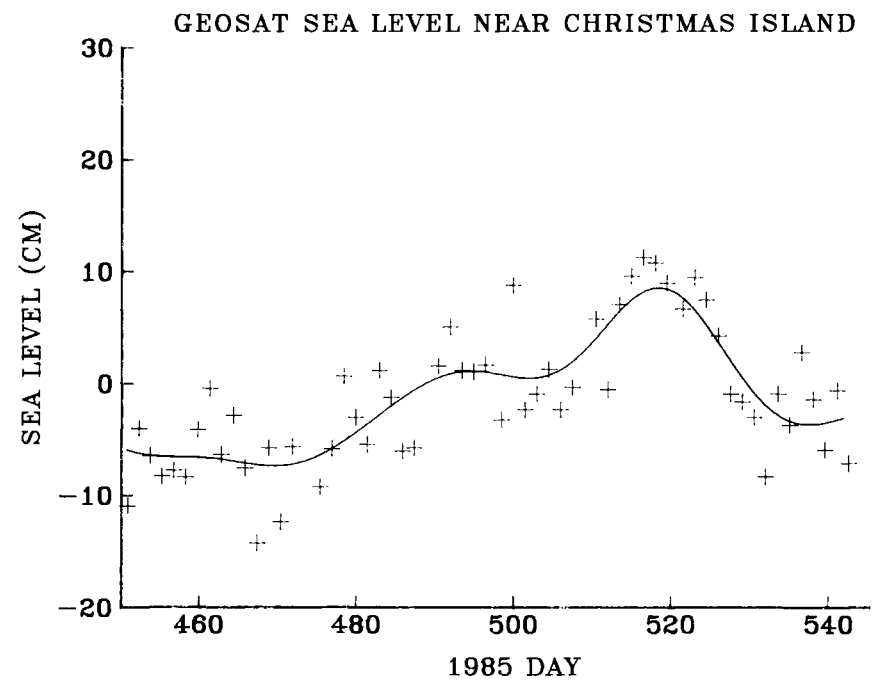

Fig. 3. Enlargement of GEOSAT time series during passage of the Kelvin wave (see Figure 2*b*). Scatter of the altimeter observations during this time is remarkably low, possibly a result of the broad, coherent sea level signal associated with the passing Kelvin wave.

peak at day 345 and the deep trough at day 395. GEOSAT times series generated at other locations on the equator suggest that these features have zonal coherence of several thousand kilometers and therefore may also be associated with equatorial waves.

We plan to use the initial 18-month GEOSAT data set to construct monthly sea level anomaly maps for the equatorial Pacific, much like those presently derived from island tide gages but with greatly improved spatial resolution and coverage. In situ data (e.g., tide gage, expendable bathythermograph, inverted echo sounder) will be merged with the altimeter data, using objective analysis to obtain the best combined solution. This sea level time series analysis will be continued into the GEOSAT ERM with the intent of evetually performing near real-time monitoring of the entire equatorial Pacific. This information should significantly enhance NOAA's ability to interpret changes in the oceans that lead to short-term climatic events such as El Niño.

Acknowledgments

We are grateful to the U.S. Navy for granting us access to GEOSAT data and to APL for their hospitality. In particular, we thank Charles Kilgus, GEOSAT Project Manager at APL, and U.S. Navy GEOSAT Project Managers Cdr. Donald McConathy and Cdr. Frank Wooldridge. Credit is also due Radm. John Bossler of NOAA and Paul Wolff, Assistant Administator for NOAA's National Ocean Service, who provided enthusiastic support for the GEOSAT processing facility. Thanks is also due to Radm. John Seesholtz, Oceanographer of the Navy, and Jim Mitchell of the Naval Ocean Research and Development Activity, who strongly supported GEOSAT's oceanographic mission.

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GEOSAT Data Available Soon

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GEOSAT altimeter data collected after November 8, 1986, will be made available to the general research community by the National Oceanic and Atmospheric Administration (NOAA) beginning in early 1987. Although GEOSAT has been operating since April 1985, observations from the first 18 months are classified. In October 1986 the satellite was maneuvered into a 17-day exact repeat orbit whose ground track coincides with the previous Seasat altimeter tracks, allowing new GEOSAT data to be unclassified. Under agreement reached with the U.S. Navy and the Johns Hopkins University Applied Physics Laboratory (Laurel, Md.), NOAA will assume responsibility for generating the unclassified data sets from this Exact Repeat Mission (ERM). Doppler tracking data will first be evaluated by the Naval Astronautics Group (NAG) to ensure that the GEOSAT ground track has deviated by no more than 1 km (cross track) from the exact repeat orbit. On-board thrusters will be fired when necessary (approximately monthly) to maintain colinearity. Raw data in the form of sensor data records (SDRs) will then be transmitted to a NOAA processing facility in Rockville, Md., where they will be converted to finished geophysical data records (GDRs). SDR-to-GDR production consists of merging the altimeter data with an ephemeris provided by NAG and adding correctionfields for tides, troposphere (wet and dry components), and ionosphere. Completed GDRs will be sent to NOAA National Environmental Satellite Data and Information Service (NESDIS) in Washington, D.C., where they will be made avilable to the public. (GEOSAT data will initially be distributed to U.S. institutions only; foreign institutions are advised to seek access through formal embassy channels.)

Additional information on GEOSAT data format and content can be obtained from Robert Cheney, Mail Code N/CG11, National Ocean Service, NOAA, Rockville, MD 20852; Telemail: NGS.VLBI.

This item was contributed by Robert Cheney.

News & Announcements

Lost CTD Recovered by French Sub

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On March 11, 1986, the R/V *Noroit,* a research vessel belonging to IFREMER (Institut Francais de Recherche pour l'Exploitation de la Mer, Paris), was on station in the northeast Atlantic Ocean (46°54'N, 11°14'W). The crew

were performing a deep conductivity-temperature-depth (CTD) cast (water depth 4750 m) as part of a survey of abyssal circulation in that region. The towed CTD instrument unit was 120 m from the bottom when the cable ruptured, resulting in the loss of the instrument and 4788 m of cable. The cause of the cable failure was quickly diagnosed as corrosion on a rarely used part of the cable.

The instrument itself was a Neil Brown Instruments CTD/O (Neil Brown Instrument Systems, Inc., Cataumet, Mass.). Attached to its frame was a set of fourteen 8-liter sampling bottles with a newly designed closure system consisting of an electric motor that is digitally controlled to avoid interference with the data transmission, as well as a prototype IFREMER-built deep nephelometer and a pinger used to monitor the instrument's approach to the bottom. The presence of the pinger allowed a detailed survey of the lost instrument package's position to be made. It was estimated that, with satellite navigation assistance, the position of the CTD was known to within 200 m.

Considering the value of the instrument and the effort that had gone into developing the new closing system and nephelometer, it was decided to attempt a recovery with the deep diving research submersible *Nautile*, which can dive to 6000 m. Two circumstances made this operation feasible: the availability of the *Nautile* after the unfortunate cancelation of the planned *Titanic* operation and the precise knowledge of the position of the lost CTD. Moreover, it was felt that this would constitute an excellent practice dive.

Two days were scheduled for the recovery during a cruise in July of the R/V *Nadir*, the *Nautile*'s tender. (The main objective of the cruise was to test the "Robin," a tethered remote camera video system operated from *Nautile*). Success was dependent on locating the instrument, cutting the attached cable, and bringing the "fish" (towed instrument package) to the surface. The estimated weight (in water) of the CTD with its frame and peripheral instrumentation was 150 kg.

The first dive did not locate the CTD after a search of about 10 km on the bottom. During the second dive, the *Nautile*, using its own sonar along with navigation instructions from the *Nadir*, found the cable and followed it to the instrument. Fortunately, the cable was resting on the bottom and not tangled on the frame. It was easily cut with shears manipulated by the *Nautile*'s arms. A package consisting of syntactic buoyancy foam, a 50-m line, an acoustic release, a flash for visual contact with *Nautile*, and expendable weight was then thrown overboard from the *Nadir*, recovered by the *Nautile*, and attached to the CTD frame by means of a line with safety hooks. Because of the duration of the whole exercise, and for safety reasons, the sub and its crew were brought to the ship at this point, after a 12-hour dive. The acoustic release was then activated and the instruments were recovered at the surface.

Inspection of the CTD showed that it was in perfect working condition. The only damage (after 4 months) was some corrosion on the aluminum frame, which had acted as an anode.

This operation owes its success to the cooperation of a number of groups within IFREMER. Particular thanks are due to the crews of the *Nautile* and the *Nadir*, to J. L. Michel, chief scientist, and to engineers J. P. Allenou and J. P. Gouillou.

This item was contributed by Y. Desaubies, *IFREMER Centre de Brest, Brest, France.*

Panel Recommendations on Oil Spill Risk Assessment

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A technical panel was convened by the Minerals Management Services (MMS) of the Department of Interior to identify deficiencies and recommend improvements in their Oil Spill Risk Analysis (OSRA) model. Members of the panel were J. M. Bane, Jr. (University of North Carolina, Chapel Hill), G. S. Janowitz (North Carolina State University, Raleigh), T. H. Lee (University of Miami, Miami, Fla.), G. L. Mellor (Princeton University, Princeton, N.J.), M. L. Spaulding (University of Rhode Island, Kingston), and F. M. Vukovich (Research Triangle Institute, Raleigh-Durham, N.C.).

The present OSRA model uses climatologically derived near-surface velocity fields on which are superposed oil trajectory velocities derived from the so-called "3.5% rule": this uses a wind series derived from a "transition probability matrix" statistical approach.

In brief, the panel recommended that MMS should use current fields calculated with a three-dimensional time-dependent numerical model. The model should have sufficient grid resolution to resolve some mesoscale dynamics and would be driven by a composited year of observed monthly wind fields in which each month is to be a statistically "typical" month.

The 20-page report, entitled "Review of the Present Methodology and Recommendations for Future Methodologies for Oil Spill Risk Assessment," may be obtained by contacting Barry S. Drucker, Minerals Management Service, 18th and C Streets, N. W., Mail Stop 644, Washington, DC 20240 (telephone: 202-343-7744).

This item was contributed by George L. Mellor, *Geophysical Fluid Dynamics Program, Princeton University, Princeton, N.J.*

Opinion

Composition of The Oceanography Report

PAGE 1356

In looking over the subject matter of The Oceanography Report (TOR), beginning with the September 1, 1981, edition of *Eos*, I am struck by the predominance of physical oceanography lead articles. In fact, out of 63 articles, 23 are "pure" physical oceanography, 25 are multidisciplinary, general, or news and announcement articles, and the remainder are about equally divided between biological, chemical, and geological oceanography (see Table 1). Although TOR Editor David Brooks is a physical oceanographer, he is emphatic about rarely soliciting articles in physical oceanography, but on the other hand, he has made some effort to get articles in the other disciplines.

Surely the physical oceanographers are not the only group in oceanography that have new and existing discoveries, new programs, workshop findings, and other newsworthy items to report on a timely basis in the *Eos* medium. Let the past predominance of physical oceanography–type articles be a challenge to the other disciplines to submit articles for TOR to its editor David Brooks.

William N. Sackett
Richard Montgomery Field Fellow
AGU Headquarters
Washington, D.C.

Editor's Note: TOR's editorial policy has always been to provide an outlet for general and timely information of potential interest to all oceanographers. As Bill Sackett notes—and as I noted when I became *Eos* editor (*Eos*, July 3, 1984, p. 426)—articles about physical oceanography predominate, even though TOR's editors have expended considerable effort to solicit articles from the other disciplines of ocean science. Perhaps the approximately 50% share of physical oceanography articles reflects the research interests of the present community of ocean scientists. Whatever the reason, I echo Sackett's challenge to oceanographers of all "flavors" to air their interests and concerns in TOR.—*DAB*

TABLE 1. TOR Article and Feature Breakdown

	Articles					General News and Announcements
Year	Biological	Chemical	Geological	Physical	Multi-disciplinary	
1981					1	3
1982	3		2	3	1	3
1983		2	1	6		3
1984		1	2	3	1	5
1985		1		7		4
1986	2		1	4	2	2
Totals*	5	4	6	23	5	20

*Total number of items appearing in TOR since its inception: 63