

Foreword

Scuba is an integral activity in many fields of scientific research but is often inadequately described in Materials and Methods sections in the literature. We therefore focus on this theme by highlighting methods and techniques utilized in scientific diving. The Proceedings of *Methods and Techniques of Underwater Research* contain 29 papers presented at the 16th Annual American Academy of Underwater Sciences Scientific Diving Symposium, October 12-13, 1996, at the Smithsonian Institution, Washington, D.C. Two keynote abstracts are included by research scientists Drs. Kenneth E. Clifton and J. Emmett Duffy, exemplifying exciting results of careful and dedicated underwater research efforts. The Academy sponsors these symposia to disseminate information and to stimulate discussion on the advancement of undersea science and technology. Diving safety is also an important research and operational focus of the AAUS. This symposium was hosted at a particularly opportune time on the occasion of the Smithsonian Institution's 150th birthday celebrating "the increase and diffusion of knowledge." Eleven papers are presented by active research scientists in the Smithsonian Scientific Diving Program covering topics related to fish systematics, foraging ecology and life history, habitats and rebreathers, mineral sciences, paleobiology, nautical archaeology, ecological and statistical methods, coral-reef geology, invertebrate biology, and animal behavior.

The American Academy of Underwater Sciences is recognized as an authority on scientific diving and undersea technology. As such, it has a responsibility to solicit and publish new information. As Rützler points out: "It is obvious that scientific diving will continue to be a powerful tool in answering [research] questions, and we look forward to further developments and refinements of the technique and hope for expedient access to its advanced technological accomplishments." As scientists we furthermore realize the need to maximize our underwater research time; as Collette correctly notes, we should benefit from past research technology and scientific diving endeavors and not reinvent the proverbial wheel. Most of this year's contributions support the notion that underwater science and scientific diving are alive and well and advancing steadily. Research diving should never be underestimated as to its potential for resulting in new discoveries when the trained scientific mind submerges beneath the surface and critically focuses on the surrounding environment (e.g., Duffy, Clifton, Johnston, Littler *et al.*). Advances in instrumentation continue to improve underwater technology for measuring or recording events for analysis. (Ackleson, Cahoon, Fiske and Avery, Macintyre, Wolcott and Hines). Saturation diving systems are part of the past, present, and future tools that the scientific diving community has at its disposal to accomplish underwater research (Collette, Shepard *et al.*, Cooper and Babb). Old and new methods and techniques described in this volume highlight mechanisms of accomplishing underwater research (Baldwin *et al.*, Canestro *et al.*, Chiappone *et al.*, Clifton, Cox *et al.*, Huber *et al.*, Lessios). Specific underwater research projects are described by Duncan and Karna, Kline and Scheel, Klos *et al.*, Marelli and Arnold, and, Van Veghel *et al.* Diving safety and operational aspects (Bash, Egstrom, Emmerman) are reviewed and recommendations presented. Governmental science and regulatory programs are outlined by Butler, Smith, and Taylor.

The production and assembly of a document of this size and diversity would not be possible without the assistance of a number of people. We extend our personal thanks to the authors for their contributed papers and numerous reviewers who helped improve the overall quality of this document.

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**Michael A. Lang
Scientific Diving Program
Office of the Provost**

**Carole C. Baldwin
Department of Vertebrate Zoology
National Museum of Natural History**