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ABOUT THE COVER IMAGE

Ramon Margalef and graduate students aboard the *Cornide de Saavedra* during the *Atlor II* cruise (March 1973) off Northwest Africa. From left to right: Ferran Vallespinós, Dolors Blasco, Guillem Mateu, Miquel Alcaraz, Santi Fraga, Josefina Castellví and Ramon Margalef.



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The Limnology and Oceanography Bulletin

The American Society of Limnology and Oceanography is a membership-driven scientific society (501(c)(3)) that promotes the interests of limnology (the study of inland waters), oceanography and related aquatic science disciplines by fostering the exchange of information and furthering investigations through research and education. ASLO also strives to link knowledge in the aquatic sciences to the identification and solution of problems generated by human interactions with the environment.

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RAMON MARGALEF, THE CURIOUSITY DRIVEN LIFE OF A SELF-TAUGHT NATURALIST

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PREFACE

January 28, 2009, ASLO Aquatic Sciences Meeting, Nice, France: Carlos Duarte approached me just before half past eight in the morning when we were walking to the *Apollon* theater to attend the award ceremony and plenary sessions of the day. He asked me if I would be willing to write a short biography of Ramon Margalef, now that ASLO's Excellence in Education Award would be named after him. It should be similar to the one Peter Williams had done of Alfred C. Redfield. I was thrilled, and immediately accepted!

Later on I realized the daunting task before me. The international recognition of Margalef as one of the leading ecologists of the 20th century and one of the few great Catalan (Catalunya or Catalonia is today an autonomous region of Spain with Barcelona as its capital) and Spanish scientists of all times, led to many very well written obituaries and biographical essays by distinguished fellow scientists and disciples. *What could I add?* I had not been a student of Margalef. I had barely met him the first time during Josep M. Gasol's dissertation defense in 1988 as Margalef was on the thesis committee. I had only attended a few lectures, seminars or talks. On top of it I had to mirror myself in the excellent piece of science history work by Peter leB. Williams.

As a biology undergraduate at the Autonomous University of Barcelona I had used Margalef's book *Los organismos indicadores en la Limnología* (Margalef, 1955) to identify freshwater organisms from the Banyoles area (NE Spain). Also at the university, several of the professors in botany, biogeography and ecology, had been former students of Margalef, and we used Margalef's textbook *Ecología* (Margalef, 1974), especially the chapters on diversity and succession. As a graduate student at the Institute of Ecology (Athens, GA, USA) I began to fully appreciate the influence Margalef had worldwide. When I was asked where I came from and answered *Barcelona*, I was immediately associated with Margalef, even if I had not attended the University of Barcelona where he taught. Later on as a postdoc back in Barcelona, this time at the Institut de Ciències del Mar (ICM), everything was reminiscent of Margalef in ideas, thinking, approach to science, even furniture and experimental setups. I had the opportunity to talk to Margalef but only occasionally and for short informal conversations when he would come to visit the ICM. The dimension of Margalef in my eyes as a scientist and a person was becoming increasingly broader. Of course, it helped that I was working on turbulence and plankton, where Margalef is a landmark reference; and also that I got to work with Cèlia Marrasé, former graduate student and daughter-in-law of Margalef.

I was working on the final report of a project on Sunday, May 23, 2004, when Cèlia called me to give me the sad news of Margalef's death. It was probably only natural that I immediately felt the compelling urge to set up a web-based repository for his work since many of his publications are not in English or are hard to find. I also felt the need to set up a condolence page. In a few hours I had a web page ready. Notes from all over the world started to flood in, while I kept adding papers, newspaper obituaries, and miscellaneous information.

These were my connections to Ramon Margalef but my question remained: *What could I add to the biography?* The answer still is *I do not know*. I have tried to read as much information about Ramon Margalef as possible from the most varied sources including his own papers and books, interviews and obituaries. I have used the information I have collected since 2004 for some data analysis. I have also made extensive use of the biography published by Pere Bonnín (Bonnín, 1994). Last minute gold nuggets have been an unpublished autobiography (Margalef, unpublished) provided to me by Marta Estrada and a collection of personal letters between Ramon Margalef and Guillem Colom (Mateu, 2009). In addition, I have interviewed more or less informally family members and scientists who had known Margalef well, and I am especially indebted to Cèlia Marrasé and Marta Estrada. In case of a conflict in information, I resorted to the most direct source and/or to the source published closest in time to a particular event. Note that I have made the choice to use the Catalan form of Margalef's first

name *Ramon* (without accent), since this was Margalef's first and native language and the spelling appearing on his identity card according to his son Ramon Margalef Mir (oral communication September 4, 2009).

With the exception of the biography by Bonnín, all biographical texts or recollections on Margalef that I can think of have been written by former students and fellow scientists who knew Margalef well. Perhaps I have added the view of someone that was not directly related to him and that knew him scantily, with the obvious danger of missing people, events, or other important aspects of Margalef's biography, and I humbly ask for the indulgence of all, including the reader. This has been a wonderful learning experience for me and I have become a converted *margalefian*. I thank Carlos Duarte for this opportunity, and above all I thank Ramon Margalef for his legacy.

September 2009

FAMILY BACKGROUND

Ramon Margalef i López [RML] was born in Barcelona, Catalunya (Spain) on May 16th, 1919. His father, Ramon Margalef i Adell, was a young farmer that moved to Barcelona with his parents and other family members after the outbreak of phylloxera (*Dactylosphaera vitifoliae*), a small insect, ruined the family grapevines



Ramon Margalef and his sister Vicenta circa 1924. Courtesy of the Margalef family.

SHORT HIGHLIGHTED BIOGRAPHY

- 1919 Birth of Ramon Margalef – Barcelona, May 16th
- 1933 Enters commerce trade school
- 1936-1939 Spanish Civil war
- 1938-1939 Forced enrollment into the *republican* army
- 1939 Joins the Institució Catalana d'Història Natural
- 1939-1943 Conscripted into the *nationalist* army (intermittently)
- 1943 Death of his mother
- 1943 First scientific publication
- 1944 Scholarship at the Instituto de Biología Aplicada (Consejo Superior de Investigaciones Científicas, CSIC).
- 1945 Completes high school degree – September 21st
- 1945 Starts studies of Natural Sciences at the University of Barcelona
- 1948 Stays in Italy and Switzerland
- 1949 Establishes a marine lab in Blanes for the CSIC. First Director of this lab.
- 1949 Finishes his university degree – December 9th
- 1951 Doctoral dissertation: *Temperatura y morfología de los seres vivos*
- 1952 Research position at the Instituto de Investigaciones Pesqueras (CSIC)
- 1952 Married Maria Mir – July 4th
- 1953 Birth of Neus Margalef i Mir – May 30th
- 1955 Birth of Núria Margalef i Mir – March 18th
- 1956 Two-month trip to America and talk at Scripps
- 1956 Birth of Ramon Margalef i Mir – September 14th
- 1958 Birth of Bartomeu Margalef i Mir – January 22nd
- 1958 Publication of *Information theory in ecology*
- 1965 Lectures at the University of Chicago
- 1965-1967 Director of Instituto de Investigaciones Pesqueras
- 1967 Ecology Chair at the University of Barcelona – June 1st
- 1968 Publication of *Perspectives in ecological theory*
- 1969 Death of his father
- 1971 Sahara II cruise with the new Spanish research vessel *Cornide de Saavedra*
- 1972 Prince Albert I Medal
- 1974 Publication of textbook *Ecología*
- 1978 Trip to Australia; Maria is hospitalized after suffering an accident – August
- 1980 A.G. Huntsman Award
- 1983 Publication of textbook *Limnología*
- 1984 Ramón y Cajal Prize
- 1986 Retirement as Professor of the University of Barcelona
- 1987 Elected Professor Emeritus of the University of Barcelona – April 8th
- 1989 Naumann-Thieneman Medal
- 1993 Retirement as Professor Emeritus of the University of Barcelona – September 30th
- 1995 International Ecology Institute Prize
- 2000 ASLO Lifetime Achievement Award
- 2004 Death of Ramon Margalef – Barcelona, May 23rd
- 2004 Death of Maria Mir – May 30th

in the region of Priorat. Ramon Margalef i Adell managed to get a job as a bank clerk and married Vicenta López Viu, who had also moved to Barcelona from the region of Aragón. RML only had one sister, Vicenta, born 1923. She was a dressmaker and tended her family before suddenly passing away in 1991.

RML married Maria Mir Tauler, a biologist from Mallorca, on July 4th, 1952 in the church of Sant Nicolau in Palma de Mallorca. They had 4 children. Neus (1953) is a mathematician and high school teacher in Barcelona, Núria (1955) is a physician in Puigcerdà, Ramon (1956) is a biologist and high school teacher in Barcelona, and Bartomeu (1958) is devoted to cooperation and at present working in an orphanage in Angola. Seven grandchildren from Neus (3), Núria (2) and Ramon (2).

1919-1936 CHILDHOOD AND YOUTH

As a child, Ramon used to play in the busy streets of the old Barcelona neighborhoods spending hours just watching merchants trading and loading and unloading all kinds of goods. He also enjoyed very much playing in the vacant lots of the city where he could find puddles of water teeming with life that he would observe and follow for days. His interest in nature was also likely sparked by Sunday visits to the parks and natural gardens of Barcelona and by helping his father tend a small backyard orchard with fruit trees, probably a hobby that reminded his father of his early farming days. Ramon would spend hours watching all kinds of ants, caterpillars, beetles and what not. He learned to preserve butterflies and would make his own accurate collections of insects and plants. At school he was a distracted student, probably thinking all the time about the puddle of water he was exploring or on the next life stage he would find an insect when later in the day he would be able to go back to the orchard. Ramon did not have good memories of his early school years as he would often be chastised. Despite his lack of interest for formal school training, he learned to read and write in Spanish and all the other basic skills easily. He even learned to write in Catalan on his own by following installments appearing in the youth magazine *El Patufet*.

In his early teens Ramon attended a commerce trade school, his father probably reasoning that becoming an accountant or bank clerk as himself would provide Ramon a good living. This was definitely not the track towards a University degree. Apparently Ramon complained that he was not learning much, probably because he was bored after acquiring the knowledge faster than his classmates and not being genuinely interested anyhow. Meanwhile, he continued with his naturalistic hobbies and started to accurately draw and describe species. His father worried about Ramon's apparent lack of progress and hired a private tutor, Alexander Jacky, to help him with his studies. Ramon learned German and French and mathematics with Mr. Jacky, an Alsatian who had also lived in Argentina. This was a blessing for Ramon, now able to read works of the German and French naturalists, who had done quite a few studies on fauna and flora in Catalunya. In his later teens, he started to go regularly to the public libraries and to the more specialized libraries in several academic institutions. Ramon and close friend Josep Maria Marcè shared the naturalist's interests and went together

on field trips with the Centre Excursionista de Catalunya (English: Hiking Center of Catalunya), collecting specimens and learning of the relationship of species to particular environments. They were applying to the Institució Catalana d'Història Natural through Mossèn Bataller, who admired their interest and knowledge, when the Spanish [uncivil] war broke out.

1936-1939 SPANISH CIVIL WAR

When Margalef was 17, the Spanish Civil war broke out on July 18th, 1936. Spain had been a democratic republic only since 1931. The reforms needed in a country still quasi-feudal, included distributing land among poor peasants; combined with other sociopolitical movements such as the right of women to vote, the right of historic regions to determine their own political fate, a certain anticlericalism with anarchistic sparks here and there, and military cutbacks, it created the unrest that resulted in the military rebellion that started the war against the government. There were barricades within the city of Barcelona, several extremist anarchist groups were burning churches. It was easy for people to become politically polarized on one side or the other. But Margalef was not interested in politics, and the chaos of the first part of the war was an opportunity for him to get more and more involved into his naturalist studies. He started to write his findings with accurate drawings in a rather formal way as he had seen in the journals he was perusing in the libraries. He made up a fictitious *Societat Catalana d'Estudis Biològics* and would bind his papers in two series named *Butlletí de la Societat Catalana d'Estudis Biològics* and *Publicacions de la Societat Catalana d'Estudis Biològics*. A third journal he made up was *Acta Hydrobiologica*. These papers have never been published.

Barcelona was on the *republican* side of the war, loyal to the legitimately elected government, but the rebel *nationalists* were quickly gaining ground. Ramon was drafted on February 22, 1938, at the age of 18. Since he had good writing skills, he was soon given a typewriter, and charged with paperwork and dispatches. He was finally sent to the Ebro river front, site of the longest and bloodiest battle of the war. Apparently Ramon became ill with fever and diarrhea and was sent back to Barcelona. Just a few days later the war ended with the defeat of the *republicans*. Josep Maria Marcè died during the war, to the great dismay of Ramon.

1940-1943 RETURN FROM WAR

Margalef had very bad memories of the war. It did convince him that one only lives once and of the need to take advantage of every possible minute to do whatever fulfills one's genuine interests. Just after the war, he was drafted again, now into the army of the newly installed military regime of general Francisco Franco, but was soon discharged by reason of his father's age who turned sixty. For monetary reasons he took a job at an insurance company. In the afternoons he would devote every minute to his naturalist interests. He reconnected with the scientists and the scientific societies he had started to frequent before the war, and restarted his field trips. He built his own microscope with bits and pieces he found in flea markets and junkyards, and started to observe most probably just anything he could get his hands on, including aquatic microorgan-

isms. Important Catalan naturalists and scientists, astounded by Margalef's work capacity, his rare self-taught knowledge acquisition process and his acute intelligence, encouraged him to pursue a university degree. Important influences and mentors of this time include Mossèn Bataller (Institució Catalana d'Història Natural), Francesc Español (Museu de Zoologia), and Antoni de Bolòs and Pius Font i Quer (Institut Botànic de Barcelona).

Unfortunately, Margalef would still have to wait somewhat since in 1941 he was drafted a second time into Franco's army, this time in artillery. The Second World War (1939 to 1945) threatened to involve each and every European country. Franco was preparing for Spain's involvement siding with Germany and Italy but finally managed not to be dragged into the war. Margalef was sent to Mallorca. What did he do in his spare time? An inventory of all freshwater bodies of the island with special emphasis on microalgae. He also established friendship with Miquel Massutí, director of the Institut Oceanogràfic in Palma, with whom he did a complete study of marine plankton that later resulted in a book.

In 1943, his mother suddenly died of a stroke and he was refused permission to return home for a last goodbye. Later that year he was finally discharged from the military. Margalef stopped his unpublished series and published his first three official scientific papers and one science popularization book. In these early publications, the word *ecología* appears in text and titles. He was 24 years old.

1944-1951 THE START OF A CAREER AS A SCIENTIST

With his military service over, Margalef followed the advice of his mentors to pursue a university degree. But there was a problem. Margalef did not have the formal and required seven years of pre-university training, *Bachillerato* (equivalent to high school). His mentors smoothed his way by getting him credit for some subjects from his unfinished trade school studies, and exempting him from some classes as long as he took the final exams. In 1944, while studying for his *Bachillerato* diploma, his mentors helped him get a scholarship to work with Dr. Francisco García del Cid (one of the Spanish research vessels is nowadays named after him) at the Instituto de Biología Aplicada in Barcelona. Margalef left his boring job at the insurance company. His father worried about this decision to leave a secure workplace but Margalef was completely determined. In 1945, he earned his *Bachillerato* and it had taken him only two years! Margalef confessed he had had the hardest time learning Latin on his own, according to Francesc Vives, a fellow university student. Later in 1945 he enrolled in Natural Sciences at the University of Barcelona.

At the university, skipping classes was not unusual. In one class they had not seen him during the whole academic year when he showed up at the final oral exam. The questions were harder and harder but Margalef answered them all brilliantly. The astounded professor gave him *Matrícula d'Honor* (with honors). With the greatest humility, Margalef was able to leave the toughest professor of the toughest subject without arguments to give him less than the highest marks. Besides attending a few classes Margalef would devote his time to work and research, writing and reading. It is very likely he already had notions

of English, and now with the decline of German naturalists after the war, he improved his English skills to delve into the literature. He was also learning Russian on his own. He did not devote much time to the social life characteristic of university students. But he did meet Maria Mir, a biology student who would later become his wife.

Margalef finished his university degree in 1949. He was 30 years old and had already published 58 papers mostly on zoology and freshwater and marine plankton. While Margalef was studying, García del Cid was charged by the CSIC (Consejo Superior de Investigaciones Científicas) with setting up a marine fisheries institute as marine biology studies were becoming an important part of the Instituto de Biología Aplicada. He asked Margalef to set up a lab in Blanes (on the Mediterranean coast, 70 km north of Barcelona). Facilities and support were provided by Karl Faust, a German with commercial interests in Barcelona, who founded the botanical garden *Marimurtra* in Blanes. In 1949 Margalef was named director of the Blanes laboratory. He gave marine biology short courses and trained others in the identification and counting of phytoplankton, as the basis of the food chain. At the same time, he began and maintained a biweekly phytoplankton time series collection. He analyzed samples and published swiftly, and his papers went beyond the description into the fundamentals of succession, diversity, community structure and ecosystem dynamics. Nonetheless, throughout the late forties and early fifties he did not hide the fact that his preferred research subject was actually limnology and the biology of freshwaters. An almost inexistent taxonomy and systematics of Spanish freshwater organisms had to be addressed to advance in the ecological and biogeographic aspects that most interested Margalef (Mateu, 2009). His job, however, was to do marine research and he did it so professionally and with such high and



Ramon Margalef and Maria Mir – April 6, 1952. Courtesy of the Margalef family.

abundant scientific output, that he had no problems in making compatible both research lines.

After finishing her degree in 1949, Maria went back to her native Mallorca as a teacher. Ramon visited her whenever he could. Margalef also started working on his doctorate dissertation that was titled *Temperatura y morfología de los seres vivos*, on experimental studies with green microalgae. The official director, Dr. Florencio Bustinza from the University of Madrid (at that time the only university in Spain allowed to issue doctoral degrees), was a bureaucratic necessity that provided little help. Margalef did his doctorate basically on his own with occasional aid from professors in Barcelona. In 1951 he defended his dissertation in Madrid. He was 32 years old and had authored 82 publications.

1952-1967 THE INSTITUTO DE INVESTIGACIONES PESQUERAS

In 1952 García del Cid recalled Margalef from Blanes to fill a position at the newly founded Instituto de Investigaciones Pesqueras (IIP) in Barcelona. On July 4th he married Maria Mir, and one year later their first daughter, Neus, was born. Three more children (Núria, Ramon and Bartomeu) would follow soon. Maria was Ramon's true love but she was also the center of the family, the lighthouse that guided the growing family boat in calm and rough seas. She managed the education of their children, the family economy, and the social life and obligations. Ramon, playful with his kids, did not have to worry about the long-term steering of the family. Maria mentioned once that she had never been jealous of the science that absorbed Ramon for long hours and days. A biologist herself, she would often be the first critical reader of Ramon's manuscripts, and occasionally

help him with plankton counts. Ramon was a jovial person, maybe a bit on the shy side but with an acute sense of humor. Standing 1.85 m, with a bony complexion, darkish hair and deep blue eyes, he had a somewhat uncommon physical appearance for the Mediterranean standards of the time. He always had a genuine half smile on his face and would never speak badly of another person. He loved to play Meccano—the playset of metal plates, wheels, nuts, screws—with his children because the possibilities for constructing imagined devices were endless. On weekends, the family would often go to the countryside and Margalef would always challenge their children with questions about the plants, animals, lichens or geology they were observing; always in a distended, unforced way. His teaching philosophy was to provide plenty of leads for others to follow and explore, but it had to be one's own willingness to take advantage of those leads. At home, when he had one calm minute he would devote it to writing. At nights he would translate foreign books into Spanish or write popular science texts to complement a meager scientist's salary.

With Margalef, the IIP became a full-scale oceanographic institution. Under the guidance of director García del Cid, they set up labs in Castellón (Mediterranean levantine coast of Spain), Vigo (Ría in Northwestern Spain) and Cádiz (on the Atlantic coast of Southwestern Spain). These labs later became institutes of their own. Margalef would spend time at these labs, especially in Vigo and Castellón, staying for months at a time setting up coastal plankton monitoring time series, sampling specific conditions and events and training people. Phytoplankton sampling would always be accompanied by nutrient samples in order to relate plankton dynamics to the physical and chemical environment. Each issue of the IIP's journal *Investigación Pesquera* usually contained one paper by Margalef and often two or more. The analysis of the data for a given time series would amazingly appear during the next year after sample collection, and not four, five or more years later as is usual. This was also the beginning of the “international era” for Margalef and for the IIP. Science funding was really scarce and travel money almost inexistent and difficult to obtain. Chance came Margalef's way. By way of García del Cid, he met Sidney Galler, a talent scout of the American Office of Naval Research and got on well with him. Through this connection, he was given basically a blank check for travel expenses through the U.S. Military Aid Transportation Service. And did he ever take advantage of it! He started to establish connections with institutions and scientists worldwide. He visited Italy (Napoli and Pallanza), Switzerland (Zurich), Belgium, Canada (St. Andrews and St. John's), the U.K. (London, Windermere, Cambridge and Plymouth), Venezuela, Puerto Rico, France, Germany, the United States (Scripps, Yale) and many other places. He traveled to labs and to international meetings. Back at the Institute he would provide detailed reports of the interesting and novel aspects he had been exposed to in his travels for anyone to read. Margalef was also given to building devices that he would use for his own research. Some say he also had a blank check to build any devices he wished. This is unlikely, but besides travel coupons he probably received some additional funding from the U.S. military that would seem much for his scantily funded lab fellows.



Ramon Margalef and his children (from left to right: Bartomeu, Núria, Neus and Ramon) out in the field circa 1962. Courtesy of the Margalef family.

Margalef was an avid reader, and he would often steer other scientists towards particular books or papers that were relevant to their research. He was kind and giving and received the admiration of fellow lab workers. During sampling trips, two or three scientists and a skipper would fit in small, ill-equipped boats. Margalef would always want to do one more sample, go a bit further offshore, which sometimes got them into trouble since the boats were not prepared for such endeavors. He never abandoned freshwater studies, whether in local lakes and streams or in his travels and stays abroad, albeit he acknowledged that most of his ecological ideas stem from his experiences in marine environments. Margalef, now with his international contacts, jumped to participate in numerous cruises in the Western Mediterranean (Marc Steyaert, from Belgium, was key in providing ship time) and the Western coast of Africa, with funding from FAO, UNESCO or NATO.

In October 1965, García del Cid, died run over by a car. Fellow scientists proposed Margalef as the new director of the IIP. He accepted, but not wholeheartedly since he despised the bureaucracy that took precious science time away. International connections were maintained and reinforced. Margalef managed to invest the meager budget in modernizing the oceanographic equipment. Weekly lab meetings were established to discuss work progress. Some fellow scientists would have probably felt overwhelmed by the seemingly endless work capacity and broad

knowledge of Margalef and perhaps uneasy to be on the spot if they had not done much during the past week. Margalef was an easy, good-natured person, but he would counter stupidity, laziness or frivolousness with irony or sarcasm. He was not careless with the military or politicians responsible for science and funding in Spain but he would not spend one minute of his time lubricating these relationships. Not all were enthusiasts of Margalef's ways. What is clear is that in

a couple of years, the IIP became an internationally recognized player in oceanography and all benefited.

From the early years at the IIP, Margalef's intellectual interests quickly turned towards the theoretical implications at the system level that he distilled from observations and experience and blended with intellectual inference. Aquatic organisms and systems were the object of study but also templates, examples and testing grounds for a higher level purpose: ecological theory. In spring 1956 Margalef gave a talk (*Temporal succession and spatial heterogeneity in natural phytoplankton*) at a meeting in California organized by the Scripps Institute of Oceanography and the Office of Naval Research where he touched on applying concepts of information theory to the structure and dynamism of communities of organisms. It caught immediate interest among the audience. The account of places he visited in this two-month trip to America is amazing (Trenton-Washington-San Diego-La Jolla-Los Angeles-San Francisco-Washington-New Haven-Boston-Woods Hole-Washington-Puerto Rico-Key West-Washington-New York-Trenton and back to Madrid and Barcelona). Besides the talk at Scripps, he gave talks in Los Angeles on mechanisms for the occurrence of red tides in the Ría de Vigo and at the geochronology lab in Yale on work with sediments also from Vigo. In Puerto Rico he studied plankton and made collaboration connections for the future besides getting to know the coral reefs, the mangroves and the rain forest. In California he met *brother* Ginés, a Basque of the La Salle Institution that was teaching in Venezuela. Later on he would visit Isla Margarita (Venezuela) often, together with other scientists from Barcelona and helped set up a marine lab.

Back in Barcelona he felt like someone had clipped his wings, referring more to the research atmosphere than to the poor funding. He told his friend Guillem Colom he really liked the States and that he felt there more at home than in some European countries. He also hinted to Colom that he had been offered a position and that he was thinking about it. In April 4, 1957 his inaugural paper as a new member of the Real Academia de Ciencias y Artes de Barcelona was titled *La Teoría de la Información en Ecología* elaborating on the ideas presented at Scripps. This paper, written in Spanish, did not have much immediate impact at home. It did get translated into English in the journal *General Systematics* in 1958. By this time the English-speaking scientific world was really becoming aware of Margalef's novel ideas. When in 1963, the paper *On certain unifying principles in ecology* appeared in the journal *The American Naturalist*, Margalef's international recognition as a world leading ecologist became established. This paper became a Citation Classic in 1980 and is one of the top ten journal articles that biologists consider to have had the greatest impact in their career training (Barrett & Mabry, 2002).

Margalef had ties with the University of Barcelona where from the mid-sixties he taught the optional course on Ecology. The laboratory part of the course he gave at the IIP. In 1967 Margalef was 48 years old and had authored 263 publications. That year, the first Ecology Chair in Spain was established at the University of Barcelona; Margalef applied and was hired. He resigned as director of the IIP but kept working at both places, three days at the University and three days at the Institute, until 1974.



Working aboard *Biomar* in Venezuela (April 1965).

1968-1974 TRANSITION

Margalef's Ecology Chair at the University of Barcelona was not set up by chance but tailored for him. His international recognition was extremely high and fellow scientists at the university feared he might leave for offers in the U.S. Funding for oceanography in Spain was scarce and the political and military apathy for scientific advancement hard for Margalef to deal with. Probably, his wife Maria resisted the idea of leaving Barcelona and the Chair of Ecology was the solution.

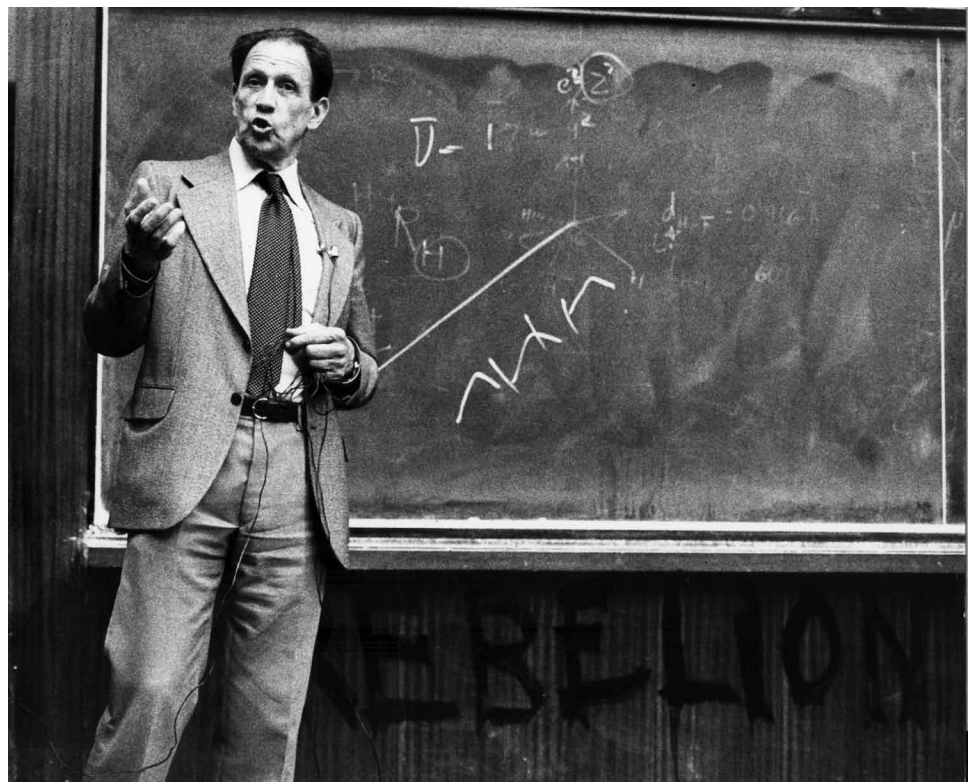
He taught at eight in the morning or at eight in the evening so that he had time to do research and to write. Margalef used to make an outline of his lectures on small library cards. Once started, he would follow the outline loosely, diverting to other issues while following his train of thought. His ecology lectures were highly stimulating, with interesting examples and connecting different aspects and disciplines to one particular issue. Often times, such connections would become so *obvious* after Margalef had made them that advanced students were left wondering why it had not occurred to themselves before! He would expose students to cutting edge research and the latest publications and provide the leads to unsolved or unanswered research questions. The lectures were probably frustrating to those students expecting textbook-like information. The rest were in awe.

Students at the university were eager to learn and Margalef took his first formal graduate students, with a predominance of marine study subjects. He directed students much in the same way he lectured, providing leads that students would have to explore and develop themselves. His office door was literally always open and Margalef ready to be interrupted by students or fellow scientists. When nobody was taking advantage of his discussion or advice, he would sit down in front of his typewriter incessantly typing page after page of a scientific paper or book with little or no typing errors. In a November 1972 letter to his paleontologist friend in Mallorca, Guillem Colom, Margalef mentions that he had just finished his *Ecología* textbook that had absorbed most of his work capacity for over one year. It is true that besides the 951 page textbook published in 1974, Margalef published only 27 papers between 1971 and 1974! The chapter on diversity found in the textbook, including the different diversity indices, is arguably his single most well known scientific contribution to ecology students.

In May 1966 he was invited to lecture at the University of Chicago, home of an important ecological school of thought. Margalef partly dethroned classical population biology and related ecosystem ecology to information theory, thermo-

dynamics and cybernetics. The lectures resulted in the first volume of the *Chicago Series in Biology* under the title *Perspectives in Ecological Theory* (1968), another highlight of his career. Ed Deevey concluded his review of the book for *Limnology and Oceanography* (Deevey, 1969) asking what would the *Chicago Series* do for an encore after such breathtaking start.

Margalef's publications of this period largely concerned studies of marine plankton. This was an exciting time for oceanographers in Spain. In 1970 Margalef organized a workshop on Analysis of Upwelling Systems, a hot topic of the time. Scientists working on two research vessels in the area (T.G. Thompson from the University of Washington and Jean Charcot from France) joined the meeting of over 100 attendants. In 1971, after many years of bureaucratic battling for a modern oceanographic research vessel that Spain lacked despite the importance of Spanish fishing interests, the new *Cornide de Saavedra* set course to its first cruise. Margalef, with his international contacts, had assembled a team of oceanographers from the IIP (labs in Barcelona and Vigo), the University of Washington, North Carolina University and the Université de Marseille for an integrated study (nutrients, bacteria, phytoplankton, zooplankton, fish, benthos, sediments and paleoceanography) of the North Africa upwelling system. Technology highlights included on-line continuous nutrient analysis and an on-board computer for data analysis. The cruise had its share of technical problems and gave meaning to an often repeated sentence Margalef used to quote from a famous physicist "a good scientist should be able to drill a hole with a file and to file with a drill bit" (Margalef, 1971b). Many ecologists and oceanographers, isolated in the middle of



Ramon Margalef giving a lecture.

nowhere, have had to put this quote into practice. Margalef was an expert at it.

Margalef received the Prince Albert I Medal from the Institut Océanographique in Paris in 1972. It is no wonder that marine studies were taking over, with the exceptions mentioned above. It is also interesting to note the start of the idea to include *man* as an integrative part of the biosphere, first published in Catalan (Margalef, 1971a).

1975-1993 THE DEPARTMENT OF ECOLOGY YEARS

It was in 1974 that Margalef had to leave his position at the CSIC because of a governmental payroll nonsense of incompatibility between the University of Barcelona and the CSIC. He continued to be on the governing board of the IIP until 1977 and he kept going to the lab, albeit less frequently. As they were finishing their Ph.D., Margalef's former doctoral students would continue working on many of his ideas at the different marine labs. In 1978 Margalef published a paper titled "Life-forms of phytoplankton as survival alternatives in an unstable environment" (Margalef, 1978). This is perhaps Margalef's most well known paper in the aquatic sciences community and one that keeps prodding research nowadays. In the abstract we can read:

"The combination of sedimentation with turbulence or variance in the components of velocity is believed to be the most important factor in the biology of phytoplankton. Consequently, the best predictor of primary production and of dominant life-forms in phytoplankton is the available external energy, on which advection and turbulence depend."

Margalef established a conceptual framework connecting temporal fluctuations in nutrients and energy at different scales in the environment to the dominance of different groups of phytoplankton including groups such as red-tide forming dinoflagellates. It is his famous *mandala*. There is an obvious connection trying to explain Hutchinson's paradox. Small-scale fluctuations as well as seasonal fluctuations allow a recurring succession of communities even with a range of reproduction strategies within a system of apparent uniformity. This idea had most certainly matured in Margalef's mind over many years from his early plankton time series and was influenced by the advances in physical oceanography. In more general terms, *external* or *auxiliary energy* with respect to a system, natural or anthropomorphized, was seen as relevant to determine community structure and production.

At the Department of Ecology, he started to shift gears back to limnology, and increasingly to theoretical ecology. Major funding came in during the seventies. The International Commission on Large Dams was to hold its XI Congress in Madrid in 1973. Despite growing concerns of eutrophication and water quality, the Spanish government realized that almost nothing was known regarding the limnology of its own over 700 reservoirs. In a hurry government officials were sent to the U.S. to seek advice and find a suitable scientific team to start a study. In the States, the Spanish officials learned that one of the world leading limnologists, Margalef, was actually Spanish. Margalef was granted a program for a complete study of the limnology of reservoirs across Spain with over one hundred sites (Campàs, oral communication August 2009); a major effort

that required new teams of scientists and students. This was no problem, as both were constantly knocking at Margalef's door eager to work with him.

The weekly seminars Margalef had started at the IIP continued at the University. They were held Thursday evenings and nicknamed *sessions de màgia* or *dijous màgics* by attending students and researchers (Armengol 2006). If no one had prepared anything to discuss, Margalef would just simply start a discussion subject as if pulling out a rabbit from a magician's hat. Thermodynamics and game theory would easily mix with the latest lab results or field observations to build on some theoretical ecology idea. Physicists, geologists, mathematicians from other departments and schools would often attend these informal seminars that had a holistic mindset. Formal lectures were also packed despite the early morning or late afternoon schedule and Margalef's unorthodox pedagogic skills. At the Department

ORGANISMS NAMED AFTER RAMON MARGALEF

Acartia margalefi Alcaraz, 1976 (Animalia, Arthropoda, Copepoda)

Alexandrium margalefi Balech, 1994 (Protoctista, Dinoflagellata)

Amphora margalefi var. *lacustris* Sanchez, 1993 (Protoctista, Bacillariophyta)

Antillobia margalefi Altaba, 1993 (Animalia, Mollusca, Gastropoda)

Echinogammarus margalefi Pinkster, 1973 (Animalia, Arthropoda, Amphipoda)

Ephemeropterus margalefi Alonso, 1987 (Animalia, Arthropoda, Cladocera)

Hemimysis margalefi Alcaraz, Riera & Gili, 1986 (Animalia, Arthropoda, Mysidacea)

Lecane margalefi de Manuel, 1994 (Animalia, Rotifera)

Lepadella margalefi De Ridder, 1964 (Animalia, Rotifera)

Microcharon margalefi Sabater & de Manuel, 1988 (Animalia, Arthropoda, Isopoda)

Oncidium margalefi (Plantae, Angiospermophyta, Liliopsida, Orchidales)

Oxytoxum margalefi Rampi, 1969 (Protoctista, Dinoflagellata)

Picarola margalefi Cros & Estrada, 2004 (Protoctista, Haptophyta, Coccolithophorida)

Pseudoniphargus margalefi Notenboom, 1987 (Animalia, Arthropoda, Amphipoda)

Stephos margalefi Riera, Vives & Gili, 1991 (Animalia, Arthropoda, Copepoda)

Typhlocirolana margalefi Pretus, 1986 (Animalia, Arthropoda, Isopoda)

AWARDS AND HONORS

- 1972. Prince Albert I Medal, Institut Océanographique de Paris.
- 1973. Doctor Honoris Causa, Université Aix-Marseille, France.
- 1980. A.G. Huntsman Award for Excellence in Marine Research, Bedford Institute of Oceanography.
- 1983. Doctor Honoris Causa, Institut Químic de Sarrià, Catalunya, Spain.
- 1983. Narcís Monturiol Medal, Department of Universities, Research and Information Society of the Catalan Government.
- 1984. Member of the National Academy of Sciences of the USA.
- 1984. Santiago Ramón y Cajal Prize, Spanish Ministry of Education and Science.
- 1985. Doctor Honoris Causa, Universitat Ramon Llull, Catalunya, Spain.
- 1987. Doctor Honoris Causa, Université Laval, Québec, Canada.
- 1987. Honorary Foreign Member Award, Ecological Society of America.
- 1989. Italgas prize for Environmental Sciences.
- 1989. Naumann-Thienemann Medal, International Association of Theoretical and Applied Limnology (SIL)
- 1990. Alexander von Humboldt Award.
- 1990. Fundació Catalana per la Recerca (Catalan Foundation for Research) Prize, Catalan Government.
- 1990. Knight commander of the Order of Alfonso X the Wise.
- 1993. International Prize for the Environment San Francisco d'Assisi, Italy.
- 1994. Doctor Honoris Causa, Universidad Nacional de Luján, Argentina.
- 1995. International Ecology Institute Prize.
- 1997. Sant Jordi Cross Award of the Catalan Government
- 1998. Grand Prix d'Océanographie de Monaco.
- 1998. Honorary Forestry Engineer of the Polytechnic University of Madrid, Spain.
- 1999. Doctor Honoris Causa, Universitat d'Alacant, Spain.
- 1999. A Ramon Margalef prize in Ecology is established by the Catalan Studies Institute
- 2000. ASLO Lifetime Achievement award.
- 2002. Gold Medal of the CSIC.
- 2003. Gold Medal Award of the Catalan Government.

POSTHUMOUS

- 2004. Award of the Department of the Environment of the Catalan Government
- 2004. The Ramon Margalef prize in Ecology is established by the Catalan Government.
- 2005. The main building of the School of Biology of the University of Barcelona is named after Ramon Margalef.
- 2005. A Ramon Margalef prize is established by the Social Council of the University of Barcelona to a student paper in Experimental or Health Sciences.
- 2009. A new research vessel of the Spanish Oceanographic Institute is named after Ramon Margalef.
- 2009. ASLO's Excellence in Education Award is named after Ramon Margalef.

of Ecology he would not impose his ways and would rarely interfere probably with the exception of buying books of the most varied subjects for the Department's library, many of which others would not even try to start reading.

In 1983 Margalef published his textbook *Limnología* (Margalef, 1983), written in a similar record-time as *Ecología*. Both books had a deep influence on several generations of scientists worldwide but mainly in Spain and Latin America. Peter Vila, a fellow graduate student of mine at the University of Georgia, started to translate *Limnología* into English in the late 80's or early 90's but the timing was not right for publishers and the project was cancelled. A few years before, Margalef published *La Biosfera: entre la termodinámica y el juego* (The Biosphere: between thermodynamics and gaming), where his ideas on the organization of matter and energy in dynamic ecosystems, the relationship between diversity and ecosystem stability, and the place and role of man in the biosphere were further developed. I can only imagine that it must have been highly stimulating to discuss these issues with scientists like Howard and Eugene Odum while advising for the Biosphere II project, that studied closed (ecological) systems in a facility in Arizona with expectations of a future space application. Energy, nutrient cycles, water, waste, human interaction, self sufficiency...

Margalef traveled often, not only to attend meetings, go on cruises or field trips, and visit other laboratories but also to teach courses worldwide, always avid to interact with interesting people.



Aboard the research vessel *García del Cid* on Margalef's last cruise in 1999.

His university teaching schedule now limited his travel mainly to the summer months. His children were growing up and Maria would often accompany him. In one visit to Melbourne, Maria was hit by a car and had to be hospitalized in Australia for several months. This accident left Maria limping for the rest of her life, but would not deter her from accompanying Ramon.

Margalef received the highest distinctions, among them those by fellow scientists in the fields of oceanography (A.G. Huntsman Award, 1980) and limnology (Naumann-Thienemann Medal, 1989). In acceptance speeches and otherwise, Margalef, a humble character, often mentioned scientists that had influenced his own thinking (Josias Braun-Blanquet, August Thienemann, the Tonollis, Wolfe Harvey, Evelyn Hutchinson, Thomas Park, the Odums, Robert MacArthur...). In 1984 he was awarded the Ramón y Cajal prize from the Ministry of Education and Science of the Spanish Government. The nomination came with over 600 letters of support from around the globe. G.E. Hutchinson wrote:

"I am delighted to hear that you are honoring my old friend Ramon Margalef... Ramon has contributed immensely to all aspects of aquatic and general ecology. He is one of the very few people who have worked in the field who can excel in both theory and practice, using the one to illuminate the other."

In 1986 Margalef had to administratively retire from his position at the University of Barcelona although he was shortly thereafter nominated Emeritus Professor and not much changed in his day-to-day work or dedication to students, as sixteen more doctorate dissertations were directed. It is true though that he started delegating scientific project leadership to the younger faculty, who were filling the positions of a growing ecology

department. While Margalef hosted many visiting professors and students, *Margalefian* disciples had started to seed other universities in Spain and the Americas.

1994-2004 RETIREMENT

At the age of 74 Ramon Margalef officially retired, albeit the Department of Ecology maintained an office for him to work whenever he pleased. He also used to visit the Institut de Ciències del Mar (CSIC), formerly the IIP, to talk to friends and keep in touch with the latest findings. Marta Estrada, former student of Margalef and now CSIC professor herself, would ask him to look at a series of plankton samples or some unusual organism that had appeared. His eyes would spark with enthusiasm looking through the old Wild microscope Marta keeps in her office. Margalef had also had a microscope in his office all along his scientific lifetime. He would meet students and ask them what they were doing and point them to literature references and, if interested, he would start relating their research to many other fields even beyond science. Students were happy if they understood a fraction of such thoughts. I remember showing him a new monopoint acoustic Doppler velocimeter to measure turbulence, proud to be working on a subject he had spurred with so many ideas. He said, the shape of the sensor head resembled a *Ceratium* and that these dinoflagellates were probably aware of flow in three-dimensions with sensing elements at their spine tips in geometric analogy to the acoustic device. This would allow *Ceratium* to orientate itself for vertical migrations and to avoid turbulence that would interfere with its swimming. There is a thesis to be developed there for anyone wishing to take the lead.

Awards and distinctions kept pouring in. Margalef did not care much about these events that distracted him from doing science. Maria, his wife, was always there to persuade him to take the time for such social recognitions. Margalef was especially fond of the 1995 International Ecology Institute (ECI) Prize because it came with the possibility to author a book for the series Excellence in Ecology. The result was *Our biosphere* (1997), [published, absolutely without censorship] Margalef wrote for his ASLO Lifetime Achievement Award (2000) acceptance speech. This book is a summary of many of Margalef's thinking avenues that he kept refining over the years. Succession and evolution, dynamics of diversity and biodiversity, dissipative self-organizing systems, phosphorus in ecosystems, mankind and biosphere as a whole, are just some issues that he updated in the book. A paragraph in the introduction is inspiring:

"For most topics that concern ecology, I like poets more than lawyers, and feel more inclined to fantasy, feeling and inspirations than to rigor, consistency and even responsibility. In my views on environmental problems, I feel more attracted by the origin of the troubles than by their solutions, at least in the way the problem is usually being faced at present."



Margalef in the garden of his summer house in Aiguafreda in 2004. Courtesy of the Margalef family.

Margalef did not think much of the environmentalist movement where causes were defended to great lengths based on faith rather than science. But during his whole life, and especially in his later years, he was genuinely concerned about many environmental issues: the use of freshwater, the overexploitation of fisheries, pollution, world food supply and what he called the inversion in topology. This last issue refers to the fact that landscape is quickly becoming humanized with few and small spots left relatively undisturbed compared to previous times when a relatively undisturbed landscape was spotted with human intervention. How this ecosystem change in structure affected function and evolution was a favorite subject.

Ramon Margalef passed away Sunday, May 23, 2004 a few days after turning 85 years old. He had authored over 536 publications, 76 since retirement in 1993, and was writing to his last days while battling a cancer. A religious man for soul matters, days before, he was joking about the fate of *his nutrients*. His playful eyes reminding of his words:

"Nature should be looked at with the eyes of a child – inquisitive and searching – which do not take anything for granted and question everything."

His soul was to be followed by his wife Maria only one week later to continue their love story.

THE PUBLICATIONS OF RAMON MARGALEF

Margalef was a prolific writer with a charming prose. He published every single year from 1943 to 2003, that is 61 years, plus a posthumous book chapter in 2005. Publications total over 537, including books and book chapters, with an annual mean and median of eight and a range of two to 19 publications per year (Peters et al., 2005). An unknown number of publications, probably over 15, still await complete confirmation. Published page count is tallied at over 25000. More astounding is that most publications (88%) are single authored, and in only 19 (3.5%) Margalef is not the first author. A large amount of this information is written in languages other than English and is the descriptive, experimental, theoretical and philosophical basis of his most well known contributions in the field of plankton structure and theoretical ecology. Margalef was a polyglot and published in seven different languages, with Spanish the most numerous (63%), followed by English (18%), Catalan (14%), and French (4.8%). He also published three papers in Italian, two in German and one book in Russian, that was translated for him despite the fact that he had some knowledge of the language.

Margalef first published in English in 1948, five years after his first paper and after authoring or co-authoring over 37 publications. Having a naturalist start, it was only natural to publish most of his early results in languages close to the source of his studies following European tradition. Later on he would publish more in English but he would never leave Spanish and also significantly contribute in Catalan. Why? I will here speculate to a large degree and even go out on a limb. I believe Margalef never actively sought public or even scientific prominence, which would have been probably even greater had he published most of his work in English. He loved to write and would never refuse an invitation to contribute to a meeting, a book, or a journal, adapting to the readership whatever the language and format.

Spanish society had never regarded science highly and it was customary to publish the meager scientific output in Spanish. Post Civil War Spain of general Franco was an autarchy, a country relatively isolated, that did not help in the internationalization of science. Despite this unfavorable environment, Margalef was the catalyst that started three different journals (*Publicaciones del Instituto de Biología Aplicada* in 1945, *Investigación Pesquera* in 1955, and *Oecología Aquatica* in 1973), and contributed profusely to them, bringing at least *Investigación Pesquera* (later *Scientia Marina*) to widespread international recognition. Did he contribute to these journals mostly in Spanish so that the local authorities would be more content and cover the costs of the journals? Maybe. Francisco García del Cid, mentor of Ramon Margalef in the early years and director of the IIP until his death in 1965, felt more comfortable than Margalef in the bureaucratic hallways of Madrid and could have talked him into the convenience to publish in Spanish. Just maybe.

Since an early age, Margalef sought information in any language it was available and probably this reflected in his not worrying about the language he was using to write, assuming that readers would make the extra effort if genuinely interested. It does seem that Margalef's textbooks *Ecología* and *Limnología* were consciously written in Spanish to aid students in their courses at the University of Barcelona and in Latin America. Margalef visited many Latin American universities and research centers and taught numerous courses. In fact, the book *Comunidades Naturales* (Margalef, 1962) was the result of lectures in Puerto Rico and served as a basis for the later *Ecología*. Also the book *Ecología Marina* (Ginés & Margalef, 1967), with several chapters contributed by Margalef, served to teach students from both sides of the Atlantic. At a time when English was not as extended in universities of Spanish-speaking countries as it is today, Margalef probably felt that textbooks would do a greater service in Spanish.

Margalef accepted most all invitations to contribute in writing. He went to numerous meetings and it was not unusual for him to publish his most recent results in the hard to find congress and workshop proceedings. Interested scientists would have attended the meeting and, if not, they could find their way to the source. This would also explain why Margalef, despite his renowned contributions, has no papers in *Nature* or *Science* and only contributed once to *Limnology and Oceanography*. Most likely he did not even consider these issues, as setting up a higher impact publication strategy would have distracted him from writing itself. Another aspect to take into account is Margalef's writing style, tending to relate many different disciplines to a particular scientific issue and with an inclination to philosophical considerations about science, that would not fit easily into orthodox journal templates. His books, book chapters and meeting proceedings allowed the greater freedom he needed to fully develop his ideas.

All in all, many of Margalef's publications are not easily available, an issue I have tried to partly remediate by providing web access to most of them (www.icm.csic.es/bio/margalef), with an accomplished quality proportional to the support I have received in this endeavor.

DOCTORAL THESIS DIRECTED

1971. Dolors Blasco Font de Rubinat. Acumulación de nitratos en determinados niveles marinos por acción del fitoplancton.
1972. M. Dolors Planas Mont. Composición, ciclo y productividad del fitoplancton del lago de Banyoles.
1973. Joandomènec Ros. Opisthobranchios (*Gastropoda: Euthyneura*) del litoral Ibérico: Estudio faunístico y ecológico.
1974. M. Rosa Miracle Solé. Estructura y dinámica de las poblaciones de la comunidad zooplanctónica del lago de Banyoles.
1976. Antonio Cruzado Alorda. Afloramiento costero en el Atlántico nororiental. Análisis del ecosistema en sus aspectos de hidrografía y producción primaria.
1976. Marta Estrada Miyares. Estudios sobre las poblaciones de organismos acuáticos en medio no uniforme.
1976. Felipe Fernández González. Influencia de la luz, temperatura y materia orgánica particulada en la actividad metabólica y en la alimentación de los copépodos planctónicos.
1976. F. Xavier Niell Castanera. Estudios sobre la estructura, dinámica y producción del fitobentos intermareal (facies rocosa) de la Ría de Vigo.
1976. Julia Toja. Estudio limnológico comparado de dos embalses con distinto grado de eutrofia (Aracena y La Minilla).
1976. Ferran Vallespinós Riera. Estudio comparado del metabolismo del nitrógeno en bacterias y cianofíceas: relaciones con el ciclo del carbono e importancia ecológica.
1977. Miquel Alcaraz Medrano. Ecología, competencia y segregación en especies congénicas de copépodos (*Acartia*).
1977. Joan Armengol Bachero. Los crustáceos planctónicos en los embalses españoles.
1978. Narcís Prat Fornells. Ecología y sistemática de los Quironómidos (*Insecta Diptera*) de los embalses españoles.
1979. Francesc Amat Doménech. Diferenciación y distribución de las poblaciones de *Artemia* (*Crustacea, Branchiopoda*) de España.
1980. Jordi Flos Bassols. Material en suspensió oceànic i la seva distribució en el Mediterrani Occidental.
1981. Francisco A. Comín. Limnología de las lagunas costeras del delta del Ebro: características físico químicas y fitoplancton de la Encañizada.
1981. Tecla Riera Figueras. Variabilitat morfològica de *Tropocyclops* i *Tëmora*: Aproximació crítica a l'ús generalitzat de la biometria en la taxonomia dels copèpodes.
1983. Carlos A. Gracia i Alonso. La clorofila en los encinares del Montseny: Interpretación como una optimización del aprovechamiento de la luz.
1983. M. Pilar López Laseras. Aguas salinas epicontinentales próximas a la costa mediterránea española: estudio del medio.
1984. Enric Ballesteros i Sagarra. Els vegetals i la zonació litoral: espècies i factors que influeixen en la seva distribució.
1985. Miguel Alonso García-Amilibia. Las lagunas de la España peninsular: taxonomía, ecología y distribución de los cladóceros.
1985. Francisco Gómez Figueiras. Ecología del fitoplancton de la Ría de Pontevedra.
1985. Josep Peñuelas Reixach. Briòfits i fanerògames com a invasors de les aigües dolces: distribució, pigments, fonts de carboni i l'obstacle dels espais aeris.
1985. Javier Romero Martinengo. Estudio ecológico de las fanerógamas marinas de la costa catalana: producción primaria de *Posidonia oceanica* (L.) Delile en las Islas Medes.
1985. Luís Zúñiga Moliner. Ecología de los entomostráceos planctónicos de los lagos nord patagónicos.
1986. Celia Marrasé Peña. Experimentos multifactoriales con plancton marino en microcosmos.
1987. Jordi Catalan Aguila. Limnologia de l'estany Redó (Pirineu Central). El sistema pelàgic d'un llac profund d'alta muntanya.
1987. Ricardo Génova. Análisis y significado de los anillos de crecimiento en dos especies forestales: *Pinus uncinata* y *Pinus silvestris* en la Península Ibérica.
1987. Emilia Gutiérrez Merino. Dendrocronología de *Fagus sylvatica*, *Pinus uncinata* y *P. silvestris* en Catalunya.
1987. Sergi Sabater. Estudi de les poblacions d'algues del riu Ter.
1988. Anna Àvila i Castells. Balanç d'aigua i nutrients en una conca d'alzinar al Montseny. Codirector: Jaume Terrades i Serra.
1988. Ricardo Iglesias. Diversidad taxonómica y ataxonomica en poblaciones de insectos: un ejemplo del ecosistema restinga.
1988. Antoni Palau Ybars. El embalse de Baserca (Pirineos centrales, Lérida). Estudio limnológico de un embalse nuevo de alta montaña con bombeo.
1988. Xavier Tomas Quevedo. Diatomeas de las aguas epicontinentales saladas del litoral mediterráneo de la Península Ibérica.
1989. Olga Delgado. Sistema carbónico-carbonatos en el Mediterráneo noroccidental y relación con las principales comunidades fitobentónicas productoras de carbonatos.
1990. M. José Gil Quílez. Estudios sobre ácaros de aguas continentales españolas.
1990. Agustín Lobo Aleu. Estudios sobre la organización espacial del bentos marino. Una aproximación a través del análisis de imagen digital y de la modelización.
1994. Jordi Camp i Sancho. Aproximaciones a la dinámica ecológica de una bahía estuárica mediterránea.
1997. Gloria Vilaclara i Fatjo. Registro de erupciones volcánicas en las diatomitas lacustres de Tlaxcala, México.
2001. M. Luísa Cros i Miguel. Planktonic coccolithophores of the NW Mediterranean.

EXCELLENCE IN EDUCATION

Education is an experience that has a formative effect on the mind and/or character of an individual. Ramon Margalef was an excellent educator. His classes were packed with students avid for his teaching even if they were only comprehending but a sliver of his reasoning. I would think that his lectures were an unconscious reflection of his mental process, with oral information output necessarily lagging behind a leaping mind that was touching on diverse bits of information all related to a particular subject. Talking to him was a similar experience. Interestingly, I have met only one other person who would do rather the same both in conversation and lectures, Eugene Odum. Perhaps it is not by chance that both are two of the pillars of 20th century ecosystem ecology.

If Margalef was good at knowing facts and generous at transmitting them to students and colleagues, he was unmatched at providing interesting, thought-provoking ideas for research subjects, leads, as I called them above, to develop whole theses and even research careers. Margalef taught at the University of Barcelona from 1955, but not exclusively. He also lectured at Woods Hole, the Université de Paris and Institut Océanographique, the University of Chicago, the Universidad Nacional Autónoma de México, Yale University, the University of Perugia, the Instituto Agronómico Mediterráneo de Zaragoza, the Université Laval, the Université du Québec at Montréal, the University of California at Davis, and in Puerto Rico and Venezuela, among others. Everywhere he inspired generations of students and researchers in limnology, oceanography and theoretical ecology. I would consider his former graduate students, many now holding important positions in academia and otherwise, a rather heterogeneous group bound together as *disciples* of Margalef and in *Margalefian* thinking. He

generated, probably despite his own will, an ecological school of thought or rather a school of thinking about science (Jordi Camp, oral communication August 2009). In aquatic sciences perhaps his greatest contribution that we can readily grasp is the dynamic structuring of plankton driven by nutrients and energy fluctuations. He would not take this as a static, dogmatic idea but rather would continuously revise it in light of new advances in knowledge. Margalef never tried to impose his science even when directing doctoral dissertations, or any other views for that matter. Nevertheless, people around him were becoming *Margalefian* by osmosis, and by way of example, as small children acquire information and become educated by following role models. Margalef emphasized hands-on work, “*you need to go out and bump your head against the trees*,” he would say. Curiosity and careful observation of nature was the basis for later inferences. His scientific findings and views, his approach to science, his attitude towards environmentalism and his life philosophy are luckily available for all humanity in his numerous writings that include 26 published books, seven of which can be considered science popularization works although with a rigorous science flavor. A selected excerpt translated from his first book in 1943 could fit perfectly well in an interview in the eighties or nineties, showing an astounding freshness even today.

“Everyone grants art the right to survive on its own essence,...on the contrary no one tires of asking science for its fruits, without considering that science too can have a human and social meaning independent of practical interests, which are benefits spun off in addition, its source extinguished as soon as we stupidly ignore the value of pure research with no utilitarian prejudice.” (my translation).

Margalef was also a moral authority to be followed. His humanity was as large as his work capacity and inference abilities. He was a kind and modest person that never spoke badly of

anyone else. In compensation I have not heard a single out of chord word about him from anyone that had met him. This is also education. Carles Bas, a fellow fisheries oceanographer from the early days and later director of the IIP, mentions how Margalef visited him at the hospital every week during his 90-day stay after an accident. They were not close friends but Margalef was his only regular visitor and would chat with him for a while, update him on the daily businesses at the IIP and, of course, inform him on new bibliography.

Ramon Margalef was a naturalist, a limnologist, an oceanographer, an ecologist, an entomologist, a biogeographer, a humanist, ... A fitting remark of Josefina Castellví was that “talking about ecology was talking about Margalef but talking about Margalef was much more than talking about ecology.” In these days of compartmentalization of science,



Teaching a laboratory course.

of scientific career races (without rear-view mirrors!), and of increasing interest in the self, it is a soothing choice for education, in its broadest sense, to attach Ramon Margalef's name to the ASLO Excellence in Education Award.

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The complete Margalef bibliography is available through the *L&O Bulletin* Web site and copies of most available through <http://www.icm.csic.es/bio/margalef>.

ASLO NEWS

MESSAGE FROM THE PRESIDENT

Carlos M. Duarte, IMEDEA (CSIC-UIB); Miquel Marqués 21, 07190 Esporles, Mallorca, Spain; president@aslo.org



This issue of the *Bulletin* takes a little more space in your bag than usual. One reason for this is that it contains a wonderful biography of the brilliant Spanish ecologist and aquatic scientist Ramón Margalef composed by Francesc Peters. I am sure you have already enjoyed reading it before paging forward to find this message. As you know ASLO initiated a new award in 2009 named after Ramón Margalef. The award recognizes

excellence in education, a task at which Ramón Margalef was as formidable as he was in the development of theory and concepts. The first ASLO Ramón Margalef Award for Excellence in Education was presented at the Aquatic Sciences meeting in Nice, 2009, to Benjamin Cuker, recognizing in particular his leadership and contribution to mentoring initiatives for minority students in aquatic sciences. Diversity is indeed an important component of ASLO's mission to foster a diverse, international scientific community that creates, integrates, and communicates knowledge across the full spectrum of aquatic sciences.

I am happy to announce that ASLO has created a new committee on diversity, chaired by Deidre Gibson, elected last year to ASLO's board of directors as member at large (see <http://www.aslo.org/information/adhoc.html> for a full membership list). The charge of this committee is to set a society goal to achieve representation on committees and the board that is representative of the diversity of ASLO's membership in terms of demographics (e.g., seniority, gender, race, etc.), geographic location, and discipline (e.g. molecular ecologists, fluidics, tropical ecology, oceanography, limnology, etc.). This is not intended as a recommendation for attaining a strict numerical result (e.g. not a quota) but rather a recommendation that the representation of members in terms of gender, geographic location, discipline, and seniority be used as a benchmark to evaluate progress (and success!) in attaining diversity in our society. Diversity is one of ASLO's strengths and, accordingly, needs be addressed with care. Please contact Deidre if you have suggestions or ideas that you'd like to share with our new Diversity Committee.

Preparation for the 2010 Summer Meeting (Santa Fé, June 2010), co-organized with the North American Benthological Society (NABS), is well underway, with abstract submission

just closed by the time you would read this message. We look forward to meeting you there! (<http://www.aslo.org/meetings/santafe2010/>). The committee for our Aquatic Sciences meeting in Puerto Rico (San Juan, Puerto Rico, 13–18 February 2011) is assembling a superb program and working hard to render this a memorable meeting. The Puerto Rico meeting will be followed later that year by ASLO's first meeting in Asia (Japan), a milestone in ASLO's history. The organizing committee and the business office are working hard in the organization of this meeting to meet this challenge.

We continue to enjoy the content of our journals, which continue to raise their profile, leading the file, and expand in breath and diversity. The arrangements to launch the new *L&O: Fluids and Environments*, co-published between ASLO and Duke University Press, are well advanced and we look forward to the birth of this exciting new journal. As you will see in the Message from the Public Affairs Office (p17), we continue to be alert to the developments around open access. Through our publications, ASLO strives to achieve the goal of maximizing free access to scientific publications with the sole constraint of balancing this goal with the necessary maintenance of sustainable business models for our publications.

This issue of the *Bulletin* also contains statements from the candidates running for office in the current 2010 elections to the ASLO Board. This includes election of the new president-elect, where you will be voting for one among a pool of three candidates and the election of two members-at-large, where you will be selecting two from a pool of five. We have a superb slate of candidates that ensures that ASLO leadership will continue to be strong in the future. I thank all of them for their willingness to serve ASLO, as well as the members of the nominations committee, chaired by Past President Sybil Seitzinger, for assembling this outstanding slate. Take your time to read their statements, which will help you conform your decision and vote through our electronic gateway. Paul Kemp, our diligent Web master, has conceived a new process to ensure the security and rigor of the voting process while reducing the number of steps to do so. Sybil Seitzinger provides a detailed explanation of the process in her text in this issue of the *Bulletin* (p26).

One component of this issue of the *Bulletin* that is also unusual in length is the obituary section. Sadly, we have lost four important and distinguished members of the ASLO community in the past few months, who served ASLO with enthusiasm and who made fundamental contributions to aquatic sciences through their successful careers. I wish to convey my condolences to their families, friends, and close colleagues; we will all miss them. I was moved by the texts composed by their colleagues, which remind us that the respect, collegiality, appreciation, and admiration for our peers are important values that make ASLO a welcoming society that accompanies and supports the needs of our members along the full span of their careers.



Carlos M. Duarte
ASLO President

MESSAGE FROM THE BUSINESS OFFICE

Helen Schneider Lemay, ASLO Business Office, 5400 Bosque Blvd., Suite 680, Waco, TX 76710-4446; Tel.: 254-399-9635 or 800-929-2756, Fax: 254-776-3767; business@aslo.org



Dear ASLO Members:

The society is well into the renewal cycle, and we hope, by virtue of your reading this *L&O: Bulletin*, you have renewed your membership for 2010. Be sure to encourage your colleagues and libraries to do the same.

2010 is an exciting year for ASLO. The 2010 Ocean Sciences Meeting jointly sponsored by AGU and TOS was the largest ever with over 4,500 people in attendance. The summer meeting will be held jointly with NABS, the North American Benthological Society, in Santa Fe, New Mexico. There will be many new activities including a CSI-like workshop and an afternoon of interactive sessions. These co-sponsored meetings should allow even greater scientific interchange and collaboration. We hope you are able to participate.

Of course, meetings also carry a huge responsibility for us due to their large carbon footprint. ASLO is working hard to develop an offset policy and to look at making our meetings and all society activities as green as possible.

Everyday products also leave their carbon footprint. The UK-based Carbon Trust is working on providing carbon poundage for labels of everyday products. Below are a few samples as taken from the November–December 2009 *Audubon* magazine.

- T-shirt – 1.4 lb. CO₂ each
- Google Search – 2.2 lb. CO₂ per 5,000 searches
- Fat Tire Beer – 7 lb. CO₂ per six-pack
- iPhone – 121 lb. CO₂ per phone
- Cheeseburger -- 7.9 lb. CO₂ each

They even assessed toilet paper (0.002 lb. CO₂ per sheet). Wouldn't it be great if we could get all products to carry this information!

2010 is also the year that ASLO will launch a new journal: *L&O: Fluids and Environments*. This will add to our other L&O publications.

But most of all, ASLO is your society. Please let us know if you have ideas to improve the society or want to get involved.



Helen Schneider Lemay
ASLO Business Manager

MESSAGE FROM THE PUBLIC AFFAIRS OFFICE

Adrienne Sponberg, ASLO Public Affairs Director, P.O. Box 8785, Silver Spring, MD 20907, sponberg@aslo.org



As director of public affairs for ASLO, I'm involved in all things outreach – be it reaching out to policymakers, educators, students, the public, or other scientific organizations. Life is never boring, with new projects cropping up all the time.

Communicating aquatic science is a big part of ASLO's mission. If you look at the 2009 Strategic Plan, five of the nine goals relate specifically to commu-

nicating aquatic science. While ASLO has grown some in the past decade, we're still a relatively small society. We don't have a multi-staff press or education office, so we rely on partnerships with you to make our science heard. Want to get involved? Drop me a line (sponberg@aslo.org) or volunteer to serve on the public policy or education and public outreach committees (<http://aslo.org/forms/volunteer.html>).

In the meantime, here is more information on specific public affairs projects.

USA SCIENCE & ENGINEERING FESTIVAL

ASLO is proud to be an official partner of the inaugural USA Science & Engineering Festival to be held in the Washington D.C. area in October 2010. The festival, which will be the country's first national science festival, is a collaboration of over 500 of the country's leading science and engineering organizations and aims to reignite the interest of our nation's youth in the sciences. The culmination of the festival will be a two-day expo on the National Mall on 23-24 October 2010, which will give children, teens and adults the opportunity to explore all facets of science and engineering through hundreds of fun, hands-on activities.

Got an idea for great hands-on activities for the festival? Please pass it on! If you're interested in attending, we still need one or two volunteers to staff the ASLO booth.

OPEN ACCESS PUBLISHING

Speaking of Washington, D.C., it seems it is only a matter of time before lawmakers in D.C. mandate that all federally-funded research be made available free to the public. While the U.S. already mandates open access for research funded through the National Institutes of Health, it is now considering requiring open access for papers funded through *all* federal agencies. ASLO was among the hundreds of organizations and individuals who responded in January to the White House Office of Science and Technology Policy's request for comments on the issue. An open access mandate has many ramifications for the way society publishers like ASLO operate, in particular, how publication is financed. Traditionally small society publishers have funded publication through subscription revenues.

Depending on the requirements of the open access mandate, subscriptions could drop to a point where page charges would increase (dramatically) to authors to recover lost subscription revenue. The issue is quite complicated and will take up a good bit of the board's time in Portland. Look for a more thorough discussion about this issue in the next issue of the *Bulletin*. In the meantime, ASLO's current open access policy can be read at <http://aslo.org/openaccess.html>. You may also want to look back at Pete Jumars' excellent article on the topic published in the *Bulletin* a few years ago: http://aslo.org/bulletin/08_v17_i1.pdf.

@AQUATICSCINEWS ON TWITTER

One of my regular duties for ASLO is writing and distributing the bimonthly Aquatic Science Policy Updates. When I began working for ASLO in 2001, we had a subscriber list of about 50; today there are over 1,500 subscribers to the reports. While I'm buoyed by the interest in the reports, I also have a deep respect for your inboxes and your time. If you're like me, you're constantly overwhelmed with e-news. I try to limit the reports to the stories that are the most relevant to our community and also least publicized in other venues. Inevitably there is a story or two each issue that doesn't make the cut, or while researching the reports, I run across an excellent story published elsewhere. Rather than leave everyone in the dark, I've set up a Twitter account to pass along links to compelling stories to those who can't get enough news. You can follow me at: <http://twitter.com/aquaticscinews>. I'll pass along links as well as society news through Twitter. (Who else is going to send you the link of Margaret Palmer going toe-to-toe with Stephen Colbert about mountaintop mining?) Not on Twitter? Not a problem. You can



ASLO is seeking partners in outreach and education projects. Do you have educational materials you'd like help distributing on-line? Contact the ASLO Public Affairs Office (via sponberg@aslo.org) to discuss a partnership with ASLO.

view the tweets using the link above without signing up. But if you want to receive the news right away, you'll need to sign up. Feel free to tweet me links as well.

AQUATIC SOCIETIES TEAMING UP...

Very soon you'll have another way to view information from ASLO—as well as several other aquatic science societies including the Coastal and Estuarine Research Federation (CERF). ASLO and CERF are partnering to create a Web portal that will serve as a clearinghouse of public-relevant information about aquatic science. The portal will launch this spring. ASLO's new podcast series will be featured on the site as well. The portal is one of several ways aquatic societies are collaborating in 2010. More about a new multisociety coalition in the next issue of the *Bulletin*!

L&O'S RESPONSE TO CHANGES IN SCIENTIFIC PUBLISHING

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O wonder! How many goodly creatures are there here!
... O brave new world!
Shakespeare, *The Tempest*

In our last report on *L&O* (*L&O Bulletin*, 2010, Volume 18, Issue 2, p. 50–51) we discussed how we are keeping *L&O* abreast of current technical publication trends: faster Web posting, the use of Web appendices, and e-prints instead of reprints. Here we address a more fundamental issue that goes to the core of the traditional peer-review system and explain how *L&O* fits within this changing scientific publishing landscape and is responding to this change.

THE SITUATION

In the fall of 2009, an *L&O* reviewer notified us that the manuscript we had sent him was already published. A Google search confirmed that the paper appeared on the *Biogeosciences Discussions* (BGD) Web site, complete with a volume number and page range. When we told the author that *L&O* does not consider publication of papers already published, she replied that the manuscript had been rejected by *Biogeosciences* (BG). Checking again, we confirmed that the article was in fact available on-line with full citation details, and there was nothing indicating that the manuscript was rejected. We notified the author that the *L&O* review process would be on hold until the paper was removed from the BGD Web site. When the author requested that the paper be removed, the BG editorial office replied that this would not be possible; i.e., that BGD papers remain on-line in perpetuity regardless of the outcome of the review process. The author was now in the vexing situation of having a published but rejected paper, and could not get it “unpublished.” Therefore, *L&O* could not consider it for publication (and, we hope, other peer-viewed journals wouldn't either).

DIGGING DEEPER

Feeling that we must be missing something, we went to the BG Web site, and this is what we found: “In the first stage,

papers that pass a rapid access-review by one of the editors are immediately published on the *Biogeosciences Discussions* (BGD) Web site. They are then subject to interactive public discussion, during which the referees' comments (anonymous or attributed), additional short comments by other members of the scientific community (attributed) and the authors' replies are also published in BGD. In the second stage, the peer-review process is completed and, if accepted, the final revised papers are published in BG. To ensure publication precedence for authors, and to provide a lasting record of scientific discussion, BGD and BG are both ISSN-registered, permanently archived and fully citable.” No misunderstanding here—BG knows exactly what it is doing.

Further investigation revealed that all EGU journals use the same publication model, with associated “Discussions” publications (*Ocean Sciences Discussions, Hydrology and Earth System Sciences Discussions, Climate of the Past Discussions, etc.*). We also found a Frequently Asked Questions page on the *Ocean Sciences* Web site (http://www.ocean-science.net/general_information/fq.html#chapter7) that attempted to address the awkward situation faced by the unfortunate *L&O* author, whose manuscript was now in limbo without, in our view, providing a satisfactory resolution.

Wondering if there were other manuscripts under review at *L&O* that had been rejected by *Discussions* journals but were still on-line, we did a comprehensive search in our files and found none. But our search did reveal another disconcerting situation. Several *L&O* submissions and page proofs contained *Discussions* citations, which we had assumed were peer-reviewed papers. We determined that some of these papers had ultimately been published in the parent journals, and we updated these citations accordingly. The fate of the remaining *Discussions* citations was unclear—they could still be under review or they might be rejected. There was no way to know. Obviously, *L&O* does not want to cite rejected manuscripts.

When in doubt, we ask the *L&O* associate editors for advice, hoping that their collective experience will provide guidance. But it turned out that very few of them were aware of the details of the *Discussions* publication model, and many expressed surprise and concern that rejected papers remain on-line and are formally published and deemed citable under the EGU publication model.

L&O'S RESPONSE

On reflection, we concluded that *L&O*'s current editorial policy covers the two situations that concerned us: 1) papers submitted to *L&O* that are published on-line by another journal but were formally rejected, and 2) citation of papers whose status at the journal that has published them on-line is unknown (under review, in press, or rejected).

Papers submitted to L&O that are published in “Discussions” Web sites—EGU has adopted a publication model where material that is either under consideration for publication, rejected for publication, or accepted for publication remains published on-line in the associated *Discussions* journal. All such articles are deemed to be published by EGU and assigned the full trappings of publication (author, year, title, volume, and page range). *L&O*'s current policy covers this situation, as stated on our Web site: “*L&O*'s criteria for rejecting a manuscript on the basis of

potential or actual dual publication include any paper that has been published, any paper that is accepted for publication, and any paper that is under consideration for publication in another peer reviewed and copyrighted publication.” Since there is misunderstanding around the EGU model, the current *L&O* policy needs only clarification. We’ve added a sentence to the *L&O Guidelines for Authors* Web page to explicitly cover the situation: “On-line publication in a discussion forum, including but not limited to *EGU Discussions* journals, will preclude papers from consideration by *L&O*.”

Citation of “Discussions” papers—*L&O* does allow citation of both peer-reviewed and other authoritative references (e.g., white papers, government documents, books, book chapters, conference proceedings) and even some material that has not been peer reviewed (“personal communication” and “unpublished”). But the status of each of these types of material is clear. On the other hand, *Discussions* citations all look the same whether actually in review, accepted, or rejected. There is no way to know the status of the paper without going to the *Discussions* forum and reading the comments—and even then there is no **ACCEPTED** stamp, or **REJECTED** stamp to aid the reader. The only way to discern the status of the paper is to search for it in the parent journal. If it is there, it has been accepted. If not, it’s still under review or rejected.

How then should we treat a *Discussions* citation, which is published but whose status is unidentified? We looked at each case:

- **UNDER REVIEW**—*L&O* does not allow citation of a paper under review (regardless of which journal it is in). If the ideas or data in such a paper need to be cited, they are referred to in *L&O* as “unpublished” or “personal communication” and that paper is not listed in the reference list. We specifically do not allow “submitted” references.
- **ACCEPTED**—If a paper in a *Discussions* journal is accepted, the citation should be to the paper in the parent journal, not to the *Discussions* paper.
- **REJECTED**—If a paper is rejected, it cannot be cited in *L&O*. We do not allow citation of material that is rejected on the basis of peer review because the clear intent of peer review is to filter out flawed work.

In each case, the *Discussions* citation is not acceptable in *L&O*. We understand EGU did not set out to publish rejected material but, under their 2-step publication model, this is indeed the outcome for all rejected manuscripts

L&O reviewers may be, as we were, unaware of the nature of references to *Discussions* papers, and it is important that they are not misled by the fact that these references carry a year, volume, and page range, which to many implies that the articles are peer reviewed published papers. To avoid misinterpretation by *L&O* reviewers, *Discussions* citations in manuscripts submitted to *L&O* will henceforth be marked with “This manuscript is submitted to an on-line discussion forum and cannot be cited in *L&O*.” If a revision of the paper under review at *L&O* is invited or if the paper is accepted, the authors will be *required* to remove *Discussions* citations from the list of references and change citations in the text to “personal communication.”

WHAT DOES THIS MEAN FOR YOU?

The Internet has greatly facilitated scientific publication. It has also made possible the creation of entirely new types of publication venues that do not conform to the traditions of the pre-Internet era peer-review system. In this ‘brave new world’ all is not what it might seem—a reference in the format of a peer-reviewed journal may not have passed peer review; it might very well be rejected work that is published on the Internet. Similarly, authors who are considering submitting their work to a journal that publishes submissions on-line should be aware of the possible consequences. If their work is not accepted, it could end up in scientific limbo because traditional journals will very likely consider it as already published. While one intent of EGU’s publication model is “to ensure publication precedence for authors,” in practice it can serve as a barrier to publication.

OUTSTANDING *L&O* REVIEWERS

Everett Fee, *Limnology & Oceanography* Editorial Office, 343 Lady MacDonald Crescent, Canmore, AB T1W 1H5, Canada; lo-editor@aslo.org

Peer review is a crucial component of modern science. The fact that *L&O* is able to utilize the services of the best scientists as reviewers allows it to be a leading journal in the aquatic sciences. However, these individuals seldom get the recognition they deserve for this selfless work. Therefore, each issue of the *Bulletin* will cite outstanding reviewers that Everett Fee, *L&O* Editor, feels deserve special recognition for their overall review-

MAKE YOUR VOICE HEARD IN D.C.... WITH JUST A FEW CLICKS!

ASLO has partnered with AIBS to make contacting lawmakers as easy as 1, 2, click...visit <http://capwiz.com/aibs/home/> to send letters to your member of Congress and track aquatic science policy.

ing efforts. The ASLO membership extends its sincerest appreciation and thanks these two outstanding scientist(s).



JEFFREY CHANTON

Jeff Chanton is a native of the Gulf Coast: Louisiana, Mississippi, and Florida. He received his Ph.D. from the University of North Carolina at Chapel Hill and has been on the faculty of Florida State University in the Department of Oceanography for 22 years. His research focus is on the production of greenhouse gases by the biosphere.

He teaches undergraduate classes in oceanography and issues in environmental science and currently supervises 10 graduate students. He is the John Winchester Professor of Oceanography and a Distinguished Research Professor.



LUCAS STAL

Lucas Stal is head of the Department of Marine Microbiology of the Centre of Estuarine and Marine Ecology of the Netherlands Institute of Ecology and also holds a chair in Marine Microbiology at the University of Amsterdam. His research has focused on the ecology, physiology and diversity of marine cyanobacteria, particularly also

on benthic and pelagic N_2 -fixing species. Recently he started a more comprehensive study on the nitrogen cycle in coastal seas and marine sediments by using a combination of the expression of functional genes and stable isotope probing techniques. His group is also known for studies on photosynthesis and carbon metabolism in cyanobacteria and microalgae. Furthermore, his group studies the diversity and microbial interactions in microbial mats and stromatolites using metagenomic approaches. Stal is involved in the Census of Marine Life field project "International Census of Marine Microbes" that aims at unraveling the diversity of microorganisms in the sea. His group maintains a collection of more than 500 strains of marine cyanobacteria and microalgae (Culture Collection Yerseke, CCY).

GETTING TO KNOW YOUR L&O ASSOCIATE EDITORS

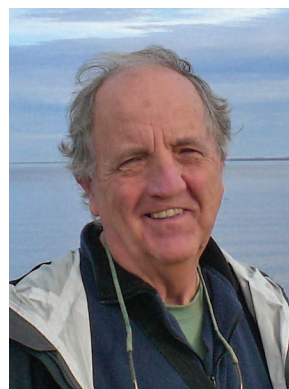
Everett Fee, Limnology & Oceanography Editorial Office, 343 Lady MacDonald Crescent, Canmore, AB T1W 1H5, Canada; lo-editor@aslo.org

The next time that you browse an issue of *L&O*, we hope that you will take a moment to peruse the list of Associate Editors (AE) on the inside of the *L&O* front cover. These are the people whose hard work determines what is published in *L&O*. ASLO

acknowledges the important work that these people do for the society; AEs are featured in each issue of the *Bulletin*.

The role of the AE is that of an impartial judge—to fairly assess the reviewers' comments and guide the author's next steps. About every two weeks an AE is assigned a new manuscript. His or her first task is to select reviewers; this delicate job requires profound knowledge of both science and politics (the often conflicting relationships among people in a society). When the reviews are received, the AE digests that input along with his or her own assessment of the manuscript to arrive at a decision. It is unfortunately quite common for reviewers to recommend very different fates for a paper, which puts the AE in the uncomfortable position of having to make at least one of the reviewers and perhaps the author unhappy. For *L&O*, the AE's final job is to edit accepted manuscripts, suggesting wording and organizational changes to improve clarity.

L&O AEs work at the highest level of our profession. Being an AE is a very demanding job, and we are extremely fortunate that these people devote so much time to the ongoing challenge of making *L&O* the leading journal in the aquatic sciences.



ROBERT HECKY

Bob Hecky is a Presidential Endowed McKnight Professor for Lake Ecology in the Biology Department and Large Lakes Observatory at the University of Minnesota-Duluth. His research interests are focused on the algal ecology, nutrient biogeochemistry and paleolimnology of the Great Lakes of Africa and North America. He handles manuscripts

on those topics for *Limnology and Oceanography*.



SAMANTHA B. JOYE

Samantha (Mandy) Joye is a professor in the Department of Marine Sciences at the University of Georgia. Mandy received her Ph.D. in 1993 from the University of North Carolina, where she worked with Hans Paerl studying nitrogen cycling in coastal estuaries. She continues to study nitrogen and phosphorous cycling in a variety of habitats, ranging from

coastal estuaries to the deep sea. She also does a substantial amount of work on methane cycling in aquatic systems, including deep sea, saline lake, and permafrost environments. Mandy's other service to ASLO includes being a member-at-large of the board, a member of the public policy and publications committees, and co-chairing the 2003 Aquatic Sciences meeting in Salt Lake City, Utah. As associate editor for *L&O*, she handles manuscripts on the following areas: biogeochemistry, nitrogen cycling, methane cycling, nutrient limitation, groundwater dynamics, and microbial ecology.

OBITUARIES

GERARD CAPRIULO, 1953–2009

Contributed by **George McManus**, Department of Marine Sciences, University of Connecticut, Groton, CT, 06340, USA; george.mcmanus@uconn.edu; **Edward Carpenter**, Romberg Tiburon Center for Environmental Studies, San Francisco State University, Tiburon, CA 94920, USA; ecarpent@sfsu.edu



Jerry Capriulo, 1953–2009.
Photo courtesy of St. Mary's College of California

Gerard “Gerry” Capriulo died suddenly at his home in Clayton, CA, on 15 November 2009. He had earlier that day led a field trip for students from St. Mary’s College of California, where he was Fletcher Jones Professor of Biology & Ocean Science, an endowed position he had occupied since 1997.

Gerry was born in Brooklyn, NY, and starting as an undergraduate he had a strong collaboration with Ken Gold at the New York Aquarium, where he acquired his enthusiasm for tintinnid ciliates.

He graduated magna cum laude from St. John’s University and earned Master’s and Ph.D. degrees from Stony Brook University on Long Island. After graduate school, Gerry joined the faculty of the State University of New York at Purchase, where he eventually became chair of the Environmental Science Department. While at Purchase, he taught a summer course in Marine Microbial Ecology at the Shoals Marine Lab, and lent his expertise to many environmental organizations, including Save the Sound, Connecticut Audubon, and the Norwalk Aquarium. He was similarly engaged in service activities after his move to California, serving, for example, on the board of the Marine Conservation Research Institute of the Aquarium of the Pacific. Just before his death he was working on plans for an environmental education vessel to take school children from the Oakland area out on San Francisco Bay.

Gerry made significant contributions in marine biology and plankton ecology, including his study of tintinnid feeding impact on phytoplankton in Long Island Sound and his studies of plankton in the Hudson River. He edited a book, *Ecology of Marine Protozoa* (Oxford 1990), that provided one of the first comprehensive reviews of an important link in the emerging microbial loop paradigm. He had an abiding interest in symbioses, and in recent years directed his research efforts towards algal symbiosis in the aggregating sea anemone *Anthopleura elegantissima*.

Gerry will likely be remembered most for his personal traits. These included creativity, expressed through nature photography and playing guitar, and an infectious enthusiasm. He was also gifted with legendary persistence, soldiering on through rough weather in small boats to get his samples despite his strong susceptibility to seasickness. And he was a man of faith. He seemed to find his niche at St. Mary’s, where he could

combine his scholarship with his faith as well as convey his love for the sea to his students. He helped develop an annual forum at St. Mary’s on “God and Science,” where the connections between faith and scientific investigation could be explored, and he wrote many pieces on science, nature, and faith for popular consumption.

Gerry is survived by his wife, Amelia, daughters Lauren and Rebecca, and a large extended family. He will be missed by all of us who were touched by his boundless enthusiasm for the ocean and its microbial inhabitants. Memorial donations may be made to the St. Bonaventure Catholic Church Capital Campaign, 5562 Clayton Road, Concord, CA 94521 (Contact: christa.fairfield@stbonaventure.net).

ROBERT FENAUX, 1927–2009

Contributed by **Gabriel Gorsky**, Laboratoire d’Océanographie de Villefranche-sur-Mer, Villefranche-sur-Mer 06230, France; gorsky@obs-vm.fr; **Marsh Youngbluth**, Harbor Branch Oceanographic Institute, Fort Pierce, FL 34946, USA; youngbluth@hboi.edu



Robert Fenaux, 1927–2009.

Robert Fenaux was born in Hayange, Moselle (northeastern France) in 1927. He initially studied architecture (1948–1950) but later decided to pursue a curriculum in physical, chemical and natural sciences (SPCN) and went to the Station Zoologique de Villefranche sur Mer to collaborate with Gregoire Trégouboff. He completed a degree of Licencié-ès-Sciences (Bachelor) in 1957. Subsequently, he joined the French science organization,

the National Centre of Scientific Research (CNRS) and in 1963 obtained the Doctorat d’Etat on the ecology and biology of Mediterranean Appendicularians. His wife, Lucienne, who he had met in Paris and who became a specialist in the biology of larval echinoderms, joined him in Villefranche-sur-Mer, where they married.

The contributions of Robert Fenaux to the knowledge of the biology, biogeography and taxonomy of appendicularians were substantial. When he began his investigations in the mid-twentieth century, this important group of fragile zooplankton was very poorly known. Robert Fenaux became one of the world’s foremost authorities on appendicularians. He published 120 papers in the scientific literature, participated in numerous oceanographic cruises and presented his research at many national and international scientific meetings. Among his personal highlights were explorations along the South American Atlantic coastal zone with Jacques Cousteau. In 1956 he dove in the Galeazzi bathyscaph and subsequently utilized other scientific submersibles (the French *Cyana* (IFREMER) and the American *Johnson-Sea-Link* (HBOI)) to observe and collect previously unknown species of deep-water appendicularians. These ventures led to descriptions of eight new species and stimulated his monograph on the clas-

sification of appendicularia published in 1993, which remains the standard reference for marine taxonomists.

Robert Fenaux retired in 1995, but he remained active and co-authored several publications thereafter. Robert left us on 2 September 2009 at the age of 82. Mireille and Jean-Loup (his children) and his many friends and colleagues will miss him.

BARUCH KIMOR, 1918–2009

Contributed by **Bella Galil**, *Israel Oceanographic & Limnological Research and National Institute of Oceanography, P.O.B. 8030, Haifa 31080, Israel; bella@ocean.org.il*, **Gabriel Gorsky**, *Laboratoire d'Océanographie de Villefranche-sur-Mer, Villefranche-sur-Mer 06230, France; gorsky@obs-vlfr.fr*



Baruch Kimor, 1918–2009.

Baruch Kimor passed away on 9 October 2009 at the age of 91 in Haifa, Israel. He pioneered the study of microplankton taxonomy and ecology in Israel and was internationally recognized for his contributions to Mediterranean Planktonology. Baruch Kimor served as a corresponding member of the Société Royale des Sciences de Liège, Belgium, and in 1991 was awarded the Trégouboff Prize by the French Academy of Sciences.

Baruch Kimor was born in Iasi, Romania in 1918. He studied law and economics at the University of London King's College, but after a couple of years he followed his natural inclination and transferred to Reading University where he took up agriculture and biology. In 1940 he immigrated to Palestine and was among the first graduates of the newly established Faculty of Agriculture in Rehovot. In 1952 he received a Ph.D. in Aquatic Sciences from the Hebrew University for his research on plankton in fish ponds. At the time, mass kills were decimating the nascent fish farming industry in the Jordan Valley. Kimor set up his "field laboratory" among the fish ponds of the Tel Amal kibbutz. The fish-killing organism was identified as *Prymnesium parvum* Carter—a toxic algal species commonly found in low salinity lakes. Kimor was involved in the studies that led to its successful suppression and his lab evolved into the National Fish Health Laboratory. During his three years' stay in Tel Amal he also served in the Israel Defense Forces in 1948–49.

Kimor joined the research staff of the Sea Fisheries Research Station of the Ministry of Agriculture, (later, Israel Oceanographic and Limnological Research) as principal research biologist. Concurrently, he was one of the founding staff members of the Lowdermilk Faculty of Agricultural Engineering at the Technion – Israel Institute of Technology. He also served as visiting professor at the Hebrew University of Jerusalem and taught at the Inter University Institute in Eilat. He continued teaching for many years after his official

retirement. Kimor's research was wide ranging – he published seminal articles on the freshwater plankton of fish ponds and the Sea of Galilee, and the marine phyto- and zooplankton of the Mediterranean and Red Sea. He was aware of the anthropogenic changes in the Levant, and especially the changes brought about by the Aswan Dam and the Suez Canal. He served in international bodies, such as UNESCO and SCOR (Special Committee for Oceanic Research). He was a member of the Consultative Committee for the Indian Ocean Biological Center in Cochin, India, and later the first chairman of the UNESCO-sponsored Advisory Council for the international oceanographic sorting centers. He has also served as a member of the Group of Experts on the Preservation of Materials in the Marine Environment, sponsored by the OECD (Organization for Economic Cooperation and Development), on problems of fouling and corrosion of ships' hulls.

Baruch Kimor introduced two generations of Israeli scientists to the world of planktonic flora and fauna. He published widely and frequently addressed international conferences, most recently on the topic of the impact of man-induced perturbations on marine ecosystems. To the last he was active in research and education, collaborating with much younger scientists. His latest project, together with members of the faculty of Civil and Environmental Engineering at the Technion, concerned use of mass-cultured microalgae to reduce carbon dioxide concentration in a heavily industrialized zone of Haifa Bay. He wrote a friend "...This development is of particular importance and encouragement for me, in view of the fact that it has a potential practical application of my life time work."

PETER VERITY, 1953–2009

Contributed by **Deborah Bronk**, *The College of William and Mary, Virginia Institute of Marine Science, P.O. Box 1346, Gloucester Point, VA, 23062, USA; bronk@vims.edu*; **Marc Frischer**, *Skidaway Institute of Oceanography, 10 Ocean Science Circle, Savannah Georgia 31411, USA; marc.frischer@skio.usg.edu*



Peter Verity.

Peter Verity was a great scientist, a wonderful collaborator and a good friend. We lost him 31 December 2009 after he sustained injuries in a fall.

He received his B.A. in 1975 from Dartmouth College, which suited him for he was the meticulous New Englander in his approach to science. He went on to complete a M.S. in 1979 and Ph.D. in 1984, both at the University of Rhode Island under the advisement of Ted Smayda.

He joined the faculty of Skidaway Institute of Oceanography in Savannah, GA, in 1986.

Peter was the author or co-author of more than 100 scientific articles and papers and was a frequent speaker at professional

conferences. His research interests include microzooplankton ecology and feeding interactions among plankton, gelatinous plankton, and invasive jellyfish. He was the author of some classic papers on the role of life cycles in ecosystem function and did groundbreaking work within the Ocean Margins Program on the microzooplankton ecology and biogeochemistry of the Mid and South Atlantic Bights. Peter worked on the nagging problem of quantifying detritus in aquatic systems and made several important contributions to the literature in this area. Another research focus was the status and future of ocean ecosystems as they respond to increasing climate variability and human perturbations. His more recent focus had been on the ecology of *Phaeocystis*, which he examined within a large interdisciplinary biocomplexity project that he directed.

Peter was also well known in the environmental community for his work on the impact of coastal land use and development upon the environmental quality and ecosystem health of Georgia estuaries. He did Broader Impacts before NSF made it a requirement. He was a frequent speaker to local civic and environmental groups, and was recently awarded the prestigious Nick Williams Award for Coastal Sustainability by the Center for a Sustainable Coast.

Peter was also a dedicated and passionate teacher who believed that perhaps the most important contribution of his professional career would be the legacy of his teaching and outreach efforts. Verity served on the graduate faculties of Armstrong Atlantic State University, Savannah State University, University of Georgia, and Georgia Institute of Technology, where he taught, advised and mentored graduate and undergraduate students. He was especially devoted to increasing diversity in the sciences. He also served on numerous advisory groups and committees responsible for the development and implementation of science curriculum in the public school system and for the preparation of future teachers.

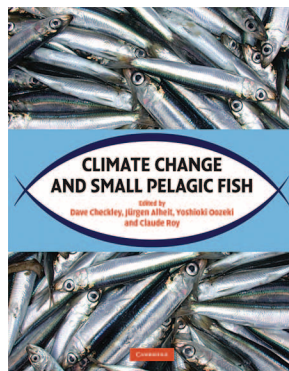
As a person Peter was uniquely gifted in his ability to inspire and motivate those around him to examine their priorities and to reach valuable realizations. He pushed those around him to be better than they thought they could be and was never afraid to ask tough questions. He was fun and funny, serious and superfluous, comforting and irritating. He was someone worth knowing and who impacted his family, friends, students, teachers, and colleagues profoundly.

Peter believed, and lived, the motto “work hard, play hard.” This passion was evident in his approach to science, sailing, friendships, students, teaching, and his beloved dogs. We will remember Peter as the consummate host. Those fortunate enough to have sat at his table were greeted with science debates, fine food and a lot of laughter. He loved his wife, Melanie, who had been his traveling companion to science meetings and fieldwork around the world for over 20 years. Melanie, you will always be welcome at ASLO meetings! He would have loved how she ended his memorial service – the attendees held up lighters, while the band played Peter’s favorite song – Free Bird!

BOOK REVIEWS

DAVID M. CHECKLEY, Jr., JURGEN ALHEIT, YOSHIOKI OOZEKI AND CLAUDE ROY. 2009. **Climate Change and Small Pelagic Fish.** Cambridge University Press. ISBN978-0-521-88482-hardback 372 pp. CDN \$ 155

Reviewed by Timothy R. Parsons, Institute of Ocean Sciences, PO Box 6000, Sidney, BC, Canada V8L4B2; parsonstimothy@shaw.ca



The editors of this book have brought together 82 authors of 15 Chapters (manuscripts) to describe a scientific history of what is largely a fascinating story of the anchovy/sardine fisheries of the world’s oceans. Other small pelagic species are included in this framework.

Chapters 1 and 2 deal specifically with historical organizations and scientific management. The main conclusion of these reviews is that, despite enormous effort, there is currently no accepted theory of the fishery/oceanographic dynamics of small pelagic fishes that can provide predictions for ecosystem-based management.

Chapter 3 mostly defines the geographical boundaries of the world’s anchovy and sardine habitats, while noting that in recent years, there has been some shift poleward of these areas. From scales found in sediments, Chapter 4 describes an extraordinary history of populations of sardines and anchovies over the last 600 years. These results illustrate large variations in abundance of both species, which are independent of fisheries harvests, and generally show a lack of synchrony between the two species. Such results make a strong case for climate control of small pelagics. Chapter 5 continues on this theme by indicating that small pelagics respond to bottom-up forcing of the ecosystem, which itself is driven by changes in ocean conditions. Such changes have been called regime shifts, and they are believed to include changes in the whole ecosystem community. How these shifts might occur is discussed in Chapter 6 with respect to bio-physical interactions on the transport, growth, mortality and behaviour of populations.

Chapter 7 gives an excellent account of the food and feeding of small pelagics, including some examples of herring and sprat. Chapter 8 introduces the speculative use of trophic models to tie together food, feeding, growth, interactions, etc. with the concluding statement that “model simulations presented here are purely illustrative of extreme situations of collapse or closure of small pelagic fisheries and should not be considered in the quantitative predictive sense” (p.182). But what else should models be for?

Chapter 9 is a factual summary of current trends in the assessment and management of small pelagic stocks. The authors raise the dreadful (and all too often practiced) spectre of management decisions based on political and poorly explained

socio-economic decisions running counter to scientific advice. This latter problem is taken further in Chapter 10 where the economics and immediate needs of developing countries for food dictates maximizing the harvest whenever it is available. International cooperation is required in these circumstances but without a clear picture on how climate change is going to impact small pelagics, such cooperation may be difficult. In Chapter 11 this theme is further developed as an urgent plea for integrated work that would bring together the social sciences and humanities with the natural sciences. The example of medicine is given as an area where such integration has been established.

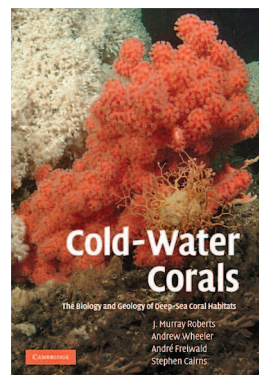
Chapter 12 proposes a hypothetical mechanism for adult stock variations based on low-frequency flushing and retention of sardine and anchovy larvae. Since these fish are generally found in boundary currents, the potential for such an explanation appears to be worth further investigation. Chapter 13 continues in a futuristic theme, and it is the only chapter in which the author brings up the idea that some new forms of methodology (e.g. automated fish egg surveys) might be needed to expand our understanding. This diagnostic need should have been given much greater emphasis in the book. In another branch of applied biology, medicine, extraordinary advances have been made using the latest diagnostic equipment to produce new kinds of data. And yet, in this book, most of the discussion comes down eventually to data on fish stocks. There is little or no suggested use of AUVs, gliders, sophisticated satellite data or “instruments and sensors that would have been inconceivable a few years ago” (p.307). After decades of emphasis on various kinds of fisheries models, fisheries scientists in this dynamic inter-play of small pelagics and climate change might do well to come out from behind their computers and take to the oceans to diagnose what is really happening.

In a broad sense, Chapter 14 is a compendium of the most important areas and problems that need to be researched in respect to small pelagic fishes and climate change. The authors elaborate on three areas: productivity and composition of lower trophic levels, distributional changes, and changes in water circulation. They conclude that many of these changes are already under way which makes some predictive science all the more important. In Chapter 15, the final chapter, the authors summarize some of the texts and point to the need for global studies and continuing international organization.

In general, the editors are to be congratulated on their careful selection, preparation and editing of the manuscripts. This book belongs in every fisheries library and is an excellent personal text for anyone working in the area. Parts of the text might also be used in graduate teaching.

J. MURRAY ROBERTS, ANDREW WHEELER, ANDRÉ FREIWALD and STEPHEN CAIRNS. 2009. **Cold-water corals. The Biology and Geology of Deep-Sea Coral Habitats.** Cambridge University Press. ISBN-13: 9780521884853, 334 p. UK £65 (Hardback). Also available as e-book: ISBN-13: 9780511537233, US\$ 100.

Reviewed by **Conny Maier**, Microbial Ecology and Biogeochemistry Group, Laboratoire d’Océanographie de Villefranche-sur-mer, 06234 Villefranche sur mer, France; maier@obs-vlfr.fr



“There are more coral species in deep, cold-waters than in tropical coral reefs. This broad-ranging treatment is the first to synthesize current understanding of all types of cold-water coral...” This is how the book is introduced on the cover page. It made me curious, to see if a book could live up to this rather ambitious statement, knowing that many topics of cold-water coral research are still in their infancy.

The book is structured into eight main chapters, starting with a chapter on the “History and research approaches,” and gives insight in some of the pioneering work of mostly taxonomists. However, it very well illustrates the technological challenges and logistic limitations in studying cold-water corals even today.

Chapter 2, titled like the book, “Cold-water corals” starts with a citation by Thomas Wayland Vaughan: “It is temperature rather than depth that controls the bathymetric distribution of all corals except the shallow-water forms...” After this citation I actually expected the temperature range for “cold-water corals” to be defined and, that following such a definition, the corals discussed in the book to be those confined to this temperature range. Yet, the authors provide a definition of corals in general and explain, that 65% of the 5160 species of “corals” occur in water deeper than 50 m. So, in this chapter which is literally dedicated to “cold-water corals,” the corals are actually defined by depth, rather than temperature, which is a bit confusing: A depth of 50 m can still easily comprise warm-water corals. It is thus unclear if the taxonomic groups and species numbers assigned as “deep-water corals” in respective tables are actually cold-water corals, or if they may also comprise corals that occur in temperate or even tropical waters. The authors do explain the difficulty in categorizing coral species according to their temperature range. Despite this problem, the chapter does provide a thorough overview on the taxonomic groups of corals and their ecological categorization. It further discusses environmental controls and global patterns of scleractinian diversity including aspects of molecular phylogeny. Chapter 3 is dedicated to the biology of (cold-water) corals encompassing anatomy, morphology, nutrition and growth. A table on linear or radial skeletal growth synthesizes literature data and provides an elaborate overview on growth of a number of cold-water coral species. Two further sub-chapters deal with the eco-physiology, and with the little amount presently known on the reproduction of cold-water corals.

The fourth chapter defines cold-water coral reefs and carbonate mounds, describes how reefs and mounds develop, and is followed by a chapter where the habitat and ecology of cold-water corals are described. Here an important part is the topic of biodiversity and a description of taxonomic groups associated with the cold-water coral ecosystems, and, in the end, the potential of predictive modeling is explained.

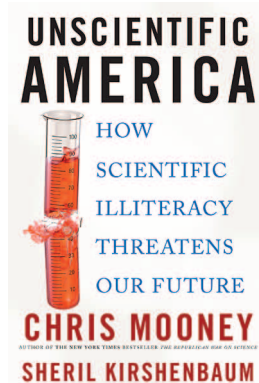
Chapter 6 covers the paleontology of corals with a comprehensive table on fossil records of cold-water corals. It further discusses the important taxonomic groups that are preserved as paleo-records. This is followed by a chapter on the use of (cold-water) corals as environmental archives. Here principal mechanisms of biomineralization, the incorporation of trace elements and fractionation of stable isotopes and the influence of biologically mediated vital effects are treated, followed by explaining how temperature, water mass, pollution or nutrients are recorded in the coral skeleton.

The last chapter “Impacts and conservation” is dedicated to the threats facing cold-water coral ecosystems, which span from fishing to global change, and last, but not least, it describes conservation efforts that need to be undertaken. In summary, the book touches all topics of presently conducted research on cold-water corals, and, as such, lives up to its promise on the cover as it provides a broad synthesis on present status of research on cold-water corals. It provides basic knowledge for students and the scientific community less familiar in deep or cold-water coral research. For the more advanced readership, respective chapters provide a thorough synthesis and review of the present literature on cold- or deep-water corals. It is complemented by 29 color plates, topic boxes and case studies. The book is also available electronically, which can be an attractive alternative to the hardbound print version.

MOONEY, CHRIS AND SHERIL KIRSHENBAUM.
2009. **Unscientific America: How Scientific Illiteracy Threatens Our Future.** Basic Books. ISBN: 9780465013050. 224 pp. US\$ 24

Reviewed by **Julie Palakovich Carr**, *American Institute of Biological Sciences*, 1444 I St. NW, Suite 200, Washington, D.C. 20005;
jpalakovichcarr@aibs.org

The views represented in this book review do not necessarily represent the views of AIBS.



If you are looking for a call to action for the scientific community to better engage and interact with the American people, you should read Chris Mooney’s third book, coauthored by Sheril Kirshenbaum. The book is a follow-up to Mooney’s bestseller *The Republican War on Science*. Kirshenbaum, a marine scientist, joins Mooney for this wake up call for America’s scientific community: the glory days of the mid-twentieth century, with the space

race and the public’s fascination of science, are over. We face a citizenry—and increasingly media and political machinery—that are apathetic about our work and the innovation that we offer. “Nearly a decade into the twenty-first century, we have strong reason to worry that the serious appreciation of science could become confined to a small group of already dedicated elites,

when it should be a value we all share,” write Mooney and Kirshenbaum.

In a richly annotated text, the authors document the plight of the perception of science by the general public. Their central position is that the major problem with the population’s view of science is not that people know too little, it’s that science doesn’t seem relevant to their lives. Therefore, we are not only dealing with an (at times) uneducated society, but an apathetic and sometimes hostile population. “Too many smart, talented, influential people throughout our society don’t see the centrality of science in their lives; and too many scientists don’t know how to explain it to them.” The authors contend that science needs to be more prominent, relevant, and influential if it is to make a comeback in public regard.

The authors offer an insightful critique of what ails the scientific community’s public relations efforts—or lack thereof—and provide a number of recommendations for improvement. First, however, we should consider why a change is needed. Some of you may be thinking, “Things aren’t that bad. With a little more education, the American people won’t be so hostile to science.” Mooney and Kirshenbaum state otherwise.

From the decline of science journalism to the negative portrayal of scientists in movies and TV, America has decided to relegate science to the cultural dustbin of history. Science is peripheral, at best, to American culture. When the entertainment industry does include “science” in their work, the outcomes are generally not good, according to Mooney and Kirshenbaum: “Too many stereotypically nerdy scientists...too many mad scientists trying to play God. Too many plotlines dependent upon the supernatural and the paranormal...and too many simply ridiculous “scientific” premises...” Perhaps the most damaging stereotype is that of “the uncaring scientist, unconcerned about consequences, pursuing knowledge at all costs.”

Some may look to the Internet to fix these ails. Mooney and Kirshenbaum, however, devote an entire chapter entitled “The Bloggers Cannot Save Us” to the idea that this newest form of media alone cannot bridge the divide between academia and the general public. Rather, they view science blogging as a false hope, as for many scientists the Internet is simply an opportunity to coalesce with like-minded academics. That’s not to say that the authors do not appreciate the power of the Web to connect millions of people and to act as the great equalizer of news in an age when the number of domestic newspapers with weekly science sections has declined by 64 percent in the last twenty years. The authors are keenly aware that the Internet is the number two source of scientific information for the average American. “The problem with the Internet is obvious to anyone who has ever used it: there’s tons of information available, but much of it is crap.” For instance, take the concerns by some parents that routine childhood vaccinations cause autism. We don’t need to look any further to realize that the Internet has provided unparalleled access to both scientific information and unscientific claims.

Researchers face other problems when it comes to the political realm, contend Mooney and Kirshenbaum. Politicians and scientists face fundamental disconnects: intensely local versus global interests, timeframes on the scale of election cycles

versus decades or millennia, and an emphasis on personality and charisma versus logic. “Whereas good science is rewarded for being painstaking and nuanced, politics is the enemy of subtlety — political battles are fought out in sound bites, decided in up or down votes,” state the authors. Moreover, the decision by many scientists to disengage from policy discussions has left some members of Congress to see science as a “wasteful” government endeavor.

Some may be tempted to rest on their laurels after the election of Barack Obama as President. In his first year in office, President Obama has instituted numerous pro-science policies. The authors, however, argue that after the Bush administration and its “war on science” we cannot afford to be disinterested in the future of science policy: “Even as science is crucial to the fate of twenty-first century America, it’s under assault from new forces that not even the science-friendly Obama administration can fully address, because they’re as much cultural and economic as directly political in nature.”

Therefore, the authors call for scientists to forge a new future for our community. Scientists can no longer hide behind their belief that to remain objective, they have to “stay above politics.” Instead, scientists should be engaging with the public, the media, and policymakers. Without this direct input of knowledge, society will continue to devalue our work. This book forces us to ask ourselves, “Who better to advocate for science than scientists?”

Mooney and Kirshenbaum offer advice for improving the future of science in the U.S., however, their recommendations contradict what many believe ails the science establishment. “What America requires isn’t necessarily *more* total scientists—or at least, not in isolation. Rather, we need more *well-rounded* scientists.” Graduate students should be better trained in communication, beyond writing scientific publications and giving presentations at conferences. Young researchers need to know how to effectively communicate with non-scientists, whether it’s an elementary school student, a reporter, or a member of Congress. Furthermore, “science needs tens of thousands of supporters calling for debates during the election season, sending e-mail blasts to members of Congress...and raising money through small donations over the Web...to support further outreach and education.”

Chris Mooney and Sheril Kirshenbaum believe that yesterday was the day for this revolution to begin. If you are ready to join, read “Unscientific American: How Scientific Illiteracy Threatens Our Future.” It’s perfect reading material for a graduate student journal club, an undergraduate science writing course, or for a researcher who is dissatisfied with the current system. If you are already aware of these problems within our community, skip the book and get more engaged. Write to your elected officials through the American Institute of Biological Sciences’ Legislative Action Center, of which ASLO is a sponsor, at www.capwiz.com/aibs. Join other scientists, educators, and citizens in the Coalition on the Public Understanding of Science at www.copusproject.org. Start a science cafe (www.sciencecafes.org). Whatever you do, just do something.

ELECTIONS

2010 ASLO ELECTIONS: THE CANDIDATES

The terms of the ASLO board of directors are staggered to ensure that experienced board members are always present. Elections are conducted by electronic ballot each spring (instructions to be sent via e-mail and on the Web site), but a written ballot can be sent upon request from the ASLO Business Office (business@aslo.org). In Spring 2010, voting will be for the president-elect and two members-at-large.

For the election of president-elect you will be voting from a pool of three candidates. For the election of members-at-large, you will be selecting two from a pool of five.

The voting system we use is a preferential, single winner, voting system, the Borda Count, which allows you to express a graded response. Based on the feedback we obtained from members, this method was widely appreciated, so we will use it again. And, once again, the board is very much interested in your feedback and suggestions. This type of vote is used widely in other societies for elections, for various functions of other boards, and quite commonly in tenure decisions or selecting graduate students into a program. In fact, you are very likely familiar with the method, if not the name.

Under this voting system, you will use the letter “A” for your first choice, “B” for your second, and so on to “D” for your least favorite. You should put a letter next to each candidate, but if you leave a blank we will score it as a “D.” If you feel that two candidates are indistinguishable, you may put the same letter for more than one candidate. So, you may have two A’s, one B and one D if you choose—four candidates, four letters (for the member-at-large category), some of which can be the same letter. We will compute the overall ranking of candidates using the Borda Count procedure (see: http://en.wikipedia.org/wiki/Borda_Count). The candidates for member-at-large with the two highest scores will be the winners of the election. The reason we are asking for alphabetic voting is to avoid the confusion that even with good instructions, some people will want to assign a 1 to their top choice, others to their last choice.

PRESIDENT-ELECT



JILL S. BARON

B.S. 1976 (Botany, minor in Geology, Cornell University, USA)
M.S. 1979 (Land Resources, University of Wisconsin-Madison, USA)
Ph.D. 1991 (Ecosystem Ecology, Colorado State University, USA)

Jill Baron is a research ecologist with the U.S. Geological Survey and a senior research scientist at the Natural Resource Ecology

Laboratory, Colorado State University. She uses monitoring, experiments, modeling, and paleolimnological methods to elucidate terrestrial-aquatic biogeochemical linkages in mountain ecosystems that are responding to atmospheric nitrogen deposition and climate change. Baron established the Loch Vale Watershed long-term ecological research and monitoring program in Colorado in 1983 (<http://www.nrel.colostate.edu/projects/LVWS>). Her research has resulted in more than 115 publications and two edited books. She has participated internationally in UNEP Science Committee on Problems in the Environment, International Nitrogen Initiative, Mountain Research Initiative, and Millennium Ecosystem Assessment activities. Baron has been a science adviser to, among others, the National Center for Ecological Analysis and Synthesis (NCEAS), Grand Canyon Adaptive Management Program, National Ecological Observatory Network (NEON), and was a member of the Science Strategy Team that redesigned the goals of the U.S. Geological Survey in 2007. She is founder and co-director of the new John Wesley Powell Center for Earth Systems Science Analysis and Synthesis, and her most recent briefing to Congress was on climate change effects to Western U.S. water resources.

Baron's ASLO activities include serving on the Hutchinson Award Committee. She reviews for *L&O* and was on the planning committee for the 1992 annual meeting in Santa Fe, NM. She is also active with the Ecological Society of America, where she has twice been a member of the governing board, is associate editor of *Ecological Applications*, and is editor-in-chief of *Issues in Ecology*, a publication that uses commonly-understood language to report the consensus of a panel of scientific experts on ecological issues. At CSU she teaches graduate classes and is active in recruiting and retaining women and minority students.

Candidate Statement

We stand at a pivotal time in Earth's history. The activities of one species, our own, are now the primary drivers of global environmental change. The decisions and actions we, as individuals, communities, and especially nations, make over the next decade could well determine the long-term legacy we leave to our children, the biosphere in which we live, and the services it provides. As aquatic scientists, we are acutely aware of alterations of the world's water resources caused by freshwater use, eutrophication, contamination, species manipulations and harvesting, climate change, and ocean acidification. And as aquatic scientists, we contribute immeasurably to the knowledge of the processes, dynamics, and trends of the world's freshwaters and oceans.

This is where ASLO comes in. ASLO has long been the world's pre-eminent aquatic science professional society, and its well-deserved reputation is maintained by providing superb services to its members in the form of highly respected journals and exciting meetings. As one example, I'm not alone in thinking the establishment of *L&O: Methods* was a stroke of genius. The 2009–2013 Strategic Plan provides specific recommendations for novel ways of sharing information among ourselves and across all aquatic disciplines. These are excellent and important, as are the suggestions for how to increase recruitment and

retention of young scientists from all over the world and from under-represented groups within the United States (a topic near and dear to my heart).

If I am given the honor of serving as ASLO president, I will work additionally toward achieving the third and fourth activities described in the Strategic Plan: advancing public awareness of the research on aquatic resources and promoting stewardship of aquatic resources for the public interest. If we are to put our considerable knowledge to use we must step up our communication and public outreach capabilities. I think we face challenges on two fronts. The first is to increase awareness of aquatic sciences and issues facing freshwater and marine resources among other environmental scientists and practitioners. Why is this important? Just one example is that critical decisions are being made now and in the near future regarding energy development from traditional and renewable sources; it is vitally important to have aquatic scientists at the table to assess the consequences and trade-offs to freshwater and marine resources of different development plans. One solution I believe we should pursue, endorsed by the Strategic Plan, is to forge closer ties with other professional organizations. Just as joining freshwater and marine sciences has catalyzed advances in knowledge, deepening the understanding of the richness of the aquatic sciences across other disciplines will benefit all. The second challenge is breaking down the communication barriers between scientists, policy makers, and the public. Our ability to connect with non-scientists is critical to recruiting the next generations of aquatic scientists, correcting or minimizing popular misunderstandings of important scientific issues, increasing the funding base for aquatic sciences research, and to providing the information that can lead toward solutions to the myriad problems facing the world's aquatic ecosystems. Limnology and oceanography are by definition highly interdisciplinary; I hope to build upon ASLO's prodigious strengths and help us become even better at what we already do.



JOHN A. DOWNING

B.S. 1973 (Biology, Hamline University, USA)
M.S. 1975 (Zoology, North Dakota State University, USA)
Ph.D. 1979 (Biology, McGill University, Canada)

John Downing is a professor in the Department of Ecology, Evolution, and Organismal Biology, and Agricultural and Biosystems Engineering, chair of

the Environmental Science graduate program, and director of the Limnology Laboratory, at Iowa State University. He is adjunct at Itasca Community College to help build a water quality technology program to enhance regional employment.

John's education began as a child, exploring the bottoms of lakes of the North American Great Plains and boreal forests, and continued with graduate studies on shallow lake ecology (MS) and on littoral zone trophic interactions (PhD).

His career began at Université de Montréal and McGill University; he helped found the Québec Inter-university Limnological Research Group (GRIL), and became director of the Laurentian Biological Station. Sabbaticals at University of Minnesota (Cedar Creek) and the Institut Mediterrani d'Estudis Avançats (Mallorca) broadened his interests toward marine and terrestrial environments.

He studies the most nutrient-active and intensively modified landscapes in the world. A major objective is to understand the influences of agriculture on freshwater and marine ecosystems. Current research foci are carbon dynamics and global change; global up-scaling of aquatic processes; landscape biogeochemistry; eutrophication and aquatic community dynamics; aquatic biodiversity; production ecology; economic valuation of ecosystem services; and non-equilibrium dynamics. John teaches aquatic ecology, limnology, the biology of aquatic organisms, publication in the biosciences (career-development), and resource ecology. He created and offers a fully on-line limnology course.

John volunteers to help communities restore or maintain water quality, works with farm groups to minimize nutrient transport to the sea, provides lake-monitoring data to two states, creates plans for lake restoration, and helps governments develop nutrient criteria and wildlife enhancement programs. He has held a variety of administrative positions and has worked on many committees, panels, and boards at the university, state, provincial, and federal levels. John and his family created and fund a research and conservation area in the Mississippi River headwaters.

Candidate statement

My vision for ASLO is to work to provide members with enhanced and economical services, support, products, and events that strengthen their careers at all stages of development. I believe that we need to serve all members, regardless of career-stage or where they work in the world. ASLO needs to help create future limnology and oceanography that is more diverse in outlook, approach, and workforce. I believe that ASLO's guiding principles are effective administration tools, but are also a bill-of-rights for members so that their investments in scientific vitality, excellence, and career development are repaid. I believe that offering synergies between marine and freshwater research in the future is a crucial responsibility as limnology moves toward a more global approach (like oceanography has) and marine science deals with more anthropogenic impacts (like limnology has). Priorities for me are keeping ASLO a vital force for excellence in enhancing the careers of members and expanding the influence of our science in the global arena.

I have been enthusiastic about ASLO since I was a graduate student – my first major scientific presentation was at an ASLO meeting and my first publication was in *L&O*. I co-chaired the 1999 Santa Fe meeting, was a member of the nominations Committee, a member of the working group that helped launch *L&O Methods*, and a member of the most recent strategic planning subcommittee. I helped draft the ASLO guiding principles and strategic plan, chaired the working group seeking the *Bulletin's* current co-editors, was long-term chair of the Awards and Hutchinson Award Committees, created the ASLO Facebook site, and recently was a member-at-large on the board.

Some objectives:

- Sustain the record of excellence in services and opportunities that members enjoy.
- Build a stronger recruitment and retention network to enhance interest and excellence in limnology and oceanography—help members build long and rewarding careers.
- Maintain ASLO's fiscal vitality and open access.
- Create an open file-sharing source exchanging lecture presentations among members.
- Strengthen social networking for ASLO members—both live and virtual.
- Offer more resumé enhancing recognitions for members.
- Assess member support for an official definition of the ASLO acronym that is more globally inclusive.
- Serve our scientists globally; strive to provide member benefits to all regions and needs.
- Make board and administrative proceedings more transparent to members.
- Assess and respond to members' satisfaction with services and products.

The strength of our science depends on making connections, being inclusive, and helping members sustain and thrive in their careers. I am committed to seeking ways of making this easier, especially for young aquatic scientists.



CRAIG E. WILLIAMSON

A.B. 1975 (Biology, Dartmouth College, USA)

M.A. 1977 (Biology, Mount Holyoke College, USA)

Ph.D. 1981 (Biology, Dartmouth College, USA)

Craig has had a passion for water all of his life, from spending much of his youth on or near ponds, lakes, and oceans, to building a laboratory in his basement as a

boy where he kept local species of invertebrates and fish, to his current position as professor and Ohio Eminent Scholar of Ecology at Miami University where he teaches courses in global change ecology to both undergraduate and graduate students. As a global change limnologist Craig views aquatic ecosystems as sentinels, integrators, and regulators of environmental change. His interests focus on the role of water transparency in the structure and function of lakes, with an emphasis on the causes of changes in ultraviolet (UV) transparency and their consequences for higher trophic levels (zooplankton and fish).

Craig has always had an active interest in understanding important issues in marine as well as freshwater ecosystems. His master's work was on freshwater sponges, and his graduate work was on zooplankton ecology. As a graduate student he took summer courses at both the Marine Biological Laboratory

at Woods Hole and at the University of Washington's Friday Harbor Laboratory in Puget Sound. As a faculty member at Lehigh University he organized two international symposia that brought together marine and freshwater scientists and their students to discuss topics on (1) advanced techniques for quantifying zooplankton, and (2) UV radiation in lakes, with both proceedings being published in international journals. More recently Craig was the lead convener of an AGU Chapman Conference that brought together aquatic scientists from around the world and led to a special issue of *Limnology and Oceanography* on lakes and climate change published in November 2009. He is currently collaborating with two marine biologists and two limnologists on writing a review paper on zooplankton diel vertical migration for *Limnology and Oceanography*. Craig has been a reviewer for manuscripts for 65 different journals and research proposals for 18 different national and international foundations and 13 different NSF programs, has participated in international workshops with NATO, ICSU, and SCOPE, and currently serves on the United Nations Environment Programme Environmental Effects Assessment Panel.

Candidate Statement

I have been a member of ASLO since I was an undergraduate, participating regularly in the annual meetings with my students and postdocs, organizing special sessions, serving as a minority mentor for five years, and serving on the committee on financial resources as well as the organizing committee for the ASLO meeting in Victoria, B.C. I was a member of the first review panel for ASLO's DIALOG program, the predecessor to ASLO's numerous other current dissertation programs. In my mind the strength of ASLO has always been the high quality of its science in both limnology and oceanography. I have thrived in ASLO, appreciate that it brings together both limnologists and oceanographers, and would be honored to serve the society.

One of the greatest opportunities for ASLO is the way in which the diverse scientific strength in both marine and inland waters can be brought to bear on important national and international issues in aquatic sciences. If I am so honored as to be able to serve ASLO as president, my primary goal will be to maintain the high quality of the scientific research that is the generator of our high quality journals and meetings. My novel contribution will be to enhance mechanisms through which we can bring this high quality research forth to address some of the compelling challenges that society now faces. Water is at the very center of many of the world's grandest challenges. There are several mechanisms by which this opportunity can be realized. One is to develop an ASLO "Grand Challenges in Aquatic Sciences" conference forum. The central idea is to generate more focused and in-depth scientific dialog on important issues than can be realized at our regular meetings. Special sessions at our annual meetings could also be developed to explicitly address leading issues in aquatic sciences in a more interactive format. ASLO has a strong record of providing solid scientific input into important policy issues ranging from an early symposium and a recent special issue of *Limnology and Oceanography* on eutrophication, to sessions on harmful algal blooms in inland and coastal waters, to input on the iron controversy in the open oceans. By establish-

ing more focused mechanisms we can enhance the ability of ASLO to connect to and provide guidance on these important global issues.

MEMBER-AT-LARGE



ANTJE BOETIUS

M.S. 1993 (Biology, University Hamburg, Germany)

Ph.D. 1996 (Biology, University Bremen, Germany)

My fascination with biological oceanography and deep-sea biology began as an undergraduate joining my first expedition to the NE Atlantic with RV METEOR in 1989. Soon after I got the chance to join an academic

exchange program for graduate students with UCSD, to take courses in biological oceanography and work as lab assistant at SIO, La Jolla. Farooq Azam introduced me to the wonders of the microbial world, and George Wilson, Craig Smith, Horst Felbeck, and Bob Hessler to the amazing variety of deep-sea life. I returned to Germany with the goal to complete a PhD thesis in deep-sea microbiology, and was so lucky to be accepted to the labs of Karin Lochte and Victor Smetacek at the Alfred Wegener Institute for Polar and Marine Research. In 1996 I completed my thesis on the "Microbial degradation of organic matter in deep sea sediments" and was hooked on the abyss. After a post doc at the Institute for Baltic Sea Research to study the coupling of deep-water processes to the monsoon winds in the Indian Ocean, I joined the Max Planck Institute for Marine Microbiology for a second post doc period. By chance, I could participate in expeditions to cold seeps on the Cascadia margin and got involved in the study of the biogeochemistry and microbiology of the marine methane cycle. In 2001 I became assistant professor of microbiology at the newly founded International University of Bremen (now Jacobs University) and senior scientist at the Alfred Wegener Institute for Marine Microbiology to study methane biogeochemistry of gas hydrate systems. In 2003 I was offered a group leader position at the Max Planck Institute for Marine Microbiology in the Department of Biogeochemistry lead by Bo Barker Jørgensen, and founded the Microbial Habitat group. We study the physical, chemical, geological, and biological characteristics of distinct microbial habitats. The goal is to understand structure and change of microbial ecosystems and their functions, the formation of specific niches for microbial populations, and the consequences of environmental dynamics on the diversity of microbial communities. We use *in situ* tools and methods for the study of aquatic systems and contribute to the development of submergence technology. In 2008 I became full professor for geomicrobiology at the Geosciences Department of the University Bremen and joined the AWI to start another group, the Helmholtz-Max Planck Joint Research Group on Deep Sea

Ecology and Technology, with a focus on the biogeochemistry of the deep Arctic Ocean. I have just completed my 40th research expedition and I am looking forward to the next to come. I serve on the editorial board of *Biogeosciences*, *Aquatic Microbial Ecology*, and various other journals of relevance to aquatic sciences, and am member of several international and national science committees dealing with biodiversity and ocean research. For nine years I have taught undergraduate and graduate courses in microbiology, biogeochemistry and oceanography, as well as in transdisciplinary topics of the natural and social sciences.

Candidate statement

In 2000 in Copenhagen I joined my first ASLO conference and was impressed by the variety of themes dealing with aquatic life, processes and ecosystems, and the intriguing mixture of disciplines. I became a member immediately, and since then I try to participate in ASLO meetings whenever I am not at sea. I have chaired a number of sessions at ASLO meetings, and have been part of the scientific committee of the 2009 meeting in Nice, an experience I enjoyed a lot. I believe in the value of diversity, and hence would like to add to the internationality and interdisciplinarity of the Society. In these times of rapid change, understanding the past, present and future of aquatic systems, their biodiversity and functioning becomes increasingly urgent, and what was basic research yesterday is now suddenly in the focus of societal needs, worries or hopes. Hence, I would like to support the society in keeping the high standard of ASLO meetings and publications, and in furthering the communication and dissemination of scientific knowledge, including the open discussion of controversial topics – such as causes and consequences of global change and its mitigation, the evolution of life, or gender bias in the interpretation of animal behavior. Attracting and enabling the international studentship to attend meetings and present their work and ideas is also very important to me. Finally, I enjoy social interaction and when “the Congress dances,” and this is also an area I would be willing to support.



HOWARD I. BROWMAN

B.Sc., 1982 (Marine Biology, McGill University, Montréal, Québec, Canada)
M.Sc., 1985 (Biological Oceanography, McGill University, Montréal, Québec, Canada)
Ph.D., 1989 (Systematics & Ecology-Limnology, University of Kansas, Lawrence, KS, USA)

While studying at McGill, I had the good fortune to be trained in

limnology and oceanography by, among others, Max Dunbar, Grant Ingram, Jaap Kalff, Bill Leggett, John Lewis, Brian Marcotte, Rob Peters, and Frank Rigler. I went on to study for a Ph.D. with W. John O'Brien and was thereafter a postdoctoral fellow at the University of Montréal (with M.A. Ali), McGill (with R.C. Chambers and W.C. Leggett), University of Victoria

(with C.W. Hawryshyn) and the Department of Fisheries and Oceans Canada (in Mont-Joli, Québec, with Jeffrey Runge). In 1998, I accepted a position as a research scientist with the Institute of Marine Research in Bergen, Norway. I have been with the IMR since then and now hold the rank of “principal” scientist (equivalent to full professor).

My research activities are broad: zooplankton and ichthyoplankton behaviour and ecology, sensory ecology, host-finding in fish parasites, effects of solar ultraviolet radiation on aquatic organisms and ecosystems, and effects of ocean acidification on the early life stages of marine organisms. I am also interested in policy issues, mainly ecosystem-based management, MPAs and aquatic animal welfare. My current research includes cascading effects of UV radiation on marine ecosystems, geomagnetic orientation in the long-distance migrations of European eel, effects of seismic survey air-gun blasts on *Calanus* spp., host-finding in the parasitic salmon louse, the effects of global warming on the distribution and relative abundance of the *Calanus* species complex and the effect of ocean acidification on the early life stages of pelagic and benthic invertebrates. My research has been funded by granting agencies in the USA, Canada, Norway, and the EU – I have had an unbroken string of funding since 1983. I have published over 100 articles, books and edited volumes and have delivered a similar number of presentations at conferences, symposia and workshops. I have lectured to students and faculty at over 50 universities and institutes all over the world and have developed and taught 13 different courses at universities in Canada, the USA and Norway. As a government-sector scientist, my teaching and mentorship has been mostly at the graduate level.

My community service and experience includes: director, Eco-ethics International Union-Germany, member of the board of directors, Eco-ethics International Union-USA, scientific director and vice president, Inter-Research Science Center (publisher of such journals as MEPS and AME), Norwegian representative on the publications committee of the International Council for the Exploration of the Sea, member of the American Fisheries Society's Publications Overview Committee, member of the committee on publication ethics, Norwegian representative at the European Commission's workshop on the Future of Fisheries and Aquaculture Research, co-founder and associate editor-in-chief of *Aquatic Biology*, editor-in-chief of *Ethics in Science and Environmental Politics*, associate editor-in-chief of *Marine Ecology Progress Series*, subject editor for *Marine and Coastal Fisheries*, staff member, International Ecology Institute, co-founder, Inter-Research Symposium Series, and president (elected), Early Life History Section of the American Fisheries Society. I review grant proposals for eight funding agencies in six countries (including NSF and NOAA) and manuscripts for 35 journals. I am a long-standing member of ASLO, the American Fisheries Society and the Council of Science Editors. More information about me is available at www.fishlarvae.com.

Candidate Statement

I have been a member of ASLO since the mid 1980s and have participated in many ASLO conferences. I have been reviewing manuscripts for *L&O* for more than 20 years and, more recently,

for *L&O Methods*. Although I have undertaken extensive community service (see above), most of it has been for other scholarly societies. I am honored to be nominated for a position on the ASLO board and would be pleased to have an opportunity to contribute to the society with which I have associated myself since the beginning of my career.

The strengths that I would bring to the ASLO board are: unusually broad research interests and activities; a familiarity with current issues in marine policy (which is a more-and-more important driver of our profession); experience with the inner-workings of scholarly societies and with scientific publishing and editing (the latter from the tripartite perspectives of publisher, editor, and author); employment as an academic research scientist and a government-sector scientist; experience with commercialization of research (through the patenting process associated with one of my projects); multi-national/multi-cultural work experience; work experience in North America and Europe; a world-wide network of collaborators. On a more general level, I have recently taken an interest in how scholarly performance is measured (critical-skeptical), the insidious impact of bureaucratization on scientists, and several emerging issues in scientific publishing (e.g. editor and author ethics, peer review, open access...).

All of this experience/expertise would allow me to make well-informed contributions to a number of ASLO committees, including awards, nominations, finance, (I also have a background in managing small businesses), meetings-conferences, professional ethics, publications, public policy, and strategic planning. I am very strongly interested in contributing to the early career committee as I have a growing concern about the unrealistically high requirements/expectations facing young aquatic scientists nowadays.



ROXANE MARANGER

B.Sc. 1992 (Biology, McGill University, Canada)

M.Sc. 1995 (Biology, Université du Québec à Montréal, Canada)

Ph.D. 1999 (Environmental Science, Université du Québec à Montréal, Canada)

After completing her Ph.D. studying the role of viruses in lakes and how mixotrophic algae acquire Fe in the ocean, Maranger

was a postdoctoral fellow with Michael Pace at the Institute of Ecosystem Studies (now the Cary Institute of Ecosystem Studies), in Millbrook, New York. There, she learned a great deal about ecosystem approaches to biogeochemical cycling and modeling had a chance to work with a number of superb ecologists. After an unconventional “break” to have 3 children (including twin boys), Maranger obtained a provincially-funded chair faculty position in aquatic ecology at the Université de Montréal which she has occupied since 2004.

Maranger’s research currently focuses on the microbial metabolism and biogeochemical cycling of C and N in lakes and rivers, but she also works in coastal and open ocean systems.

Although her background is in microbial food web dynamics, when assuming her position at Ude M, Maranger decided to develop a program on aquatic N cycling because at the time little attention was being paid to N dynamics in lakes, particularly in Canada. Lakes appear to be biogeochemical hotspots in the landscape particularly at retaining N. Other research interests include how community structure, invasive species, and climate change influence N processing and N_2O flux in different aquatic systems. Maranger seeks to identify broad patterns across systems and benefits from approaches used in both in limnology and oceanography.

Maranger has been a member of ASLO since her graduate student days when she attended her first meeting in Santa Fe. She is co-organizing a special session on whether N fixation can reverse N limitation for the 2010 meeting in Portland, Oregon, and has volunteered and encouraged her students to volunteer to chair open sessions at various other meetings. She has reviewed for *L&O*, other journals and various granting agencies. Maranger has been an active member of the Society for Canadian Limnology (SCL, the Canadian arm of SIL) and was the vice-president of that society from 2006–2009. During her mandate, Maranger was the program co-chair for the most successful meeting of that society (Montreal 2007), was responsible for the awards committee and initiated student workshops as part of the annual meeting.

Candidate Statement

If elected it would be an exciting opportunity to serve you on the ASLO board and contribute to its inner workings. To me ASLO is a critically important international society as one of the few that brings together freshwater and marine scientists. As freshwaters and coastal waters rapidly degrade around the world and ocean systems are increasingly affected by global change, our science, basic and applied, is critical to the development of a sustainable society. The cornerstones of ASLO are its superb meetings and excellent journal. The rapid international expansion of the society and the creation of more joint society meetings have been very exciting developments and have contributed greatly to the knowledge transfer across many disciplines critical to enhancing scientific creativity. As the sizes of meetings grow however it is more difficult to facilitate “intergenerational” scientific exchange of controversial topics. Meeting workshops and the various more specific mixers and functions for students and early career scientists is helping to facilitate important scientific and social exchange. I would like to continue developing these initiatives and develop new ones. One possibility is creating a mentoring program for early career scientists and students struggling to balance science and raising young families. Another possibility would be to create a “debate” forum where controversial scientific topics are discussed in a heated “live” public debate. There is also a need for our meetings to become more “green” and I would work hard to achieve this. I believe one critically important component to a vibrant scientific society is its capacity to extend our knowledge and discoveries to the broader public. People want to learn about what we do and we have a responsibility to educate them through various means. Along with the K-12 initiatives, one element I would like to

develop is better public outreach through workshops with journalists on how to write an effective scientific press release or tips on how to speak with a journalist. As a member-at-large I would approach as many of you as possible to better understand what you would like from your society, and work hard to facilitate your requests. It would be a pleasure to contribute to the ever-expanding mandates of the ASLO community and I thank you in advance, should I be given that opportunity.



UTA PASSOW

Diplom (Master) 1985 (Biology Oceanography, Institute for Marine Science, Kiel, Germany)
Ph.D. 1989 (Biological Oceanography, Institute for Marine Science, Kiel, Germany)
Habilitation 2001 (Biological Oceanography, Institute for Marine Science, Kiel while at the Alfred Wegener Institute, Bremerhaven, Germany)

It was love at first sight: One class in marine science and I moved from South Germany to the North, to be nearer to the ocean and to study biological oceanography. My master's thesis (with V. Smetacek) was a group project investigating benthic-pelagic coupling. During my Ph.D. (with B. Zeitzschel) I looked at spatial patchiness of phytoplankton species and their sedimentation. My first post doc was within JGOFS (Joint Global Ocean Flux Studies), working on flux in the Atlantic and Indian Ocean to better understand mechanisms behind sedimentation patterns. I continued the quest to investigate the drivers of the biological pump with a move to California to work with A. Allredge on aggregation and its role for carbon flux. Our discovery of transparent exopolymer particles (TEP) opened an exciting field of new questions and I remained in Santa Barbara as a professional researcher for almost 10 years, with several short work visits to Germany and Norway studying the role of TEP in ecosystems and carbon cycling. In 2000 I packed up for another cross-continental move to accept a position at the Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany to work on carbon cycling in a changing world. There, we (the biogeosciences group) approached the topic by combining my experimental and field expertise with modeling approaches (D. Wolf Gladrow) and paleo-reconstructions (J. Bijma). Two years ago, I moved back to the University of California, Santa Barbara, where I'm a researcher continuing my research to learn more about the consequences of rising atmospheric CO₂ for the ocean and expected feedbacks. In the past years I combined field sampling, mesocosm experiments and laboratory scale experiments, always working in teams with my students and colleagues, to focus on the mechanisms driving carbon flux.

I review regularly for several journals on a wide variety of topics and have for many years reviewed proposals both for European funding agencies and for several sections of NSF. I've also served as a panel member for NSF, and volunteered my

expertise in a community effort to influence local politics on the topic of levee building and sea level rise. The public global change discussion has swept my field of scientific interest into the limelight of public and political attention, changing the relationship between my work and my community. The need of the public for accurate information on climate change has encouraged me to teach at different venues and to all age classes.

Candidate Statement

I've been a member with ASLO for many years and have presented numerous talks at ASLO meetings, judged student posters and chaired a session. I've also enjoyed serving on the G. Evelyn Hutchinson Award committee. I appreciate the mingling of scientists with very different expertise at ASLO meetings—and more recently I appreciated belonging to a society that responded to the public need for a clear stand on climate change issues. I also appreciate what ASLO does for graduate students and young researchers, and many of my PhD students have profited from these efforts.

My dual association with the Alfred Wegener Institute, Germany and the Marine Science Institute at UC Santa Barbara, USA and my strong connections to both the European and U.S. science communities will allow me to further substantiate and implement ASLO's goal to become a truly international society that encourages and fosters international collaborations. My second goal, if elected, will be to find ways for ASLO to facilitate the exchange of graduate students during portions of their laboratory and thesis work that I found to be so rewarding for myself and for my students. Sharing graduate students is a wonderful way for the students to get exposed to different aspects of their topic, or learn different tools, and simultaneously encourages new collaborations and ties for their advisors.



CANDIDA SAVAGE

B.Sc. (Hons). 1994. (Marine Biology, University of Cape Town, South Africa)
M.Sc. 1996 (Marine Biology, University of Cape Town, South Africa)
Ph.D. 2003 (Systems Ecology, Stockholm University, Sweden)

Candida is an aquatic ecologist with a broad interest in ecosystem structure and function and

nutrient cycling and how these parameters vary spatially and temporally in marine ecosystems. Candida has been an assistant professor at the Department of Marine Science, University of Otago, New Zealand, since 2005. Her research team investigate the relationship between organisms and sediment chemistry, quantifying oxygen conditions, nutrient flux and rates of benthic denitrification in relation to nutrient loading and macrofaunal communities. She also studies the assimilation of terrestrial nutrient sources in coastal food webs using models and stable isotopes, with laboratory experiments conducted to quantify the isotopic turnover rates in macroalgae, bivalves and fishes in order

to ground-truth field measurements and transplant experiments. A national collaboration with Simon Thrush and his group examines the cumulative and antagonistic effects of nutrients and sediment loads from land to estuaries and adjacent coastal systems. The linkage between terrestrial and marine ecosystems is a common theme in her research. In collaboration with Tom Bianchi from Texas A&M, they are characterizing the relative contribution of more refractory terrestrial organic matter and labile marine organic matter to sedimentary environments in fjords using biochemical markers. Research is ongoing to understand the mechanisms that affect these biomarkers as they settle out of the water column and are incorporated into the sedimentary record. These studies will help interpret sediment proxy records and facilitate their paleoecological work that seeks to reconstruct the historical changes in organic matter sources in fjords in relation to climatic variables and other drivers.

Candida obtained her Ph.D. at the Systems Ecology Department at Stockholm University, Sweden, in 2003 under the tutelage of Ragnar Elmgren. Her doctoral research investigated the influence of sewage nitrogen on a coastal ecosystem and adopted stable isotopes in macroalgae and sediments and long-term data on macrofaunal communities to trace the spatial and temporal incorporation of sewage nitrogen into a Baltic coastal ecosystem. Her university career commenced on the foothills of Table Mountain at the University of Cape Town in South Africa. “It was impossible not to be captivated by marine science when studying the organisms that live at the interface where the warm Moçambique current mixes with the cool Benguela current,” states Savage. Candida became a masters student of John Field in 1995 and completed a masters dissertation on soft-bottom macrobenthos off the Namibian coast, quantifying the effects of offshore diamond mining on seabed communities using multivariate techniques.

Savage has been involved with programs to promote science in school classrooms, having recently completed a web-based teaching module on food webs and paleoecology. She has also

conducted public fieldtrips and lectures. Candida has a strong commitment to science communication that started in the mid-90s when she wrote more than 30 popular science articles for various research laboratories and companies in the United Kingdom and Sweden. Savage has been a member of ASLO, participated in meetings and conducted reviews for *L&O* since 2002. She has served as a reviewer for NSF grant applications and nine scientific journals, and has served on the Applied Science Board at the University of Otago (2007–present) and the Ministry of Fisheries Biodiversity Research Advisory Group (2006–present).

Candidate Statement

ASLO was the first professional society I joined as a graduate student, and I believe its dedication to graduate students keeps the society dynamic and at the cutting-edge of aquatic sciences. It was also through ASLO that I found my first and current faculty position in marine science in New Zealand. Accordingly, I have benefited tremendously from being a member of ASLO and would welcome the opportunity to contribute to the society as a member-at-large in return. I applaud the society’s interdisciplinary nature and global outreach that unites expertise on the physical, theoretical and biological sciences from around the world. The ASLO meetings provide an exciting forum to present data and elicit scientific debate and the alternation between American and European conference destinations celebrates the global nature of the society. Being based in the Asia-Pacific region, I would like to raise the profile of science in this region as well as promote ASLO in the Asia-Pacific area. My goals are to promote international collaboration in the scientific community and communicate aquatic research through tertiary and public education programs. ASLO plays an active role in public outreach and policy and therefore relays important news and messages on aquatic ecosystems to the greater public. It is the thrill of discovery that keeps me in aquatic science, and I hope to ignite other people’s passion for aquatic ecosystems.

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Become a member of ASLO today! ASLO is the leading professional organization for researchers and educators in the field of aquatic science. Visit the ASLO booth during the meeting, go to our Web site, or contact us at business@aslo.org.

OUTSTANDING ASLO PUBLICATIONS

Limnology and Oceanography (L&O) is an internationally acclaimed scientific journal published bi-monthly by ASLO. *L&O* is dedicated to publishing peer-reviewed, original papers and is available in both print and electronic formats.

L&O: Methods is an all-electronic journal published in annual volumes containing primarily methodological manuscripts focused on the aquatic sciences.

L&O: Bulletin, the ASLO newsletter, is published quarterly and contains peer-reviewed articles and society news.

L&O: Fluids and Environments publishes interdisciplinary limnology and oceanography research focusing on the interactions of fluid, sediment, rock statics, and dynamics. Featured in an online-only format, it explores the link between fluid dynamics and aquatic system processes.

ASLO Web Lectures are available as a service to members who use electronic media to prepare lectures for teaching.

WWW.ASLO.ORG

ASLO's Web site contains a wealth of information pertaining to the society and its publications. The site provides easy access to online editions of ASLO publications, job and funding opportunities, course offerings, programs for PhD's, meetings and events, student career information, and much more.

UPCOMING MEETINGS

ASLO 2010 Summer Meeting with NABS
6-11 June 2010, Santa Fe, New Mexico, USA

ASLO 2011 Aquatic Sciences Meeting
13-18 February 2011, San Juan, Puerto Rico, USA

**ASLO 2012 Ocean Sciences Meeting
with TOS and AGU**
20-24 February 2012, Salt Lake City, Utah, USA

ASLO 2012 Aquatic Sciences Meeting
6-13 July 2012, Lake Biwa, Otsu, Japan

Society members receive discounts on registration. Join one or both societies and SAVE!

This meeting is one full week and starts with an opening evening session and keynote address on Sunday, 6 June. Oral sessions will run for a full day on Friday, 11 June.

Register and book your travel early! Santa Fe is a very popular destination in the summer.



Important Dates

ASLO Student Travel and Early Career Awards Recipients Notified in **March 2010** / NABS Endowment Student Awards Recipients Notified in **March 2010**

Authors notified and schedule posted in **April 2010**



www.aslo.org/santafe2010



AQUATIC SCIENCES: GLOBAL CHANGES FROM THE CENTER TO THE EDGE

The theme of the meeting, Aquatic Sciences: Global Changes from the Center to the Edge, will pull all of our aquatic sciences together and build strong synergy and collaboration between societies and scientists.

2010 is the 400th year commemoration of Santa Fe, so there will be lots of great activities going on in the city.

2010 Summer Meeting
Joint Meeting with ASLO & NABS
6-11 June 2010
Santa Fe, NM, USA



ASLO
Advancing the science of limnology and oceanography



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