **Methods & Sampling** PI: Jack Barth and Tim Cowles of: Oregon State University dataset: Shipboard acoustic doppler current profiler data (ADCP) dates: December 20, 1997 to January 03, 1998 location: N: -44.0608 S: -64.7435 W: 191.1855 E: 173.7344 project/cruise: Southern Ocean JGOFS/KIWI7 - Polar Front Process 1 ship: R/V Roger Revelle PI methodology notes

KIWI8

Website	https://www.bco-dmo.org/deployment/57726
Platform	R/V Roger Revelle
Report	http://usjgofs.whoi.edu/aesops/RRs2.html
Start Date	1998-01-08
End Date	1998-02-08
Description	Polar Front Survey II **Methods & Sampling** PI: Tim Cowles of: Oregon State University dataset: Shipboard acoustic doppler current profiler data (ADCP) dates: January 08, 1998 to February 08, 1998 location: N: -44.1191 S: -67.8782 W: 190.6021 E: 173.6486 project/cruise: Southern Ocean JGOFS/KIWI8 - Polar Front Survey 2 ship: R/V Roger Revelle PI methodology notes

KIWI9

Website	https://www.bco-dmo.org/deployment/57727
Platform	R/V Roger Revelle
Report	http://usjgofs.whoi.edu/aesops/RRp2.html
Start Date	1998-02-13
End Date	1998-03-19
Description	Polar Front Process II **Methods & Sampling** PI: Jack Barth and Tim Cowles of: Oregon State University dataset: Shipboard acoustic doppler current profiler data (ADCP) dates: February 13, 1998 to March 19, 1998 location: N: -44.7914 S: -71.316 W: 194.0860 E: 174.6010 project/cruise: Southern Ocean JGOFS/KIWI9 - Polar Front Process 2 ship: R/V Roger Revelle PI methodology notes

Project Information

U.S. JGOFS Antarctic Environment and Southern Ocean Process Study (AESOPS)

Website: http://usjgofs.whoi.edu/research/aesops.html

Coverage: Southern Ocean, Ross Sea

The U.S. Southern Ocean JGOFS program, called Antarctic Environment and Southern Ocean Process Study (AESOPS), began in August 1996 and continued through March 1998. The U.S. JGOFS AESOPS program focused on two regions in the Southern Ocean: an east/west section of the Ross-Sea continental shelf along 76.5°S, and a second north/south section of the Southern Ocean spanning the Antarctic Circumpolar Current (ACC) at ~170°W (identified as the Polar Front). The science program, coordinated by Antarctic Support Associates (ASA), comprised eleven cruises using the R.V.I.B Nathaniel B. Palmer and R/V Roger Revelle as observational platforms and for deployment and recovery of instrumented moorings and sediment-trap arrays. The Ross-Sea region was occupied on six occasions and the Polar Front five times. Mapping data were obtained from SeaSoar, ADCP, and bathymetric systems. Satellite coverage was provided by the NASA SeaWiFS and the NOAA/NASA Pathfinder programs.

Program Information

U.S. Joint Global Ocean Flux Study (U.S. JGOFS)

Website: http://usjgofs.whoi.edu/

Coverage: Global

The United States Joint Global Ocean Flux Study was a national component of international JGOFS and an integral part of global climate change research.

The U.S. launched the Joint Global Ocean Flux Study (JGOFS) in the late 1980s to study the ocean carbon cycle. An ambitious goal was set to understand the controls on the concentrations and fluxes of carbon and associated nutrients in the ocean. A new field of ocean biogeochemistry emerged with an emphasis on quality measurements of carbon system parameters and interdisciplinary field studies of the biological, chemical and physical process which control the ocean carbon cycle. As we studied ocean biogeochemistry, we learned that our simple views of carbon uptake and transport were severely limited, and a new "wave" of ocean science was born. U.S. JGOFS has been supported primarily by the U.S. National Science Foundation in collaboration with the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the Department of Energy and the Office of Naval Research. U.S. JGOFS, ended in 2005 with the conclusion of the Synthesis and Modeling Project (SMP).