

Woods Hole Sea Grant: Geology

Past and Future Evolution of Marine Geology

Helpful to educators and students.

Emery, K.O. and D.A. Ross

SEPM Special Volume, pp. 11-14, 1991 WHOI-R-91-006

An attempt is made to understand some of the ways that marine geology developed during the past 50 years, essentially the working lifespan of an active but venerable scientist. This interpretation is aided by comparing marine geology with the development of land geology during a longer period, and by attempting to understand the relative roles of science and technology in the field of marine geology. Excursions from simple straight-line advance for all geology (and also for other fields) are provided by the unexpected appearances of broad generalizations, or paradigms, that commonly are developed by a few scientists and opposed by many, at least for a time. These sudden advances await the accumulation of critical masses of knowledge that, in turn, depend upon exceptional opportunities, partly in the form of adequate funding and partly by transfer of technology. These unusual circumstances make accurate prediction of future advances in marine geology (and in other scientific and technical fields) unreliable but still worthy of thought.

Diffuse Flow from Hydrothermal Vents

[Only available on loan from the National Sea Grant Library](#)

Trivett, D.A.

Ph.D. Thesis, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program Dissertation for Sc. D. in Ocean Engineering, 216 pp., 1991 WHOI-X-91-001

The effluent from a collection of diffuse hydrothermal vents was modelled to determine the fate of this source of flow under typical environmental conditions at seafloor spreading centers. A laboratory simulation was conducted to test an analytic model of diffuse plume rise. The results showed that diffuse plumes are likely to remain near the seafloor, with their maximum rise height scaled with the diameter of the source of diffuse flow. The entrainment of ambient seawater into these plumes is limited by the proximity to the seafloor, thus slowing the rate of dilution. The model of diffuse plume behaviour was used to guide the design and implementation of a scheme for monitoring the flow from diffuse hydrothermal vents in the ocean. A deployment of an array at the Southern Juan de Fuca Ridge yielded measurements of a variety of diffuse plume properties, including total heat output.

The Sound Field Near Hydrothermal Vents on Axial Seamount, Juan De Fuca Ridge

Little, S.A., K.D. Stolzenbach, and G.M. Purdy

Journal of Geophysical Research, Vol. 95, No. B8, pp. 12927-12945, 1990 WHOI-R-90-009

The Geologic Enigma of the Red Sea Rift

Uchupi, E. and D.A. Ross

In: Ittekkot, V., S. Kempe, and W. Michaelis (eds.), Facets of Modern Biogeochemistry, Springer Verlag, pp. 52-61, 1990 WHOI-R-90-011

Tectonic Development of the Western Branch of the East African Rift System

Ebinger, C.J.

Geological Society of America Bulletin, Vol. 1, pp. 885-903, 1989 WHOI-R-89-009

Geometric and Kinematic Development of Border Faults and Accommodation Zones, Kivu-rusizi Rift, Africa

Ebinger, C.J.

Tectonics, Vol. 8, No. 1, pp. 117-133, 1989 WHOI-R-89-005

Chronology of Volcanism and Rift Basin Propagation: Rungwe Volcanic Province, East Africa

Ebinger, C.J., A. Deino, R. Drake, and A. Tesha

Journal of Geophysical Research, Vol. 94, pp. 15785-15803, 1989 WHOI-R-89-022

Thermal and Mechanical Development of the East African Rift System

[Only available on loan from the National Sea Grant Library](#)

Ebinger, C.J.

Ph.D. Thesis, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography and Oceanographic Engineering, 180 pp., 1988 WHOI-X-88-002

Fluid Flow and Sound Generation at Hydrothermal Vent Fields

[Only available on loan from the National Sea Grant Library](#)

Little, S.A.

Ph.D. Thesis, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography and Oceanographic Engineering, 152 pp., 1988 WHOI-X-88-001

Several experiments are presented in this thesis which examine methods to measure and monitor fluid flow from hydrothermal vent fields. Simultaneous velocity, temperature, and conductivity data were collected in the convective flow emanating from a hydrothermal vent field located on the East Pacific rise. The horizontal profiles obtained indicate that the flow field approaches an ideal plume in the temperature and velocity distribution. Such parameters as total heat flow and maximum plume height can be estimated using either the velocity or the temperature information. The results of these independent calculations are in close agreement. The nonlinear effects of large temperature

variations on heat capacity and volume changes slightly alter the calculations applied to obtain these values.

Post-miocene Rifting and Diapirism in the Northern Red Sea

Mart, Y. and D.A. Ross

Marine Geology, Vol. 74, pp. 173-190, 1987 WHOI-R-87-003

The Geology of the Persian Gulf: Gulf of Oman Region: A Synthesis

Ross, D.A., E. Uchupi, and R.S. White

Review of Geophysics, Vol. 24, No. 3, pp. 537-556, 1986 WHOI-R-86-003

The Tectonic Style of the Northern Red Sea

Uchupi, E. and D.A. Ross

Geo-Marine Letters, Vol. 5, pp. 203-209, 1986 WHOI-R-86-015

Multichannel seismic reflection profiles recorded in the northern Red Sea show structures that are interpreted to be the result of the intrusion of uppermost Miocene salt. The authors believe that the evaporites are underlain by attenuated continental crust and the flow of salt is due to renewed faulting of basement in the Pliocene when sea floor spreading began between latitudes 21°N and 15°30'N.

Continental-oceanic Crustal Transition off Southwest Africa

Austin, J.A. and E. Uchupi

The American Association of Petroleum Geologists Bulletin, Vol. 66, No. 9, pp. 1328-1347, 1982 WHOI-R-82-027

Salt Diapirism and Associated Faulting Beneath the Eastern End of Georges Bank

Uchupi, E., J.A. Austin Jr., and D.H. Gever

Northeastern Geology, Vol. 4, No. 1, pp. 20-22, 1982 WHOI-R-82-006

Mesozoic-cenozoic Regressions and the Development of the Margin off Northeastern North America

Uchupi, E., J.P. Ellis, J.A. Austin Jr., G.H. Keller, and R.D. Ballard In: Scrutton, R.A. and M. Taiwani (eds.), The Ocean Floor, John Wiley & Sons, Ltd., Chichester, pp. 81-95, 1982 WHOI-R-82-023

Mesozoic Lithofacies Development and Economic Potential of the Georges Bank Basin off Southern New England

Austin, J.A. and E. Uchupi

Northeastern Geology, Vol. 2, No. 2, pp. 55-61, 1980 WHOI-R-80-016

Geology of New England Passive Margin

Austin, J.A., E. Uchupi, D.R. Shaughnessy, and R.D. Ballard

The American Association of Petroleum Geologists Bulletin, Vol. 64, No. 4, pp. 501-526, 1980 WHOI-R-80-009

The Use of the Coastal Oceans in the 80's: Opportunities for Marine Geology

[Only available on loan from the National Sea Grant Library](#)

Ross, D.A. and D.G. Aubrey

Woods Hole Oceanographic Institution Technical Report WHOI-80-19, 63 pp., 1980 WHOI-T-80-004

Continental Margin Subsidence and Heat Flow: Important Parameters in Formation of Petroleum Hydrocarbons

Royden, L., J.G. Sclater, and R.P. Von Herzen

The American Association of Petroleum Geologists Bulletin, Vol. 64, No. 2, pp. 173-187, 1980 WHOI-R-80-007

Geology of the Passive Margin off New England

[Only available on loan from the National Sea Grant Library](#)

Austin, J.A.

1979 WHOI-Y1-79-002

Particulate Calcium Carbonate in New England Shelf Waters: Result of Shell Degradation and Resuspension

[Only available on loan from the National Sea Grant Library](#)

Fitzgerald, M.G., C.M. Parmenter, and J.D. Milliman

1979 WHOI-R-79-018

The Geologic History of the Passive Margin off New England and the Canadian Maritime Provinces

Uchupi, E. and J.A. Austin Jr.

1979 WHOI-R-79-007

Last updated: June 24, 2014

Copyright ©2007 Woods Hole Oceanographic Institution, All Rights Reserved.

Mail: Woods Hole Oceanographic Institution, 266 Woods Hole Road, Woods Hole, MA 02543, USA.

E-Contact: info@whoi.edu; press relations: media@whoi.edu, tel. (508) 457-2000
Problems or questions about the site, please contact webdev@whoi.edu