case study, we use altimetric maps of the Mediterranean Sea and the Alboran Sea, combining TOPEX-POSEIDON and ERS-1/2 data for the period October 1992 to March 2000. The learning procedure is applied to each mode individually. The final forecast is then reconstructed from the EOFs and the forecasted amplitudes, and compared to the real observed field, the persistence and linear forecasts for validation purposes.

OS41Q-09 1050h

The Path of the Overflows From the Sills in the Sicily Strait

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The Sicily Strait forms a natural barrier to the passage of the deep waters from the eastern to the western basins of the Mediterranean. The strait has a complicated bathymetry with two near-parallel channels separated by a central bank that rises to within 100 m of the sea surface.

In the top 150 m of the strait there is an eastward flow of Modified Atlantic Water. Below this, Levantine Intermediate Water (LIW) flows westward. An energetic vein of LIW passes through the narrow eastern channel (sill depth 430 m) and a weaker, slightly cooler and fresher, vein flows through the broader western channel (sill depth 370 m). The region immediately downstream of the sills has been identified as a site for mixing between the overflow waters and Tyrrhenian Deep Water.

The flow across the sills and the area of mixing downstream of the sills was investigated during a research cruise in the strait in June 2000. High-resolution CTD and ADCP measurements were made using instruments on Autosub-2, an autonomous underwater vehicle (AUV), in addition to shipborne CTD, ADCP and LADCP profiles.

These measurements have allowed us to map the spatial distribution and the path of the deep overflow water in this region and to estimate the salt and heat fluxes along different paths through the sills. We are also using small-scale T-S variability to investigate the spatial variation of small scale mixing processes in the Sicily Strait in the vicinity of the two sills.

OS41Q-10 1105h

Hydrography and ADCP Observations of the Costa Rica Coastal Current in NW México

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The Costa Rica Coastal Current (CRCC) is the easternmost branch of the Eastern Tropical Pacific cyclonic circulation; it flows north following the coast of Central America and México before joining the California Current in feeding the North Equatorial Current. Despite its importance, there are very few studies of this current. We report the CTD and ADCP observations collected in November 2000 and May 2001. The surveys, the first of a 3-year program, were made in a box 200nm along shore by 100nm offshore (16-19°N, 101-106°W) in the SW of México. The hydrography shows the expected water masses (Tropical Surface Water, SubTropical SubSurface Water, Pacific Intermediate Water, and Pacific Deep Water) with some seasonal variation in the upper layers. In both surveys the CRCC was well developed, flowing to the NW with speeds exceeding 0.5 m/s in a coastal band some 50 km wide. Further offshore, strong horizontal shears were observed, which satellite altimeter data suggest are due to eddies.

OS41Q-11 1120h

Circulation on the Western Shelf of the Gulf of Mexico

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The seasonal to synoptic scale circulation on the western shelf of the Gulf of Mexico is studied using the Navy Coastal Ocean Model simulation of the entire gulf and analyzing different in situ data. It is shown that there is a strong seasonal component of the circulation variability of the shelf. During fall-winter a southward current dominates the circulation on the shelf. This counterclockwise current reaches the southern Bay of Campeche where it meets an opposing along-shelf current. During spring-summer, south of 27°N, a dominant northward circulation appears.

The seasonal circulation is accompanied by a strong temperature and salinity variability. During winter, fresh water from the Mississippi and Atchafalaya rivers is advected along the Louisiana-Texas shelf to the Tamaulipas-Texas shelf developing along-shelf fronts. Other rivers have local influence developing fronts along the coast.

Episodic cross-shelf currents can transport as much as 0.5 Sv, a magnitude similar to that of the along-shelf transports. Cross-shelf transports are associated with eddy-pair when they interact with the shelf break and to small eddies formed by meanders in the along shelf current.

OS41Q-12 1135h

Contrasting Views of Shelf Circulation in the Northern Gulf of Mexico

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Ocean circulation over the continental shelf in the northwestern to northeastern regions of the Gulf of Mexico is described with Lagrangian drifter data. Near 350 ARGOS tracked surface drifters were air-deployed in a 150 km square over the Louisiana-Texas shelf between June 1993 and September 1994. An equal number of identical drifters were released on the northern Florida shelf from February 1996 through June 1997. Surface currents in the northwestern Gulf during the months of August through May are primarily toward the west along isobaths. Mean velocities are near 20 cm s^{-1}, slightly larger close to the shoreline. Gulf eddies force mostly offshore flow once the Mexican coast is reached. Surface currents during June and July are mainly along bathymetry toward the east with slightly reduced velocities. Surface currents in the northeastern Gulf are highly variable in both space and time. Monthly mean currents over the inner Florida shelf are only a few cm s^{-1}. Larger, more coherent flows exist along the outer-shelf, near the shelf-break. The shelf break flows are mainly toward the east and southeast along bathymetry during June and July, and are variable during other months. A semi-permanent eddy near DeSoto Canyon is the primary mechanism responsible for cross-shore flows in the northeastern Gulf. Drifters west of Cape San Blas are occasionally transported westward past the Mississippi Sound into the northwestern Gulf at speeds in excess of 50 cm s^{-1}. These strong westward shelf flows are forced by winds associated with the passage of strong low-pressure systems. Coherence among shelves exists only during summer months when flow is eastward, and during strong easterly wind events when strong westward jets are observed.

OS41Q-13 1150h

Observation of Deep Water Manifestation of Loop Current and Loop Current Rings in the Eastern Gulf of Mexico

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Deep currents beneath the Loop Current (LC) in the eastern Gulf of Mexico were observed using a mooring deployed near 87oW and 25.5oN with water depth of 3356 m, a strategic location that appears to lie in the path of every Loop Current Ring (LCR) formed in the Gulf of Mexico. The mooring was equipped with two ADCPs, one upward-looking at 140 m and the other downward-looking at 3200 m, and six Aanderra current meters set at 155, 750, 1500, 2500, 3000, and 3200 m in order to sample the entire water column. The successful initial deployment covers the period extending from June 1, 2000 to August 1, 2001. The water column sampled behaves basically as a two-layer system. The weakest currents were observed at 750 m which appears to be close to the interface between the upper-layer and the lower-layer. Currents in the upper-layer are dominated by the LC. The two strongest events are nearly 300 days apart, with observed maximum current speeds reaching approximately 150 cm/s at 60 m, corresponding to the time when the high-speed core of LC was sweeping past the mooring site. Once the high-speed core moved away from the mooring site, upper-layer currents weakened significantly. Currents in the lower-layer below 750∼1000 m are generally decoupled from the upper-layer currents. However, currents in the lower-layer are nearly depth-independent within the lower layer with maximum current speeds reaching 30∼35 cm/s between1500 m and 3200 m. Correlations between the currents in the two layers increase significantly during a few episodic events. Concurrent TOPEX/ERS-2 observations suggest that one of those episodic events coincided with the formation of a LCR, namely Millenium Eddy in early 2001. Effects of the bottom boundary layer can be clearly seen within 30 m of the bottom. Variability of lower-layer currents in terms of magnitude and frequency relative to the upper-layer currents will be discussed.

OS41R HC: 319 A Thursday 0830h

Scientific Communication, Publishing, and Libraries: What Lies Ahead?

Presiding: **E Uhlinger,** MBL/WHOI Library**; J Parker,** Librarian Moss Landing Marine Laboratories and the Monterey Bay Aquarium Research Institute

OS41R-01 0830h INVITED

Developing New Models for Scholarly Publishing

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Advances in technology are continuing to transform the scholarly communications process, and participants on all levels are finding their roles undergoing change. As traditional boundaries shift and new ones emerge, publishers, librarians and scholars alike are struggling to understand where they fit into the new landscape. Consequently, new collaborative initiatves are springing up as participants begin to work together to address the technical and financial challenge of distributing research results electronically. This talk will focus on examing a host of new initiatives that offer effective strategies and even some concrete solutions to address common concerns.

OS41R-02 0900h INVITED

Electronic Publication From one Researcher's Point of View

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Electronic publishing (E-publishing) linked with internet access can provide a valuable, yet precarious, avenue to research publications. Advantages of E-publishing may include lower costs for, and facilitated access to, publications. Disadvantages may include reduced access and increased expense to academics with no internet access, decentralization of scientific societies, a potential for lower quality peer review and editing procedures, and a threat to a manuscript's longevity. The present view of this researcher is E-publication will be an inevitable and significant avenue to disseminate research results, and that scientific societies should lead the charge rather than react to the change.

THU

OS41R-03 0930h

Next Generation Digital Publishing - Journals as Living Literature Databases

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Publishing the results of scientific research in a purely digital environment is a relatively new paradigm that few publishers have fully embraced. Dependency on formats derived from print publications, albeit enhanced with links to the literature, does not take full advantage of the technology available.

We propose that the scientific journal should be a database of articles containing multiple data types alphanumeric, text, image, video and audio that are linked coherently within the database and to multiple external sources. Comprehensive indexing and classification of information enables one to publish a single multidisciplinary journal that links seamlessly to other databases in a federated search environment. In addition to articles, data, whether single reference values or large data sets, can be published with full credit to the author. Such a journal, integrated with the worlds scientific literature and factual databases provides an information resource that with the addition of search, data mining, visualization, interpretative and other tools provides the research scientist and the librarian with a rich information environment to extract the knowledge from the information base to improve the productivity and efficiency of the research and development processes.

As an example of what we propose, TheScientificWorldJOURNAL is a peer-reviewed digital journal for the Life Sciences and Environmental Sciences providing for online submission and immediate worldwide dissemination of accepted work. Authors retain copyright ownership of their work that, upon publication, may be accessed and purchased via the web site of TheScientificWorld. All articles are also deposited immediately in public online libraries where the content may be searched without charge. All articles published in TheScientificWorldJOURNAL may be obtained free of charge one year after their publication through either TheScientificWorld web site or through the public online libraries.

References cited in TheScientificWorldJOURNAL as well as author and title information are linked online to bibliographic databases including sciBASE, which incorporates data from PASCAL, CAB ABSTRACTS(R) and MEDLINE (R), as well as other leading sources to enable further bibliographic searches (e.g., author search); to provide abstracts of cited references; and, in addition, to link to document supply services that enable cited full text articles to be procured, by immediate pdf download or email delivery of copies. Articles can be dynamically updated through links to factual databases to retain the currency of the article.

OS41R-04 1000h

Marine Realms Information Bank, a Distributed Geolibrary for the Ocean

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The Marine Realms Information Bank (MRIB) is a prototype web-based distributed geolibrary that organizes, indexes, and delivers online information about the oceanic and coastal environments. The improvement of computer power and connectivity of the 1990s, by enabling very fast exchange of data online, has shown that effective information management does not automatically result from quicker connection or large broadband. Millions of web sites have been setup to provide information on every subject, and various information-gathering systems have been developed to locate information online. Unfortunately, these search engines often produce exhaustive bibliographic lists that mix first-quality scientific knowledge with irrelevant materials. To be really useful, information banks require not only quality control but also classification systems that integrate and organize the information.

In 1999 the National Research Council proposed the concept of distributed geolibraries, which are online digital libraries able to provide a simple mechanism for searching and retrieving information in response to topical and geographically defined needs. Distributed geolibraries are beneficial for various reasons, the most important of which is the authoritative role they would come to assume as subject gateways. To be referenced through a scientific geolibrary, information sources must meet quality standards set by the library gatekeeper. Another important benefit of a distributed geolibrary comes from its distributed attribute. Without the need to collect information in one physical location, local curators can serve and update online information without the requirement of maintaining consistency among multiple copies.

The MRIB prototype implements the distributed geolibrary concept to organize, index, and deliver online information about the oceanic and coastal environments. MRIB provides access to information, but it is not an information repository. It incorporates information that exists in remote sources, without modifying formats or content. This system succeeds by building a central index that consists of Electronic Index Cards containing metadata about the information sources, their geographical areas, and their network locations. The ontology of MRIB is expressed in the classification system through which users can explore the available information. MRIB currently classifies information with 13 types of categories (facets): Location, Geologic Time, Features, Biota, Discipline, Scientific Method, Hot Topics, Project Name, Agency Name, Author, Class, Format, and Audience. Classifying information is not automatic but is performed by a librarian, which is both the major benefit and the major operating cost of MRIB.

The significance of MRIB lies both in the utility of the information bank and in the implementation of the distributed geolibraries concept. Distributed information banks, such as MRIB, can be applied widely as unifying portals for extensive or rapidly developing information bases, for which a centralized repository would be impractical. In addition, MRIB has a modular structure that allows a classification system to be easily modified, to expedite the development and testing of suitable classification systems for existing information bases.

URL: http://mrib.usgs.gov

OS41R-05 1050h INVITED

Electronic Journals: A Work in Progress

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Despite the fact that journals have been distributed electronically for >5 years, the electronic journal is in the very early stages of development. How quickly it will change and what it will change to depend on the imagination of authors as they exploit the medium to convey their results. AGU's goal from the beginning has been to go beyond a flat page reproduced on a screen. Providing members the means to customize their AGU information packages was also a critical part of the AGU plan. Starting 1 Jan. 2002, the SGML files in the AGU archive will constitute the journal of record; the html will be the online rendition of the journal of record and will contain material that will not be in the printed journal. Thus, the printed journal can no longer serve the archival role it has in the past. The responsibility for maintaining and upgrading the archive for electronic journals must lie with the publisher; libraries and other entities are unlikely to have the means to do the job. Seemingly mundane things are also changing: how to cite articles in a persistent way; how to maintain the integrity of the literature while making it easy to find the errata. Adjusting the economic model is another aspect of this work in progress. To what extent can societies continue to rely on three traditional revenue streams: member subscriptions, institutional subscriptions, and author fees? The terms under which access will be granted are also likely to change as there is more experience. There are many unknowns, but it is clear that change will be the norm for electronic journals for a long time.

OS41R-06 1120h

Deep-Sea Research: A Classic Journal Enters the Digital Millennium

Name TBD (508-289-7665; euhlinger@mbl.edu)

Elsevier Science, Molenwerf 1 1014 AG Amsterdam The Netherlands, Netherlands

Elsevier Science, publisher of a number of highly respected oceanography journals, continues to be a leader in the rapid evolution from print to electronic journals. The process of taking a journal such as Deep-Sea Research into the electronic era, the impact on the journal, and the emerging issues for scholarly scientific communication in the ocean sciences will be discussed.

OS41S HC: 317 B Thursday 0830h

Ocean Dynamics and Instabilities II

Presiding: **D P Marshall,** University of Reading**; R A de Szoeke,** Oregon State University

OS41S-01 0830h

Destabilisation of barotropic flows by small-scale topography

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We examine the stability of a zonal jet on the beta-plane with bottom topography (such that the isobaths are zonal). It is assumed that the horizontal scale of topography is much smaller than the width of the jet. The attention is mostly focussed on linear, normal-mode disturbances.

Two types of disturbances are considered: *long* disturbances, the length of which is comparable to the width of the jet; and *short* disturbances, the length of which is comparable to the spatial scale of topography. The former have been examined by Benilov (2000), who demonstrated that topography is, generally, a stabilizing influence for them. The latter are the subject of the present work: using analytical methods and direct numerical integration of the eigenvalue problem for normal modes, it is argued that they are always unstable.

OS41S-02 0845h

Effects of Bottom Friction on a Baroclinically Unstable Oceanic jet

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Bottom friction is an important sink of energy in the ocean. Indeed, high resolution ocean models need bottom friction to achieve a satisfactory kinetic energy level at the equilibrium.

In this study we reexamine the effects of bottom friction on the non-linear equilibration of an unstable baroclinic jet using a PE model. As in previous studies using QG models (Panetta, 1993) we have found that the bottom friction strongly affects the barotropic mode whereas the baroclinic modes are weakly changed. The new result is that the bottom friction can yield a significant space scale selection, either in QG or PE model. A comparison between PE and QG solutions reveal that the characteristics of the PE eddy field differ from that of the QG eddy field in the upper layers.

The "barotropic governor" of James (1987) cannot explain the effects of the bottom friction for this oceanic eddy field. A rationalisation of these results is proposed.

OS41S-03 0900h

Instability of vortices in a two-layer ocean with thin upper layer

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We examine the stability of a quasigeostrophic vortex in a two-layer ocean with *thin* upper layer on the f-plane. It is assumed that the vortex has a sign-definite swirl velocity and is localised in the upper layer, whereas the disturbance is present in both. The stability boundary-value problem admits three types of normal modes: *fast* (upper layer dominated) modes, responsible for *equivalent-barotropic* instability, and two *slow baroclinic* types (mixed and lower layer dominated modes). The growth rate of unstable fast modes is the largest of the three, however, they exist only for unrealistically small vortices (with a radius smaller than