The IEEE Oceanic Engineering Society at Forty: The Challenges of an Evolving Society

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***Abstract*—The IEEE Oceanic Engineering Society (OES) has completed forty years of active engagement: the initial eight years in the form of the Oceanography Coordinating Committee (OCC), followed by seven years as the Council of Oceanic Engineering (COE), then the past twenty-five years in the form of an IEEE society. During those forty years, the OCC/COE/OES has existed to serve society, the profession, the oceanic engineering community, and the professional interests of IEEE members working in oceanic engineering. OES has sponsored a strong set of conferences, including OCEANS, the Offshore Technology Conference (OTC), the Undersea Technology (UT) symposium, the United States/European Union (U.S./EU) Baltic International Symposium series, and a variety of specialty workshops. The OES publishes an influential group of science and technology publications, including its flagship IEEE JOURNAL OF OCEANIC ENGINEERING (JOE), a quarterly newsletter, and a "just-in-time" electronic newsletter. The OES has sought to encourage engineering students to enter the oceanic engineering field through a variety of student-focused activities, including the OCEANS conference student-posters program, human-powered submarine races, the Ocean Science Bowl competitions, and an academic scholarship. Chapters have been established in eight IEEE global regions of the world. These forums and activities have been established and maintained to allow OES members and others in the oceanic engineering community to learn and grow by interacting with each other and sharing their ideas and contributions for solution to technical problems and to the broader challenges of society. As the society has moved through its various eras described later, the OES has invented ways to serve its members and the community at-large and will continue to adapt, innovate, modify, and otherwise support the changing needs of the profession.**

***Index Terms*—Anniversary, history, oceanic engineering.**

I. INTRODUCTION

IN conjunction with the celebration of the fortieth anniversary of the IEEE Oceanic Engineering Society (OES), this paper traces the history of the society from 1983 to 2008. The history is organized into the following six "eras" of significant activities and events: 1) the first era is described in a brief summary of the "formative years," from the OES's inception in 1968 to its evolution to an IEEE society in 1983, as documented by Ivan Coggeshall in "Oceanic engineering: The making of an IEEE society" (IEEE J. Ocean. Eng., vol. OE-10, No. 2, pp. 63–83, Apr. 1985); 2) the era from 1983 to 1988 was largely devoted to addressing national interests of the United States of America; 3) the years from 1989 to 1994 addressed the expansion of the OCEANS conference venues; 4) the era from 1995 to 1998 focused on strengthening the OCEANS conferences; 5) the emphasis from 1999 to 2004 was in expanding the OES globally; and 6) the current era, the years from 2005 to the present, when a multidimensional OES continues its evolution, with growth occurring in many directions. This paper concludes with a summary of some significant aspects of the society at age forty. Tables of significant statistics and information are referenced in the text and included in the Appendixes I–XXIV.

II. 1968–1982: THE FORMATIVE YEARS

A. Oceanography Coordinating Committee

In spring 1968, a group of IEEE engineers working on oceanic engineering problems developed a plan for holding a conference devoted to engineering in the ocean environment. In April 1968, after petitioning the Technical Activities Board of IEEE, this group was granted permission to form the Oceanography Coordinating Committee (OCC). Gilbert Jaffe, Director of the National Oceanographic Instrumentation Center, Washington DC, served as the first Chairman of the OCC. Because of the broad nature of electrotechnology in the oceans, initially three IEEE societies, and eventually a total of 22 IEEE societies,[1] had representatives on the OCC or on its follow-on entity. The initial focus of the OCC was to represent IEEE interests in the multiple-society-sponsored, annual Houston-based, and offshore oil-related Offshore Technology Conference (OTC) in 1969. This was followed in 1970 with the OCC initiation of the OCEANS conferences, devoted to the broad applications of electrotechnology to oceans-related problems. The first of these OCEANS conferences, which quickly became a major focus of the OCC, was held in Panama City, FL, with Wayne Burt as General Chair and Calvin Koesy

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[1]Acoustics, Speech and Signal Processing Society, Aerospace and Electronic Systems Society, Antennas and Propagation Society, Circuits and Systems Society, Communications Society, Components, Hybrids & Manufacturing Technology Society, Computer Society, Control Systems Society, Electrical Insulation Society, Electron Devices Society, Engineering in Medicine and Biology Society, Engineering Management Society, Geoscience and Remote Sensing Society, Industrial Electronics Society, Information Theory Group, Instrumentation and Measurement Society, Microwave Theory and Techniques Society, Nuclear and Plasma Sciences Society, Power Engineering Society, Reliability Society, Sonics and Ultrasonics Group, and Vehicular Technology Society.

TABLE I
OCEANS CONFERENCE VENUES

Title	Dates	Sponsor(s)	City	Facility	Theme	General Chairs [Honorary Chairs]	Executive Chairs [Vice-Chairs]	TP Chairs
OCEANS'70	Sep. 21-24, 1970	IEEE/OCC	Panama City, FL		IEEE International Conference on Engineering in the Ocean	Wayne Burt	---	Calvin Koesy
OCEANS'71	Sep. 21-24, 1971	IEEE/OCC	San Diego, CA	Sheraton Inn – Airport	IEEE International Conference on Engineering in the Ocean	George Tajima	---	Maurice Nelles
OCEANS'72	Sep. 13-15, 1972	IEEE/OCC	Newport, RI	Newport Harbor Treadway Inn	IEEE International Conference on Engineering in the Ocean	Norman Serotta	---	Charles Polk
OCEANS'73	Sep. 25-28, 1973	IEEE/OCC	Seattle, WA		IEEE International Conference on Engineering in the Ocean	Ed Early, Theodor Hueter	[Gordon Vincent]	Gil Raudsep, R. vanHaagen, Robert Bunney
OCEANS'74	Aug.. 21-23, 1974	IEEE/OCC	Halifax, NS	Hotel Nova Scottian	IEEE International Conference on Engineering in the Ocean	Ove Gashus	[C. S. Mason]	J. Brooke
OCEANS'75	Sep. 22-25, 1975	IEEE/OCC, MTS	San Diego, CA	Town and Country Hotel	IEEE International Conference on Engineering in the Ocean	Charles Bishop	[Eric Herz]	Ivor Lemaire, Mel Folkert
OCEANS'76	Sep. 13-15, 1976	IEEE/COE, MTS	Washington, DC	Sheraton – Park Hotel	Ocean Imperatives	Joe Vadus	[Bill Nicholson, Bud Burke]	Bill Nicholson, Jack Boller, Robert Cohen, C. D. Kearse
OCEANS'77	Oct. 17-19, 1977	IEEE/COE, MTS	Los Angeles, CA	Bonaventure Hotel	Impact of Developing Technology on Public Policy and Education	Simon Ramo	[Robert Douglass]	Bernard LeMehaute
OCEANS'78	Aug. 6-8, 1978	IEEE/COE, MTS	Washington, DC	Sheraton – Park Hotel	The Ocean Challenge	Richard Frank	[Bill Nicholson]	Anthony Eller
OCEANS'79	Sep. 17-19, 1979	IEEE/COE, MTS	San Diego, CA	Town and Country Convention Center	The Technical Challenge of Inner Space	Howard Blood	[Allen Beutel]	Gilbert Westervelt, Jack Jaeger, Richard Robinson
OCEANS'80	Sep. 8-10, 1980	IEEE/COE	Seattle, WA	Olympic Hotel	Ocean Engineering in the 1980s	Ted Heindsmann, Stanley Murphy	---	Bruce Adee
OCEANS'81	Sep. 16-18, 1981	IEEE/COE, MTS	Boston, MA	Boston Sheraton Hotel	The Ocean – An International Workplace	Stan Chamberlain	---	James Barger, Robert Collier, James Bartram
OCEANS'82	Sep. 20-22, 1982	IEEE/COE, MTS	Washington, DC	Shoreham Hotel	Industry, Government, Education… Partners in Progress	John Byrne	[Radm Herbert Lippold, Jr.]	Cliff McLain
OCEANS'83	Aug. 29-Sep. 1, 1983	IEEE/OES, MTS	San Francisco, CA	San Francisco Hilton Hotel	Effective use of the Sea: An Update	James Wenzel	[Lloyd Maudlin]	Dennis Douglas, John Vesecky, Dick Paquette

TABLE I
(CONTINUED.) OCEANS CONFERENCE VENUES

Title	Dates	Sponsor(s)	City	Facility	Theme	General Chairs [Honorary Chairs]	Executive Chairs [Vice-Chairs]	TP Chairs
OCEANS'84	Sep 10-12, 1984	IEEE/OES, MTS	Washington, DC	Sheraton Washington Hotel	Industry, Government, Education… Designs for the Future	Comm. John Seesholtz, Radm Brad Mooney	[Andreas Rechnitzer]	Helaine Elderkin, Anthony Eller
OCEANS'85	Nov 12-14, 1985	IEEE/OES, MTS	San Diego, CA	Town and Country Convention Center	Ocean Engineering and the Environment	Victor Anderson	[Charles Bishop]	Jack Jaeger, James Brown
OCEANS'86	Sep 23-25, 1986	IEEE/OES, MTS	Washington, DC	Sheraton Washington Hotel	Science – Engineering – Adventure	Gilbert Maton	[Scott Drummond]	Anthony Eller, Eugene Russin
OCEANS'87	Sep 28- Oct 1, 1987	IEEE/OES, MTS	Halifax, NS	Halifax Conference Center	The Ocean –International Workplace	Comm. E. Lawder, Peter Mayboom	[Clifford Tyner]	David McKeown, Urich Lobsiger
OCEANS'88	Oct 31- Nov 2, 1988	IEEE/OES, MTS	Baltimore, MD	Baltimore Conference Center	A Partnership of Marine Interests	Adm P. Yost	[Radm M. Gilbert, Ed Cannon]	Sam Powell, Joseph Czika, Jr.
OCEANS'89	Sep 18-21, 1989	IEEE/OES, MTS	Seattle, WA	Washington State Convention Center	The Global Ocean	Robert Spindel	[Ed Early]	Joseph Scott
OCEANS'90	Sep 24-16, 1990	IEEE/OES	Washington, DC	Washington Convention Center	Engineering in the Ocean Environment	Radm Richard Pittenger, Radm William Miller	Anthony Eller	David Bradley
OCEANS'91	Nov 1-3, 1991	IEEE/OES	Honolulu, HI	Hilton Hawaiian Village	Ocean Technologies & Opportunities in the Pacific for the 1990s	Adm R. Kelly, Governor John Wallace	[Adm Thomas Haywood, Kiman Wong]	Joseph Vadus, Paul Yuen
OCEANS'92	Oct 26-29, 1992	IEEE/OES	Newport, RI	Marriott & Sheraton Hotels	Mastering the Oceans Through Technology	Craig Dorman	Stan Chamberlain	Thomas Mottl
OCEANS'93	Oct 18-21, 1993	IEEE/OES	Victoria, BC	Victoria Conference Center	Engineering in Harmony with the Ocean	James Collins	---	Jon Preston
OCEANS'94 – OSATES	Sep 13-16, 1994	IEEE/OES, SEE,CUB	Brest, France	Park de PENFELD	Ocean Engineering for Today's Technology and Tomorrow's Preservation	Pierre Sabathe	Jean-Luc Lambla	Bruno Barnouin, Stan Chamberlain
OCEANS'95	Oct 9-12, 1995	IEEE/OES, MTS	San Diego, CA	Town and Country Convention Center	Challenges of Our Changing Global Environment	Robert Wernli, Charles Kennel	[Daniel Alspach]	Jack Jaeger, Glen Williams
OCEANS'96	Sep 23-26, 1996	IEEE/OES, MTS	Ft. Lauderdale, FL	Broward County Convention Center	Prospects for the 21st Century	Claude Brancart	---	Stan Chamberlain, Chris Mooers
OCEANS'97	Oct 6-9, 1996	IEEE/OES, MTS	Halifax, NS	World Trade and Convention Center	---	Hugh MacPherson, Prakash Bhartia	---	Graham Smith, Barry Patton
OCEANS'98	Sep 28-Oct 1, 1998	IEEE/OES	Nice, France	Acropolis Convention Center	Engineering for Sustainable Use of the Oceans	Pierre Sabathe	---	Phillipe Marchand, Rene Garello, Stan Chamberlain

TABLE 1
(CONTINUED.) OCEANS CONFERENCE VENUES

Title	Dates	Sponsor(s)	City	Facility	Theme	General Chairs [Honorary chairs]	Executive Chairs [Vice-Chairs]	TP Chairs
OCEANS'99	Sep 13-16, 1999	IEEE/OES, MTS	Seattle, WA	Washington State Convention Center	Rising the Crest into the 21st Century	Robert Spindel	[Ted Brockett]	Jack Jaeger
OCEANS'00	Sep 11-14, 2000	IEEE/OES, MTS	Providence, RI	Providence Convention Center	Where Marine Science and Technology Meet	John Sirmalas	Jack Heller, Christian Casagrande	Claude Brancart
OCEANS'01 MTS/IEEE	Oct 5-8, 2001	IEEE/OES, MTS	Honolulu, HI	Hilton Hawaiian Village	An Ocean Odyssey	[Seiji Naya, Adm Thomas Fargo]	John Wiltshire, Elizsabeth Corbin	Lorenz Magaard
OCEANS'02 MTS/IEEE	Oct 29-31, 2002	IEEE/OES, MTS	Biloxi, MS	Mississippi Coast Coliseum and Convention Center	Marine Frontiers – Reflections of the Past, Visions of the Future	[Herbert Anderson, Adm Thomas Donaldson]	Rebecca Smith, Jerry Boatman	Catherine Woody, Frank Caimi
OCEANS'03 MTS/IEEE	Sep 22-26, 2003	IEEE/OES, MTS	San Diego, CA	Town and Country Convention Center	Celebrating the Past… Teaming Toward the Future	Robert Wernli, Charles Kennel	Kevin Hardy	Jack Jaeger
OCEANS'04 MTS/IEEE Techno-Ocean'04	Nov 9-12, 2004	IEEE/OES, MTS, CJO	Kobe, Japan	Kobe International Exhibition Hall	Bridges Across the Oceans	[Tatsuo Yada, Naochika Namba]	Tamaki Ura, [Hitoshi Hotta, Hiroyuki Nakahara]	Shinichi Takagawa, Toshio Tsuchiya, Stan Chamberlain, Daniel Schwartz
OCEANS'05 IEEE Europe	Jun 20-23, 2005	IEEE/OES	Best, France	Le Quartz Convention Center	Today's Technologies for a Sustainable Future	Rene Garello, Radm Pierre de Roquefeuil	----	Shinichi Takagawa, Toshio Tsuchiya, Stan Chamberlain, Daniel Schwartz
OCEANS'05 MTS/IEEE WashDC	Sep 18-23, 2005	IEEE/OES, MTS	Washington, DC	Marriott Wardman Park Hotel	One Ocean	[Adm James Watkins, Adm Thomas Collins, Vadm Conrad Lautenbacher, Radm Richard West, Radm Steven Tomaszeski, Lydia Thomas, John Kreider, Roger Rufe, Robert Gagosian]	Barry Stanley, Fred Klein, Steve Holt	Joseph Czika, Karin Lynn, Craig McLean
OCEANS'06 IEEE Singapore	May 16-19, 2006	IEEE/OES	Singapore	Raffles City Convention Centre	Oceanic Engineering in Asia Pacific – The Next Frontier	John Potter	Arjuna Balasuriya	Sardha Wijesoma, Chunru Wan
OCEANS'06 MTS/IEEE Boston	Sep 18-22, 2006	IEEE/OES, MTS	Boston, MA	Hynes Convention Centre	Revolutionizing Marine Science & Technology	John Irza	---	Vincent Premus, Albert (Sandy) Williams
OCEANS'07 IEEE Aberdeen	Jun 18-21, 2007	IEEE/OES	Aberdeen, Scotland	Aberdeen Exhibition and Conference Centre	Marine Challenges: Coastline to Deep Sea	[C. Duncan Rice, Sir Ian Wood, John Reynolds]	John Watson, Graham Shimmield	Thangavel Thevar, David Green
OCEANS'07 MTS/IEEE Vancouver	Sep 29- Oct 4, 2007	IEEE/OES, MTS	Vancouver, BC	Vancouver Convention & Exhibition Center	On the Edge of Tomorrow	James McFarlene	---	Micheal Wrinch

Fig. 1. OCEANS'76 Chair Joseph R. Vadus, 1976 Council of Oceanic Engineering President Edward Early, 1976 IEEE President Joseph K. Dillard, and 1976 Marine Technology Society President Phillip Eisenberg.

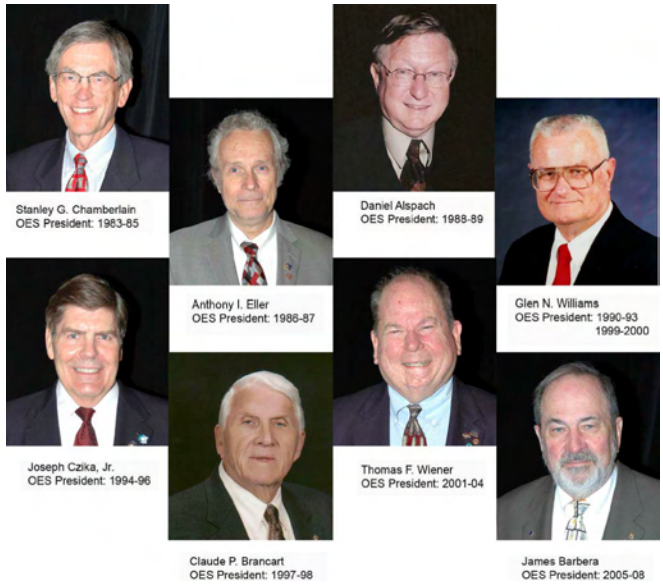

Fig. 2. Eight OES Presidents since 1983.

as Technical Program Chair. See Table I for a complete list of OCEANS conferences.

B. Newsletter/Journal

The OCC established a quarterly newsletter in 1970, with Donald Bolle of Brown University, Providence, RI, as the first continuing editor in 1973. Shortly thereafter, the desire grew for a more archival, peer-reviewed forum for papers describing the activities of the oceans community, similar to the technical journals produced elsewhere within the IEEE. However, in the IEEE, only the technical societies or councils of societies may produce such journals.

C. Council of Oceanic Engineering

The desire to produce a journal led to the evolution of the OCC into the Council of Oceanic Engineering (COE) in 1976, with Edward Early as its first Chairman (see Fig. 1). Donald Bolle migrated from the newsletter editorship to become the first Editor-in-Chief of the IEEE JOURNAL OF OCEANIC ENGINEERING (JOE) in 1976, and the newsletter responsibility was passed to Harold Sabbagh. Along with the JOE and the newsletter, the COE continued the OCEANS conferences and cosponsorship of the OTC. As the OCEANS conferences moved from one venue to another, a local community of oceanic engineers was needed to help plan and conduct each conference. This could be accomplished if the COE could establish members. However, in the IEEE structure, members of councils like the COE were IEEE societies and not individuals.

D. Oceanic Engineering Society

To have individual members, the Council had to evolve from a council into a society. The IEEE Technical Activities Board approved the COE's petition to become a society, and the Oceanic Engineering Society (OES) began on January 1, 1983, with Stanley G. Chamberlain serving as the first President (see Fig. 2 for the eight OES Presidents since 1983). A detailed history of these early years is documented in a paper by Ivan Coggeshall, "Oceanic engineering: The making of an IEEE society," (IEEE J. Ocean. Eng., vol. OE-10, No. 2, pp. 63–83, Apr. 1985).

III. 1983–1988: SUPPORTING US NATIONAL INTERESTS

A. Washington OCEANS Conferences

During the 1983–1988 era, the OES focused on national interests of the U.S. Many OES members were supported by U.S. government contracts from the U.S. Navy, the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation, and the Coast Guard. Articles in JOE and the OCEANS conferences were largely oriented toward activities sponsored by U.S. federal agencies. With this emphasis on government activities, the Washington, DC, area became a primary location for the OCEANS conference, hosting the conferences in 1982, 1984, 1986, 1988, and 1990. Agency tie-ins of OCEANS conferences in Washington DC were alternated among the major oceans-related U.S. agencies, including NOAA (1976, 1978, 1982), the U.S. Navy (1984, 1990), and the Coast Guard (1988). The 1986 conference was held in conjunction with the National Geographic Society. The decision to hold OCEANS conferences in Washington, DC, was heavily influenced by our sister society in sponsoring the OCEANS conference, the Marine Technology Society (MTS), which comprised the leadership of small marine technology firms with primary markets in Washington, DC.

B. Partnership With the Marine Technology Society

The MTS was formed in the late 1960s and began hosting a series of conferences dealing with marine technology. The similarities of the OCEANS and MTS conferences and the commonality of the oceanic/marine community they were both serving led to merging the two conferences into a single annual OCEANS conference beginning in 1975. This joint sponsorship of the OCEANS conferences continued annually, except for a

brief separation in 1979 and 1980, and a longer separation in the early 1990s.

C. OES Chapters

The U.S. ocean community wanted the national conference to also serve their local interests. To hold OCEANS conferences in various locations outside the Washington, DC, area, the OES needed to have a local presence and local members who could help organize the conferences. This need led to the formation and strengthening of OES chapters in Halifax, NS, Canada (1985, Canadian Atlantic chapter); San Diego, CC (1985); Seattle, WA (1985); Washington, DC/Northern Virginia (1986); and Victoria, BC, Canada (1987) (see Appendix I).

D. Technology Committees

With the OES's focus on the OCEANS conferences, the society's Administrative Committee (AdCom) sought to strengthen the OES's Technology Committees (TCs) and their involvement in the conferences. Stanley G. Chamberlain became the Technology Committees Coordinator in 1986, a position he held until relinquishing it to Albert (Sandy) Williams 3rd in 2005. The eight TCs the society had during the 1983–1988 era grew to 14 TCs by 2004 and the expansion continues today (see Appendix II). The number of papers and sessions in the OCEANS conferences that fell into one or more of the TC technology areas was significant, as noted in Appendix III.

E. Workshops

The TCs also began to expand their involvement beyond the OCEANS conferences. The Current Measurements TC (CMTC) held its third workshop in 1986, continuing its program of a workshop every four years.[2] It held its eighth workshop in 2005 (see Appendix IV). The Autonomous Underwater Vehicles TC began planning to hold biannual workshops, the first being held in 1990 (Appendix V). TC-sponsored workshops held during the next era include Homeland Security (2003, 2004, 2005) and Submarine Cables and Scientific Submarine Cables (2002, 2003, 2004, 2006, 2007). See Appendixes VI and VII.

IV. 1989–1994: Expanding OCEANS Conference Venues

A. From the Cold War to the Environment

The year 1989 began an era of change in the OES and in the conduct of the OCEANS conferences. The end of the "cold war" reduced support by the U.S. Navy and the Defense industry for ocean-related programs, and raised concerns for the resulting impact on OCEANS conference participation as well as on OES membership development. At the same time, the sinking of the *Exxon Valdez* in Prince Edward Sound, AK, changed the focus of the OCEANS conferences to the environment. This focus was reflected in "The Global Ocean" theme of OCEANS'89 held in Seattle, WA. OCEANS'89 was highly successful with both a large attendance and significant exhibitor participation.

[2]The first CMTC workshop was held in 1978 at the University of Delaware, Newark, with William Woodward and Gerry Appell as Chair and Executive Chair, respectively.

Fig. 3. 2003 first prize winner Micaela Pilotto with Student-Poster Chair Norman D. Miller.

B. OES Launches Students Programs

1) OCEANS Conference Student-Posters Program: With the leadership of Norman D. Miller, a new OES program was launched at OCEANS'89 that encouraged the participation of students in the conference and the OES. Norm recommended to the AdCom that the OES sponsor a "Student-Posters Competition" where graduate and undergraduate students would be invited to present posters describing their work. The conference would cover the students' registration and travel expenses. The AdCom agreed, and a grant of $7500 was provided to the OCEANS'89 organizing committee to fund the program. The MTS was invited to participate on a matching fund basis, but they declined. Working with Sea Grant, the U.S. national agency that funds oceans-related university research, invitations were sent out for poster abstracts. Sixteen abstracts were received and the students were invited to attend and present their posters. The posters were displayed where the conference attendees had ready access to them and the students were at their posters to explain them. The program proved highly successful and was continued at OCEANS'91 and subsequent OCEANS conferences. Support for the student-posters program has been incorporated into the Conference Guidelines as a budget line item, and as such is endorsed by both the OES and the MTS. In 1993, the OES began giving more prominence to its student presenters by publishing the winning student papers in the OES newsletter. A competition was held for best student poster, with the winners being awarded cash grants (see Fig. 3). See Appendix VIII for a summary of the student-poster program history.

2) Human-Powered Submarine Races: In 1989, the OES expanded its encouragement of students in their pursuit of oceanic engineering careers and became a major sponsor of the International Human-Powered Submarine Races, with Claude P. Brancart playing a major role (see Appendix IX). The first race was held in 1989, off Rivera Beach, FL, with 17 boats competing. The race pitted one- and two-person teams from high schools, colleges, universities, as well as corporate research centers—and even private individuals—against each

Fig. 4. Human-powered submarines in the 2007 competition.

other in an attempt to develop a "wet" (i.e., filled with water; the crews wearing scuba gear) submarine design to compete against the clock. In 1995, the event was moved indoors to the U.S. Navy's 3200-m-long Carderock test tank in Bethesda, MD. By 2005, speeds for the human-powered submarines had reached 7.061 kn by the submarine *Omer 5* from the École de Technologie Supérieure, University of Québec, Montréal, QC, Canada. By 2007, the competition had expanded to include 22 teams (see Fig. 4).

3) High School Students Invited at OCEANS Conferences: In 1991, the OCEANS conference opened its doors to high school students and invited them to come to the conference at no cost, to attend plenary sessions as well as technical paper sessions, and to explore the exhibits. Subsequent OCEANS conferences continued to invite high school students to come to the conference as a field trip. As a side note, at OCEANS'99, following the plenary presentation on the *Titanic* by Robert Ballard, all the questions were asked by high school students. The students were fascinated by the exhibits and learned much during the opening plenary sessions. At OCEANS'91 in Honolulu, the State of Hawaii underwrote the cost of bringing to the conference three students and one instructor from all of the high schools in the state. The OES provided a grant to assist in the program and provided a guest speaker at the students' morning sessions. Donald Walsh attended one of their sessions and described his deep dive in the Marianas Trench. He later commented that the high school students were one of the most challenging audiences he had ever faced.

4) Oceans Science Bowl: The OES became a sponsor of the National Ocean Sciences Bowl to foster oceanic engineering as a career choice. This program, sponsored by the Consortium for Oceanographic Research and Education (CORE), conducts high school competitions across the U.S. and then holds a final competition to select the top eight teams. Each year, the OES presents awards of educational material to the teams finishing in the fifth through the eight place.

C. MTS–OES Split

Following OCEANS'89 and a long-simmering dispute, the MTS declined to continue joint sponsorship of the OCEANS conferences. OCEANS'90 was held in Washington, DC, without MTS technical participation. While somewhat smaller in attendance, it was considered a successful conference with many of the Washington, DC, government workers attending for one day. OCEANS'91 in Honolulu was the first OCEANS conference held outside the North American continent. There was an initial concern regarding conference attendance, due both to the lack of MTS participation and a major airline strike earlier in the year, but the conference proved to be successful. OCEANS'92 returned to the U.S. East Coast, in Newport, RI. It was a successful event away from the Washington, DC, environment. Similarly, OCEANS'93 in Victoria, BC, the second Canadian conference venue, was well attended and drew visitors from Japan as well as Europe and the United States.

D. New OES Officers

The 1993 OES AdCom meeting in Victoria, BC, Canada, approved a milestone change in the governance of the society. When the OES became a society, the governing body consisted of the President, a Vice President/East, a Vice President/West, a Secretary, a Treasurer, and members of the AdCom elected by the society's membership. The duties of the two vice presidents were not well defined and the result was that the day-to-day direction of the society fell on the shoulders of the President. In 1993, Vice President/West Norman D. Miller proposed a Constitution and Bylaws change that defined duties for the vice presidents and a reorganization of the AdCom. The vice presidents became Vice President/Technical Activities and Vice President/Professional Activities. The Vice President/Technical Activities

Fig. 5. 2003 ExCom: Stephen M. Holt (Secretary), James S. Collins (VP-Technical), Norman D. Miller (VP Professional), Joseph R. Vadus (VP International), Glen N. Williams (Junior Past-President), Thomas F. Wiener (President), James T. Barbera (Treasurer), and Claude P. Brancart (Senior Past-President)

was primarily responsible for the technology committees, oversight of the annual OCEANS conferences and technical workshops, and the JOURNAL. Similarly, the Vice President/Professional Activities was responsible for administrative activities of the OES, including membership development, awards, chapters, student activities, and the newsletter. The AdCom also decided to create a Vice President/International to develop membership and chapters and foster conferences and other activities outside North America. The proposed changes to the organization were approved and the Constitution and Bylaws were ratified by the vote of the full OES membership. An election was held for the new offices and James S. Collins was elected Vice President/Technical Activities, Norman D. Miller, Vice President/Professional Activities, and Ferial El-Hawary, Vice President/International. Fig. 5 captures the executive committee (ExCom) hard at work ten years later, in 2003, and Fig. 8 shows the AdCom of 2003.

E. OCEANS'94 OSATES, Brest, France

OCEANS'94 OSATES in Brest, France, was the first conference outside North America and Hawaii. The groundwork for the conference began in Paris in 1991, with a meeting between Ferial El-Hawary and Jean-Luc Lambla about hosting an OCEANS conference in France. At the AdCom meeting held at OCEANS'91 in Honolulu, tentative approval was given for France as a site for an OCEANS conference. A lot of hard work then had to be done to organize the conference and gain sponsorship from the French IEEE Section as well as the city of Brest. An OES Chapter was organized and a Conference Organizing Committee was assembled. The city of Brest encouraged a conference in 1993; however, OCEANS'93 had already been approved for Victoria, BC, Canada. The AdCom gave approval for OCEANS'94 OSATES, combining the OCEANS Conference with the well-established OSATES conference, to be held in Brest, France, with Pierre Sabathé as General Chairman and Jean-Luc Lambla as Conference Chair. The conference was successful in achieving the OES objectives for its first non-North American OCEANS conference. European participation was very good and U.S. and Canadian participation exceeded expectations. In fact, the conference in Brest had 70% of the authors and 75% of the attendees from Europe, in contrast to the 10% attendance by Europeans at the OCEANS conferences held in North America. It also showed that conferences away from the North American continent could be successful from an exhibitor's point of view as well as overall conference attendance. This conference ushered the development of the French OES Chapter and OES growth throughout Europe.

Fig. 6. Ribbon cutting at opening ceremony at OCEANS–TechnoOcean'04 in Kobe, Japan. Left to right: Yasuhiro Kato [President of Japan Agency for Marine-Earth Science and Technology (JAMSTEC)], VAdm Conrad C. Lautenbacher, Jr. (NOAA Administrator), Ted Brockett (MTS President), Tatsuo Yada (Kobe Mayor), Naochika Namba (Chair, Consortium of Japanese Organizers), Thomas F. Wiener (OES President), Joseph R. Vadus (OES VP International), and Tamaki Ura [OCEANS-TechnoOcean'04 (OTO'04) General Chair].

V. 1995–1998: STRENGTHENING THE OCEANS CONFERENCES

A. Ocean Community Concerns

The split in 1990 between the MTS and the OES led to two conferences that year, one by each society. Heated feedback from the ocean community began almost immediately. Exhibitors and attendees complained that two oceans-related conferences stretched their budgets to the breaking point and that they could not continue to support both conferences. They demanded that something be done by the two societies to resume cosponsorship of a single yearly conference. Otherwise, the ocean community would split and neither society's conference would succeed. The lack of a strong OCEANS conference would hurt the ocean community.

B. MTS–OES Agreement

Discussions for renewed cosponsorship of the OCEANS conference had begun in late 1991. Various drafts of a cosponsorship agreement were circulated to both societies. After many deliberations and subsequent approval by the societies' governing boards, a memorandum of understanding was signed in July 1995 by Edward Clausner, President of the MTS, and Joseph Czika, Jr., President of the OES. The agreement established the official name of the cosponsored conference as OCEANS'YY MTS/IEEE and called for alternating year copyright ownership by the societies, among other provisions. That agreement is still the basis of the cosponsorship of the OCEANS conferences.

C. Not Quite Together Yet

The agreement paved the way for a very successful OCEANS'95 MTS/IEEE conference in San Diego, CA, which hit a new high for attendance, then OCEANS'96 MTS/IEEE in Fort Lauderdale, FL, a first in the U.S. southeast coastal area, and OCEANS'97 MTS/IEEE in Halifax, NS, to date the best attended Canadian OCEANS conference. However, all was not yet smooth. The OES had made a commitment, before the signed agreement between the MTS and the OES, to hold OCEANS'98 in Nice, France. MTS balked at going outside North America. The MTS President Wayne Ingram advised the OES that the MTS was going to hold its 1998 conference in Baltimore, MD, and call it "OCEANS'98 MTS."

D. "OCEANS" Ownership

In response, the MTS was advised that the name "OCEANS'YY" was the property of the IEEE, and that the MTS was not allowed to use the name without OES's participation. Many meetings were held with the IEEE legal department and with the MTS. At first, the MTS would not change its position. Many months before the conferences, the MTS was presented with an ultimatum: The "OCEANS'YY" name was the legal property of the IEEE/OES, and the MTS was not authorized to use the name. If the MTS did so, the IEEE would take legal action. The MTS finally acceded to the IEEE's position and substituted the name Oceans Community Conference (OCC'98 MTS). A huge amount of effort was expended over protection of the name OCEANS'YY. If the IEEE OES had lost ownership of the OCEANS name, it would have lost a major part of its identity.

The 1994–1998 period succeeded in strengthening the OCEANS conferences by: 1) reuniting the MTS and the OES as cosponsors of the premier oceans community conference; 2) demonstrating to the international oceans community that the OCEANS conference was for them too, thereby leading to the subsequent formation of two OCEANS conference series, one cosponsored with the MTS in North America, and another OES-sponsored series currently alternating between Europe and Asia/Pacific; and 3) firmly securing the OCEANS'YY name as belonging to the IEEE/OES.

VI. 1999–2004: Expanding OES Globally

A. Where Should We Hold the OCEANS'04 Conference?

During the 1990s, the OCEANS'94 OSATES Conference in Brest, France, and the OCEANS'98 Conference in Nice, France, were the first two OCEANS conferences held outside North America, and both were highly successful. In 1998–1999, additional venues in Europe were actively sought for OCEANS'04, particularly by Joseph R. Vadus. Vadus had contacts all over the world, but had effectively chosen Bergen, Norway, as the site, and his long-time close friend, Arnold Hansen, as the Chairman for the next offshore OCEANS conference. Individuals in Hamburg, Germany, interested in hosting the next European OCEANS Conference, had also contacted Glen N. Williams, the 1999–2000 OES President. In response, Glen N. Williams and Robert Wernli went to Bergen, Norway, and Hamburg, Germany, for site visits in November 1999. Both sites, as well as the proposed technical lead persons, conference centers, and conference personnel were certainly acceptable. Bergen, a relatively small city in Norway, was considered the more picturesque venue, while Hamburg was recognized as the more cosmopolitan of the two candidate cities. The final decision was expected to be made at the OCEANS'00 Conference in Providence, RI.

B. Additional Proposals for OCEANS'04

Proposals from both Norway and Germany were received well before OCEANS'00 and were under consideration by the OES AdCom. A short time before the Providence meeting, another of Joseph R. Vadus' international friends, Hisaaki Maeda from Tokyo, Japan, asked whether Japan could submit a proposal for OCEANS'04, which was received about one week before OCEANS'00. Also at that time, a group of engineers and conference planners led by John Watson and Brian Horsburgh in Aberdeen, Scotland, asked whether they could submit a proposal for OCEANS'04, which was actually hand-carried by the group to the OCEANS'00 Conference.

C. OCEANS'04 Site Determination

All four groups from Norway, Germany, Japan, and Scotland presented their proposals to the OES Conference Coordinating Committee (OES CCC). Because of the short proposal development time, Aberdeen really did not have much of a chance, which left the other three groups. All of the proposals were acceptable, some more than others. In fact, the proposal from Japan clearly was the most financially attractive, since the proposal had virtually guaranteed a conference surplus of $150 000, specifically from grants by the Japanese government. There were seven voting members on the CCC, and the final vote was tabulated as four votes for Japan and three votes for Norway (discussions after the vote revealed that Japan won for purely financial reasons). The first OES OCEANS foray into Asia was the result of this vote, which led to the successful OCEANS-TechnoOcean'04 Conference in Kobe, Japan. However, the $150 000 surplus never materialized. It was explained away as a misinterpretation of the proposal submitted by Japan. Regardless, the proposal team from Bergen, Norway, was extremely disappointed after strong solicitation by the OES,

Fig. 7. Joint OCEANS Advisory Board meeting in 2006. Left to right: Tamaki Ura, Pan-Mook Lee, Ferial El-Hawary, Joseph R. Vadus, René M. Garello, Robert Wernli, Brian Ferguson, Albert (Sandy) Williams 3rd, Robert T. Bannon, James S. Collins, Jerry C. Carroll, Pamela Hurst, and James T. Barbera.

resulting in damage to some personal relationships and loss of OES's credibility in Norway.

D. CoCoPo, JOAB, and RECON

During the 1999–2004 period, a new plan to hold two conferences a year began to take shape: one conference every year in North America and the other one alternating venues between Asia/Pacific (in even years) and Europe (in odd years). To address the logistical and administrative problems posed by holding multiple conferences each year, and to ensure there were enough papers submitted to allow conferences to meet the high technical standards the OES wished to maintain, OES President Thomas F. Wiener appointed a Committee on Conference Policy (CoCoPo). The first CoCoPo Chair René M. Garello was charged with considering all the conferences that OES sponsors, and proposing a coherent policy for deciding on sponsorship, scope, frequency, attracting local organizing committees, and the technical and financial goals of the conference. The outcome of the CoCoPo's deliberations was the formation of the Joint OCEANS Advisory Board (JOAB) (see Fig. 7) and the establishment of a permanent adjunct to the OCEANS Conference Technical Program Committee. The latter consisted of the chairs of the society's Technology Committees. An additional result of this activity was the formation of the Reconnaissance (RECON) Committee, under the leadership of Joseph R. Vadus, Vice President/International Activities. RECON accepted the responsibility for finding suitable venues for future OES conferences and workshops. Both JOAB and RECON, while formed primarily for IEEE OES's purposes, have involved the participation of the MTS, primarily for the North American OCEANS conferences. The result has been an improved operation of the OCEANS Conferences and a more collegial relationship with the MTS. See Appendix X.

E. Underwater Technology Symposia

Besides holding the OCEANS conferences in non-North America venues, the OES organized other conferences to address various segments of the global oceans community. Hisaaki Maeda and Joseph R. Vadus came up with the idea of an underwater technology symposium while riding in a bus in New Orleans on a U.S.–Japan Cooperative Program on Natural Resources/Marine Facilities Panel (UJNR/MFP) tour in 1995. When the Tokyo Chapter of IEEE/OES was being formed by Tamaki Ura, Maeda, Vadus, and Ura proposed the Underwater Technology (UT) Symposium'98 Japan to the OES AdCom, which approved the proposal. The Conference Co-Chairs were Hisaaki Maeda and Joseph R. Vadus; the Technical Program Co-Chairs were Tamaki Ura and Robert Wernli; other active ExCom members were from the Office of Naval Research/International Field Office, the IEEE/OES Tokyo Chapter, and the Institute of Industrial Science of the University of Tokyo. The Underwater Technology Symposium'98, the inaugural event in the planned series of biennial conferences, received an overwhelming response from the professional community, not only in the Pacific Rim countries but also the world in general. The UT symposia were subsequently held in Tokyo in 1998, 2000, 2002, and 2007, and the 2004 symposium was held in Taiwan, Republic of China (see Appendix XI).

F. Baltic Beginning

In Europe, VP/International Joseph R. Vadus perceived a need for an environmental conference on the Baltic Sea. He received an expression of interest for a symposium or workshop in Lithuania and the Lithuanian Embassy in Washington, DC, provided a list of key contacts, mainly under the Ministry of Environment. The most apparent lead organization was the Center for Marine Research in the port city of Klaipeda, about 325 km west of the capital city Vilnius. The First U.S./EU-Baltic International Symposium devoted to "Advances in Marine Environmental Research, Monitoring and Technologies" was successfully conducted in Klaipeda, Lithuania, June 15–17, 2004. More than 110 papers were presented with participants from 17 nations, including all nine Baltic Nations, the United States, and several members of the European Union. Sponsors

Fig. 8. AdCom 2003. Row 1: James F. Lynch and René M. Garello. Row 2: Steven Anderson, John Irza, Ferial El-Hawary, William M. Carey, Robert T. Bannon, Thomas F. Wiener, James T. Barbera, Diane D. DiMassa, Norman D. Miller, Pamela Hurst, and Hisaaki Maeda. Row 3: Christian de Moustier, Kenneth Foote, Archie Todd Morrison III, James S. Collins, Stanley G. Chamberlain, Joseph Czika, Jr., Albert (Sandy) Williams 3rd, Stephen M. Holt, Glen N. Williams, Daniel Alspach, and Claude P. Brancart.

included Lithuania's Ministry of Environment and Center of Marine Research; NOAA's National Ocean Service; the U.S. Office of Naval Research Global; the IEEE OES; and the IEEE Region 8. Joseph R. Vadus and Algirdas Stankevicius, the head of the Center for Marine Research, were Co-Chairs; Victor Klemas was the Technical Program Co-Chair and James T. Barbera was the Finance Chair.

G. U.S./EU-Baltic International Symposium Series

A second U.S./EU-Baltic International Symposium was held in May 2006, with the same sponsors, venue, and leadership as the first one. The theme of this second symposium was "Integrated Ocean Observation Systems (IOOS) for Managing Global and Regional Ecosystems." IOOS is the ocean component of the Global Earth Observation System of Systems (GEOSS), a research/development activity of more than 60 nations. Authors from more than 20 nations presented over 140 papers. Many papers discussed the problems of natural and man-induced hazards, including oil pollution and the many hazards caused by the thousands of tons of munitions of all kinds that were dumped after World War II. After the first two U.S./EU-Baltic International Symposia successfully held in Klaipeda, Lithuania, the participants in 2006 voted to rotate the venue to Tallinn, Estonia. Thus, the series continues on a biennial cycle, with the next one planned for May 27–29, 2008, in Tallinn, Estonia. (See Appendix XII).

H. Global Earth Observation System of Systems

The OES is heavily involved in the multinational GEOSS program. At the IEEE Technical Activities Board meeting in Seattle, WA, in November 2003, the subject of GEOSS was discussed at a dinner meeting with officers of the IEEE Geoscience and Remote Sensing Society (GRSS) and the OES. The group concluded that the IEEE needed to be involved in this global effort. The two societies championed the IEEE Committee on Earth Observations as a topic for the New Technologies Initiative of the IEEE Technical Activities Board. Proposed by a consortium of 60 nations and 40 Non-Government Organizations, GEOSS is a virtual system that will assemble, analyze, process, and display information for the well being of the earth community. Information proposed to be encompassed in GEOSS includes, but is not limited to, climate variability and change, improving water resource management, improving the management and protection of terrestrial, coastal and marine ecosystems, and sustainable agriculture and combating desertification.

I. OES in GEOSS

The IEEE Committee on Earth Observations (ICEO) is positioned to track developments in systems engineering and integration, architecture, and standards related to sensor systems, communications, data processing, data archiving and cataloging, data searching and access, data portrayal, and decision support systems. The ICEO will interface with OES technical committees, IEEE Technical Councils and Societies, and select international scientific and technical organizations to recommend solutions to difficult issues related to the GEOSS mission. Currently, the OES has representation on the ICEO executive board, the tsunami warning system, the standards registry, the science and technology, and the architecture and data committees. The society is actively involved in a series of one-day workshops to expose the concept to the overall IEEE as well as to other technical audiences in various venues around the globe (e.g. Africa, Australia, and United Kingdom). These workshops detail the planning process for the system of systems and the progress achieved to date.

J. Competing Conferences

From time to time, other ocean related conferences are created, often by profit-seeking companies. While the OES seeks to satisfy the needs of the oceanic engineering community by teaming with other organizations when it makes sense, sometimes teaming is not feasible, so a competitive situation arises. For example, there was a perceived competitive threat from an American presence of the highly successful Oceanology International (OI) exhibition series in the United Kingdom. In fact, meetings, at times unfriendly and threatening, were held between the OES officers and the sponsors of the OI conference. Although two OI Americas conferences were

held, the competitive threat never really materialized. Some societies declined to participate in the OI Americas exhibit held in Miami, FL, in 2001, and the 2003 OI Americas exhibition in New Orleans, LA, did not siphon off as many exhibitors from MTS/IEEE OCEANS'03 as had been feared. In fact, MTS/IEEE OCEANS'03, scheduled to coincide with the centennial celebration of the Scripps Institution of Oceanography, San Diego, CA, was the largest OCEANS conference to date.

K. Maritime Homeland Security

The horrible terrorist attacks on the World Trade Center in New York City, and on the Pentagon in Washington, DC, on September 11, 2001, drew attention to the terrorist threat to coastlines and harbors, especially the threat of explosive, radioactive, biological, or chemical weapons. The need to protect against such an attack gave a particular urgency to the branches of oceanic engineering that have to do with monitoring maritime traffic and cargoes. The OES, under the leadership of Pamela Hurst and Robert T. Bannon, began planning and sponsoring an annual series of two-day Maritime Homeland Security Technology Workshops, with such topics as protecting ports, waterways, and coastlines, mine countermeasures, screening cargoes and personnel, and also law of the sea ramifications. The scope was international. In addition to the U.S. participants, speakers presented global issues concerning the European Community members, while delegates from Japan presented Pacific Rim concerns. The first workshop, held in Warwick, RI, in December 2003, drew almost 400 participants and three dozen exhibitors. In the following years, participation in the workshops held in 2004 and 2005 included additional Eastern European and Asian countries. See Appendix VI.

L. OES Digital Archive

In a major initiative spearheaded by Glen N. Williams to make the society's publications more easily available, the OES released its *OES Digital Archive* on CD-ROMs. The digital archive included OES-sponsored conference proceedings from 1970 to 2000 and the IEEE JOE from 1974 to 2000 for a total of 9600 papers on six CD-ROMs with a search engine by AstaWare providing full-text search. Before the next generation of the OES Digital Archive was planned, the IEEE Xplore Web-accessible database of current and past issues of IEEE periodicals, including those of the OES, came online and eliminated the need for an updated OES archive. Having the OES archives retrievable on Xplore enhances access by OES members and brings additional income to the society. Starting in 2008, all OES members will have free access to all OES archived material (JOE articles and proceedings of OES-sponsored conferences, symposia, and workshops) in the Xplore database.

M. Online Access to OES Periodicals

In 2003, OES members were given the option of receiving their technical periodicals online via the IEEE's Web-accessible database IEEE Xplore, a delivery method that was considerably less expensive than paper. Members who wished to continue to receive paper copies would be charged the incremental costs of printing and mailing the paper copies (approximately $30 in 2007).

N. Secretarial Records

In 2001, Stephen M. Holt, the OES Secretary, began compiling into a single, comprehensive report the minutes, action items, motions, and additional reports for all AdCom and ExCom meetings. In addition, a database was developed for tracking these action items and motions. The AdCom and Excom reports from 2001 to the present have been digitized and archived for future reference.

O. Impact of Declining Stock Market

The OES finances began to be affected during the 1999–2004 period by the decline of the IEEE's investment revenues. The IEEE and the OES finances benefited positively during the rising stock market in the 1990s, but when markets fell, the IEEE societies and councils were faced with paying for overhead and other IEEE shortfalls as an explicit expense. In 2000, the OES's share provided to the IEEE was $96 000. In 2001, the OES's share was 31% of its reserves, or approximately $266 000, to balance the IEEE's budget. These financial problems arose from a change in the way the IEEE funded itself. To keep membership dues down, and to keep them affordable—especially in the developing world from which much of the IEEE's membership growth was coming in the latter part of the twentieth century—for the past decade, the IEEE had been funding initiatives and some operations using income from reserves. As the stock market lost value in the late 1990s, the reserves assigned to the corporate IEEE dwindled and became insufficient to cover the costs being incurred. As a result, IEEE societies, which actually held most of the IEEE's reserves in their accounts, were beginning to pay for IEEE corporate activities. This payment was strongly resisted by many societies. The OES had been fortunate in that it was a participant in the Offshore Technology Conference. This participation, over the years, had been a significant factor in the OES's net surpluses. As a result, during the years of the IEEE's financial difficulties—which had pretty much ended by 2004 thanks to the recovery of the stock market—the OES was able to pay the charges attributable to the IEEE and the OES overhead and still maintain a comfortable reserve.

P. OES Membership Dues

At the same time, the leadership of the OES was reviewing the membership dues structure, because of a policy change instituted by the IEEE Technical Activities Board Finance Committee, which encouraged societies to set their membership dues to cover the marginal cost of membership. The cost of services to OES members, most notably the printing and mailing of journals, was about $54 per annum. However, membership dues—only $12 per annum—were deliberately set to be less than the cost, the difference being more than made up by the revenue from conferences and from sales of the OES Journal to institutional subscribers. In 2001, the OES AdCom voted to approve a category of permanent membership in the society, wherein a member had the option of paying a one-time membership fee to retain membership in the society without further payment of dues so long as the member retained his or

her membership in the IEEE. This option was later rescinded with encouragement from the Technical Activities Board as not being in the best interest of the society. For the 2003 membership year, the OES raised its dues to $19 as a means of recouping a higher percentage of the true cost of membership.

VII. 2005 to the Present: Multidimensional Challenges—Growth in Many Directions

A. Constitution and Bylaws Revisions

To keep up with the ongoing growth of the society, a major review and revision of the OES Constitution and Bylaws was completed and approved by vote of the society's membership in 2005, to be operational starting in 2006. Fundamental to these changes was a restructuring of the society's officers. A Vice-President/Conference Development and a Vice-President/Conference Operations were established and the Vice-President/International was dissolved. The VP/Conference Development, working with the RECON Committee, is responsible for soliciting and vetting future venues for OCEANS conferences and technical symposia, while the VP/Conference Operations, working with the JOAB, is responsible for overseeing the quality of OES conferences. The Treasurer and Secretary became officers who are now elected by the AdCom, along with the other society officers. The Editor-In-Chief (EIC) of the IEEE Journal of Oceanic Engineering (JOE) also became an elected officer. The ExCom now comprises ten officers, including the President, Junior Past-President, Senior Past-President, VP/Technical Activities, VP/Professional Activities, VP/Conference Development, VP/Conference Operation, Editor-In-Chief of JOE, Treasurer, and Secretary. Besides changes to the OES's officers, modifications were made to include in the Constitution only those aspects that properly belong in a "constitution" and to include in the Bylaws only those aspects that properly belong in a set of "bylaws." Those aspects of our activities that are important, but of a more transient nature, were to be put into the Policies and Procedures, whose development is in progress. As part of the Policies and Procedures changes, the JOAB, previously known as the Joint OCEANS *Advisory* Board, was renamed to be the Joint OCEANS *Administrative* Board, with a stronger responsibility for "administering" requirements for local organizing committees of OCEANS conference, rather than just "advising" them.

B. Global AdCom

With conferences regularly scheduled for Asia/Pacific and Europe, the OES strengthened its efforts to have the geographical distribution of AdCom members reflect that of the profession, the IEEE, and the OES. Tamaki Ura (Japan) began serving a three-year term in 2005, Malcolm L. Heron (Australia) and John Watson (Scotland) starting their terms in 2006. Previously elected members included Pierre Sabathé (France) in 1995–1998, Hisaaki Maeda (Japan) in 1996-1998, and René M. Garello (France) in 1999–2002. See Fig. 9.

Fig. 9. AdCom at work at OCEANS'07-Aberdeen: Claude P. Brancart, William M. Carey, Christian de Moustier, David Weissman, Thomas F. Wiener, Archie Todd Morrison III, Elizabeth Creed, Marinna Martini, Milica Stojanovic, John Potter, and Ferial El-Hawary.

C. Multiple Conferences Per Year

Having begun planning for multiple conferences each year, the OES initiated the practice of sponsoring two OCEANS conferences in 2005. The first was a return to Brest, France, having been there 11 years earlier, but this was the first OCEANS conference to be held in spring. René M. Garello, as General Chair, was now well experienced in organizing OCEANS conferences. The conference was very successful, while being on the smaller side as expected, due to having two conferences a year and to the MTS's declining to cosponsor non-North American OCEANS conferences except for those in Japan where they have a strong local chapter. The second 2005 OCEANS conference was held in Washington, DC. Two OCEANS conferences were held in 2006 (Singapore and Boston, MA) and in 2007 (Aberdeen, Scotland, see Fig. 10, and Vancouver, BC, Canada). See Fig. 11 for pictures of recent OCEANS conference Executive Chairs. Future conferences are planned for Kobe, Japan, and Quebec City, QC, Canada, in 2008; Bremen, Germany, and Biloxi, MS, in 2009; and Sydney, Australia and Seattle, WA, in 2010.

D. Web-Based Conference Tools

To handle the logistics of organizing conferences, the OES developed web-based processes and tools with the help of an outside contractor. Led by René M. Garello and OES web master Archie Todd Morrison III, and with assistance from Stanley G. Chamberlain and Albert (Sandy) Williams 3rd, online tools were developed for setting up conference websites, abstract and manuscript submission and handling, author notification, technical program generation, and attendee registration. These tools streamlined many of the formerly time-consuming procedures and led to a common "look and feel" for authors and registrants from one conference to the next conference.

E. Common OCEANS Topics

In an additional effort to give consistency to the OCEANS conferences, the Technology Committees developed a broad set of common topics for the technical programs, with provision for additional topics unique to specific venues. The involvement of the OES Technology Committee chairs in each conference,

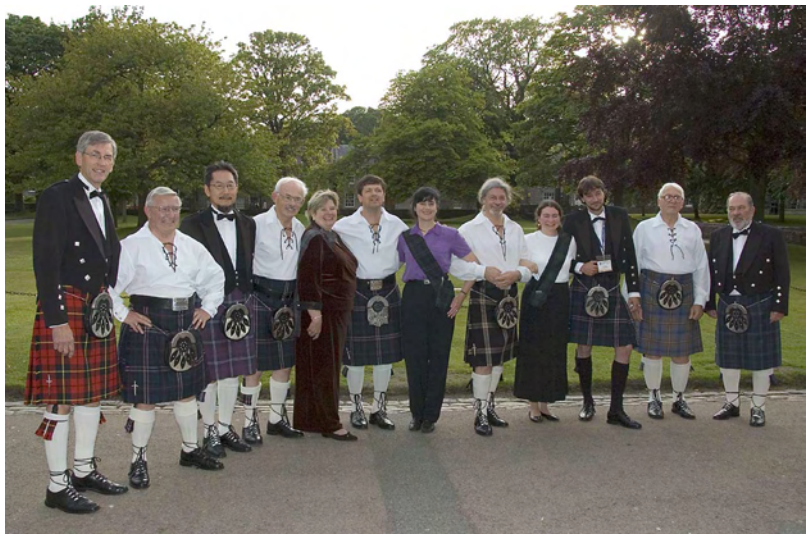

Fig. 10. AdCom members at OCEANS'07-Aberdeen: Stanley G. Chamberlain, Robert Wernli, Tamaki Ura, Frederick H. Maltz, Pamela Hurst, Archie Todd Morrison III, Diane D. DiMassa, René M. Garello, Marinna Martini, Philippe Courmontagne (non-AdCom OES member), Claude P. Brancart, and James T. Barbera.

Fig. 11. General Chairs of recent OCEANS conferences.

along with the Professional Committee chairs from MTS for jointly sponsored conferences, provided quality standards and corporate memory to the technical program development. As procedures for organizing the conferences became standardized, the Joint OCEANS Administrative Board became more proactive in providing assistance and oversight to local organizing committees.

F. Technology Committee Changes and Workshops

As emphases on various technologies changed, the society's Technology Committees continued to evolve under the leadership of Technology Committees Coordinator Albert (Sandy) Williams 3rd. Some committees were dissolved and additional ones added, including Submarine Cable Technology (Scientific and Commercial), Homeland Security, Ocean Policy, Ocean Energy, and GEOSS. Robert T. Bannon was active with the Submarine Cables Committee in cosponsoring Scientific Submarine Cables Technology Workshops in Dublin, Ireland, in 2006, and Tokyo, Japan, in 2007. These followed similar Scientific Workshops in Tokyo in 2001 and 2003, and a Commercial Workshop in Washington, DC, in 2004. Workshops by two of our other Technology Committees were held for the first time outside North America: the Eighth Current Measurements Technology Workshop headed by Albert (Sandy) Williams 3rd in Southampton, UK, in 2005, and the Autonomous Underwater Vehicles Symposium chaired by Claude P. Brancart and René M. Garello in Brest, France, in 2007. The Homeland Security Technology Workshop organized by Pamela Hurst and Robert T. Bannon was held in 2005 (Newport, RI), following the successful workshops in 2003 (Warwick, RI) and 2004 (Valley Forge, PA).

G. OCEANS Tutorials

One of the strengths of the OCEANS conference is the set of tutorials that is presented on the day before the formal opening of the conference. These tutorials provide continuing education to conference attendees in a classroom environment. Topics and instructors for tutorials from OCEANS'98 to the present are listed in Appendix XIII. Starting in 2007, Education Credit Units (ECUs) have been granted for selected tutorials.

H. Teaming with IEEE Societies

In 2005, the Quebec Section Joint Chapter (the Aerospace and Electronic Systems Society, the GRSS, and the OES) was formed. The OES was one of six IEEE societies (the others were the Dielectrics and Electrical Insulation Society, the Industry

Fig. 12. Recent Editors-in-Chief of the IEEE JOURNAL OF OCEANIC ENGINEERING: Stanley Ehrlich (1982–1988), Fredrick Fisher (1988–1992), William M. Carey (1992–1999), Allan Pierce (EIC, Journal of Acoustical Society of America), James F. Lynch (1999–2005), and Christian de Moustier (2005–present).

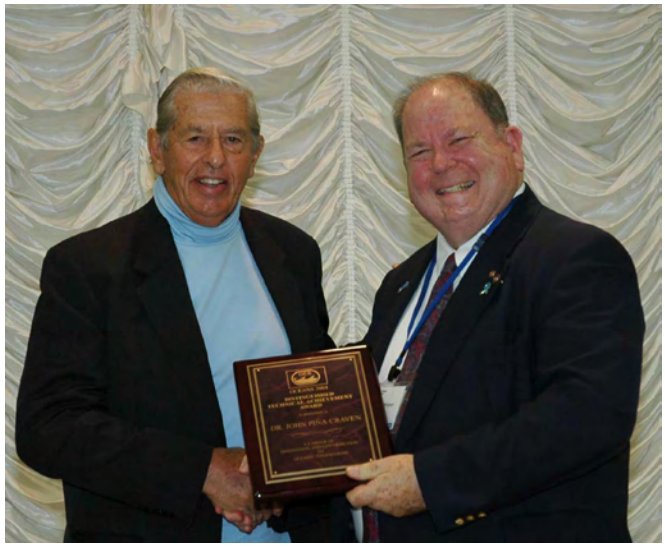

Fig. 13. John Craven (left) Receiving the OES Distinguished Technical Achievement Award from OES President Thomas F. Wiener at the OCEANS-TechnoOcean'04 in Kobe, Japan.

Applications Society, the Power Electronics Society, the Power Engineering Society, and the Vehicular Technology Society) that cosponsored a fast-track initiative of the IEEE Technical Activities Board (with participation from the American Society of Naval Engineers and the Institute of Marine Engineering, Science, and Technology) to foster the design of an all-electric ship. With involvement by OES President James T. Barbera, this group organized the All-Electric Ship Conferences held annually starting in 2007. In another partnership, the OES participated in the GRSS's International Geosciences and Remote Sensing Society (IGARSS) 2004 conference in Anchorage, AK, following up on overlapping OCEANS and IGARSS conferences in the same venue in San Francisco, CA, in 1983.

I. Offshore Technology Conference

OES's involvement, as a cosponsor with 11 other societies, in the annual Offshore Technology Conference (OTC) in Houston, TX, has increased with Claude P. Brancart as the OES representative to the OTC Technical Program Committee. The 2007 conference featured two OES-sponsored technical sessions in the 300-paper technical program, and a luncheon featuring the Honorable Rodney MacDonald, Premier of Nova Scotia, Canada. Attendance at OTC'07 reached a 25 year high, increasing 13% over the previous year to reach 67 155 attendees, perhaps because of an emphasis on offshore oil drilling driven by sharply rising petroleum prices. The conference included nearly 2400 companies from more than 30 countries, exhibiting their offshore oil- and gas-related technology. See Appendix XIV.

J. Expanded Student Support

The OES continues to solidly support the various student programs, including the student-posters competition at each OCEANS conference, the International Submarine Races (ISR), the National Oceans Science Bowl (NOSB), and the Marine Advanced Technology Education (MATE) Center's Remotely Operated Vehicles (ROV) competition. In addition, a new OES-sponsored scholarship program led by Norman D. Miller was initiated for the 2007–2008 academic year.

K. JOE Leadership

The IEEE JOURNAL OF OCEANIC ENGINEERING (JOE) continues to be one of the foremost publications in its field, receiving a very high citation level for its papers (based on journal citation reports by Thomson Scientific, the JOE was rated to be in the top three ocean engineering journals in 2006). Christian de Moustier has moved into the Editor-in-Chief role, relieving James F. Lynch, and he serves in his new capacity on the OES's Executive team. See Fig. 12 for recent Editors-in-Chief of JOE. See Appendixes XV and XVI for listings of the special issues of JOE and the JOE Associate Editors.

L. Newsletter and Electronic Newsletter

The OES newsletter continues to be a major source of news of the OES's activities. Under Editor Frederick H. Maltz, the newsletter coverage has increased considerably, as summarized in Appendix XVII. After serving 18 years, Frederick H. Maltz will be turning the editorship responsibilities over to John Irza starting in 2008. An electronic newsletter began to appear in 2004, with Diane D. DiMassa as editor.

M. OES Awards

The society continues to recognize those in the profession who have made significant contributions to the technology and in service to the society. Appendix XVIII lists the members of OES who have attained the rank of IEEE Fellow, and Appendixes XIX and XX identify those who have received the OES Distinguished Technical Achievement and Service awards, respectively. See Fig. 13.

VIII. The Oceanic Engineering Society at 40 Years

A. OES Field of Interest

The OES's field of interest is an ever-evolving statement of technical coverage. It is currently defined as to encompass:

> All aspects of science, engineering, and technology that address research, development, and operations pertaining to all bodies of water. This includes the creation of new capabilities and technologies from concept design through prototypes, testing, and operational systems to sense, explore, understand, develop, use, and responsibly manage natural resources.

B. Administrative Committee

The OES is lead by the AdCom elected by the society's membership. Currently, there are 18 elected members who serve for a period of three years and are elected in three contiguous classes of six each. See Appendix XXI for a listing of AdCom members from 1976 to the present. The officers of the society are elected by the AdCom and serve for two-year periods. A history of the society's officers is given in Appendix XXII.

C. OES Membership Level

The OES membership has appreciably declined in the last 20 years from an initial level of 2789 to the present stable base of around 1500 total members (see Appendix XXIII). Several reasons pertain. While people join a professional society largely because of the society's activities and the chance to participate in them, the IEEE dues have risen considerably over that span, making cost a significant driver for joining a given society. The practice of many companies in the earlier years of paying for membership in professional societies as a benefit of employment has been severely curtailed. In addition, external events, such as the end of the cold war, have caused research and technology aspects related to oceanic engineering to be underfunded. For instance, the U.S. Navy antisubmarine warfare budget for research and development in the mid 1980s was around eight billion dollars while in the late 1990s it dropped below one billion. This caused engineers to look elsewhere for their livelihood, so that the pool of possible OES members declined. With the move toward globalization, the OES has sought to enroll members in all countries, but that has brought with it the added problem of average wages in some countries that preclude engineers and scientists in those countries from joining the OES. The distribution of OES members across the ten IEEE regions and various countries is typified by that for 1999, as given in Appendix XXIV.

D. Finances

The OES has fared well financially during the past two decades. After fairly consistent yearend surpluses during the 1990s, followed by a two-year deficit due to a decline of the stock market, a positive surplus has been realized over the past four years. The income for OES is generated by the hard work of our volunteer members, who organize and manage conferences, serve on our technical and administrative committees, and generate and manage our publications. The financial goal of the OES is to maintain a solid financial base and to conduct a well-managed organization so that those resources provide benefit to society, the profession, and our members and volunteers with solid technical and professional services. The OES has four major sources of income: conferences, publications, return on investment, and membership dues. The Offshore Technology Conference and the OCEANS conference are major sources of OES discretionary resources. Several OES workshops have produced a consistent surplus each year. Publications, now electronic, are a source of income for the IEEE through the sale of the publications to corporations and libraries. The publications income is shared with the other IEEE societies based on total page contributions, which were about 1000 pages per year in 2005–2007 for JOE. The return on investments has become more significant as our surplus continues to grow. Our membership dues, currently $19 per year, generate less than $30 000 each year.

E. Oceanic Engineering Is People

Ivan Coggeshall said it very well in his history of the first 20 years of the society, "Oceanic engineering: The making of an IEEE society" (IEEE J. Ocean. Eng., vol. OE-10, No. 2, pp. 63–83, Apr. 1985):

> *"It's not what you know but whom you know." The cliché is more trite than cynical. In this history our emphasis has been on the intellectual content of our activity. But just as important is the participation of individuals, who convene again and again to cement old friendships and to begin new friendships. Some bring their spouses as a social bonus. They get away from their own shop to talk shop with others, widening their outlook by breaking with routine. Those immersed in committee work are double gainers—looking across the table, they see and hear peers in action, coming to grips with problems, adjusting to circumstances.*

> *"It has been always thus. Fifty* [now seventy-four] *years ago in 1934, an AIEE ex-President Charles F. Scott (1902–1903) wrote: "What have I gotten out of the Institute? . . . I don't remember what it was that took so much time in our board meetings, but I do remember the men and their ways. . . . Yes, to me, social intercourse may even take first place, for it has brought me friends and activities that have enriched my life."*

APPENDIX I

OES CHAPTERS (COMPILED BY JAMES S. COLLINS). CHAPTERS ARE RELATED TO SECTIONS EXCEPT WHERE A COUNCIL RELATION IS CITED

REGION	*CHAPTER NAME*	*FORMED*	*CLOSED*
1	Central New England Council	1984	1994
	Boston	2001	
2	Washington DC / Northern Virginia Joint Chapter	1986	
4	Chicago Joint Chapter with NPS05/AES10/GRS29/MAG33	2007	
5	New Orleans	1986	1992
	Galveston Bay/Houston	1987	1994
	Houston	2006	
6	Hawaii	1992	
	San Diego	1985	
	Seattle	1985	
7	Canada Atlantic	1985	
	Ottawa Section Joint Chapter with SP01/GRS29	1998	
	Quebec Joint Chapter with AES10/GRS29	2005	
	Toronto Joint Chapter with VT06/AES10/CIS11/UFFC20/GRS29	1993	
	Victoria, BC	1987	
8	France	1992	
	Norway Section Joint Chapter with CS23	1996	2004
	Spain	2004	
	United Kingdom-Republic of Ireland Joint Chapter with GRS29	2004	
10	Japan Council	1995	
	Singapore	2002	
	Taipei	2002	
	India Council	2008	

APPENDIX II
OES TECHNOLOGY COMMITTEES AND CHAIRS (COMPILED BY STANLEY G. CHAMBERLAIN)

No	*Technology Committee*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*
1	Autonomous Underwater Vehicles	A. Westneat	A. Westneat	M. O'Brien	M. O'Brien		D. Steiger	D. Steiger	D. Steiger	C. Brancart	C. Brancart
2	Non-Acoustic Imaging									F. Caimi	F. Caimi
3	Oceanographic Instrumentation & Data Acquisition	T. Dauphinee	T. Dauphinee	T. Dauphinee	T. Dauphinee		O. Diachok	O. Diachok	O. Diachok	O. Diachok	O. Diachok
4	Data, Modeling & Simulation	G. Williams	G. Williams	G. Williams			P. Katz	P. Katz	G. Dworski	G. Dworski	G. Dworski
5	Sonar Signal Processing									R. Dwyer	R. Dwyer
6	Underwater Acoustics	D. Ramsdale	D. Ramsdale	D. Ramsdale	D. Ramsdale		R. Farwell	R. Farwell	R. Farwell	R. Farwell	R. Farwell
7	Marine Communication & Navigation	R. Cassis	R. Cassis	J. Illgen	J. Illgen	J. Illgen	J. Illgen	J. Illgen	J. Atkinson	J. Illgen	J. Illgen
8	Arctic Instrumentation	E. Early	E. Early	E. Early	E. Early	E. Early	E. Early	E. Early	P. Lau		
	Severe Environments									P. Lau	P. Lau
9	Air/Space Remote Ocean Sensing	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman
10	Current Measurements	W. Woodward	W. Woodward	W. Woodward	W. Woodward		G. Appell	G. Appell	G. Appell	G. Appell	G. Appell
11	Neural Networks & Info Processing										V.W. Porto
	Technology Committees Coordinator	A. Eller	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain

APPENDIX II
(CONTINUED.) OES TECHNOLOGY COMMITTEES AND CHAIRS (COMPILED BY STANLEY G. CHAMBERLAIN)

No	*Technology Committee*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
1	Autonomous Underwater Vehicles	C. Brancart	C. Brancart	C. Brancart	C. Brancart	C. Brancart	C. Brancart	C. Brancart	C. Brancart	C. Brancart
2	Non-Acoustic Imaging	F. Caimi	F. Caimi	F. Caimi	F. Caimi	F. Caimi	F. Caimi	F. Caimi	F. Caimi	F. Caimi
3	Oceanographic Instrumentation & Data Acquisition	O. Diachok	O. Diachok	O. Diachok	K. Ferer	K. Ferer	K. Ferer	K. Ferer	K. Ferer	K. Ferer
4	Data, Modeling & Simulation	G. Dworski								
	Modeling, Simulation & Visualization		E. Gough	E. Gough	E. Gough	E. Gough	E. Gough	E. Gough	E. Gough	E. Gough
5	Sonar Signal Processing	R. Dwyer	R. Dwyer	R. Dwyer	R. Dwyer		J. Candy	J. Candy	J. Candy	J. Candy
6	Underwater Acoustics	R. Farwell	R. Farwell	R. Farwell	D. Ramsdale	D. Ramsdale	D. Ramsdale	K. Foote	K. Foote	K. Foote
7	Marine Communication & Navigation	J. Illgen	J. Illgen	J. Illgen	J. Illgen					
	Marine Communication, Navigation & Positioning					J. Illgen	J. Illgen	J. Illgen	D. Chadwell	D. Chadwell
8	Severe Environments	P. Lau	P. Lau							
9	Air/Space Remote Ocean Sensing	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman	D. Weissman
10	Current Measurements	A.J.Williams 3rd	A.J.Williams 3rd	A.J.Williams 3rd	A.J.Williams 3rd	A.J.Williams 3rd	A.J.Williams 3rd	A.J.Williams 3rd	A.J.Williams 3rd	A.J.Williams 3rd
11	Neural Networks & Info Processing	V.W. Porto	V.W. Porto	V.W. Porto	V.W. Porto	V.W. Porto	V.W. Porto	V.W. Porto	V.W. Porto	V.W. Porto
12	Environmental Technology						J. Barbera	J. Barbera	J. Barbera	J. Barbera
13	Environmental Technology							R. Bannon-Chair, P.Hurst-ViceChair	R. Bannon-Chair, P.Hurst-ViceChair	R. Bannon-Chair, P.Hurst-ViceChair
14	Homeland Security Technology									P. Hurst-Chair, R. Bannon - CoChair
15	Ocean Technology Policy									
	Technology Committees Coordinator	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain	S. Chamberlain

APPENDIX II
(CONTINUED.) OES TECHNOLOGY COMMITTEES AND CHAIRS (COMPILED BY STANLEY G. CHAMBERLAIN)

No.	*Technology Committee*	*2004*	*2005*	*2006*	*2007*
1	Autonomous Underwater Vehicles	C. Brancart	C. Brancart	C. Brancart - Chair, H. Singh-CoChair, H. Kondo-ViceChair-Asia	C. Brancart - Chair, H. Singh-Co-Chair, H. Kondo-ViceChair-Asia
2	Non-Acoustic Imaging	F. Caimi - Chair, J. Watson Vice-Chair-Europe			
	Optics, Imaging & EM Systems		F. Caimi - Chair, J.Watson ViceChair-Europe	F. Caimi - Chair, J. Jaffee - CoChair, J. Watson-ViceChair-Europe	F. Caimi - Chair, J. Jaffee-CoChair, J. Watson-ViceChair-Europe
3	Oceanographic Instrumentation & Data Acquisition	M. Harris	M. Harris	M. Harris	M. Harris
4	Modeling, Simulation & Visualization	W. Fox	W. Fox	W. Fox	W. Fox
5	Sonar Signal Processing	J. Candy	J. Candy	J. Candy - Chair, E.Sullivan-CoChair, J-P.Hermand-ViceChair-Europe, A.Asada-ViceChair-Asia	J. Candy - Chair, E.Sullivan-CoChair, J-P.Hermand-ViceChair-Europe, A.Asada-ViceChair-Asia
6	Underwater Acoustics	K. Foote	K. Foote - Chair, M.Zakharia-ViceChair-Europe, M. Furusawa-ViceChair-Asia	K. Foote - Chair, M.Zakharia-ViceChair-Europe, M. Furusawa-ViceChair-Asia	K. Foote - Chair, M.Zakharia-ViceChair-Europe, M. Furusawa-ViceChair-Asia
7	Marine Communication, Navigation & Positioning	D. Chadwell	D. Chadwell	D. Chadwell - Chair, L. Freitag & M. Stojanovic-CoChairs	D. Chadwell - Chair, L. Freitag & M. Stojanovic-Co-Chairs
8	Severe Environments				
9	Air/Space Remote Ocean Sensing	D. Weissman	D. Weissman	D. Weissman Chair, R. Garello-Vice-Chair-Europe	D. Weissman Chair, R. Garello-Vice-Chair-Europe
10	Current Measurements	S. Anderson	S. Anderson	S. Anderson - Chair, A.Williams-CoChair, K. Sicco-ViceChair-Europe, M.Heron-ViceChair-Asia	S. Anderson - Chair, A.Williams-CoChair, K. Sicco-ViceChair-Europe, M.Heron-ViceChair-Asia
11	Neural Networks & Information Processing	V.W. Porto	V.W. Porto	V.W. Porto	V.W. Porto
12	Environmental Technology	K. Dial	D. Hanes	D. Hanes - Chair, A. el S.M. Mohamed-ViceChair-Europe	D. Hanes - Chair, A. el S.M. Mohamed-ViceChair-Europe
13	Submarine Cable Technology	R. Bannon-Chair, P.Hurst-ViceChair	R. Bannon-Chair, P.Hurst-ViceChair	R. Bannon-Chair, P.Hurst-ViceChair, G. Watersworth-ViceChair-Europe, K.Asakawa-ViceChair-Asia	R. Bannon-Chair, P.Hurst-ViceChair, G. Watersworth-ViceChair-Europe, K.Asakawa-ViceChair-Asia
14	Homeland Security Technology	P. Hurst-Chair, R. Bannon-CoChair	P. Hurst-Chair, R. Bannon-CoChair	P. Hurst-Chair, R. Bannon-CoChair	P. Hurst-Chair, R. Bannon-CoChair
15	Ocean Technology Policy	J. Czika	J. Czika	J. Czika	J. Czika
16	Environmental Acoustics Technology		K. Dial	T. Duda	T. Duda
17	Ocean Energy		C. Brancart	C. Brancart - Chair, W. Carey-CoChair	C. Brancart - Chair, W. Carey-CoChair
18	Global Earth Observing System of Systems		J. Pearlman	J. Pearlman - Chair, S.Holt-CoChair, C. Waldmann-ViceChair-Europe	J. Pearlman - Chair, S.Holt-CoChair, C. Waldmann-ViceChair-Europe
	Technology Committees Coordinator	S. Chamberlain	A.J.Williams 3rd	A.J.Williams 3rd	A.J.Williams 3rd

APPENDIX III
NUMBER OF SESSIONS AND PAPERS IN EACH TECHNOLOGY AT RECENT OCEANS CONFERENCES (COMPILED BY STANLEY G. CHAMBERLAIN)

	Number of Sessions in Each Year												
OES Technology Committee	***93***	***94***	***95***	***96***	***97***	***98***	***99***	***00***	***01***	***02***	***03***	***04***	***Average***
Modeling, Simulation & Visualization		3	6	2	6	5	5	5	7	16	3	2	5
Communications, Navig. & Positioning		2	6	4	8	9	6	13	9	11	4	6	7
Oceanographic Instrumentation	1	3	4	7	5	8	10	4	7	13	2	4	6
Current Measurements	2	2	2	5	5	3	1	6	2	3	1	1	3
U/W Acoustics	12	10	9	13	11	12	9	19	10	13	11	12	12
Autonomous Underwater Vehicles		7	6	8	7	11	6	18	12	9	9	13	10
Air/Space Remote Sensing	6	4	3	5	4	5	6	2	3	5	7	3	4
Sonar Signal & Image Processing	1	4	4	6	6	9	3	23	16	11	20	4	9
Non-Acoustic Image Processing	1	3	2	5	1	4	3	3	3	7	1	6	3
Neural Networks & Info Processing		1	0	1	2	7	2	4	2	2	3	6	3
Environmental Technology					1	2		7		2	1	4	3
Polar Instrumentation		1	1	1									1
Submarine Cable Technology									1	1	3	3	2
Homeland Security Technology											1	2	2
Ocean Technology Policy												1	1
Total Number of Sessions	23	40	43	57	56	75	51	104	72	93	65	68	70

	Number of Papers Presented in Each Year												
OES Technology Committee	***93***	***94***	***95***	***96***	***97***	***98***	***99***	***00***	***01***	***02***	***03***	***04***	***Average***
Modeling, Simulation & Visualization		19	31	6	25	16	18	18	30	60	17	7	22
Communications, Navig. & Positioning		17	25	15	30	38	25	36	48	36	22	17	28
Oceanographic Instrumentation	6	28	17	27	24	36	44	14	33	47	12	13	25
Current Measurements	15	12	7	19	19	12	4	22	10	10	13	8	13
U/W Acoustics	86	76	44	46	44	45	37	69	49	59	52	47	55
Autonomous Underwater Vehicles		45	23	23	27	40	21	52	52	28	47	45	37
Air/Space Remote Sensing	50	22	15	19	15	23	20	5	11	18	35	8	20
Sonar Signal & Image Processing	8	27	15	26	23	35	13	69	74	39	78	15	35
Non-Acoustic Image Processing	5	25	9	18	5	16	10	10	11	29	3	23	14
Neural Networks & Info Processing		7		3	5	32	10	13	12	8	26	19	12
Environmental Technology					4	10		7		8	8	16	9
Polar Instrumentation		6	5	3									5
Submarine Cable Technology									4	3	10	14	8
Homeland Security Technology											4	5	5
Ocean Technology Policy												4	4
Total Number of Papers	170	284	191	205	221	303	202	315	334	345	323	241	290
Average Number of Papers per Session	7.4	7.1	4.4	3.6	3.9	4.0	4.0	3.0	4.6	3.7	5.0	3.5	4.1

APPENDIX IV
HISTORY OF CURRENT MEASUREMENTS TECHNOLOGY CONFERENCES (CMTC) (COMPILED BY ALBERT (SANDY) WILLIAMS 3RD)

Title	Dates	Sponsor(s)	City	Facility	Theme
CMTC 1	Jan. 11-13, 1978	NOAA OOE & Delaware Sea Grant	Newark, DE	University of Delaware	Working Conference on Current Measurement
CMTC 2	Jan. 19-21, 1982	CMTC of OES, IEEE	Hilton Head, SC	Hilton Head Inn and Sea Pines Plantation	2nd Working Conference on Current Measurement
CMTC 3	Jan. 22-24, 1986	CMTC of OES, IEEE	Airlie, VA	Airlie House Conf. Center	3rd Working Conference on Current Measurement
CMTC 4	Apr. 3-5, 1990	CMTC of OES, IEEE	Clinton, MD	Colony South Hotel	4th Working Conference on Current Measurement
CMTC 5	Feb. 7-9, 1995	CMTC of OES, IEEE	St. Petersburg, FL	St. Petersburg Hilton	Upper Ocean, Boundary Layer, Moving Platform, and Non-Invasive Current Measurements
CMTC 6	Mar. 11-13, 1999	CMTC of OES, IEEE	San Diego, CA	Bahia Resort Hotel	The Lagrangian and Eulerian Current Measurement Techniques
CMTC 7	Mar. 13-15, 2003	CMTC of OES, IEEE	San Diego, CA	Bahia Resort Hotel	Current and Wave Monitoring and Emerging Technologies
CMTC 8	Jun. 28-29, 05	CMTC of OES, IEEE	Southampton, U.K.	National Oceanography Center	Experimental, Practical and Operational Current and Wave Monitoring Systems and Applications

Title	Chair(s)	Executive (Vice) Chair(s)	TP Chair(s)	# Sessions	# Papers	# Exhibitors	# Attendance
CMTC 1	William Woodward	Gerald Apell		4	22	None	169
CMTC 2	William Woodward	Gerald Apell	Maureen Dursi	6	25	None	124
CMTC 3	William Woodward	Gerald Apell	Dorothy Hull	4	26	None	109
CMTC 4	Gerald Appell	Thomas Mero	Dorothy Hull	4	39	8	125
CMTC 5	Gerald Appell	Thomas Mero	Albert Williams	7	47	13	100
CMTC 6	Albert Williams	Ron George	Steven Anderson & Eugene Terray	10	61	15	124
CMTC 7	Albert Williams	Archie Morrison	Steven Anderson & Eugene Terray	8	56	14	72
CMTC 8	Steven Anderson	Archie Morrison	Albert Williams & Eugene Terray	4	31	9	61

APPENDIX V
SYMPOSIA ON AUTONOMOUS UNDERWATER VEHICLE (AUV) TECHNOLOGY (COMPILED BY CLAUDE P. BRANCART)

Symposium	*Date*	*Location*	*Theme*	*General Chairs*	*Technical Program Chairs*	*Sessions*	*Papers*	*Attendance*
AUV '90	June 5-6, 1990	Washington DC	AUVs	Charles Stuart	Glen Williams	11	44	264
AUV '92	June 2-3, 1992	Washington DC	AUVs	Capt Alan Beam	Dan Steiger	9	42	
AUV '94	July 19-20, 1994	Cambridge, MA	AUVs	Mack O'Brien, Claude Brancart	Anthony Healey	24	69	225
AUV '96	June 2-6, 1996	Monterey, CA	AUVs	Claude Brancart, Anthony Healey	Donald Brutzman	20	61	175
AUV '98	August 20-21, 1998	Cambridge, MA	Navigation	Claude Brancart	William McFarland, Anthony Healey			
AUV '00	June 28-29, 2000	State College, PA	Advanced Technology for AUV Development and Deployment	David Bradley	John Dzielski	11	35	
AUV '02	June 20-21, 2002	San Antonio.TX	Energy Systems			4	33	59
AUV '04	June 17-18, 2004	Sabasco, ME	Multiple/Cooperat-ing AUVs	Claude Brancart	Edgar An	4	23	56
AUV '06	February 12-13, 2007	Brest, France	Navigation	Claude Brancart, René Garello	Hubert Pelletier, Manell Zakharia	6	16	40

APPENDIX VI
HISTORY OF HOMELAND SECURITY TECHNOLOGY WORKSHOPS (HSTW) FOR MARINE INFRASTRUCTURE PROTECTION (COMPILED BY ROBERT T. BANNON)

Title	*Dates*	*Sponsor(s)*	*Location*	*Facility*	*Theme*	*Chair(s)*	*Executive (Vice) Chair(s)*	*Technical Program Chairs*	*Attendees (Planned/ Actual)*	*Tracks/ Papers*	*No. Exhibitors*
HSTW '03	10-11 Dec. 2003	IEEE-OES/ NAVSEA NUWC	Warwick, RI	Crowne Plaza at the Crossings	On-the-Sea, Under-the-Sea, Above-the-Sea	Pamela Hurst, Robert Bannon	Jim Pollock, NUWC Pam Lisiewicz, NUWC	Pamela Hurst, Robert Bannon, Jim Pollock	200 / 267	5 Tracks / 88 Papers	31
HSTW '04	6-8 Dec. 2004	IEEE-OES/ NAVSEA NUWC	Valley Forge, PA	Valley Forge Convention Center	On-the-Sea, Under-the-Sea, Above-the-Sea	Pamela Hurst, Robert Bannon	Jim Pollock, NUWC Pam Lisiewicz, NUWC	Pamela Hurst, Robert Bannon, Jim Pollock	200 / 217	5 Tracks / 70 Papers	24
HSTW '05	6-8 Dec. 2005	IEEE-OES/ NAVSEA NUWC	Newport, RI	Marriott Hotel 25 America's Cup Ave. Newport, RI	On-the-Sea, Under-the-Sea, Above-the-Sea	Pamela Hurst, Robert Bannon	Jim Pollock, NUWC Pam Lisiewicz, NUWC	Pamela Hurst, Robert Bannon, Jim Pollock	225 / 167	4 Tracks / 48 Papers	27

APPENDIX VII
HISTORY OF SUBMARINE CABLES AND SCIENTIFIC SUBMARINE CABLES TECHNOLOGY WORKSHOPS (COMPILED BY ROBERT T. BANNON)

Title	***Dates***	***Sponsor(s)***	***City***	***Facility***		***Theme***
Scientific Submarine Cables Technology Workshop 2003	24-27 June 2003	IEEE-OES, IIS U. Tokyo, ERI U. Tokyo, ORI U. Tokyo, JAMSTEC	Tokyo, JP	University of Tokyo		Underwater Observation Platforms / Tsunami Warning Systems/ Achievement of Existing Cabled Observatories/New Projects
Submarine Cables Technology Workshop 2004	11-12 February 2004	IEEE-OES, USN, AT&T, Holland & Knight	Washington, DC	Jefferson Hotel		Underwater Fiber Optics Communications/ Submarine Cable Technology and Protection
Scientific Submarine Cables Technology Workshop 2006	8-10 February 2006	IEEE-OES, ITS- UK & Ireland	Dublin, IR	Dublin Castle		Underwater Fiber Optics Technology and Protection / Tsunami Warning Systems
Internat. Symp. on Underwater Tech 2007 Internat. Workshop on Scientific Use of Submarine Cables and Related Techs 2007	17-20 April 2007	IEEE-OES, IIS U. Tokyo, JAMSTEC	Tokyo, JP	Institute of Industrial Science, University of Tokyo		Underwater Observation Platforms / Tsunami Warning Systems/ Achievement of Existing Cabled Observatories/ New Projects/Sensors
Title	***Chair(s)***	***Executive (Vice) Chair(s)***	***Technical Program Chair***	***No. Attendees***	***No. Papers***	***Special Features***
Scientific Submarine Cables Technology Workshop 2003	Junzo Kasahara, Alan Chave	Kenichi Asakawa, Yasuyoshi Ishii, Hisaaki Maeda, Hitoshi Mikada, Chang-kyu Rheem, Hisayoshi Shimizu, Yuichi Shirasaki	Yuichi Shirasaki, Alan Chave	104	67	Discussion on new projects and international collaboration
Submarine Cables Technology Workshop 2004	Robert Bannon	Doug Burnett	George Vance, Jim Coble	67	20	Selected Authors were invited to present at the Pentagon
Scientific Submarine Cables Technology Workshop 2006	Robert Bannon, Gary Waterworth, Alan Chave, Mick Gillooly	Junzo Kasahara, Kenichi Asakawa,	Mick Gillooly, Alan Chave, Gary Waterworth, Robert Bannon	97	61	Discussion on Tsunami and Porcupine Abyssal Plain
Internat. Symp. on Underwater Tech 2007 Internat. Workshop on Scientific Use of Submarine Cables and Related Techs 2007	Tamachi Ura, Robert Wernli, Junzo Kasahara	Kenichi Asakawa, Robert Bamnnon, Akira Asada, Shinichi Takagawa, et al.	Akira Asada, Shinichi Takagawa	230	113	In conjunction with Underwater Technology 2007

APPENDIX VIII
STUDENTS POSTERS HISTORY (COMPILED BY NORMAN D. MILLER)

Title	*City*	*Abstracts Received*	*Abstracts Accepted*	*Chair*	*Award Winners*
OCEANS '89	Seattle, WA	16	16	Norman D. Miller	Franz Hover – MIT, US
OCEANS '91	Honolulu, HI	6	6	Norman D. Miller	Bruce Hartwig - Texas A&M U., US
OCEANS '92	Newport, RI	8	8	Gerald Sedor	Daniel M. Hernandez - Stanford U., US
OCEANS '93	Victoria, BC	14	11	Norman D. Miller	Rick Driscoll – U. Victoria, CA
OCEANS '94	Brest, France	22	22	René Garello	Linda Mullen - Drexel U., US 1st Stephan Grassin - Telecom Bertagne, FR 2nd Charles Randell – U. Victoria, CA, 3rd Gabriel Thomas – U TX El Paso, US Honorable Paolo Cipollinin – U. Pisa, IT Honorable
OCEANS '95	San Diego, CA	24	11	Norman D. Miller	Joseph M. Riley - Florida Atlantic U., US - 1st Oleg Kirichenko - Far Eastern U., PH 2nd Guanging Yang - Drexel U., USA 3rd
OCEANS '96	Fort Lauderdale, FL	20	13	Norman D. Miller	Smantha Dugelay – IFREMER, FR 1st Rick Driscoll – U. Victoria, CA 2nd Rolando Blanco – U. Miami, US 3rd Andrew Vasilev – U. Varna, BG, Honorable
OCEANS '97	Halifax, NS	21	21	Zhizhang David Chen	Andrea Trucco - University of Genoa, IT
OCEANS '98	Nice, France	31	15	René Garello	Georgina Hackett - U. Victoria, CA, 1st G.J. Crossingham - U. South Hampton, UK, 2nd Amy Hower - U. North Carolina, US, 3rd Jason Gobat - WHOI, USA, Honorable Irene M. Williams - U Melbourne, AU Honorable
OCEANS '99	Seattle, WA	24	12	Norman D. Miller	David Boulinguez - ENSIETA, Brest, FR 1st Fabienne Poree ENST de Bretagne, FR 2nd Brian Strully, U. Washington, US 2nd Glodina Connan, ENST de Bretagne, FR 3rd Barryl Newborough – Loughborough U., UK 3rd Christophe Sintes - GESMA, Brest, FR 3rd
OCEANS 2000	Providence, RI	19	18	Ted Colburn	Christophe Sintes -GESMA, Brest, FR 1st Danielle Hoja - Institute of Remote Sensing 2nd Andreas Huster - Stanford U., US 2nd Eric Hulen - Santa Clara U., US 3rd Charles Humphrey – U. Victoria, CA 3rd R.E. Loke, U. Algarve, PT 3rd
OCEANS 2001	Honolulu, HI	22	18	Sherwood Maynard	Robert E. Raye - Florida Atlantic U., US 1st Bradley J. Buckham – U. Victoria, CA 2nd Ryan M. Moody - North Carolina State U. US 2nd Andreas Andersson - Hawaii Pacific U., US 3rd Anna P. M. Michel – MIT, US 3rd Philomene A. Verlaan - Royal School of Mines 3rd
OCEANS 2002	Biloxi, MS	26	19	Richard Crout	Dusan Curic - Florida Atlantic U., US 1st Katy Croff - MIT/WHOI, US 2nd James Van Zweiten - Florida Atlantic U., US 2nd François Enet – U. Rhode Island, US 3rd Saurabh Malhotra - U Mass Dartmouth, US 3rd Nadya Viogradova – U. Southern MS, US 3rd

APPENDIX VIII
(CONTINUED.) STUDENTS POSTERS HISTORY (COMPILED BY NORMAN D. MILLER)

Title	*City*	*Abstracts Received*	*Abstracts Accepted*	*Chair*	*Award Winners*
OCEANS 2003	San Diego, CA	124	27	Edward Crenshaw	Micaela Pilotto – MIT, US 1st Megan Hendry-Brogan – MIT, US 2nd David Palandro – U. South Florida, US 2nd Christina Carollo – U. Reading, UK 3rd Temitope Ojo - Texas A&M U., US 3rd Chris D. Fallows – U. Southampton, UK 3rd
OCEANS 2004	Kobe, Japan	83	33	Ken Takagi	Charles Humphrey U. New Foundland, CA 1st Kotaro Ichikawa - Kyoto U., JP 2nd Stephen Licht – MIT, US 2nd Gerard Llort Pujol - ENST Bretagne FR 3rd Maria Palmese - University of Genoa, IT 3rd Christopher Scott - Oregon State U., US 3rd Tomohiro Kojiya - Tohoku U. - JP Kohei Nishi - Hiroshima U. - JP
OCEANS 2005-Brest	Brest, France	24	17	Jean-Marc LeCailles	Eva-Marie Nosal – U. Hawaii, US 1st Stefania Repetto – U. Genoa, IT 2nd Manuel Toscana-Jimenez – U. Seville, SP 2nd Philip Barclay – U. Canterbury, NZ 3rd Jose Garcia - U. Hanover, DE 3rd Alan Hunter – U. Canterbury, NZ 3rd Laurent Marrec - ENST, Brest, FR 3rd
OCEANS 2005-Washington DC	Washington, DC	28	24	Justin Manley	Anna Michel – MIT, USA 1st Maria Palmese – U. Genoa, IT 2nd Emily Brownlee - Calvert High School, US 2nd Elizabeth Burg – S. Dakota School of Mines 3rd Jesse Davis - Florida Inst. Technology, US 3rd Nayrah Saltour - Natl Inst. Oceanography, IN 3rd
OCEANS 2006 Asia Pacific-Singapore	Singapore	16	14	Mandre Chitre	Gerard Llort-Pujol - ENST Bretagne, FR 1st Imen Karoui - ENST Bretagne, FR 2nd Philip Barclay – U. Canterbury, NZ 2nd Jose Garcia – U. Hanover, DE 3rd Alan Hunter – U. Canterbury, NZ 3rd Oliver Wurl - Natl U. Singapore, SG 3rd
OCEANS 2006-Boston	Boston, MA	49	24	Alexandra Techet	Branden Cochenour - Johns Hopkins U., US 1st Lauren Cooney - MIT, US 2nd Jordan Stanway – MIT, US 2nd Alexander Pavin – MIT, US 3rd Ye Li – U. British Columbia, CA 3rd **Undergraduates** Zhipeng Sun - Harvard University, US 1st Jeff Kaeli -VPI, Blacksburg, VA, US 2nd Andy Schneider – U. Wisconsin, US 3rd
OCEANS 2007 Aberdeen	Aberdeen, Scotland	42	22	Martin Solan	Angela Piehl-Harms - U Bergen, NO, 1st Morgan Admas - Robert Gordon U, Scotland, 2nd Ejria Sibadogil - Borneo Mar. Res. Inst, MY, 2nd Edward Pibrow –U. Canterbury, NZ, 3rd Lee Pius – U. Singapore, SG 3rd Sergi Pons-Mar.Tech Unit (CMIMA-CSIC)SP, 3rd
OCEANS 2007-Vancouver	Vancouver, BC, Canada	53	22	Norman D. Miller	Arthur C.R. Gleason - U. Miami, Florida US, 1st Chris Watts – U. Glasgow, Scotland, 2nd Michelle Weirathmueller – U New Hamp, US, 2nd Windell Jones – U. Hawaii, Manoa, US, 3rd Marcos M Sastre -UMASS Marine S&T, US, 3rd Daniel G. Walker - MIT, US, 3rd

APPENDIX IX
INTERNATIONAL HUMAN-POWERED SUBMARINE RACES (ISR) (COMPILED BY CLAUDE P. BRANCART)

Race No.	Date	Location	General Chair	Sponsor	# Teams	Overall Performance Winner
ISR 1	June 22-25, 1989	Singer Island, Riviera Beach, FL	Hap Perry	H.A.Perry Foundation & Florida Atlantic Univ. Ocean Eng. Dept.	16	U.S. Naval Academy
ISR 2	June 23-25, 1991	Singer Island, Riviera Beach, FL	Hap Perry	H.A.Perry Foundation & Florida Atlantic Univ.Ocean Eng. Dept.	34	Subasaurus, Benthos, Falmouth, MA
ISR 3	June 1993	Ft. Lauderdale, FL	Hap Perry	H.A.Perry Foundation & Florida Atlantic Univ. Ocean Eng. Dept.	44	Tech Torpedo II Tennnessee Technological Univ.
ISR 4	December 27-30, 1995	U.S. Navy NSWC's David Taylor Model Basin, Bethesda, MD	Nancy Hussey	Foundation for Underwater Research & Education	11	Cape Fear, Cape Fear Technological Univ.
ISR 5	June 23-27, 1997	U.S. Navy NSWC's David Taylor Model Basin, Bethesda, MD	Nancy Hussey	Foundation for Underwater Research & Education	16	Omer 3, Ecole de Technologie Superieure, Univ. Quebec, Montreal, Canada
ISR 6	June 11-15, 2001	U.S. Navy NSWC's David Taylor Model Basin, Bethesda, MD	Nancy Hussey	Foundation for Underwater Research & Education	24	Phantom, Virginia Polytechnical School
ISR 7	June 23-27, 2003	U.S. Navy NSWC's David Taylor Model Basin, Bethesda, MD	Nancy Hussey	Foundation for Underwater Research & Education	19	Omer 5, Ecole de Technologie Superieure, U. Quebec, Montreal, Canada
ISR 8	June 27 - July 1, 2005	U.S. Navy NSWC's David Taylor Model Basin, Bethesda, MD	Nancy Hussey	Foundation for Underwater Research & Education	19	Wasub, Technical Univ. Delft, Netherlands.
ISR 9	June 24-29, 2007	U.S. Navy NSWC's David Taylor Model Basin, Bethesda, MD	Nancy Hussey	Foundation for Underwater Research & Education	22	Team OMER, Ecole de Technologie Superieure, Univ. of Quebec, Montreal, Canada

APPENDIX X
DEVELOPMENT OF COMMITTEE ON CONFERENCE POLICIES (COCOPO) AND ITS EVOLUTION INTO JOINT OCEANS ADVISORY/ADMINISTRATIVE BOARD (JOAB) (COMPILED BY RENÉ M. GARELLO)

In early 2001, Thomas F. Wiener, President of the OES, asked René M. Garello to head a committee to formalize OES conference activities, with the objective of finding the proper balance between the responsibility of the sponsoring society and the authority and autonomy of the local organizing committees, and of improving the management of the conferences so that society technical, professional, and financial goals are met.

This committee, named the Committee on Conference Policies (CoCoPo), had four main issues to be addressed:

- conference guidelines;
- multiple conferences;
- conference benefits;
- conference regional support.

CoCoPo, which included members of both the MTS and the OES, addressed these four issues. It was quite clear that the conference guidelines (established in 1999) were an extremely good starting point. Nevertheless, the application of the guidelines needed to be more strongly followed by the local organizing committees and our operating procedures needed to be improved. Indeed, to keep a level of continuity and quality from conference to conference, a complete set of approaches and tools needed to be developed: a permanent Technical Program Committee had to be created, a database of conference "facts" (topics, attendees, exhibitors, etc.) needed to be generated, a website link had to be developed, a metric for assessing the quality of a conference had to be formulated, and descriptions of these needed to be incorporated into an updated set of Conference Guidelines.

The OES AdCom agreed to experiment with a two conference-a-year concept, the first one to be in 2005. The schedule that was selected was to have an OCEANS Conference every year in North America with the participation of the MTS, an alternating conference every other odd year in Europe and every other even year in Asia/Pacific, the latter two generally sponsored only by the OES.

The parameters for defining a metric for conference benefits are still under discussion. More data are needed to design a model that would consider the uniqueness of the various regions for the proposed venues, including North America, Europe, and Asia/Pacific.

On the fourth issue, a growth trend in Europe had been seen, generated by the prospect of hosting an OCEANS conference there. New chapters have been formed. Where there had been only two chapters, one in France and for a short period of time one in Norway, there are now two new ones, with the addition of Spain and the United Kingdom, and two additional ones are expected soon, in Germany and in Italy.

To support these new directions, CoCoPo evolved, by mid 2002, into a new structure, the Joint OCEANS Advisory Board (JOAB), with Dick Butler from the MTS and René M. Garello from the OES as Co-Chairs. JOAB was populated with members from both societies who had extensive experience in organizing and running OCEANS conferences and who are able to provide guidance on the technical program, exhibits, publicity, finances, and website interface.

Besides providing expert advisors to OCEANS conference local organizing committees, JOAB had to create tools necessary for insuring sustainable procedures for the OCEANS conferences. An additional goal was to select a web contractor to assist the local committee in moving to an all-electronic process, from abstract submissions to proceedings generation. In addition, a process had to be established to begin implementing all the tools for allowing a smooth transition from one conference to the next one (pertinent and mandatory documents, database, mailing lists, etc.).

An additional goal was to consider and make a recommendation regarding whether the societies should make use of a conference management firm or hire a paid consultant to manage the conferences. In the latter case, the consultant would interact with the JOAB chairs, the society liaisons, and the local organizing committees, similar to the IEEE GRSS model. In the case of a management firm, the discussion revolved around the limitations of their involvement: should they oversee all aspects of the conference or just be assigned specific tasks (such as hotel negotiations). After deliberating over this choice for a year and a half, it was finally agreed to hire a conference management firm, with a variable set of tasks for each conference, to work in parallel with the website development contractor.

In the meantime, the definition of the roles and relationship between JOAB and RECON, the Reconnaissance Committee headed by Joseph R. Vadus, was discussed and agreed upon. Charters describing both bodies were written and approved by the societies. As described in the documents, the conference venue selection and local organizing committee organization process starts about five years before a given conference. RECON either is solicited or solicits a given venue (or venues if there are several candidates). RECON's main role is then to support the core of the local committee in providing an estimated budget, a description of the venue itself (conference center, hotels, local arrangements, etc.), a theme for the conference, a complete organizing committee, and the local support and local arrangements for the attendees. A formal presentation to JOAB, RECON, and the MTS/OES leadership is scheduled four years before the conference. JOAB is then in charge of making a recommendation to the MTS Board and the OES AdCom, who then determine whether to grant the conference to that venue. If the decision is affirmative, a letter of appointment and a Memorandum of Agreement are signed between the presidents of the societies and the general chair of the conference. JOAB is then in charge of advising/supporting/counseling the selected conference committee.

Regarding the contracting services, Veraprise Inc. was selected to develop and support the OCEANS website and the IEEE Conference and Management Services was hired to provide conference management services. For the latter, an "a la carte" set of services were requested, with the local organizing committee selecting the specific set of services that would meet their particular needs. Veraprise Inc. proved to be a valuable choice in that all the tools for handling the technical part of the conference were delivered in time and tested in real-life contexts, beginning with the OCEANS'05 conferences in Brest, France and Washington, DC. As the General Chair of Oceans'05-Brest testified, a positive net benefit was obtained from this approach. In addition to the first step in the continuity and the corporate memory the societies were seeking, a substantial economy was indeed realized. The web-based approach continued to be expanded with the implementation of a delegate registration tool to allow registrations to be cross checked more easily with the author database.

Over the past four years, a large portion of the challenge that was proposed by Thomas F. Wiener had been achieved. The approach to managing the conferences had evolved from an initial concept—society advisors revolving around a paid consultant—to an approach more internal to the societies with web-based data exchanges between the authors, registrants, local organizing committee, the conference management and website contractors, JOAB advisors, and the societies.

APPENDIX XI
UNDERWATER TECHNOLOGY SYMPOSIUM HISTORY (COMPILED BY TAMAKI URA AND JOSEPH R. VADUS)

Title	Date	Location	Theme	General Chairs	Tech Prog Chairs	Papers	Attendees	Special Features
UT'98	April 14-17, 1998	Tokyo, Japan	Key Issues in the Global Underwater Environment	Hisaaki Maeda, Joseph Vadus	Tamaki Ura, Robert Wernli	78 from 14 countries	201 from 14 countries	First UT Symposium held in Japan, first event conducted by the new OES Japan Chapter
UT'00	May 24-26, 2000	Tokyo, Japan	Advanced Underwater Technologies for the 21st Century	Hisaaki Maeda, Joseph Vadus	Tamaki Ura, Robert Wernli	87 from 15 countries	160 from 17 countries	Technical Tour to Mega-Float Experimental Site at Japan Marine Science and Technology Center (JAMSTEC)
UT'02	April 16-19, 2002	Tokyo, Japan	Technology for the Last Frountier	Tamaki Ura, Joseph Vadus	Tamaki Ura, Robert Wernli	47 from 10 countires	117 from 11 countries	Technical Tour to the Tsukuba Reasearch Center; Post UT'02 Workshop in Taipei
UT'04	April 20-23, 2004	Taiwan, R.O.C.	Collaboration Toward Breakthrough	Yih-Nan Chen, Tamaki Ura, Robert Wernli	Sheng-Wen Cheng, Akira Asada, Jerry Carroll	61 from 13 countries	105 from 15 countries	First UT Symposium in Taiwan (R.O.C.)
UT'07	April 17-20, 2007	Tokyo, Japan	Advanced Underwater Technology for the Ocean	Tamaki Ura, Robert Wernli, Junzo Kasahara	Akira Asada, Shinichi Takagawa	118 from 18 countries	225 from 18 countries	UT'07 in conjunction with Scientific Submarine Cables (SSC'07) Workshop; Post UT'07 2-day Symposium in Shanghai, China

APPENDIX XII
U.S./EU-BALTIC INTERNATIONAL SYMPOSIUM HISTORY (COMPILED BY JOSEPH R. VADUS)

Title	Date	Location	Theme	General Chairs	Tech Prog Chairs	Papers	Attendees	Special Features
US-Baltic International Symposium 2004	June 15-17, 2004	Klaipeda, Lithuania	Advances in Marine Environmental Research, Monitoring & Technologies	Joseph Vadus, Algirdas Stankevicius	Victor Klemas, Lina Siaule	120	150	First US-Baltic Symposium held in the Baltic Region
US/EU-Baltic International Symposium 2006	May 23-25, 2006	Klaipeda, Lithuania	Integrated Ocean Observing Systems (IOOS) for Managing Global and Regional Ecosystems Using Marine Research, Monitoring & Technologies	Joseph Vadus, Algirdas Stankevicius	Victor Klemas, Mindaugas Vaisvila	140	180	Second US/EU-Baltic Symposium repeating 2002 venue

APPENDIX XIII
OCEANS CONFERENCE TUTORIALS SUMMARY (COMPILED BY DIANE D. DIMASSA)

Year	Tutorial Titles	Instructors	Instructor Affiliations
1998	CLASSIFICATION: GOALS, TECHNIQUES and APPLICATIONS to ACOUSTIC SIGNALS	A. Lemer / F. Ywanne	Thomson Marconi Sonar SAS- FRANCE
1998	MODELING in SHALLOW WATER ACOUSTICS	B. Katsnelson	Voronezh State University - RUSSIA
1998	Underwater Machine Vision: 3D Scene Reconstruction from Underwater Video Imagery	S. Negandaripour	Dept. Electrical & Computer Engineering, Univ. of Miami -USA
1998	Implementation of Adaptive & Synthetic Aperture Processing Schemes in Integrated Active Passive/Sonars with Multidimensional Arrays of Sensors	S. Stergiopoulos	Defense & Civil Institute of Environmental Medicine - CANADA
1998	ENVIRONMENTAL INFORMATION for THE MANAGEMENT of the COASTAL ZONE	J. Denis	Laboratoire Côtier, Ifremer Toulon- FRANCE
1998	New Approaches in Optimization of Space-Time Signal Processing in Hydroacoustics	I.I. Gorban	Institute of Mathematical Machines and Systems- Kiev -UKRAINE
1998	Maritime Positioning and Navigation Using Satellites	G. W. Hein	Institute of Geodesy & Navigation of the University FAF Munich - GERMANY
1998	APPROXIMATE METHODS in LIGHT SCATTERING MEDIA OPTICS	A. Kokhanovsky	Inst. of Particle Technology and Environmental Engineering, Clausthal Tech. University-GERMANY
1999	Onboard Acoustic Sensors	Fredrick Maltz	Consultant
1999	Understanding and Using SAR Imagery of the Marine Environment	John Apel	Global Ocean Associates
1999	Understanding Technological Forecasting and Competitive Technology Intelligence Methods - Part 2	Richard Mignogna	Technology/Engineering Management, Inc
1999	Introduction to Technological Forecasting and Competitive Technology Intelligence	Richard Mignogna	Technology/Engineering Management, Inc
1999	Computation Intelligence: Theory and Applications in Ocean Surveillance	Bill Porto	Natural Selection, Inc.
1999	Re-Engineering University-Level Marine Science Education	Frank Hughes	The Boeing Company
1999	Principles and Applications of Synthetic Aperture Radar (SAR)	Barton Huxtable	User Systems, Inc.
1999	Adaptive Equalization for High Speed Underwater Data Communications	Milica Stojanovic & Lee Freitag	Northeastern Univ. & Woods Hole Oceanographic Institution
2000	A Systematic Approach to Redundant and Fault Tolerant System Design	Philip Babcock	Charles Stark Draper Laboratory, Inc
2000	Hydrodynamics, Dynamics and Control of Undersea Vehicles	Douglas E. Humphreys	Vehicle Control Technologies, Inc.
2000	Model-Based Ocean Acoustic Signal Processing	Edmund J. Sullivan & James V. Candy	Sullivan: Physics & Tech Div., Naval Undersea Warfare Ctr., Newport, RI; Candy: Ctr. for Adv. Signal & Image Sci. Univ. California, Lawrence Nat. Lab

APPENDIX XIII
(CONTINUED.) OCEANS CONFERENCE TUTORIALS SUMMARY (COMPILED BY DIANE D. DIMASSA)

Year	Tutorial Titles	Instructors	Instructor Affiliations
2000	A Practical Law Primer for Ocean Science and Technology	Richard T. Tobol	Columbus-America Discovery Group and Professor of Law, Univ. of Dayton Law School
2000	Technological Forecasting for Competitive Technology Intelligence	Richard P. Mignogna	President, Technology/ Engineering Management, Inc..
2000	Ocean Acoustics	William A. Kuperman, Michael B. Porter & Henrik Schmidt	Kuperman: Professor & Director, Marine Physical Lab., Scripps Inst. of Oceanography, UCSD; Porter: Science Applications Int. Corp.; Schmidt: Professor, Dept. Ocean Eng., MIT
2001	New Developments in Electronic Navigation	Lee Alexander	Assoc. Res. Professor, Cntr. for Coastal Ocean Mapping, Univ. New Hampshire; Adj Professor, Marine Science, Univ. So Mississippi; Director, Amer. Forum Electronic Chart Technol. (AFFECT)
2001	Hydrodynamics, Dynamics and Control of AUVs	Douglas E. Humphreys	President & Senior Design Engineer, Vehicle Control Technologies, Inc.
2001	Ocean Acoustics	William A. Kuperman, Michael B. Porter & Henrik Schmidt	Kuperman: Professor & Director, Marine Physical Lab, Scripps Inst of Oceanography, UCSD, Porter: Science Applications Int. Corp.; Schmidt: Professor, Dept Ocean Eng., MIT
2001	New Technological Development for Undersea Exploration	Thomas K. Dettweiler	Exec. Vice President, Nauticos Corp.
2001	Applied Digital Signal Processing in Acoustics	James Candy	Chief Scientist for Engineering and Director, Center for Advanced Signal & Image Sciences, Univ. of California, Lawrence Livermore National Lab
2001	Introduction to Marine Corrosion Engineering	James E.Jenkins	CORMAT, Inc.
2001	Synthetic Aperture Sonar - Part 1	Marc Pinto & Enson Chang	NATO SACLANT Centre, Dynamic Technology, Inc.
2001	Synthetic Aperture Sonar - Part 2	Enson Chang	Dynamic Technology, Inc.
2001	Life Raft and Emergency Distress Signal Training	Robert N. Yonover & Lt. Com Ed McCauley (USCG, ret.)	McCauley: Liftraft & Marine Safety Equip. Inc. owner and operator
2002	Modern Spectral Estimation Techniques in Digital Signal Processing: Temporal and Spatial	James V. Candy	Chief Scientist for Engineering and Director, Center for Advanced Signal & Image Sciences, Univ. of California, Lawrence Livermore National Lab
2002	Introduction to Marine Corrosion Engineering	James E.Jenkins	CORMAT, Inc.
2002	Applications of GPS in Marine Navigation and Hydrographic Surveying	Ahmed El-Rabbany	Assistant Professor, Ryerson University, Toronto, Canada.
2002	Communication Networks for Measurement Systems	John Walrod	Planning Systems Inc.., Slidel, MS
2002	Marine Applications of Remote Sensing	Richard Crout	Center for Higher Learning, University of Southern Mississippi
2002	Qualitative and Quantitative Visualization Techniques for Laboratory and Field Applications	Peter H.-T. Liu	QUEST INTEGRATED INC.
2002	Introduction To Seafloor Geotechnical Engineering	Mr. Herb Herrmann	U.S. NAVY, NFESC
2003	Practical Analog and Digital Control System Design	Barry L. Dorr	Dorr Engineering

APPENDIX XIII
(CONTINUED.) OCEANS CONFERENCE TUTORIALS SUMMARY (COMPILED BY DIANE D. DIMASSA)

Year	Tutorial Titles	Instructors	Instructor Affiliations
2003	Target Classification Architectures: The Class-Specific Method	Paul Baggenstoss	NUWC (Naval Undersea Weapons Center)
2003	Underwater Optical Imaging: Theory and Practice	Jules Jaffe	Scripps Institution of Oceanography
2003	Battery Systems: Primary and Secondary Cells	Ken Arnold	Wireless Innovation , Inc.
2003	Introduction to Wireless Sensor Networks	Ken Arnold	Wireless Innovation , Inc.
2003	Introduction to Seafloor Geotechnical Engineering Properties	Herb Herrmann	NFESC
2003	AUV Technology and Application Basics	William Kirkwood, Mark Sibenac, Hans Thomas, James Bellingham	MBARI (Monterey Bay Aquarium Research Institute)
2003	Qualitative and Quantitative Visualization Techniques for Lab and Field Applications	Peter H.-T. Liu	Omax Corporation
2003	Introduction to Marine Corrosion Engineering	James E.Jenkins	CORMAT, Inc.
2003	Side Scan Sonar Workshop	Garry Kozak	Klein Associates
2003	Fiber Optic Design Principles	Mike Brininstool	FIBER TECH
2003	Mastering Moored ADCPs: Current and Waves	Paul Devine, Peter Spain	RD Instruments
2003	Efficient Use of ADCPs from Moving Vessels	Darryl Symonds, Jim Rogers	RD Instruments
2003	Synthetic Aperture Sonar2: Applications	Edson Chang	Dynamic Technology, Inc.
2003	Synthetic Aperture Sonar	Marc Pinto	NATO SACLANT Center
2004	Methane Hydrate –Utilization as an Energy Resource	Tetsuo Yamazaki	Japan National Institute of Advanced Industrial Science and Technology
2004	High Resolution Mapping of the Seabed	Donald M. Hussong	Fugro Seafloor Surveys, Inc.
2004	Marine Geophysical Observations in Japan - From Active-Source Survey to Long Term Cabled Observatory	Hitoshi Mikada	Japan Marine Science and Technology Center
2004	Synthetic Aperture Sonar	Enson Chang	Dynamics Technology, Inc.
2004	Acoustic Seabed Classification with Multibeam and Sidescan Images	Jon Preston	University of British Columbia
2004	Monitoring Methods and Strategies by Using Automated Systems	Friedhelm Schroeder	GKSS Research Centre
2004	AUV Technology and Application Basics	William Kirkwood Mark Sibenac	Monterey Bay Aquarium Research Institute
2004	Environmental Investigations at the Seafloor Using Optical and Acoustic Sensors on "Bottom Landers"	Anders Tengberg	Goteborg University

APPENDIX XIII
(CONTINUED.) OCEANS CONFERENCE TUTORIALS SUMMARY (COMPILED BY DIANE D. DIMASSA)

Year	Tutorial Titles	Instructors	Instructor Affiliations
2005 Brest	Applied Model-based Signal Processing	James Candy	Lawrence Livermore National Laboratory
2005 Brest	Propagation of EM Waves through Seawater	Ahmed Al-Shamma'a	University of Liverpool, U.K.
2005 Brest	Environment-referred Navigation and Guidance of Autonomous Underwater Platforms	Maria Joao Rendas	Laboratoire I3S, USNA-CNRS, France
2005 Brest	Development of a Marine GIS	Christopher Gold	University of Glamorgan, U.K.
2005 Brest	Acoustic Time Reversal - Marine Applications	William Kuperman	Scripps Institution of Oceanography
2005 Brest	Acoustic Time Reversal - Theory	Mathias Fink	Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), France
2005 Washington DC	Subsurface Wave Measurements	Atle Lohrmann, Torstein Pedersen	Nortek USA, Nortek AS
2005 Washington DC	Hydrodynamics, Dynamics and Control of UUVs	Douglas E. Humphreys	Vehicle Control Technologies, Inc.
2005 Washington DC	Environmental Investigations at the Seafloor Using Optical and Acoustic Sensors	Anders Tengberg	Goteborg University
2005 Washington DC	Acoustic Seabed Classification with Multibeam and Sidescan Images	Jon Preston	University of British Columbia
2005 Washington DC	AUV Technology and Application Basics	William J. Kirkwood	Monterey Bay Aquarium Research Institute
2005 Washington DC	Systems Engineering with Wave, Wind and Ocean Currents Data	Sean M. Kery	Oceaneering International
2005 Washington DC	Fundamentals of Geodesy as Applicable to GPS Surveying	Muneendra Kumar, Francis W. Derby	Montgomery Village, MD and Penn State University, Wilkes-Barre campus
2005 Washington DC	Applied Model-based Signal Processing	James Candy	Lawrence Livermore National Laboratory
2006 Singapore	Multiple Target Tracking	Darko Musicki	University of Melbourne
2006 Singapore	Signal Processing Methods for Underwater Acoustic Communications	Milica Stojanovic, Lee Freitag	Massachusetts Institute of Technology, Woods Hole Oceanographic Institution
2006 Singapore	Time Reversal Acoustics	Mathias Fink	Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), France
2006 Singapore	Design of Autonomous Underwater Vehicles	Tamaki Ura	University of Tokyo
2006 Singapore	Signal and Array Processing	William Kuperman	Scripps Institution of Oceanography
2006 Singapore	Environmental Ocean Acoustics	Henrik Schmidt	Massachusetts Institute of Technology
2006 Boston	Signal Processing Methods for Underwater Acoustic Communications	Milica Stojanovic, Lee Freitag	Massachusetts Institute of Technology, Woods Hole Oceanographic Institution
2006 Boston	Workshop on Airborne Hyperspectral Imaging	Herb Ripley	Hyperspectral Imaging Limited
2006 Boston	Acoustic Seabed Classification with Multibeam and Sidescan Images	Jon Preston	University of British Columbia

APPENDIX XIII
(CONTINUED.) OCEANS CONFERENCE TUTORIALS SUMMARY (COMPILED BY DIANE D. DIMASSA)

Year	Tutorial Titles	Instructors	Instructor Affiliations
2006 Boston	Matlab Tools for Processing Data from Acoustic Doppler Current Meters Deployed on Deep Water Moorings	Bruce Andrews, Bruce Magnell	Woods Hole Group
2006 Boston	AUV Technology and Application Basics	William J. Kirkwood	Monterey Bay Aquarium Research Institute
2006 Boston	Design of Synthetic Aperture Sonar System for High Resolution Seabed Imaging	Marc Pinto	NATO Saclant Undersea Research Center
2007 Aberdeen	Interferametric Swath Survey Design	Matt Geen	Systems Engineering and Assessment Ltd.
2007 Aberdeen	Introduction to Underwater Acoustics with Particular Reference to Environmental Impact Assessment	Rodney Coates	Seiche Ltd., Anglesey Scotland
2007 Aberdeen	Bayesian Signal Processing	James Candy	Lawrence Livermore National Laboratory
2007 Aberdeen	Synthetic Aperature Sonar and Target Recognition	Hugh Griffiths	Cranfield University
2007 Aberdeen	Propagation of Electromagnetic Waves through Seawater	Jim Lucas	University of Liverpool
2007 Aberdeen	Satellite Communications and Location for Ocean Platforms	David Meldrums	Scottish Association for Marine Science, Oban
2007 Aberdeen	Bottom-Interacting Shallow Water Acoustics	Bill Carey, Allan Pierce	Boston University/Woods Hole Oceanographic Institution
2007 Aberdeen	Signal Waveform Design for Underwater Acoustic Communication	Charalampos Tsimenidis, Bayan Sharif	Newcastle University
2007 Aberdeen	Marine Optics	Alex Cunningham	University of Strathclyde
2007 Aberdeen	Lander and Floater Design	Phil Bagley	University of Aberdeen
2007 Aberdeen	Wave and Tide Farming	Ian Bryden	University of Edinburgh
2007 Vancouver	Signal Waveform Design for Underwater Acoustic Communication	Charalampos Tsimenidis, Bayan Sharif	Newcastle University
2007 Vancouver	Bayesian Signal Processing	James Candy	Lawrence Livermore National Laboratory
2007 Vancouver	End User Applications of Underwater Cable and Connectors	B. Rosenthal, K. Hardy, C. Peters, A. Gardner	Ocean Innovations, Deep Sea Power and Light, Falmat, Impulse Enterprises
2007 Vancouver	High-Frequency Over-The-Horizon Radar Applications in Oceanography	Klaus-Werner Gurgel	University Of Hamburg
2007 Vancouver	Sonar Signal / Image Processing and Communication	John Gann	Chesapeake Technology, Inc.
2007 Vancouver	Workshop on Airborne Hyperspectral Imaging	Herb Ripley	Hyperspectral Imaging Limited
2007 Vancouver	Signal Processing Methods for Underwater Acoustic Communications	Milica Stojanovic, Lee Freitag	Massachusetts Institute of Technology, Woods Hole Oceanographic Institution
2007 Vancouver	Acoustic Seabed Classification with Multibeam and Sidescan Images	Jon Preston	University of British Columbia
2007 Vancouver	AUV Technology and Application Basics	William J. Kirkwood	Monterey Bay Aquarium Research Institute

APPENDIX XIV
OFFSHORE TECHNOLOGY CONFERENCE HISTORICAL INFORMATION (COMPILED BY CLAUDE P. BRANCART)

Year	*Attendees*	*No. of Technical Papers Presented*	*Exhibiting Companies*	*Total Net Square Feet of Exhibit Space Occupied*	*Income Brought to Houston by OTC*
1969	4,200	125	200	38,500	$4,183,200
1970	11,600	145	269	50,000	$11,553,600
1971	10,800	155	380	56,000	$10,756,800
1972	15,500	175	540	93,500	$15,438,000
1973	22,097	175	820	150,600	$22,008,612
1974	32,636	182	1,200	201,700	$32,505,456
1975	51,212	245	1,200	280,000	$51,007,152
1976	61,784	250	1,500	375,000	$61,536,864
1977	65,511	275	1,600	393,000	$65,248,956
1978	79,850	284	1,800	438,000	$79,530,600
1979	78,686	271	2,000	450,000	$78,371,256
1980	86,965	229	2,200	483,000	$86,617,140
1981	100,329	184	2,300	519,000	$99,927,684
1982	108,161	144	2,500	631,000	$107,728,350
1983	58,775	190	2,500	433,000	$58,339,900
1984	2,773	177	-	-	$2,761,908
1985	56,438	230	1,725	431,000	$56,212,248
1986	27,681	243	1,231	251,896	$27,570,276
1987	25,628	238	1,050	175,000	$85,085,956
1988	26,136	238	1,165	176,870	$26,031,456
1989	26,450	260	1,200	185,000	$26,344,200
1990	31,451	258	1,240	210,000	$31,325,196
1991	34,272	240	1,260	237,020	$34,134,912
1992	34,828	234	1,257	238,666	$34,688,688
1993	32,875	256	1,254	231,000	$32,743,500
1994	32,908	237	1,320	234,000	$32,776,368
1995	33,351	269	1,405	247,336	$33,217,596
1996	36,424	309	1,410	256,656	$36,278,304
1997	43,394	280	1,521	283,526	$43,220,424
1998	49,641	266	1,846	370,166	$49,443,436
1999	44,749	272	1,900	376,639	$44,570,004
2000	43,785	296	2,036	369,877	$43,609,860
2001	47,649	266	2,185	399,891	$47,458,404
2002	49,620	279	2,024	375,100	$49,421,520
2003	50,655	282	2,010	384,450	$50,452,380
2004	50,921	295	2,120	397,750	$50,717,316
2005	51,320	324	2,092	409,700	$51,114,720
2006	59,236	291	2,233	469,700	$57,695,864
2007	67,155		2,400	530,000	

APPENDIX XV
HISTORY OF JOE SPECIAL ISSUES (COMPILED BY ANDREA LIM)

Year - Volume	*Special Issue Topic*	*Guest Editor(s)*	*No. of Papers*
1977 v2-1	Special Joint Issue on Radio Oceanography	C. T. Swift	15
1977 v2-3	Special Joint Issue on Maritime Communication	J.J. Fee & J.J. Renner	14
1980 v5-1	The Practical Salinity Scale 1978	T.M. Dauphinee	8
1980 v5-2	Seasat-1 Sensors	D.E. Weissman	12
1982 v7-1	Signature Problems in Microwave Remote Sensing of the Surface of the Earth	R.K. Moore	7
1983 v8-3	Positioning, Localization, and Tracking	J.F. Bartram	9
1983 v8-4	Atlantic Remote Sensing Land Ocean Experiment (ARSLOE)	L. Baer & C.L. Vincent	7
1984 v9-1	Oceanic Seismic Exploration	R.J.P. DeFigueiredo & G.H.F. Gardner	8
1984 v9-2	Simulation & Modeling	S.G. Chamberlain	5
1984 v9-3	Extremely Low Frequency (ELF) Communications	M. L. Burrows	11
1985 v10-1	Instrumentation Development for High-Level Nuclear Waste Disposal Beneath the Deep-Ocean Floor	K.R. Hinga	6
1985 v10-2	Bicentennial Issue	S.L. Ehrlich	4
1985 v10-3	Beam Forming	M.D. Grossi / G. Tacconi	13
1985 v10-4	Advances in Electromagnetic Remote Sensing of the Ocean	A.K. Fung / D.E. Weissman	12
1986 v11-1	Ocean Acoustic Remote Sensing	J.E. Ehrenberg	11
1986 v11-2	High-Frequency Radar for Ocean & Ice Mapping & Ship Location	J.F.R. Gower / D.E. Barrick	23
1986 v11-3	Manned & Unmanned Underwater Vehicles	J.A. Pritzlaff	8
1986 v11-4	Application of Machine Intelligence Technology to Autonomous Submersible Vehicles	S.L. Ehrlich	4
1987 v12-1	Underwater Acoustic Signal Processing	R.F. Dwyer	27
1987 v12-2	Scattering	G.C. Gaunaurd	19
1988 v13-3	Instrumentation	T.M.Dauphinee	8
1988 v13-4	Low-Frequency Acoustics in the Ocean	M.A. Deaett	14
1989 v14-1	Sound Reverberation & Electromagnetic Clutter	T.K. Stanton	5
1989 v14-2	Arctic Ocean Science	W.W. Denner	11
1989 v14-4	Bathymetry & Seafloor Acoustic Remote Sensing	C. de Moustier	9
1990 v15-3	Autonomous Underwater Vehicle Technology	R.Blidberg / D.R.Yoerger	10
1990 v15-4	Sea Surface-Generated Ambient Noise: 20-2000 Hz	W.C.Carey / E.C.Monahan	11
1991 v16-1	Ocean Acoustic Data Telemetry	J.A. Catipovic	16
1991 v16-4	Current Measurement	G.F.Appell / T.B.Curtin	15
1992 v17-1	Acoustic Synthetic Aperture Processing	E.J.Sullivan / W.M.Carey / S.Stergiopoulos	12
1992 v17-4	Neural Networks in Oceanic Engineering	P.K.Simpson	9
1993 v18-3	Detection & Estimation in Matched-Field Processing	R.D.Doolittle / A.Tolstoy / E.J.Sullivan	11
1993 v18-4	Sonar System Technology	S.Stergiopoulos / A.T.Ashley	20
1994 v19-1	Shallow Water	P.C.Wille / W.R.Alpers / S.Stolte	8
1994 v19-4	Advanced Control & Signal Processing for Oceanic Applications	F. El Hawary / D. Lainiotis	8

APPENDIX XV
(CONTINUED.) HISTORY OF JOE SPECIAL ISSUES (COMPILED BY ANDREA LIM)

Year - Volume	*Special Issue Topic*	*Guest Editor(s)*	*No. of Papers*
1996 v21-2	Acoustic Communications	J. Catipovic	7
1996 v21-4	Inversion Techniques and the Variability of Sound Propagation in Shallow Water	J.H. Wilson / S.D.Rajan / J.M Null	16
1997 v22-1	Image Processing for Oceanic Applications	C. de Moustier / S.E. Hammel / E. J. Sullivan	10
1997 v22-2	Shallow Water Acoustics I	J.Lynch	14
1997 v22-3	Shallow Water Acoustics II	J.Lynch	9
1999 v24-2	Long Range Propagation	E.S.Livingston / A.Tolstoy / P.F.Worcester	7
2002 v27-1	Underwater Technology	T.Ura / R.L.Wernli	4
2002 v27-2	Ocean Observatories	J.B.Edson / A.D.Chave/ M.Dhanak / F.K.Duennebier	13
2002 v27-3	High-Frequency Sediment Acoustics	E.I.Thorsos / M.D.Richardson	19
2003 v28-1	Marine Mammals and Noise	P.Tyack	3
2003 v28-2	Marine Mammals and Noise - continued	J.Potter / P.Tyack	1
2003 v28-3	Geoacoustic Inversion in Range-Dependent Shallow-Water Environments	R.Chapman / S.Chin-Bing / D.King / R.Evans	17
2003 v28-4	Underwater Image and Video Processing	H.Singh / X.Tang / E.Trucco / D.Lane	8
2004 v29-1	Geocaustic Inversion in Range-Dependent Environments	N.R.Chapman / S.A.Chin-Bing / D.King / R.Evans	9
2004 v29-2	Non-Rayleigh Reverberation & Clutter	D.A.Abraham / A.P.Lyons	12
2004 v29-3	Biology-Inspired Science & Technology for Autonomous Underwater Vehicles	P.R.Bandyopadhyay	24
2004 v29-4	Science & Engineering Advances in Exploring the Asian Marginal Seas	J.F.Lynch / P.H.Dahl	30
2005 v30-1	Open Aquaculture Engineering	D.W.Fredriksson / I.Tsurkrov / W.Paul	10
2005 v30-2	Archival Papers	W.M.Carey	12
2005 v30-3	Synthetic Aperture Radar Imaging of the Ocean Surface	R.Garello / R.Romeiser / R.L.Crout	9
2005 v30-4	Interaction of Low-to-Mid-Frequency Sound with the Ocean Bottom	C.W.Holland / R.Gauss / G.Frisk / N.Makris	11
2006 v31-1	Effects of Sound on the Marine Environment	M. Siderius / D.S. Houser	12
2006 v31-2	Capturing Uncertainty in the Tactical Ocean Environment	E.S.Livingston / J.A.Goff / S.Finette / P.Abbot / J.F.Lynch / W.S.Hodgkiss	12
2006 v31-4	HF/VHF Ocean Surface Radar	L.R.Wyatt / M.L.Heron / R.Garello	16
2007 v32-1	Mine Burial Processes	R.H.Wilkens / M.D.Richardson	23

APPENDIX XVI
JOE ASSOCIATE EDITORS HISTORY (COMPILED BY ANDREA LIM)

Associate Editor	***Term as Assoc Editor***	***Associate Editor***	***Term as Assoc Editor***
Abraham, Douglas	2003 – present	Lewis, E. Lyn	Jul. 1990 – Oct. 1990
Ashley, Anthony T	Jul. 1992 – Apr. 1998	Lynch, James F	1997 – 1998, 2005 – present
Baggeroer, Arthur B	1976 – Jan. 2005	Maeda, Hisaaki	1997 - present
Benjamin, Michael R.	2006	Mesecar, Rodney	1986
Blidberg, Richard	Jul. 1986 - 2007	Mitra, Urbashi	Oct. 2006- present
Brown, Gary S	Jul. 1979 - 1988	de Moustier, Christian	1990 - 2005
Buck, John R	2005 - present	Muir, Thomas G	Apr. 1995 – Apr. 1998
Calder, Brian	Apr. 2004 - present	Nehorai, Arye	Apr. 1998 - 2000
Chapman, Ross	2005 - present	Pascoal, Antonio	Oct. 2007 - present
Cohen, Robert	Jul. 1986 – Jul. 1990	Penrose, John D	1989 - 2003
Dahl, Peter	Oct. 1997 – Apr. 2004	Plant, William J	1989 - 1992
Dauphinee, Thomas M	1976 – Apr. 1990	Potter, John	Apr. 1999 - present
Diachock, Orest	Apr. 2001 – 2003	Preisig, James	2002 - present
Dial, Kenneth G	Jul. 1992 – Jul. 1993	Ramsdale, Daniel	Oct. 1999 - 2000
Dwyer, Roger F	Apr. 1995 – Jul. 1999	Romeiser, Roland	Oct. 2000 - present
Edelson, Geoff	Apr. 1997, Oct. 1997 – Jul.2003	Seidman, Lawrence	1976 – Apr. 1978
Ehrenberg, John E	Jul. 1982 – Jan. 2005	Spindel, Robert C	Jul. 1979 - present
Ehrlich, Stanley L	1976 – Apr. 1982, 1987 - 1988	Spooner, Ronald	1976 – Jul. 1979
El-Harawy, Ferial	Oct. 2000 – Apr. 2005	Stergiopoulos, Stergio	Jul. 1997 – Jan. 1999
Eller, Anthony I	Jul. 1982 - 1986	Stern, Richard	1990 – Apr. 2006
Farmer, David M	Jul. 1994, 1995 - 2000	Stilwell, Daniel J.	Jan. 2006 – present
Farwell, Robert W	1990 – 1996, Jul. 1997 – Jul.1999	Sullivan, Edmund J	Jul. 1992 – Jan. 1999
Fisher, Frederick H	Oct. 1988, Apr. 2002 - 2004	Swift, Calvin T	Apr. 1980 - 1985
Fung, Adrian K	Jul. 1982 - 1992	Tacconi, Giorgio	1986 – Jul. 1993
Garello, René	1997 - 2007	Tang, Dajun	Oct. 2003 – Jul. 2007
Goodman, Louis	2002 - 2006	Trucco, Andrea	Oct. 2000 – present
Heron, Malcolm L	Jul. 1986 - present	Ura, Tamaki	2000 – 2006
Hover, Franz S.	Jan. 2006 - present	Von Alt, Christopher	1990 - 1996
Kajikawa, Takenobu	Jul. 1986 – Jul. 1993	Wage, Kathleen E.	Oct. 2005 - present
Knobles, David P	Oct. 1997 – Jan. 2004, Jan.2006-present	Weissman, David E	1976 – Jul. 1979
Levine, Edward R.	Oct. 2006 – present	Whitcomb, Louis	Oct. 2000 - present
Leonard, John J	Apr. 1997 - 2005	Wyatt, Lucy	Oct. 2000 - present

APPENDIX XVII
HISTORY OF THE LAST 20 YEARS OF THE OES NEWSLETTER (COMPILED BY FREDERICK H. MALTZ)

Harold Sabbagh was the first long standing editor of the OES Newsletter (OESNL), having followed founding editor Donald Bolle. Harold served in this capacity from 1978 to 1990. Frederick H. Maltz became the new editor in 1990. The next year, the first IEEE-produced OESNL appeared when Glen N. Williams was President of the OES. Also in 1991, a paper by John J. Carey and Joseph R. Vadus, which described the role of NOAA in the development, utilization, and conservation of the oceans and their resources was featured in the Summer 1992 issue of OESNL. The following year, Stanley G. Chamberlain published a description of the OES Technology Committees in the Spring 1993 issue of OESNL. This was also a call for participation from the general membership and the beginning of a discourse in OESNL on Technology Committees activities.

In 1993, OESNL began the publishing of Winning Student Papers at OCEANS Conferences, coordinated by Norman D. Miller. Also in 1994, OESNL included an interesting paper on the history of the Harvard Underwater Sound Laboratory in the early 1940s, thanks to Roger Dwyer. It was in 1994 under the OES President Joseph Czika, Jr., that OESNL began to publish editorials from the Vice Presidents of the society. There were two editorials in the Fall 1994 issue, one by James S. Collins, VP for Technical Activities and one by Norman D. Miller, VP for Professional Activities. Also in 1994, OESNL began to report on chapter activities. This first report was from Edward Early, Chapter Coordinator and James T. Barbera, Washington/Northern Virginia Chapter Chairman.

It was in 1994 that OES held its first OCEANS Conference outside the North American Continent and the U.S. Subsequently, there were three international news items carried in OESNL in 1995. The first was the editorial by Ferial El-Hawary, VP International, announcing the success of the first of the International OCEANS Conference Series, OCEANS'94/OSATES, which was held in Brest, France, in September 1994. The second was a report on further details of the Brest conference by Glen N. Williams. The third international article was a reprint from the IEEE Instrumentation and Measurement Society Newsletter entitled "A short history of French Trans-Atlantic cables from the French viewpoint" by Rene Salvador. This article was supplied by Tom Carver who was transitioning their newsletter to a magazine at the time. Tom Carver lived on Cape Cod, MA, and noted that the U.S. terminus was in Orleans, MA, which is now a museum. This was the second part of an article, the first of which was published in winter 1994 OESNL, entitled "The French cable museum," also courtesy of Tom Carver. Coincidentally, the French terminus was outside Brest, France, in Deolen.

In the ensuing years, 1996 and 1997, OESNL began reporting on IEEE intersociety activities. This included the "Sharing Activities Letters" of Harold Goldberg who was Chair for the IEEE Technical Activities Board's Public Relations Committee, and Norman D. Miller's reporting on the Professional Activities Council for Engineers which is part of the IEEE U.S. Activities Board. Also, in 1997, OESNL began the "Who's Who In The OES" column originated by Edward Early. These years saw the transitioning of the OES leadership from the Presidents Glen N. Williams to Claude P. Brancart who previously served as OES Secretary. The next stated goal envisioned by Claude P. Brancart was for the newsletter to improve graphical presentation and coverage of individual members within the OES. Since that time a more personal touch has been evolving in the newsletter.

In 1998, OESNL began to appear on the web. The first two issues appeared in PDF form only, and after that in both PDF and HTML. This was also the year that the OCEANS conference returned to France. This time it was held in Nice, France. In the Fall 1998 issue of OESNL, René M. Garello, OCEANS'98 Technical Committee Co-Chair and President of the IEEE/OES French Chapter, proclaimed that the conference was clearly a success. Throughout 1999, under the new leadership of Glen N. Williams who returned to serve another term as President, the OES explored various options for delivering the newsletter to its members. Finally, with such faithful advocates as Joseph R. Vadus, in early 2000, Glen announced " for the foreseeable future, the OES will continue to publish the Newsletter in both hard copy form as well as the web-based electronic versions, with the hard copy version delivered to all the members ." Also in 2000, the EIC of OESNL Frederick H. Maltz was awarded the Distinguished Service Award at the OCEANS conference in Providence, RI.

In the Winter 2001 issue, John Irza initiated a regular column entitled "Soundings," which was designed to report on ocean engineering news as it appears in the mainstream media. Also in 2001, color was introduced to the newsletter, and coverage of people and events was expanded. A concerted effort was made in 2002 to provide the members with an upgraded, high quality print version of the newsletter with relevant and interesting content.

In 2003, the strategic management of the OES and plans for revitalization of the AdCom were communicated to the members by the then OES President Thomas F. Wiener in a regular series of President's Messages. In addition, long-term OCEANS Conference planning reports were initiated by Joseph R. Vadus, Vice President International and Life Fellow. The latter were in the form of editorials and included other non-OCEANS symposia and workshops. Also in 2003, increased coverage of offshore events as UT'04 International Symposium in Taipei, Taiwan, and U.S.-Baltic 2004 International Symposium in Klaipeda, Lithuania, were given more visibility. This trend will continue beyond 2004 with a Scientific Submarine Cable Workshop in Tokyo, Japan, reported on by Hisaaki Maeda and the symposia on Ocean Electronics in Cochin, India, brought to the attention of the OES by James S. Collins. These and the two yearly conference plans for OCEANS Conferences, one of which alternates annually between Europe and Asia/Pacific, has prompted a call by Thomas F. Wiener for two new Associate Newsletter Editors, one from Europe, and one from Asia/Pacific. A secondary purpose of this was to strengthen ties with local chapters. John Irza of the Boston chapter had been appointed earlier as an Associate Editor of OESNL.

During 2004 and early 2005, the IEEE Newsletters Coordinator Paul Doto has been working with the EIC to further improve newsletter graphic presentation, with a distinctive appearance emerging in the Spring 2005 issue. Also in 2005, work was started on the OESNL web archive to include an XML formatted version in addition to the PDF and HTML versions. The purpose of this is to gain experience with the forthcoming XHTML standard and to explore possibilities for more efficient newsletter material handling and new options for enhanced newsletter content delivery. This is in keeping with the future goals of partial automation of the newsletter production process and a richer viewing experience for the readers of the newsletter.

In the latter part of 2005, it was voted on by the AdCom to accept paid advertising in the newsletter. Also, in 2005, two newly appointed Associate Editors of OESNL, John Watson from the Aberdeen, Scotland chapter and Sheng-Wen Cheng from the Taipei, Taiwan chapter were welcomed aboard. Starting with the Fall 2005 issue, the OESNL began reporting on the yearly National Ocean Sciences Bowl sponsored by the Consortium for Oceanographic Research and Education and supported by the OES. Also in this issue, we began to publish summary reports on the annual meeting of the IEEE OES AdCom.

In the Spring 2006 issue of the OESNL, we started introducing newly elected members of the IEEE/OES. These elections are held yearly and this practice of introducing the new AdCom members in the newsletter is being continued. Also, upon the request of the IEEE TAB Newsletter Committee Chair, we published in the Spring 2006 issue an interview with the two candidates, Lew Terman and John Vig, for the office of 2007 IEEE President-Elect. Terman and Vig assisted by the TAB Newsletter Committee prepared answers for the readers to ten key questions in support of their respective platforms. In the Summer 2006 issue, Joseph R. Vadus, OES Vice President, gave a summary report on the U.S./EU-Baltic International Symposium 2006 and in the Fall 2006 issue, he gave his Conference Development Report, which included OCEANS Conference plans out to the year 2013 and Symposia out to the year 2008.

APPENDIX XVIII
IEEE FELLOWS IN THE OCEANIC ENGINEERING SOCIETY (COMPILED BY KENNETH FERER, DAVID WEISSMAN, AND THOMAS F. WIENER)

IEEE Fellows	*Year Elected*	*CITED FOR CONTRIBUTIONS TO:*
* Alspach, Daniel L.	1998	theoretical development of non-linear estimation theory and its practical applications to multiple target tracking problems in ocean surveillance
Ametani, Akihiro	1992	the analysis of electrical transients in power systems
Aronow, Saul	1979	
Bachynski, Morrel P.	1977	the fields of electromagnetic waves and plasmas
* Baggeroer, Arthur B.	1989	advanced array processing and underwater acoustics
* Bannon, Robert T.	2003	leadership in ocean engineering and the practical application of sensor technology
Bargellini, Pier L.	1976	satellite communications
Batchelder, Laurence	1957	the design and development of sonar equipment.
* Bienvenu, Georges R.	1991	the theory and implementation of high-resolution methods in passive sonars
* Bjorno, Leif	1992	ultrasound technology
Boerner, Wolfgang-Martin	1984	inverse methods in sensing systems and in high-resolution broad band Doppler radar polarimetry
Bohme, Johann F.	1990	array signal processing
* Bolle, Donald M.	1987	nonreciprocal components for microwave and millimeter-wave systems
Bouyoucos, John V.	1978	the field of hydrodynamic energy conversion devices
Britton, T. Vincent,	1995	development of solid-state phased-array radar systems and hybrid microwave integrated circuits
Brown, Gary S.	1986	the understanding and application of electromagnetic scattering from rough surfaces
Brown, Homer E.	1976	the application of computers in the electric utility industry
Brownlee, William R.	1951	
Bubenko, Janis A.	1985	energy systems through new concepts in power system analysis and modeling
* Candy, James V.	1999	high-speed digital coders and video picture processing
Caplan, Norman		
* Carey, William M.	1996	the modeling and analysis of acoustic signal fields and noise in the ocean
* Carter, G. Clifford	1988	the theory of coherence and time delay estimation
Chadwick, Joseph H.	1967	advanced marine instrument and control systems
Corona, Paolo	1992	development of continuous-mode stirred chambers, and their application in electromagnetic compatibility evaluations
Cottony, Herman V.	1962	antenna research and measurement
* Cox, Henry	1983	technical leadership in underwater research and development
De Figueiredo, Rui J.P.	1976	nonlinear system theory and the application of spline functions to signal processing theory
De Moor, Bart	2004	algebraic and numerical methods for systems and control
Dean, Walter N.	1988	leadership in the development and implementation of radio-navigation systems
Doherty, William		
Doxey, Willie L.	1964	leadership in research and development of electronic materials and devices
Duncan, C.C.		
* Dyer, Ira	1979	the science of acoustics and its applications and for distinguished academic leadership in advancing oceanic engineering applications
* El-Hawary, Ferial M.	1999	applications of digital system concepts to underwater dynamic motion estimation and marine seismic methods
El-Khamy, Said El-Sayed I.	1999	signaling techniques for propagation through natural media
Elmer, William		
Engelson, Irving	1993	management leadership of IEEE technical activities worldwide
Franceschetti, Giorgio	1988	the field of electromagnetic theory and antenna design technology
Fung, Adrian, K.		
* Garello, René	2006	signal processing applied to remote sensing of the ocean
Gardiol, Fred E.	1987	the design of ferrite microwave devices
Gilbert, R.W.		
Gaunaurd, Guillermo C.	1999	direct and inverse scattering interaction of acoustic, elastic, and electromagnetic waves with matter
* Gogineni, Sivaprasad	1999	development of innovation research radars and radar studies of polar sea and glacial ice

* Nominated by OES

APPENDIX XVIII
(CONTINUED.) IEEE FELLOWS IN THE OCEANIC ENGINEERING SOCIETY (COMPILED BY KENNETH FERER, DAVID WEISSMAN, AND THOMAS F. WIENER)

IEEE Fellows	*Year Elected*	*CITED FOR CONTRIBUTIONS TO:*
Gould, Gerald G.	1974	underwater systems development, and for contributions to the design of a major underwater tracking range
Greenfield, Eugene W.	1951	
Hall, W.M.		
Harrison, JR., Charles W.	1975	and technical leadership in the development of microwave ferromagnetic compounds and their application in microwave components and integrated circuits
Hellmann, R.K.		
Herczfeld, Peter R.	1991	the application of lightwave technology to microwave and millimeter-wave devices, circuits, and systems
Herz, Eric	1983	the development and management of information systems for testing aerospace vehicles and for valuable services to the Institute
Honey, Richard C.	1968	the fields of microwave antennas and laser applications
Isberg, Reuben A.	1971	the engineering aspects of television broadcasting, and for leadership in demonstrating the important application of television techniques to university-level teaching
Jacobson, A. Walter	1966	the field of industrial instrumentation and control
Johnson, B.		
* Jones, Colin	2007	deep ocean exploration, search and recovery, and salvage
Kassam, Saleem	1993	the theory and application of signal detection and estimation
Kay, Steven M.	1989	the theory and application of parametric spectral estimation and detection
Kazakos, Demetrios	1992	detection and estimation theory, with applications to multiuser data communications and statistical pattern recognition
Kirkham, Harold	2004	the field of optical measurements for power systems
Kirtley, Jr., James L.	1991	the theoretical understanding, development, and implementation of superconducting turbogenerators
Knoll, Charles		
Knop Charles M.	1987	high-gain, low-sidelobe, microwave reflector antennas for satellite communication earth stations and multiband terrestrial radio relay systems
La Rosa, Richard	1982	the field of electron optics, traveling-wave tubes, and particle acceleration
Leonard, Naomi	2007	control of underwater vehicles
Lubcke, Harry		
* Lynch, James F.	2005	sound transmission in shallow coastal waters for mapping bottom boundary layer characterizations
* Maeda, Hisaaki	2002	the theory of floating structures and wave energy absorption
Masters, R. Wayne	1962	the field of antennas and RF transmission systems
Mc Clure, George F.	1981	mobile telephone communications systems engineering and the creation of new and more effective methods of spectrum utilization
Mc Ghee, Robert B.	1990	the theory and experimental study of mobile robots and legged locomotion
Mcintosh, R. E.		
Middleton, David	1959	the theory of noise in electronic system
Mitra, Urbashi	2007	multiuser wideband digital communication systems
Miyari, Shota		
Mochizuki, Hitoshi	1984	maritime communications systems
Moore, Richard, K.	1962	the development of monolithic microwave acoustic filters
Moura, Jose M. F.	1994	nonlinear filtering and model-based signal processing
Nakano, Yoshiei	1980	the development and standardization of insulation systems for electrical locomotives and cars
Nehorai, Arye	1994	statistical signal processing and system identification
Newhouse, Russell		
Pampaloni, Paolo	1999	and leadership in microwave remote sensing
Pansini, Anthony J.	1954	the development of transmission and distribution systems capable of serving adequately a load of exceptionally rapid growth
Pendleton, Wesley W.	1962	the development of ultra high-temperature electrical insulation
Peterson, H.A.		
Pookaiyaudom, Sitthichai	2006	circuits and systems and engineering education
Powers, Jr., Edward J.	1983	the analysis of data relating to nonlinear phenomena in materials such as controlled thermonuclear plasmas
Proakis, John	1984	decision-directed measurement techniques and adaptive equalization techniques to digital communication over various channels
Raisbeck, Gorden	1969	research on communication theory, transmission line theory, and transistor circuits
Ramachandran, Venkatanarayana	1989	theory of multivariable networks with applications to two-dimensional digital filters
Raney, R. Keith	1991	synthetic aperture radar theory, design, and applications

* Nominated by OES

APPENDIX XVIII
(CONTINUED.) IEEE FELLOWS IN THE OCEANIC ENGINEERING SOCIETY (COMPILED BY KENNETH FERER, DAVID WEISSMAN, AND THOMAS F. WIENER)

IEEE Fellows	*Year Elected*	*CITED FOR CONTRIBUTIONS TO:*
Reagan, John	2001	lidar and solar radiometric atmospheric sensing, and for contributions to electrical engineering education
Rempt, H.F.		
Rosenberg, Paul		
Schmitt, O.H.		
* Schuler, Dale, L.	2000	the development of coherent multi-frequency microwave sensor and polarimetric SAR techniques for the remote sensing of geophysical parameters on both the ocean and the land
Schulkin, Morris		
Shapiro, Gustave	1961	the development of electronic miniaturization techniques and components
Sherman, S.M.	1976	radar systems engineering and signal processing
* Spindel, Robert C.	1991	ocean engineering and the advancement of the technology for ocean acoustic tomography
Strom, Jr., S.M.		
* Sullivan, Edmund J.	2001	model-based acoustic array signal processing
* Swift, Calvin T.	1983	the area of microwave remote sensing of the oceans
Tai, Chen-To		
Tanaka, Ikuo		
Tomiyasu, Kiyo	1962	microwave theory
Tufts, Donald W.	1982	digital communications and signal processing
Uhlir, Jr., Arthur	1967	theory, development and application of varactor diodes in parametric amplifiers
* Ura, Tamaki	2007	autonomous underwater vehicle technologies
* Vadus, Joseph R.	2001	ocean technology, engineering, and research
Van Trees, Harry L.	1974	teaching and research in the detection, estimation and modulation theory area, and the design of military communications systems
Von Winkle, William A.	1985	technical leadership in research and exploratory development in underwater acoustics, signal processing, sonar systems, and antisubmarine warfare
Ward, James	2005	space-time adaptive processing for radar and sonar systems
* Weissman, David E.	1991	development of radar techniques to measure ocean surface wave parameters and surface winds
Whitman, W.C.		
* Williams, III, Albert J.	2005	development of instrumentation for measuring oceanic processes
* Williams, Glen N.	1995	development of a computer operated, highly reliable control system for autonomous underwater vehicles, and development of computer science courses
Worcester, Peter F.	2003	acoustic techniques for observing the ocean
Wright, Jay W.	1958	electronic devices for the Armed Services
Yuh, Junku	2005	autonomous underwater robots

* Nominated by OES

APPENDIX XIX
OES DISTINGUISHED TECHNICAL ACHIEVEMENT AWARDEES

1975	Robert Frosch
1976	Werner Kroebel
1977	Howard A. Wilcox
1978	Richard K. Moore
1979	David W.Hyde
1980	Neil Brown
1981	No Award
1982	Ira Dyer
1983	Alan Berman
1984	John B. Hersey
1985	William N. Nierenberg
1986	Robert J. Urick
1987	James R. McFarlane
1988	Chester M. McKinney
1989	Victor C. Anderson
1990	Robert C. Spindel
1991	Henry Cox
1992	Arthur B. Baggeroer
1993	William J. Plant
1994	Edmund J. Sullivan
1995	Mack O'Brien
1996	Frederick H. Fisher
1997	Newell Booth
1998	Burton G. Hurdle
1999	William M. Carey
2000	Albert J. Williams 3rd
2001	Werner R. Alpers
2002	James Candy
2003	Georges Bienvenu
2004	John P. Craven
2005	Douglas C. Webb
2006	Fred N. Spiess
2007	Donald E. Barrick

APPENDIX XX
IEEE OCEANIC ENGINEERING SOCIETY DISTINGUISHED SERVICE AWARD

1975	Arthur S. Westneat
1976	Frank Snodgrass
1977	Calvin T. Swift
1978	Edward W. Early
1979	Richard M. Emberson
1980	Donald M. Bolle
1981	Lloyd Z. Maudlin
1982	Arthur S. Westneat
1983	Elmer P. Wheaton
1984	John C. Redmond
1985	Joseph R. Vadus
1986	Stanley G. Chamberlain
1987	Stanley L. Ehrlich
1988	Harold A. Sabbagh
1989	Eric Herz
1990	Anthony I. Eller
1991	Frederick H. Fisher
1992	Gordon Raisbeck
1993	Edward W. Early
1994	Daniel Alspach
1995	David Weissman
1996	Glen N. Williams
1997	Ferial El-Hawary
1998	Norman D. Miller
1999	Pierre Sabathé
2000	Frederick H. Maltz
2001	Claude P. Brancart
2002	James S. Collins
2003	Joseph Czika
2004	William M. Carey
2005	Claude P. Brancart
2006	René Garello
2007	Stephen M. Holt

APPENDIX XXI
IEEE/OES ADCOM HISTORICAL MEMBERSHIP TABULATION (COMPILED BY GLEN N. WILLIAMS)

Member/Year	76	77	78	79	80	81	82	C=>S	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
R. Bannon																											1	1	1	1	1	1		1	1	1
J. Carroll																													1	1	1			1	1	1
P. Hurst																											1	1	1	1	1	1		1	1	1
A. T. Morrison																										1	1	1			1	1	1	1	1	1
J. Vadus									1	1	1	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1			1	1	1	1	1	1
C. Waldemann																																		1	1	1
E. Creed																														1	1	1	1	1	1	
B. Fletcher																																	1	1	1	
V. Klemas				1	1	1																											1	1	1	
M. Martini																																	1	1	1	
J. Potter																																	1	1	1	
A. Williams																									1	1	1						1	1	1	
M. Heron																																1	1	1		
M. Stojanovic																																1	1	1		
J. Watson																																1	1	1		
R. Garello																									1	1	1		1	1	1	1	1	1		
F. Maltz														1	1					1	1	1	1	1	1		1	1	1			1	1	1		
R. Wernli																													1	1	1	1	1	1		
W. Carey																												1	1	1	1	1	1			
D. DiMassa																												1	1	1	1	1	1			
F. El Hawary														1	1	1	1	1	1		1	1	1					1	1	1	1	1	1			
T. Ura																															1	1	1			
E. Chang																														1	1	1				
B. Spindel									1	1	1	1			1	1	1	1	1	1		1	1	1	1	1	1			1	1	1				
D. Sternlicht																														1	1	1				
J. Barbera																		1	1	1	1	1	1		1	1	1		1	1	1					
S. Chamberlain						1	1		1	1	1	1			1	1	1	1	1	1		1	1	1	1	1	1		1	1	1					
C. de Moustier																	1	1	1		1	1	1	1	1	1		1	1	1						

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/ - Indicated by April 89 OES Journal

R - Resigned

APPENDIX XXI
(CONTINUED.) IEEE/OES ADCOM HISTORICAL MEMBERSHIP TABULATION (COMPILED BY GLEN N. WILLIAMS)

Member/Year	76	77	78	79	80	81	82	C=>S	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
T. Wiener																					1	1	1	1	1	1		1	1	1						
J. Czika											1	1	1				1	1	1				1	1	1		1	1	1							
S. Holt																											1	1	1							
C. Brancart																				1	1	1					1	1	1							
D. Alspach				1	1	1				1	1	1	1	1	1		1	1	1				1	1	1	1	1	1							
J. Irza																										1	1	1							
M. Ingram																										1	1	1							
N. Miller														1	1	1	1	1	1	1	1	1	1	1		1	1	1							
P. Rosenstrach																									1	R	R								
C. Randell																									1	1	1								
S. Rees																									1	1	1								
H. Maeda																						1	1	1	1	1	1								
P. Sabathe																					1	1	1	1	R	R									
E. Gough																								1	1	1									
D. Weissman	1					1	1		1	1	1	1	1	1	1	1	1/	1	1		1	1	1	1	1	1									
J. Collins																					1	1	1	1	1	1									
R. Dwyer														1	1	1	1	1		1	1	1	1	1	1										
J. Glynn																				1	1	1	1	1	1										
G. Williams	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1			1	1	1		1	1	1										
P. Lau																							1	1	1										
L. Breslau	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1		1	1	1	1	1	1											
E. Early	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1		1	1	1	1	1	1											
B. Farwell															1	1	1	1	1	1		1	1	1											
F. Caimi																						1	1	1											
A. Healey																						1	1	1											
E. Nelson																		1	1	1	1	1	1												
D. Robinson			1	1	1		1		1	1	1									1	1	1													
D. Kazakos																				1	1	1													

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R - Resigned

APPENDIX XXI
(CONTINUED.) IEEE/OES ADCOM HISTORICAL MEMBERSHIP TABULATION (COMPILED BY GLEN N. WILLIAMS)

Member/Year	76	77	78	79	80	81	82	C=>S	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
M. Briscoe																			1	1	R															
C. Stuart																	1	1	1																	
F. Aminzadeh																1	1	1																		
S. Balk																1	1	1																		
T. Raisbeck																1	1	1																		
M. Serotta											1	1	1			1	1	1																		
R. deFiqueiredo							1		1		1	1	1		1	1	1																			
B. Cassis	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1																			
T. Dauphinee	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1																			
H. Sabbagh			1	1	1	1	1		1	1	1	1	1	1	1	1	1																			
D. Yoerger														1	1	1																				
D. Douglas														1	1	1																				
P. Katz														1	1	1																				
M. Obrien														1	1																					
A. Bisson														1	1																					
D. Steiger														1	1																					
S. Ehrlich									1	1	1	1		1	1																					
W. Hodgekiss														1	1																					
P. Kurtz														1	1																					
L. Maudlin	1	1	1							1	1	1	1	1	1																					
D. Irwin						1	1		1	1	1	1	1																							
W. Woodward									1		1	1	1																							
A. Baggeroer	1	1	1	1	1	1	1		1	1	1	1																							
W. Bacon	1	1	1	1	1	1	1		1	1	1	1																							
D. Bolle									1	1	1	1																							
A. Eller	1	1	1	1	1	1	1		1	1	1	1																							
A. Westneat	1	1	1	1	1	1	1		1	1	1	1																							
R. Lake							1		1	1																									

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APPENDIX XXI
(CONTINUED.) IEEE/OES ADCOM HISTORICAL MEMBERSHIP TABULATION (COMPILED BY GLEN N. WILLIAMS)

Member/Year	76	77	78	79	80	81	82	C=>S	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
J. Anton			1	1	1	1	1		1	1																										
C. Beckers									1	1																										
F. Envant						1	1		1	1																										
J. Redmond									1	1																										
S. Parker						1	1		1	1																										
G. Thiele							1		1																											
S. Tashiro	1	1	1	1	1	1	1		1																											
A. Christou						1	1		1																											
D. Stomberg		1	1	1	1	1	1		1																											
J. Pearson							1		1																											
R. Flaherty						1	1		1																											
J. Eckerman						1	1		1																											
S. Morgera	1	1	1	1	1	1	1		1																											
J. B. Oakes	1	1	1	1	1	1	1		1																											
F. Walter						1	1		1																											
R. Hurter					1	1	1		1																											
D. Sehexnailder				1	1	1	1		1																											
G. Cook							1		1																											
W. Jackson									1																											
H. Hayre				1	1	1	1																													
P. Ktonas				1	1	1	1																													
H. Skutt			1	1	1	1	1																													
Linwood Jones	1	1	1	1	1	1																														
L. J. Palkuti		1		1	1	1																														
Dean McKee					1	1																														
J. Tanaka		1	1	1	1	1																														
M. Hastings	1	1			1	1																														
J. Scallion				1	1	1																														

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APPENDIX XXI
(CONTINUED.) IEEE/OES ADCOM HISTORICAL MEMBERSHIP TABULATION (COMPILED BY GLEN N. WILLIAMS)

Member/Year	76	77	78	79	80	81	82	C=>S	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
R. Gentile			1	1	1	1																														
L. Solomon	1	1	1	1	1																															
A. Brodzinsky	1	1	1	1																																
G. Gerhard	1	1	1	1																																
C. Maninger	1	1	1	1																																
K. Kaiser	1	1	1	1																																
G. McClure	1	1	1	1																																
K. Astrom			1																																	
J. Swiss	1	1	1																																	
M. Sims	1	1	1																																	
G. Foote	1	1																																		
L. Seidman	1	1																																		
E. Herz	1	1																																		
T. Y. Young	1	1																																		
R. Wollett	1	1																																		
K. Graf	1	1																																		
S. Jackson	1	1																																		
B. J. Wilson	1																																			
Lyle Tiffany	1																																			
Total	33	33	30	33	31	38	35		40	26	24	23	15	23	27	22	21	17	17	17	19	24	25	23	21	19	20	17	16	16	17	18	18	18	12	6
Member/Year	76	77	78	79	80	81	82	C=>S	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10

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APPENDIX XXII
IEEE OES OFFICER HISTORY [ACCORDING TO COGGESHALL (1985) (1968–1982) AND THE IEEE OFFICIAL RECORDS (1983–2006)]

Year	*Organization*	*Officers*						
	1968-1977	*Chair*	*Vice-Chair (1)*	*Vice-Chair (2)*		*Secretary*	*Treasurer*	*OES Journal Editor*
	1978-1992	*President*	*Vice Pres (East)*	*Vice Pres (West)*				
	1993-2005	*President*	*Vice Pres (Tech)*	*Vice Pres (Prof)*	*Vice Pres (Int'l)*			
1968	**OCC**	G Jaffe						
1969	OCC	G Jaffe						
1970	OCC	G Jaffe						
1971	OCC	OL Tiffany					T Stephens	
1972	OCC	AS Badger					T Stephens	
1973	OCC	AS Badger	A Westneat			W Schneider	W Schneider	
1974	OCC	A Westneat				W Schneider	W Schneider	
1975	OCC	A Westneat				W Schneider	W Schneider	D Bolle
1976	**COE**	E Early	RH Cassis	LH Maudlin		D Weissman	J Swiss	D Bolle
1977	COE	E Early	RH Cassis	LH Maudlin		D Weissman	T Eller	D Bolle
1978	COE	L Maudlin	JB Oakes [1]	RC Robinson [1]		D Weissman	T Eller	D Bolle
1979	COE	L Maudlin	JB Oakes	RC Robinson		DH Stomberg	A Baggeroer	D Weissman
1980	COE	L Maudlin	JB Oakes	RC Robinson		DH Stomberg	A Baggeroer	D Weissman
1981	COE	D Bolle	JB Oakes	WL Bacon		DH Stomberg	A Baggeroer	D Weissman
1982	COE	D Bolle	S Chamberlain	L Maudlin		DH Stomberg	E Early, L Maudlin	D Weissman, S Ehrlich
1983	**OES**	S Chamberlain	T Eller	L Maudlin		C Beckers	E Early	S Ehrlich
1984	OES	S Chamberlain	T Eller	L Maudlin		J Czika	E Early	S Ehrlich
1985	OES	S Chamberlain	T Eller	L Maudlin		J Czika	E Early	S Ehrlich
1986	OES	T Eller	G Williams	L Maudlin		J Czika	M Serotta	S Ehrlich
1987	OES	T Eller	G Williams	D Alspach		J Czika	M Serotta	S Ehrlich
1988	OES	D Alspach	G Williams	L Maudlin		G Raisbeck	R Dwyer	F Fisher
1989	OES	D Alspach	J Czika	G Williams		G Raisbeck	R Dwyer	F Fisher
1990	OES	G Williams	J Czika	N Miller		G Raisbeck	R Dwyer	F Fisher
1991	OES	G Williams	J Czika	N Miller		G Raisbeck	R Dwyer	F Fisher
1992	OES	G Williams	J Czika	N Miller		C Brancart	R Dwyer	W Carey
1993	OES	G Williams	J Czika [2]	N Miller [2]	F El-Hawary	C Brancart	R Dwyer	W Carey
1994	OES	J Czika	J Collins	N Miller	F El-Hawary	C Brancart	R Dwyer	W Carey
1995	OES	J Czika	J Collins	N Miller	F El-Hawary	C Brancart	R Dwyer	W Carey
1996	OES	J Czika	J Collins	N Miller	P Sabathe	C Brancart	R Dwyer	W Carey
1997	OES	C Brancart	J Vadus	N Miller	P Sabathe	E Nelson	T Wiener	W Carey
1998	OES	C Brancart	J Vadus	N Miller	P Sabathe	C McKee (Acting)	T Wiener	W Carey
1999	OES	G Williams	J Vadus	N Miller		L Foster	T Wiener	J Lynch
2000	OES	G Williams	J Vadus	N Miller		D Rosenkranz	T Wiener	J Lynch
2001	OES	T Wiener	J Vadus	N Miller		S Holt	J Barbera	J Lynch
2002	OES	T Wiener	J Vadus	N Miller		S Holt	J Barbera	J Lynch
2003	OES	T Wiener	S Chamberlain	N Miller	J Vadus	S Holt	J Barbera	J Lynch
2004	OES	T Wiener	S Chamberlain	J Collins	J Vadus	S Holt	J Barbera	J Lynch
2005	OES	J Barbera	S Chamberlain	J Collins	J Vadus	S Holt	J Carroll	C de Moustier

[1] Vice Chair (1-2) = > Vice Chair (East,West) = > Vice President (East,West)
[2] Vice President East = > Vice President Technical Activities, Vice President West => Vice President Professional Activities

APPENDIX XXII
(*CONTINUED*) IEEE OES OFFICER HISTORY [ACCORDING TO COGGESHALL (1985) (1968–1982) AND THE IEEE OFFICIAL RECORDS (1983–2006)]

Year	*Organization*	*Officers*							
	2006 -	*President*	*Vice President Technical Activities*	*Vice President Professional Activities*	*Vice President Conference Development*	*Vice President Conference Operations*	*Secretary*	*Treasurer*	*OES Journal Editor*
2006	**OES**	J Barbera	S Chamberlain	J Collins	J Vadus [3]	R Garello [3]	S Holt	J Carroll	C de Moustier
2007	OES	J Barbera	S Chamberlain	J Collins	J Vadus	R Garello	S Holt	J Carroll	C de Moustier
2008	OES	J Barbera	S Chamberlain	J Collins	J Vadus	R Garello	S Holt	J Carroll	C de Moustier

[3] Vice President International => Vice President Conference Development, Vice President Conference Operations added.

APPENDIX XXIII
DISTRIBUTION OF OES MEMBERS BY REGION (COMPILED BY JAMES S. COLLINS)

Year End	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10	Total
1983	456	366	219	136	209	559	160	311	100	273	2789
1984	406	327	179	117	149	470	135	258	68	205	2314
1985	425	316	179	106	150	437	140	229	53	178	2213
1986	427	296	199	95	139	425	146	238	53	166	2184
1987	421	324	197	109	145	420	151	253	50	178	2248
1988	425	311	204	116	132	412	143	259	42	180	2224
1989	416	339	203	90	124	442	149	263	46	153	2225
1990	412	331	203	87	121	468	139	256	53	163	2233
1991	416	336	211	94	133	466	145	265	52	196	2314
1992	415	351	220	105	143	451	152	286	62	219	2404
1993	350	290	181	70	110	423	128	260	39	183	2034
1994	331	261	125	71	116	372	120	250	38	182	1866
1995	328	262	127	70	106	364	106	324	63	196	1946
1996	306	224	126	69	105	336	104	354	60	214	1898
1997	283	218	123	60	96	320	98	355	54	212	1819
1998	284	215	120	58	114	304	100	373	55	233	1830
1999	273	230	127	56	112	317	91	345	46	233	1830
2000	265	239	117	52	96	296	85	328	39	227	1744
2001	260	232	117	42	94	275	81	304	38	234	1677
2002	274	222	120	40	95	283	81	276	30	345	1666
2003	250	190	116	37	90	272	94	275	33	232	1589
2004	258	191	109	32	88	260	82	307	23	233	1583
2005	272	189	107	29	90	264	90	288	19	239	1587
2006	268	192	105	40	81	250	88	296	15	242	1577
2007	274	199	113	37	96	254	91	331	23	259	1677

APPENDIX XXIV
DISTRIBUTION OF OES MEMBERS IN SECTIONS WITH 10+ MEMBERS AS OF DECEMBER 31, 2007 (COMPILED BY JAMES S. COLLINS).
IN ALL 330 SECTIONS THERE ARE 1643 OES MEMBERS

REGION 1 (22 Sections, 274 Members)

Boston	**65**
Connecticut	19
Long Island	12
Maine	10
New Hampshire	26
Princeton/Cntl Jersey	10
Providence	96

REGION 2 (20 Sections, 199 members)

Baltimore	45
NV/Wash(Joint)	**71/46**

REGION 3 (41 Sections, 113 Members)

Broward	10
Florida West Coast	13
E. N. Carolina	10

REGION 4 (23 Sections, 37 Members)

Chicago (Joint)	**5**

REGION 5 (24 Sections, 96 Members)

Central Texas	14
Houston	**27**
New Orleans	20

REGION 6 (35 Sections, 254 members

Central Coast	10
Hawaii	**12**
Orange County	11
Oregon	12
San Diego	**69**
Santa Clara V.	38
Seattle	**48**

REGION 7 (20 Sections, 91 Members)

Cdn. Atlantic	**12**
Nfld. & Lab.	11
Ottawa (Joint)	**5**
Quebec (Joint)	**5**
Toronto (Joint)	**4**
Vancouver	17
Victoria	**20**

REGION 8 (53 Sections, 331 Members)

Benelux	15
France	**35**
Germany	29
Italy	24
Norway	39
Russia	10
Spain	**29**
Sweden	16
UK & Ireland	68

REGION 9 (34 Sections, 23 Members;
No Section has 10+ OES members)

REGION 10 (58 Sections, 259 Members)

Madras(Chennai)	15
New S. Wales	13
Seoul	10
Singapore	**25**
South Australia	10
Taipei	**12**
Japan	**47**
Xian	10

— Sections with OES Chapters are named in **Bold**
— Member counts for Chapters Joint with other societies include only the OES members.

ACKNOWLEDGMENT

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