

# MBL

ANNUAL REPORT 2013



Marine Biological Laboratory, Woods Hole

AN AFFILIATE OF THE UNIVERSITY OF CHICAGO

1888



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The MBL Annual Report is published by the Marine Biological Laboratory. Although the greatest possible care has been taken in the preparation of this record, the MBL recognizes the possibility of inaccuracies. If any are noted, please accept our apology and advise us of any corrections to be made.

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## From the President and Director



### 2013 was a historic year for the MBL.

As the laboratory commemorated its past with a 125th anniversary celebration, we embarked on the promising future of a full affiliation with a major university.

With the support and hard work of the Board, scientists, staff, and the greater MBL community, we found a partner in the University of Chicago, a remarkable institution with strong historical and intellectual ties to the MBL that date back to the laboratory's founding in 1888. At a special meeting of the MBL Corporation in June of 2013, members voted for a change in the bylaws that made it possible for the MBL to form a landmark affiliation with the University.

Both UChicago and the MBL have reputations for scientific excellence and highly collaborative cultures that draw top biologists from around the world. And with our affiliation, a shared mission of leadership and innovation in scientific research and education was strengthened.

In the months following the affiliation's official start on July 1, 2013, MBL scientists and staff worked diligently with University colleagues with the essential task of implementing the new partnership through both operational and scientific planning.

MBL's resident faculty members met regularly to discuss ways to enhance interactions among programs within the MBL, and with faculty and programs at the University of Chicago. A committee comprised of the heads of MBL's administrative units was convened in the summer of 2013, and focused on operational implementation. A University faculty committee,

chaired by Neil Shubin, the Robert R. Bensley Professor of Organismal Biology and Anatomy and Senior Advisor to the President and Vice President for Research and National Laboratories at the University of Chicago, was formed in the Fall of 2013 to foster and develop the affiliation through collaborative research and educational initiatives. These efforts remain underway and have expanded to include joint scientific and operational retreats in both Chicago and Woods Hole.

This spring, the MBL Board of Trustees welcomed Robert J. Zimmer, president of the University of Chicago, as the new chair of the MBL Board. President Zimmer succeeds Jack W. Rowe, who led the MBL through an exceptionally successful capital campaign and two significant renovation projects that transformed Loeb and Rowe laboratories. The MBL has benefitted tremendously from Jack Rowe's leadership and from the exceptional generosity of the Jack and Valerie Rowe family, for which we are very grateful.

As the MBL looks toward its next 125 years, we are energized by the opportunity to craft a vision and strategy that will make the most of our affiliation with the University of Chicago and further distinguish the quality and impact of our research and educational programs. There is enormous room for discovery before us as we work to ensure that the future of the MBL is as bright, if not brighter, than its remarkable past.

A handwritten signature in black ink that reads "Joan Ruderman" followed by a horizontal line.

Joan Ruderman  
*MBL President and Director*

# Highlights



## University of Chicago and MBL Form Landmark Affiliation

In July 2013 the University of Chicago and the MBL strengthened their combined eminence and innovation in biological research and education by forming an affiliation that builds upon their shared values and historical ties. Both institutions have reputations for scientific excellence, highly collaborative cultures that draw top biologists from around the world, and programs that will benefit from the affiliation's combination of strengths.



## Senator Warren Visits the MBL

U.S. Senator Elizabeth Warren (D-Massachusetts) toured the MBL accompanied by MBL President and Director Joan Ruderman, University of Chicago President Robert J. Zimmer, Argonne National Laboratory Director Eric Isaacs, and other members of the institutions' leadership teams. The MBL's affiliation with the University of Chicago, Senator Warren said, "is a great partnership; great for Massachusetts and for [the MBL]." Her visit, she said, was a "reminder of why we are investing in research ... Woods Hole is the place the world is looking to for the best research and latest ideas."

## MBL Celebrates 125th Anniversary

The MBL commemorated its 125th anniversary with a series of special events, including Discovery Day, a free family science fair and anniversary party. In conjunction with the celebration, the MBL Community Archives Project collected community photos, memorabilia, and remembrances for the MBL Archives and History of MBL website, developed by the MBLWHOI Library, EOL Informatics Group, and Arizona State University.

## Life in the "Plastisphere" of the World's Oceans

Plastics are the most abundant form of marine debris, with global production rising and documented impacts in some marine environments. Associate Scientist Linda Amaral Zettler and collaborators published a study documenting the microbial community associated with plastic marine debris at several locations in the North Atlantic. They uncovered a diverse multitude of microbes, a community now called the "Plastisphere." They showed that plastisphere communities are distinct from surrounding surface water, implying that plastic serves as a novel ecological habitat in the open ocean.



### Long-Term Tundra Warming Study Provides Insight into Ecosystem's Resiliency

University of California Santa Barbara Ph.D. student Seeta Sistla, a graduate of the Brown-MBL program, compared plant species and total carbon and nitrogen storage in warmed and control tundra plots. These plots were established by Ecosystems Center Senior Scientist Gus Shaver more than 20 years ago as part of the Arctic Long-Term Ecological Research Project. Sistla found that warming increased plant biomass and woody dominance, indirectly increased winter soil temperature and suppressed surface-soil-decomposer activity, but did not change total soil carbon or nitrogen stocks and thereby increased ecosystem carbon storage. This is an important prediction that indicates carbon loss could be partially offset by greater storage in vegetation as the tundra warms.

### University of Chicago, MBL Launch Research Awards, Scholarship Programs

The MBL and UChicago introduced the Frank R. Lillie Research Innovation Awards. The competitive, multi-year grant program, one of the first results of the UChicago-MBL affiliation, supports innovative, interdisciplinary research that will lead to novel ideas and biological discovery. UChicago also initiated a full-tuition, merit based, renewable scholarship for undergraduate study at the University to be awarded annually to the child of a year-round MBL employee who is accepted for enrollment at the University of Chicago.



### New Sculptures Grace Waterfront Park

MBL's Waterfront Park was enhanced with the installation of two new sculptures. "Flukes," a cast-bronze abstract form inspired by the shape of a whale's tail, was generously donated to the MBL by the artist, Gordon Gund. A life-sized bronze statue of environmentalist and writer Rachel Carson was also unveiled. The statue commemorates Carson's ties to Woods Hole and Cape Cod and is modeled on a photograph taken of the scientist seated on a Woods Hole dock, notebook in hand, looking out at the sea. The statue is the culmination of the work of the Falmouth, MA-based Rachel Carson Statue Committee.





### **Jellyfish Built for Efficiency, Not Speed**

Jellyfish may not be fast, but they are one of the most efficient swimmers on the planet, reported MBL Whitman Investigators Brad Gemmill and John Costello of Providence College and Sean Colin of Roger Williams University. The key to the energy savings is a previously overlooked part of the way jellies move, a mechanism scientists call “passive energy.” During the relaxation phase, after the jellyfish contracts, the scientists discovered that another vortex ring in the water gives the animal a second locomotive boost. The discovery may explain why jellyfish can “bloom” and overrun an ecosystem, outcompeting much swifter predators like fish.

### **Microbial Diversity Course Named “Milestones in Microbiology” Site**

The MBL Microbial Diversity Course was honored as the 2013 “Milestones in Microbiology Site” by the American Society for Microbiology. The designation recognizes places where major developments in microbiology occurred and/or where outstanding microbiologists made seminal discoveries. The course, initiated in 1971, has shaped the careers of generations of outstanding microbiologists, and continues to be a premier site for advanced training at the leading edge of microbiological investigation.



### **Genes Linked to Human Neurological Disorders Found in Lamprey Genome**

A consortium of scientists including Jennifer Morgan of the Eugene Bell Center for Regenerative Biology and Tissue Engineering published the genome of the sea lamprey, a vertebrate fish used by Morgan to study the molecular and cellular basis of spinal cord regeneration. Morgan and MBL Whitman Investigators Ona Bloom and Joseph Buxbaum identified several genes linked to human neurological disorders, including Alzheimer’s disease, Parkinson’s disease, and spinal cord injury.



### **Staying Alive in the High and Dry**

Ecosystems Center Senior Scientist Zoe Cardon and colleagues showed how the movement of water from deep moist soil, through plant roots,

to shallow dry soil delivers sips of sustaining water during drought to surface soil microbes that make nitrogen available to plants. Working in Utah’s sagebrush steppe, the team monitored this “hydraulic lift” of soil water and discovered that the mechanism stimulated microbial activity and more than doubled the plants’ uptake of nitrogen from the surrounding surface soil at exactly the time they were flowering and setting seed. Greater understanding of hydraulic lift could aid scientists and growers in finding ways to protect crops from the effects of prolonged drought.

### **New Program Helps Scientists Build a SUCCESSful Career**

The MBL launched SUCCESS (Shaping and Understanding Career Choices in Education, Science and Self), a new career development program for young scientists. The program features a series of weekly workshops led by panels of established scientists from institutions across the United States. Topics address everything from choosing a career, to honing presentation skills, to obtaining funding and finding mentors.

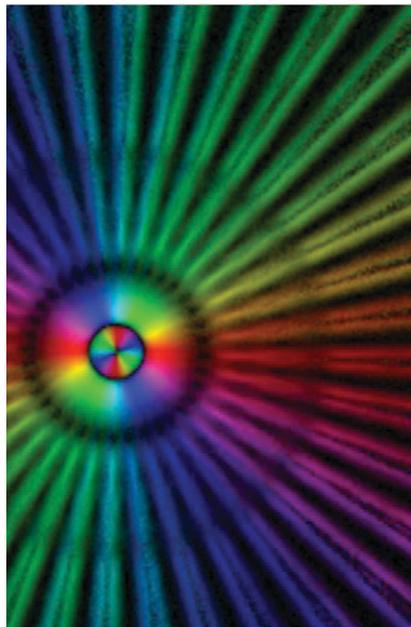


### Impacts of Beach Oiling on Coastal Microbes

The beach ecosystems along the northern Gulf Coast underwent a major disturbance in the months following Deepwater Horizon oil spill. Bay Paul Center scientists published a study of the changes in microbial community composition from oil hydrocarbon contaminated sands at seven coastal sites that experienced a range of oiling. They documented that, in addition to increases in oil hydrocarbon-degrading bacteria, there were community-wide impacts including increased variability of core, resident, and transient members of the bacterial community in coastal sands. These changes could affect the biological and chemical stability of coastal ecosystems.

### Shedding Light on Cell Structures

Cellular Dynamics Program scientists Rudolf Oldenbourg, Michael Shribak, and Shalin Mehta developed the optical setup, image acquisition, and processing algorithms needed to measure the polarization sensitive absorption of pigments in photoreceptors and in other light absorbing cell structures. In related work, members of the Oldenbourg laboratory created OpenPolScope.org for users and developers of polarized light microscopy techniques. The open-access website is a platform for the collection and dissemination of knowledge about the technology, its applications, and its further development.



### New Insight on Cuttlefish Decision-Making During Camouflage

A study from Kimberly Ulmer and Roger Hanlon in the Program in Sensory Physiology and Behavior and their colleagues showed that when cuttlefish change their skin patterns for camouflage purposes, they respond to vertical visual cues in their environment more strongly than to horizontal cues. Many prior experiments had shown the influence of two-dimensional substrates, such as sand and gravel habitats, yet many marine habitats have three-dimensional structures, such as rocks and coral, among which cuttlefish camouflage from predators. Such choices highlight the selective decision-making that occurs in cuttlefish as they determine their camouflage body patterns.

### Bell Center Student Awarded Ph.D.

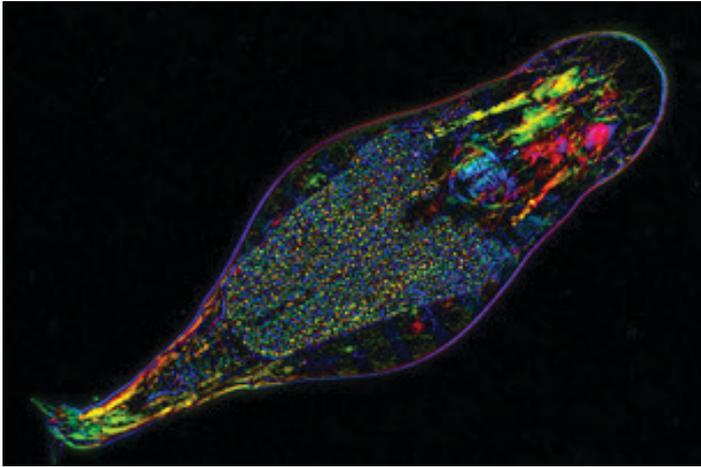
Brown-MBL Program student Cassandra Bilogan successfully defended her Ph.D. dissertation, making her the first Brown-MBL student to complete her degree in the Eugene Bell Center for

Regenerative Biology and Tissue Engineering. Bilogan conducted her doctoral research in the lab of Associate Scientist Marko Horb. Bilogan's research focused on embryonic development, in particular development of the pancreas. Understanding how the pancreas develops is vital to finding treatments for a range of pancreatic diseases, including diabetes and pancreatic cancer.



### Study Examines Effects of Cropland Intensification on Amazon Watershed

Ecosystems Center Senior Scientists Christopher Neill and Linda Deegan and colleagues study ways that clearing of Amazon forest for soybean cropland influences runoff to streams, water quality and stream habitats. The work also indicates that cleared and intensively farmed regions of the Amazon are near a point where clearing for cropland is reducing rainfall by lowering the amount of water recycled to the atmosphere.



### How to Survive Without Sex

Bdelloid rotifers, a group of more than 400 small aquatic invertebrate species, are considered an “evolutionary scandal” due to their successful evolution apparently without sex. An international collaboration of scientists including the Bay Paul Center laboratories of Irina Arkhipova and David Mark Welch published the first genome sequence of a bdelloid rotifer. Their analysis is shedding new light on the evolutionary significance of sex, and suggests that the homogenizing and diversifying roles of sex may have been replaced in bdelloids by gene conversion and horizontal gene transfer.

### Rudolf Oldenbourg Appointed Director of Cellular Dynamics Program

MBL Senior Scientist Rudolf Oldenbourg was named director of the Cellular Dynamics Program, whose research focuses on developing new techniques and technologies for the study of living cells. Oldenbourg has pioneered advances in transmitted light microscopy and invented the LC-PolScope, a polarized light microscope enhanced by the use of liquid crystal technology, electronic imaging, and digital image processing. The LC-PolScope is now widely used in clinical and research laboratories around the world and has found particular relevance in fertility clinics, where it can be used noninvasively to visualize meiotic spindles in human eggs.

### Fish Study Probes Evolution of Vertebrate Jaw

The emergence of the biting jaw is a major novelty in the evolution of vertebrates. A classical and widely cited hypothesis that the jaw evolved from the gill skeleton remained unsupported by palaeontological evidence or genetic data. Using shark, skate, and paddlefish embryos, Whitman Investigator Andrew Gillis of Dalhousie University and his colleagues showed that nested expression of the *Dlx* genes—the “*Dlx* code” that specifies upper and lower

jaw identity in mammals and bony fishes—is actually a primitive, shared feature of the jaw and gill arches of jawed vertebrates. The evidence supports the hypothesis made by anatomist Karl Gegenbauer more than a century ago and demonstrates that the structures were primitively specified by a common *Dlx* blueprint.

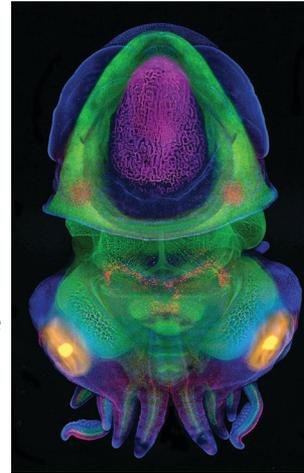
### Embryology Course Turns 120

The MBL’s Embryology course celebrated its 120th session in 2013.

The course was founded in 1893

by University of Chicago scientists Charles Otis Whitman (then MBL Director) and Frank Rattray Lillie. Considered the premier course on animal developmental biology, the course brings together leading faculty and students in an intensive research experience that

explores the latest paradigms, problems, and technologies in modern developmental biology. To celebrate the course’s legacy, a commemorative symposium was held at which former directors, faculty, and students discussed their research, and considered the course’s role in shaping the practice of science.



## MBL At-A-Glance\*

*The Marine Biological Laboratory (MBL) is dedicated to scientific discovery and improving the human condition through research and education in biology, biomedicine, and environmental science. Founded in Woods Hole, Massachusetts, in 1888, the MBL is a private, nonprofit institution and an affiliate of the University of Chicago.*

### LEADERSHIP

Chairman of the Board of Trustees: **Robert J. Zimmer**

President and Director: **Joan V. Ruderman**

Speaker of the MBL Society: **Colleen M. Cavanaugh**

### SCIENTISTS & AFFILIATED STAFF

The MBL has approximately 250 year-round employees, about half of which are scientists and science support staff. The staff is joined each year by more than 300 visiting scientists, summer staff, and research associates from hundreds of institutions around the world, as well as a large number of faculty and students participating in MBL courses (see below).

### AWARD-WINNING SCIENCE

Among the scientists with a significant affiliation with the MBL (scientists, course faculty and students) are 55 Nobel Prize winners (since 1929); 124 Howard Hughes Medical Institute investigators, early career scientists, international researchers, and professors (since 1960); 229 Members of the National Academy of Sciences (since 1960); and 198 Members of the American Academy of Arts and Sciences (since 1960).

### AFFILIATION WITH THE UNIVERSITY OF CHICAGO

The MBL and the University of Chicago formed an affiliation on July 1, 2013, that enhances both institutions' missions of leadership and innovation in scientific research and education. The affiliation builds on shared values and historical ties between Chicago and the MBL, which was led by University of Chicago faculty members for the first four decades of its existence.

### MAJOR PROGRAMS & RESEARCH AREAS

**Ecosystems Center:** Ecosystems processes, biogeochemistry, and climate change

### **Bay Paul Center for Comparative Molecular Biology**

**& Evolution:** Microbial ecology; genetics and metagenomics; molecular evolution

### **Bell Center for Regenerative Biology & Tissue**

**Engineering:** Cell, developmental and regenerative biology; tissue engineering and regeneration

**Cellular Dynamics Program:** Microscopy, imaging and cellular dynamics; cellular physiology and biocurrents; biosensors

**Program in Sensory Physiology & Behavior:** Sensory biology (especially vision, balance, hearing); cephalopod camouflage; animal behavior

**Whitman Center for Visiting Research:** Collaborative research by leading scientists from around the world

### EDUCATIONAL PROGRAMS

**MBL Courses:** 25 courses providing advanced, laboratory-based research training in fields such as cellular physiology, embryology, neurobiology, and microbiology, including (in 2013) 557 students from 416 institutions and 45 countries; and 845 faculty, staff, and lecturers from 276 institutions and 17 countries.

Educational programs also include undergraduate education and independent research, graduate training, the Brown-MBL Graduate Program in Biological and Environmental Sciences, postdoctoral training, and community continuing education programs.

### OTHER PARTNERSHIPS

**The Brown-MBL Partnership** fosters research collaborations between scientists from the MBL and Brown University, and includes undergraduate training, a joint graduate program, graduate training grants, and collaborative research programs.

**The Woods Hole Consortium** is a research and educational alliance between the MBL, the Woods Hole Oceanographic Institution, and the Woods Hole Research Center.

**Encyclopedia of Life (EOL):** The MBL is a founding member of the Encyclopedia of Life, a global consortium working to provide free, open access to curated digital knowledge about life on Earth, with a special focus on more than 200,000 marine organisms. The software programming team responsible for building EOL is based at the MBL.

### SCIENTIFIC CONFERENCES

The MBL annually hosts scientific meetings, conferences, and departmental retreats, accommodating more than 2,600 participants from around the world.

### RESOURCES

**The MBLWHOI Library** houses one of the world's foremost print and electronic literature collections in the biological, biomedical, ecological, and oceanographic sciences; and conducts digitization and informatics projects.

**The W. M. Keck Ecological and Evolutionary Genetics Facility** is a high-throughput DNA template production and sequencing facility in the MBL's Josephine Bay Paul Center.

### **The Marine Resources Department**

is an advanced facility for maintaining, culturing, and providing aquatic organisms essential to biological, biomedical, and ecological research.

**National *Xenopus* Resource** breeds and maintains *Xenopus* (frog) genetic stocks; and provides training in *Xenopus* husbandry, cell biology, imaging, genetics, transgenesis, and genomics.

### FINANCES

**2014 Operating Budget:** \$47.4 million (40% government grants and contracts; 11% nonfederal grants and contracts; 8% contributions; 7% endowment earnings; 34% other)

**Endowment:** \$76.0 million (as of Dec. 31, 2013)

**Net Assets:** \$166.7 million (as of Dec. 31, 2013)

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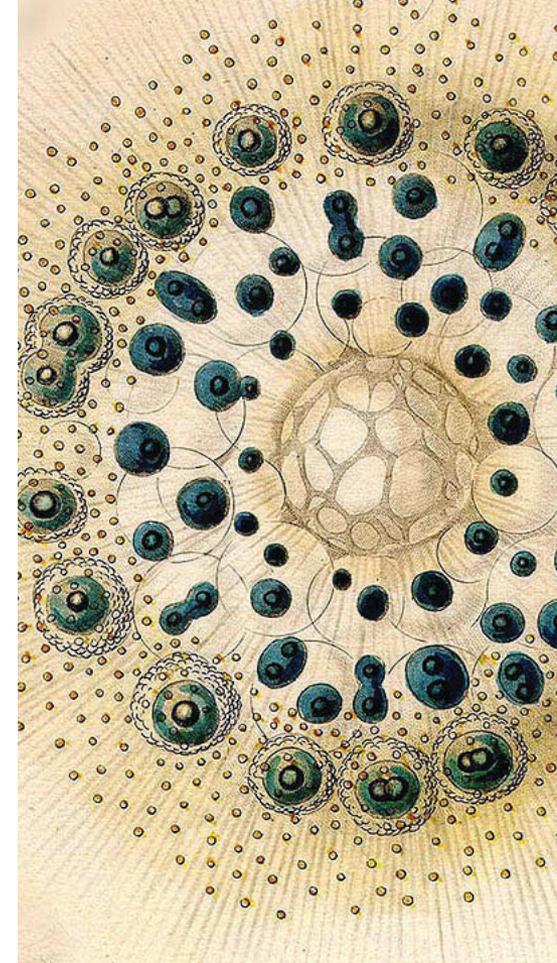
## Report of the Treasurer

2013 brought several significant financial changes to the MBL, in addition to transitioning to the new affiliation with the University of Chicago, which became effective July 1, 2013. The University has committed to substantial financial support to the MBL for the coming years, and in 2013 \$6.0 million in cash was received as income for operations. MBL realized a \$2.0 million loss from operating activities, after including the University support, largely driven by decreases in federal revenue as available grant streams continue to tighten.

The affiliation with the University necessitated a review of the fair market value of MBL's assets and liabilities, as the MBL results will be consolidated into the University's financial statements. The result of the review was a revaluation of MBL's real estate assets, and a \$50.0 million increase in land value was recorded on MBL's balance sheet in 2013. Net assets as of December 31, 2013 were \$166.7 million, up from \$109.7 million as of December 31, 2012. MBL's endowment value rose to \$76.0 million at the end of 2013, up from \$69.4 million at the end of 2012.

MBL has been working closely with the University on intensive strategic planning activities, both scientific and operational, since July 2013. Revenues and expenditures of each major business unit are being reviewed in detail, and an operational modeling exercise has begun to consider new activities and their revenue impacts on the institution. Partnerships between staff and researchers at both institutions have developed, integrating activities and contributing to initial programmatic successes and operational improvements. While there is much work left to be done, leadership of both the MBL and the University are optimistic and enthusiastic about the potential for mutual benefit, and the future growth of the MBL.

— Mary S. Harrington, Treasurer



The financial statements of the Marine Biological Laboratory for the fiscal year ending December 31, 2013, were audited by Grant Thornton LLP.

Complete financial statements are available on request from:

Financial Services  
MBL  
7 MBL Street  
Woods Hole, MA 02543

ASSETS		Statement of Activities: Year ended December 31, 2013				
		Unrestricted	Temporarily Restricted	Permanently Restricted	Total	
Cash and cash equivalents	\$ 734,067					
Cash held for others	302,915					
Accounts receivable, net of allowance for doubtful accounts of \$35,000	567,396					
Contributions receivable, net	1,765,351					
Receivables due for costs incurred on grants and contracts	3,195,727					
Inventory and prepaid expenses	786,214					
Investments, at fair value	80,846,876					
Charitable remainder trusts	480,797					
Plant assets, net	115,192,315					
Other assets	1,343,419					
<b>Total assets</b>	<b>\$ 205,215,077</b>					
LIABILITIES AND NET ASSETS		Operating support and revenues:				
Accounts payable and accrued expenses	\$ 3,133,860	Federal grants	\$ 18,883,765	\$ -	\$ -	\$ 18,883,765
Future program resources	302,915	Non-Federal grants and contracts	4,913,541	1,136,000	-	6,049,541
Deferred income	2,029,653	Income from affiliate	6,040,000	-	-	6,040,000
Annuities and unitrusts payable	422,372	Fees for conferences and services	4,436,109	-	-	4,436,109
Interest rate swap	3,049,573	Contributions	2,155,322	1,089,088	295,058	3,539,468
Long-term debt	29,615,000	Investment earnings used for operations	387,920	2,569,511	-	2,957,431
<b>Total liabilities</b>	<b>38,553,373</b>	Laboratory rentals	1,011,158	-	-	1,011,158
Commitments and contingencies		Tuition, net	936,324	-	-	936,324
Net assets:		Other revenue	615,635	-	-	615,635
Unrestricted	93,244,744	Investment loss	(6,301)	-	-	(6,301)
Temporarily restricted	21,900,525	Net assets released from restrictions and reclassifications	5,749,042	(5,781,543)	32,501	-
Permanently restricted	51,516,435	<b>Total operating support and revenues</b>	<b>45,122,515</b>	<b>(986,944)</b>	<b>327,559</b>	<b>44,463,130</b>
<b>Total net assets</b>	<b>166,661,704</b>	Expenses:				
<b>Total liabilities and net assets</b>	<b>\$ 205,215,077</b>	Research	27,612,268	-	-	27,612,268
		Education	10,000,661	-	-	10,000,661
		Visiting research	4,161,126	-	-	4,161,126
		Conferences, housing and dining	3,419,631	-	-	3,419,631
		Other expenses	1,954,660	-	-	1,954,660
		<b>Total expenses</b>	<b>47,148,346</b>	<b>-</b>	<b>-</b>	<b>47,148,346</b>
		Change in net assets before non-operating activities	(2,025,831)	(986,944)	327,559	(2,685,216)
		Non-operating revenue (expense):				
		Change in value of interest rate swap	3,171,103	-	-	3,171,103
		Present value adjustment to annuities	(17,903)	-	-	(17,903)
		Post retirement - related charges other than periodic pension costs	638,409	-	-	638,409
		Contributions for investment in plant	19,024	-	-	19,024
		Change in net assets from non-operating activities	3,810,633	-	-	3,810,633
		Investment income and gains (losses):				
		Net investment income and gains	1,109,848	7,650,791	-	8,760,639
		Less: investment earnings used for operations	(387,920)	(2,569,511)	-	(2,957,431)
		Recovery of deficiencies in historical values	299,729	(299,729)	-	-
		<b>Investment income and gains</b>	<b>1,021,657</b>	<b>4,781,551</b>	<b>-</b>	<b>5,803,208</b>
		Changes in net assets	2,806,459	3,794,607	327,559	6,928,625
		Net assets, December 31, 2012	40,438,285	18,105,918	51,188,876	109,733,079
		Fair value adjustment due to Affiliation	50,000,000	-	-	50,000,000
		Net assets, December 31, 2013	\$ 93,244,744	\$ 21,900,525	\$ 51,516,435	\$ 166,661,704

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## Report of the Development Committee



I am pleased to report that in 2013, we raised \$6,794,685 in new private support for MBL's research and education programs.

This is a strong accomplishment, given that 2013 was the first year following the very successful Catalyst Campaign.

Funds raised in 2013 include \$1.47 million in Annual and unrestricted funds that were immediately available to meet operational needs, and a \$1.25 million grant from the Alfred P. Sloan Foundation in support of The Bay Paul Center's Deep Carbon Project, which seeks to generate new insights about the abundance and diversity of subsurface marine microorganisms.

2013 proved to be a landmark year for the MBL in many ways. As the 125th anniversary of the MBL's founding, it was a time of reflection about where we've been, and for looking ahead to the next generation of MBL science. It was also the start of the MBL's affiliation with the University of Chicago, and the beginning of a new era in the lab's history.

Thank you to all our Trustees, Overseers, scientists, alumni, friends, staff, and extraordinary donors! On behalf of the Development Committee of the Board of Trustees, I offer my gratitude and thanks. Your generosity and belief in our work is an inspiration!

Thank you.

A handwritten signature in black ink, appearing to read 'JP', written in a cursive style.

— Jeffrey Pierce, Chair

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## Gifts

### Major Gifts

The MBL gratefully acknowledges the generous contributions and pledges of the individuals, foundations, and companies who supported our programs and operations in 2013.

#### **\$1,000,000-\$2,000,000**

ALFRED P. SLOAN FOUNDATION  
\$1,256,000 grant for support of the Deep Carbon Project; Mitchell Sogin, Principal Investigator.

#### **\$100,000-\$999,999**

BURROUGHS WELLCOME FUND  
\$820,000 in support of the Frontiers in Reproduction and Embryology courses and the Physiology Alumni Fund.

CHARLES M. AND PHYLLIS ROSENTHAL  
\$550,000 in support of the Ecosystems Recruitment Fund for Postdoctoral Scientists and the Annual Fund.

THE BAY AND PAUL FOUNDATIONS  
\$500,000 for support of the Bay Paul Center for Molecular Evolution's expanding investigation of human microbial biome.

THE GRASS FOUNDATION  
\$450,000 in support of the Neural Systems and Behavior and Neurobiology courses.

ESTATE OF LAURA HUNTER COLWIN  
\$401,549 for discretionary use.

THE G. UNGER VETLESEN  
FOUNDATION  
\$350,000 for support of the Bay Paul Center and the Marine Resources Center.

SIMONS FOUNDATION  
\$250,000 in support of the Microbial Diversity course.

GEORGE AND KATHY PUTNAM  
\$129,788 in support of the Strategic Planning Fund and the Annual Fund.

MILLICENT BELL  
\$125,000 in support of the Strategic Planning Fund and the Annual Fund.

DAVID AND SUSAN HIBBITT  
\$102,348 in support of the Strategic Planning Fund and the Annual Fund.

### Restricted Gifts

#### **\$50,000-\$99,999**

James F. Case  
Patrick Gage and Irina Wilson  
Jeffrey Gardner  
Shinya and Sylvia Inoué  
Kurt J. and Rhoda S. Isselbacher  
Tom and Maryann Jalkut  
George Frederick Jewett Foundation East  
Jeffrey and Margaret Pierce  
Promega Corporation  
George and Kathy Putnam  
Patricia and Charles Robertson  
Ann E. Stuart and John W. Moore

#### **\$10,000-\$49,999**

Anonymous (2)  
The Agouron Institute  
The American Society for Cell Biology  
American Society for Reproductive Medicine  
Margaret C. and Francis P. Bowles  
Worthington and Dorothy Campbell  
Carolyn Cohen  
The Company of Biologists Limited  
Sally Cross  
Saint Michael and All Angels  
Episcopal Church  
Fund for Science  
Howard Hughes Medical Institute  
Barbara Woll Jones  
Ethan and Lisa Lerner  
Marianne F. Milkman  
Gordon and Betty Moore Foundation  
Richard S. and Susan G. Morse  
The Morton Cure Paralysis Fund  
Nikon Instruments, Inc.  
Saul Pannell and Sally Currier  
William Townsend Porter Foundation  
Society for Developmental Biology, Inc.  
Ivan and Virginia Valiela  
Waksman Foundation for Microbiology  
Wellcome Trust

#### **\$5,000-\$9,999**

Donald R. Aukamp  
William and Susan Cobb  
Peter and Ginny Foreman  
Joan C. Miller  
Donald and Patricia Mintmire  
Joan V. and Gerald S. Ruderman  
Edward D. and Nancy M. Salmon  
Walter J. and Marjorie B. Salmon  
Woods Hole Foundation, Inc.

## \$1,000-\$4,999

American Society of Naturalists  
Porter W. Anderson, Jr.  
Gloria S. Borgese  
Paul N. Chervin  
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Photos

*Cover:* MBL's R/V *Gemma* (Daniel Cojanu)

*Inside front cover:* MBL Campus on Eel Pond, Woods Hole, MA (Tom Kleindinst)

*P1:* MBL President and Director Joan Ruderman (Bachrach Studios)

*P2: clockwise:* The University of Chicago and the Marine Biological Laboratory sign an agreement to affiliate (Bruce Gilbert); Massachusetts Senator Elizabeth Warren visits the MBL (Tom Kleindinst)

*P3: clockwise:* Arctic LTER greenhouses in peak autumn. (Sadie Iverson); The University of Chicago campus (UChicago); Flukes statue (MBL Communications Office); Rachel Carson statue (Tom Kleindinst)

*P4: clockwise:* Moon jellyfish (Brad Gemmill); Field experiments were conducted in a remote area near Utah's Bear Lake where the ecosystem's productivity is limited by both water and nitrogen availability. (Zoe Cardon); MBL's Microbial Diversity course (Tom Kleindinst)

*P5: clockwise:* Heavy oiling of Bay Jimmy, Plaquemines Parish, Louisiana (Wikimedia); cuttlefish (C. Vallino); Rain over a soybean field at Tanguro Ranch in the Upper Xingu watershed, Mato Grosso, Brazil. (Christopher Neill); Polarization sensitive absorption of a Siemens star pattern etched into a thin metal film (Shalin Mehta)

*P6: clockwise:* Bdelloid rotifer *Adineta vaga*, birefringence image, polarized light microscope. (M. Shribak and I. Arkhipova); cuttlefish embryo (Nipam Patel)

*P8:* *Collospheera huxleyi* microbe (David Patterson, ICoMM)

*P 10:* Jeff Pierce (Dan Cutrona)