

Greening of the Marguerite Kent Repass Ocean Conservation Center

Nicholas School of the Environment
Marine Laboratory
Beaufort, NC 281516

Final Report to the
Wallace Genetics Foundation

submitted by

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History of the Marguerite Kent Repass Ocean Conservation Center

The concept of an Ocean Science Teaching Center was originally developed by the DUML faculty and the DUML Advisory Board in the early 1990s. Under the leadership of Dr. Joe Ramus, Director of DUML from 1989-1998, an original design concept was developed for a facility containing a teaching laboratory, a lecture hall, and a series of service modules to support the activities in the building. A tentative site was selected, a draft design concept was selected, and fundraising began. By the late 1990s, approximately \$900,000 has been raised towards a goal of \$1.5 million.

In 1998, Dr. Mike Orbach assumed the Director position from Dr. Ramus, and a re-evaluation was done of the OCC concept and design. The original purpose of the building – teaching in laboratory and lecture settings – was retained, but a new concept developed of a “green” building. Groundwork was laid with the University Architect, John Pearce, and the Duke Facilities Management Department (FMD), coordinated through the DUML parent organization, the Nicholas School. The “green” concept was viewed as being in keeping of the mission of Duke University and the Nicholas School, and was full supported by the DUML faculty, staff and students.

Fundraising began for the OCC under the new “green” concept, and in 2003 Randy and Sally Christine Repass made a naming gift of \$1 million, which allowed the design and construction of the building to move forward. Randy, a Duke Engineering graduate, and Sally Christine are committed environmentalists, and live in a “green” residence in Watsonville, California. The new estimate for the OCC construction was \$2.2 million.

In the spring of 2004 Frank Harmon of Harmon and Associates was selected to be the architect on the project. Frank, an architect based out of Raleigh, NC, opened his firm in 1981, when few clients considered the environmental impacts of their buildings. He now works green components into every one of his designs. He had received awards from Time Magazine; the North Carolina Chapter American Institute of Architects; the South Atlantic Region of the American Institute of Architects; Raleigh, Durham, and Chapel Hill Sections, American Institute of Architects; Triangle Architecture Awards; Architectural Record; and the North Carolina Museum of Art. His work has also been published in two books: *The New American Cottage* and *Designing the New Museum*, and he and his firm had extensive experience with “green” building in North Carolina.

Working with Harmon and Associates, Consider Design of Raleigh was responsible for the design of the mechanical, plumbing, and electrical work for the OSTC. The Building Systems Engineer, Isaac Panzarella, also served as the project’s LEED Consultant.

From the spring through the fall of 2004, design ‘charettes’ were held by the Harmon team with faculty, staff, and students of DUML. These were open meetings, guided by the Harmon team, in which all aspects of the OCC design and function were discussed and agreed upon. In the fall, based on the results of the charette process, final design and cost estimates were developed, and the project was given the go-ahead for construction in December of 2004.

In February of 2005 the contractor, Joyce and Associates of Morehead City, was selected. Because of the higher level of skill required for sustainable buildings, Joyce and Associates had a chance to showcase their talents with the OCC. The contractors provided building permits, trade permits, fire permits, and a schedule of values for the architect and

owner. The contractor communicated regularly with the building's owner through the architect. They also prepared and kept current a schedule of submittals, providing a copy to the architect and owner on a monthly basis to comply with the LEED process requirements.

The LEED Process

The United States Green Building Council (USGBC), the United States' leading organization on environmental building matters, forms a national consensus for sustainable building, design, and maintenance standards. As a national coalition of building industry leaders, the USGBC's mission is to promote a new generation of high performance buildings that are "environmentally responsible, profitable, and healthy" inside and out.¹ Council members represent all facets of the building industry—including contractors and builders, building product manufacturers, and building owners, managers, users, and brokers—and come from diverse backgrounds—such as financial and insurance firms, nonprofit organizations, universities, and research institutions. Members form alliances with key industry and government members to "transform the built environment" through international conferences, policy guidance, and educational and marketing tools that support the adoption of sustainable building techniques.²

To achieve its mission, the USGBC encourages buildings that work with nature, rather than against it, stating, "no longer is it acceptable to inhabit buildings and cities that make little or no reference to environmental issues or are patently bad for our health and well-being"³ The newly emerging market for sustainable architecture encourages the blending of "gentle architecture" with ecosystem concepts in order to live in harmony with nature. To accomplish this, the Council promotes three broad solutions: reducing daily energy consumption, using renewable materials, and exploiting natural ventilation and illumination. It focuses its efforts on large-scale urban development, where sustainable building has the largest possible impact.⁴

The USGBC enhances the resources available for its members to make informed decisions when adopting green building practices. Their "unique perspective and collective power" culminated in the development of the Leadership in Energy and Environment Design, or LEED, rating systems.⁵

Leadership in Energy and Environment Design

The LEED rating systems "adhere with USGBC policy and procedures guiding development and maintenance of building systems."⁶ There are currently seven individual systems:

- LEED-NC: New commercial construction and major renovation projects,
- LEED-ED: Existing building operations,
- LEED-CI: Commercial interiors projects,
- LEED-CS: Core and shell projects,

¹ United States Green Building Council. www.usgbc.org. March 11, 2006

² United States Green Building Council. www.usgbc.org. March 11, 2006

³ *In Search of Natural Architecture* 12

⁴ *Big and Green*

⁵ United States Green Building Council. www.usgbc.org. March 11, 2006

⁶ LEED-NC Green Building Rating System for New Construction and Major Renovations Version 2.2

- LEED-H: Homes,
- LEED-ND: Neighborhood development, and
- LEED Application Guilds for Retail, Multiple Buildings/Campuses, Schools, Healthcare, Laboratories, and Lodging.

The LEED rating systems are national standards that create frameworks for measuring progress, assessing building performance, and tracking building goals—differentiating “definitely” achievable goals from “possibly” achievable goals.⁷ Created to transform the building market by establishing a standard metric for “green building” and promoting whole-design practices, the rating systems stimulate green competition by recognizing environmental leadership in the building industry and raising consumer awareness of green building benefits.⁸ Based on a holistic, systematic analysis LEED quantifies the differences in sustainability between buildings from the initial stages of the projects through building commissioning and operation. Rating is voluntary, consensus-based, market-driven, and based on accepted energy and environmental principles that balance established practices with modern technologies.⁹ The systems are reworked every two years. In addition to the seven rating systems, LEED offers project certification, professional accreditation, training, and other practical resources.

Benefits of using LEED¹⁰

The Ocean Science Teaching Center (OSTC) follows the Version 2.2 of LEED-NC, which was published in January 2006. LEED-NC “helps professionals across the country to improve the quality of buildings and their impact on the environment.”¹¹ Because it is located on the coast, those involved in the construction and operation of the OSTC cannot simply accept nationwide building standards. They are challenged to think locally and prepare for the conditions unique to the North Carolina coast—the biophysical environment.

Certification

Certification distinguishes buildings “committed to sustainability by meeting the highest performance standards.”¹² To become certified as a green building under the USGBC guidelines, a building must be registered during the early phases of the project, document the achievement of all prerequisites, and satisfy a minimum of 26 points.¹³ (See LEED website—www.leedbuilding.org—for details about the review process, schedule, and fees.)

The first step toward LEED certification is to register the project on the LEED website. Second, the project team, with the help of a LEED accredited professional, fulfills the documentation and calculations necessary to complete the prerequisites. The LEED accredited professional is the project’s contact and the team member responsible for

⁷ LEED-NC Green Building Rating System for New Construction and Major Renovations Version 2.2

⁸ US Green Building Council. www.usgbc.org. March 11, 2006

⁹ LEED-NC Green Building Rating System for New Construction and Major Renovations Version 2.2

¹⁰ LEED-NC Green Building Rating System for New Construction and Major Renovations Version 2.2

¹¹ LEED-NC Green Building Rating System for New Construction and Major Renovations Version 2.2

¹² www.usgbc.org

¹³ www.usgbc.org

coordinating the LEED process. After technical reviews, USGBC decides whether or not to award certification to the project. If a project is not certified, the team can appeal.

LEED-NC and the OCC

LEED for New Commercial Constructions and Major Renovations (LEED-NC) focuses on guiding and distinguishing high performance office buildings. It can apply to commercial and institutional buildings, multiple buildings (i.e., campuses), churches, and hotels that are no taller than four stories.¹⁴ The latest edition, Version 2.2, lists intent, requirements, submittals, technologies, and strategies for each credit. It also provides preformatted templates to help streamline the preparation of certificate submittal sheets.¹⁵ LEED-NC standards cover sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental air quality. Because it is located on the coast, those involved in the construction and operation of the OSTC cannot simply accept nationwide building standards. They are challenged to think locally and prepare for the conditions unique to the North Carolina coast—the biophysical environment.

Construction

Construction began in October of 2005, and the building itself was essentially completed by August of 2006. Instruction began in the OCC in August of 2006, and the building was formally dedicated in November of 2006.

¹⁴ LEED-NC

¹⁵ www.usgbc.org

Press Release

DUKE MARINE LABORATORY BREAKS GROUND FOR NEW OCEAN SCIENCE TEACHING CENTER

New center will be Marine Lab's first totally 'green' building and the first new academic building on the Beaufort campus in 30 years.

April 22, 2004 -- More than 100 faculty, students, Marine Lab Advisory Board members and distinguished guests joined Dean William Schlesinger and Dr. [Michael Orbach](#), director of the [Duke Marine Laboratory](#), to celebrate the groundbreaking of the Marine Lab's new \$1.5 million Ocean Science Teaching Center on April 24 at the Beaufort campus.

The 5,000-square-foot center, to be located at the point of Pivers Island, will be the first new academic building constructed on the Beaufort campus in 30 years, and the Marine Lab's first totally "green" building, designed to the highest standards for energy and environmental efficiency adopted by the U.S. Green Building Council. It will house a teaching laboratory; a televideo-capable lecture hall for team teaching and distance education; interpretive educational displays; and spaces for social interactions.

When completed in fall 2005, it will greatly expand the Marine Lab's teaching capacity and enhance its capabilities for public outreach and education.

A \$2.3 million gift from naming donors Randy Repass, chairman of West Marine Inc., and his wife Sally-Christine Rodgers, to Duke's Nicholas School of the Environment and Earth Sciences helped fund the center and create a new University Professorship in Marine Conservation Technology at the Marine Lab.

Repass and Rodgers were honored for their support of the Nicholas School at a dinner at the Marine Lab on Friday, April 23, as were longtime Marine Lab friends and supporters Charles and Bernard Blanchard.

Prior to the groundbreaking on Saturday, architect Frank Harmon led a panel discussion on "green" buildings and answered questions about the preliminary design of the new center from a crowd of about 60 faculty members, board members, students and local citizens.

At the groundbreaking ceremony itself, ten Naming or Leadership donors joined Schlesinger and Orbach in turning the first dirt for the new center. They were: Randy Repass, Sally-Christine Rodgers and their son, Kent-Harris Repass; Howard Hardesty; Carolyn Thomas and her granddaughter Margaret Wilbanks; Richard Seale; Albert Oettinger; Mrs. Alton B. Smith; and Robert Hardy. Two donors, Bob Schwartz and the Wade Family, were unable to attend.

A grant from the Wallace Genetic Foundation will make it possible to build the new Ocean Sciences Teaching Center to LEED (Leadership in Energy and Environmental Design) certification standards. In accordance with LEED, the center will incorporate green technologies such as solar and geothermal energy, tidal and wind power, and sustainable materials such as bamboo paneling and concrete made from fly ash.

Media contact: Tim Lucas, 919/613-8084 or tdlucas@duke.edu

<http://www.nicholas.duke.edu/news/ostc2.html>

the log

Duke Marine Lab Dedicates Ocean Conservation Center

The Nicholas School dedicated its new 5,600-square-foot Marguerite Kent Repass Ocean Conservation Center at the Duke Marine Laboratory campus in Beaufort, N.C., in a festive outdoor November ceremony.

The Repass Center is the first new academic building constructed at the Marine Lab in 30 years and is the lab's first "green" building. It uses geothermal pumps for heating and cooling, solar panels for hot water, and photovoltaic rooftop panels to convert sunlight into electricity. Local building materials, such as yellow southern pine and Atlantic white cedar, and recycled wood are used throughout the structure.

Other eco-friendly features include natural daylight in all spaces, fresh-air ventilation, deep overhangs to provide shade, native landscape and permeable sidewalks, and a zinc roof designed to last 100 years.

The center houses a teaching laboratory, a 48-seat lecture hall equipped with state-of-the-art teleconferencing and videoconferencing facilities to connect to other classrooms and research labs worldwide, and a large, glass-enclosed commons area containing art and sculpture, with views of the Rachel Carson Research Reserves, Beaufort Inlet and Shackleford Banks.

A \$2.3 million gift from Randy Repass chairman of West Marine Inc. of Watsonville, Calif., and his wife Sally Christine Rodgers, helped fund the center and create a University Professorship in Marine Conservation Technology at the Marine Lab. The new center is named in honor of Repass' mother.

During the dedication ceremony, both Repass and Rodgers made remarks expressing the urgent need for action to preserve the marine environment, and they cited the lifelong inspiration that Marguerite Kent Repass has been to marine conservation. The elder Mrs. Repass was in attendance and helped cut the ribbon for the new building.

The center was designed by Raleigh architect Frank Harmon to meet the highest standards for energy and environmental efficiency adopted by the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) program. A grant from the Wallace Genetic Foundation made it possible to design the Repass Center to LEED certification standards.

"The Repass Center represents a major first step in our long-term initiative to make our Beaufort campus a model for environmental sustainability, and it significantly enhances our capabilities for collaborative research, outreach and education," said Marine Lab Director Cindy L. Van Dover.

William H. Schlesinger, dean of the Nicholas School, said, "Thanks to the vision and generosity of Randy Repass, Sally Christine Rodgers and the Wallace Genetic Foundation, and to the leadership of Michael Orbach, former director of the Marine Lab who continues to play an integral part in the Repass Center's development, we have been able to construct a state-of-the-art facility that benefits both our students and our environment."

bottom from left: Repass Center teaching laboratory; Michael Orbach presents building proclamation plaque to Randy Repass, Kent Harris Repass and Sally Christine Rodgers; Randy Repass. **Top right and down:** Cindy Van Dover and Michael Orbach; Marguerite Kent Repass cuts ribbon; Repass Center's glass-enclosed commons area. *Photos by Brent Taylor*



Major Environmental Features of the OCC

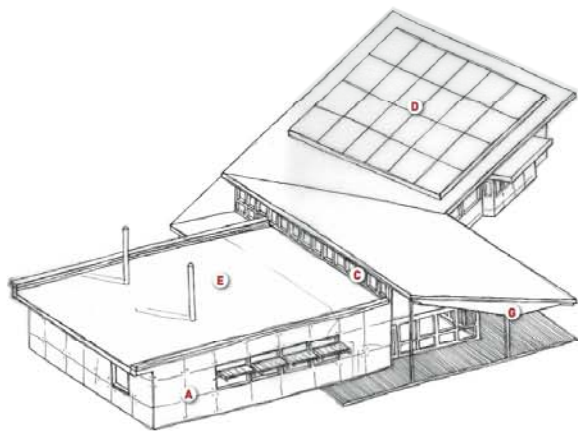
The OCC has the following major environmental features:

- 1) Site Design – The entire site is designed to take advantage of prevailing winds and sunlight. Native plants and a constructed sand dune system are in place, mimicking the natural landscapes on the adjacent barrier islands.
- 2) Energy Supply – The OCC uses photovoltaic cells to convert sunlight for approximately 20% of the energy needs of the building, and passive solar for heating the water used in the building.
- 3) Heating and Cooling – The OCC uses a geothermal circulation system, taking advantage of the constant temperature of the groundwater below the building, for heating and cooling, supplemented by a conventional heat pump system. All air systems re-circulate air for maximum efficiency.
- 4) Innovative Materials – The exterior of the laboratory portion of the OCC and the interior ceilings are a material called Windscreen, a concrete-based material that is 90% heat and light reflective and is mounted with a “breathable” interface with the supporting wall structure. Walkways to the building are permeable concrete, allowing rain to go directly into the ground beneath the walkways.
- 5) Local Materials – The wood used in the building is either recycled from other buildings, or produced within 500 miles of the building site in Beaufort.
- 6) Non-toxic Paints and Solvents – All paints and solvents used in the OCC are “low volatile organic content (VOC)”.
- 7) Natural Light and Ventilation – The OCC is design for maximum use of natural sunlight and ventilation.

THE MARGUERITE KENT OCEAN CONSERVATION CENTER

A GREEN BUILDING AT THE DUKE UNIVERSITY MARINE LAB

The Marguerite Kent Ocean Conservation Center is an "Earth Friendly" building that exists in balance with nature. All elements of the building – from landscaping to building materials to technological innovations – work in harmony to produce an attractive, high-performance facility that reduces energy consumption and has minimal impact on the planet. The result is a building that demonstrates environmental responsibility and provides a healthy place in which to learn and work. Certified by the U.S. Green Building Council's LEED (Leadership in Energy & Environmental Design) Green Building Rating System®, the Marguerite Kent Ocean Conservation Center sets a new standard for building design and construction in North Carolina.



A FEW EXCITING GREEN FEATURES

A RAIN SCREEN

The laboratory spaces are clad in a fiber cement Rain Screen paneling system, an insulating, "breathable," maintenance-free material that keeps the wall framing dry and intact. The fiber cement reflects sunlight (thus minimizing heat gain), resists mold, mildew and severe climatic conditions, and never needs painting or staining, so potential toxins from those substances are eliminated.



B SAND DUNE

The new sand dune, landscaped with native plants, directs wind over the building rather than directly at it. It also protects other landscaping features and helps filter pollutants from storm water run-off.



C DAYLIGHT + ROOF OVERHANGS

Natural daylight illuminates the interior, reducing the use of energy needed for that purpose. Broad overhangs protect the interior from the summer sun's excessive heat but also allow direct light to enter the building in the winter, allowing the building to retain heat during the colder months.



D SOLAR ENERGY

Photovoltaic panels produce power directly from sunlight by converting the sun's energy into a moving current of electricity, which can be conserved when excesses are produced. Solar panels collect heat from the sun and transfer that heat to water that is used in the building's restrooms.



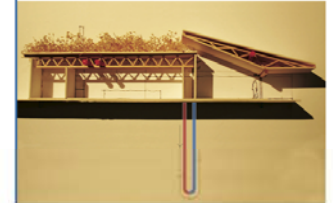
E ENERGY STAR® ROOF

The roof meets Energy Star® standards and reflects the sun's rays, thereby lowering the surface temperature by up to 100°F. This decreases the amount of heat transferred into the building, thus reducing the amount of air conditioning needed to cool the interior.



F GEOTHERMAL WELLS

A pump system uses the constant temperature of the earth to heat and cool the interior of the building by circulating water through a network of 250 foot-deep underground pipes.



G LONG LIFE + REUSABLE PARTS

All materials are chosen for their durability within a coastal climate. The simple construction method, including stainless steel fasteners, means that the building can literally be taken apart with ease whenever repairs are necessary.



H NATURAL VENTILATION

Like traditional buildings in Beaufort, the Ocean Conservation Center is oriented on its site along the edge of Piver's Island to make the most of natural ventilation. Southwestern breezes blow in from the Atlantic Ocean, and the angular design creates an open, inner courtyard for the campus.



I RECYCLED CONTENT

Recycled and local materials are used whenever possible, including Southern yellow pine and cedar-shake shingles.



Initial Findings Regarding the “Green” Building and LEED Process at DUML

- 1) With the exception of the University Architect and the Harmon and Associates architecture firm, the Duke FMD and local contractors had little familiarity with LEED or the “green” building process.
- 2) Even with heroic efforts on the part of the contractor, they could use few if any local suppliers due to the nature of the “green” building materials requirements.
- 3) The LEED process itself has limitations for, and is not well adapted to, the coastal climate and other peculiarities of the coastal construction permitting and other processes.
- 4) The students, both in Durham and Beaufort, were some of the primary drivers of the “green” process.
- 5) The local Carteret County community has evidenced a great deal of interest in the OCC and its construction process, as evidenced by articles in local media and requests for tours of, and information regarding, the building.
- 6) The OCC has resulted in the new Strategic Plan for DUML specifying that all future buildings will be of a similar, “green” character.

Certification Award

The US Green Building Council awarded the Marguerite Kent Repass Ocean Conservation Center a gold certification for new constructions in November 2008. The LEED-NC report for the building was issued on 11/18/2008 and is included on the following page.



U.S. Green Building Council

HEREBY CERTIFIES THAT

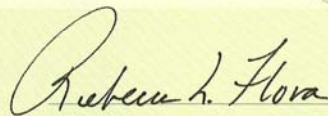
MARGUERITE KENT REPASS OCEAN CONSERVATION CENTER

BEAUFORT, NC

HAS SUCCESSFULLY MET THE GREEN BUILDING STANDARDS REQUIRED FOR
THE FOLLOWING LEVEL OF CERTIFICATION UNDER THE LEADERSHIP IN
ENERGY AND ENVIRONMENTAL DESIGN (LEED®) GREEN BUILDING RATING SYSTEM™.

LEED for New Construction

GOLD


Chairman

November 2008


S. Richard Pedrizzi, President, CEO and Founding Chairman

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Press Release

Duke University Marine Lab's Repass Center Earns Gold by Going Green

Contact: Tim Lucas, 919/613-8084, tdlucas@duke.edu

November 24, 2008

BEAUFORT, N.C. – The Marguerite Kent Repass Ocean Conservation Center at the Duke University Marine Lab in Beaufort, N.C., has been awarded the Gold LEED certification by the U.S. Green Building Council. LEED stands for Leadership in Energy and Environmental Design.

The 5,600-square-foot Repass Center, which was dedicated in November 2006, uses geothermal pumps for heating and cooling, solar panels for hot water, and photovoltaic rooftop panels to convert sunlight into electricity. Local building materials, such as yellow southern pine and Atlantic white cedar, and recycled wood are used throughout the structure.

Other eco-friendly features include natural daylight in all spaces, fresh-air ventilation, deep overhangs to provide shade, native landscape and permeable sidewalks, and a zinc roof designed to last 100 years.

The center houses a teaching laboratory, a 48-seat lecture hall equipped with advanced teleconferencing and videoconferencing facilities to connect to other classrooms and research labs worldwide, and a large, glass-enclosed commons area containing art and sculpture, with views of the Rachel Carson Research Reserve, Beaufort Inlet and Shackleford Banks.

A \$2.3 million gift from Randy Repass, chairman of West Marine Inc. of Watsonville, Calif., and his wife, Sally-Christine Rodgers, helped fund the center and create a University Professorship in Marine Conservation Technology at the Marine Lab. The center is named in honor of Repass' mother.


The center was designed by Raleigh architect Frank Harmon to meet the highest standards for energy and environmental efficiency adopted by the U.S. Green Building Council's LEED program. A grant from the Wallace Genetic Foundation made it possible to design the Repass Center to LEED certification standards.

<http://www.nicholas.duke.edu/news/ns-repass.11.24.08.html>

Woodworks Green Building Wood Design Award

<http://www.woodworks.org/woodDesignShowcase/woodDesignAwards/southeast/default.aspx>




GREEN BUILDING WOOD DESIGN AWARD



FIRM: Frank Harmon Architect, PA
Raleigh, NC

PROJECT: Ocean Science Teaching Center
Beaufort, NC

PHOTOGRAPHY: Jeffrey Jacobs



Press Release

Duke Marine Lab's Repass Center Wins Green Building Wood Design Award

Contact: Tim Lucas, 919-681-8084, tdlucas@duke.edu

Feb. 25, 2009

BEAUFORT, N.C. – The Marguerite Kent Repass Ocean Conservation Center at the Duke University Marine Lab in Beaufort, N.C., has been awarded a Green Building Wood Design Award from WoodWorks, a nonprofit cooperative program of the Wood Products Council.

The award, which was presented Feb. 24 in Raleigh, recognizes the center as an example of a nonresidential building that makes outstanding use of sustainable wood products.

In 2008, the Repass Center was awarded the Gold LEED certification by the U.S. Green Building Council. LEED stands for Leadership in Energy and Environmental Design.

The 5,600-square-foot center, which houses a lecture hall, teaching laboratory and commons area, was dedicated in November 2006. It uses geothermal pumps for heating and cooling, solar panels for hot water, and photovoltaic rooftop panels to convert sunlight into electricity. Local building materials, such as yellow southern pine and Atlantic white cedar, and recycled wood are used throughout the structure.

A \$2.3 million gift from Randy Repass, chairman of West Marine Inc. of Watsonville, Calif., and his wife, Sally-Christine Rodgers, helped fund the center, which is named in honor of Repass' mother.

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<http://www.nicholas.duke.edu/news/ns-repass.02.25.09.html>

Wallace Foundation Contributions

The Wallace Foundation contributed to the documentation of the “green” process in the two major following ways:

- 1) In the support of a Coastal Environmental Management student, Gwen McLaughlin, to document the history of the project.
- 2) In support of the LEED certification procedures, which account for a significant proportion of the administrative cost of the project, but which were necessary to obtain the LEED certification.

These contributions have been recognized by the placement of a plaque in the Commons Area of the OCC.

The McLaughlin Report is included as Appendix 2 of this document.

Summary of Green Building Costs

Duke University Marine Lab Marguerite Kent Repass Ocean Conservation Center Green Building Costs

Type of Service	Vendor	Invoice Date	Amount
Preparation of report on Sustainable Architecture on the NC Coast	Gwen McLaughlin	March - August 2006	10,167.62
Total Salaries			10,167.62
Geothermal System	Joyce & Associates	1/4/06	41,106.07
Total Geothermal System			41,106.07
LEED Services	Frank Harmon Architect	1/4/05	3,930.00
LEED Services	Frank Harmon Architect	2/15/05	3,160.00
LEED Services	Frank Harmon Architect	7/12/05	11,895.00
LEED Services	Frank Harmon Architect	11/28/05	6,000.00
LEED Services	Frank Harmon Architect	9/26/06	3,294.62
Total LEED Services			28,279.62
Solar Photovoltaic Energy Sys.	Frank Harmon Architect	7/12/05	8,940.00
Solar Photovoltaic Energy Sys.	Frank Harmon Architect	11/28/05	1,589.33
Solar Photovoltaic Energy Sys.	Frank Harmon Architect	6/28/06	2,106.00
Solar Photovoltaic Energy Sys.	Frank Harmon Architect	8/8/06	1,404.00
Total Solar consulting			14,039.33
Solar Photovoltaic Energy Sys.	Joyce & Associates	1/4/06	111,401.97
Total Solar Phovoltaic Systems			125,441.30
Grand Total			219,033.94
Contribution of Wallace Genetic Foundation to the total green building costs			150,000.00

Web Page Development and Slide Show

The Marine Laboratory is in the process of designing a webpage that highlights the Marguerite Ocean Conservation Center and its environmentally sensitive construction. The images in the 'slide show' below will be included on these web pages.

Marguerite Kent Repass Ocean Conservation Center

Nicholas School of the Environment
Marine Laboratory
Duke University



deep overhangs on eastern and southern exposures shield the commons from harsh sunlight and provide welcome shade for study and thought



the building blends with the natural environment and enhances the visual impression of Pivers Island from water and town perspectives



rain water is directed to porous surfaces that prevent run-off into the estuary



the front porch of the Repass Center is protected from the wind during winter months and seems always to catch the breeze in summer

Marguerite Kent Repass Ocean Conservation Center

Nicholas School of the Environment
Marine Laboratory
Duke University



the Repass lecture room offers state-of-the-art videoconferencing and is used for a variety of purposes, including classes, public seminars, and meetings



the Repass Center hosts the annual Marine Laboratory Open House in August that draws visitors from around the county



the front porch on a summer day



the laboratory classroom features natural light from the north and south and lab benches recycled from Duke biology labs in Durham