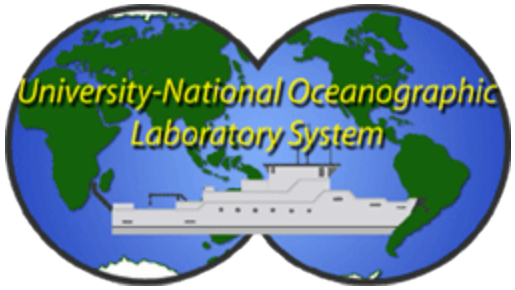
History of the Green Boats & Ports Initiative

Bruce Corliss
Graduate School of Oceanography
University of Rhode Island



2010 UNOLS GOAL

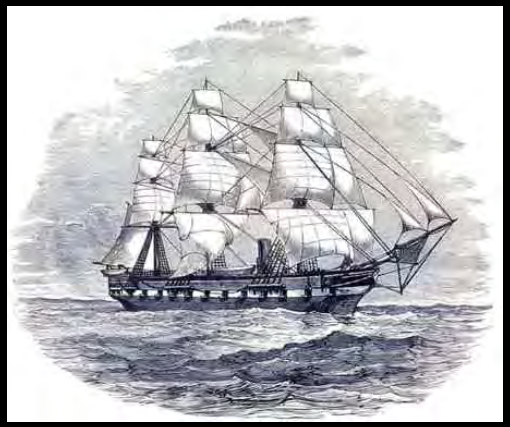
"Greening the Fleet – UNOLS should explore how to make the present and future fleet more environmentally sustainable. New and existing technologies and practices should be used in the construction, operation, and recycling of research vessels and UNOLS should take a leadership role in promoting a green U.S. research fleet, as we move forward in developing the academic fleet."

Greening the Research Fleet

January 10-11, 2012

Nicholas School of the Environment

Duke University



http://www.geology.19thcenturyscience.org/books/hmsc.jpg

?????

THE UNIVERSITY OF RHODE ISLAND
GRADUATE SCHOOL OF OCEANOGRAPHY

THINK BIG WE DO

GREEN BOATS AND PORTS FOR BLUE WATERS

A Workshop to Promote Environmental Sustainability of Boats and Ports

April 8-9, 2014

Green Boats and Ports for Blue Waters III

April 5 - 6, 2016

URI Graduate School of Oceanography

UNOLS

11TH HOUR RACING

NSF

THE UNIVERSITY OF RHODE ISLAND
GRADUATE SCHOOL OF OCEANOGRAPHY

ONR

GREENING THE FLEET INITIATIVE 2012-

FEATURED INFORMATION

UNOLS continues to promote efforts that make the present and future fleet environmentally sustainable

Ships/Facilities

UNOLS Vessels

Small Research Vessel

In 2012, a UNOLS-sponsored workshop was held to develop sustainability guidelines for oceanographic research vessels. The meeting included presentations from marine architects, designers, builders, related private businesses and representatives of the federal government and foreign research vessel operators. UNOLS continues to promote the recommendations of the Greening the Research Fleet Workshop to help make the present and future fleet more environmentally sustainable.

Objective: An Assessment of Current Technologies, Designs and Practices for Environmentally Sustainable Research Vessels and Port facilities

Composition: Representatives from UNOLS Council, RVOC, RVYEC, FIC, NSF, Navy, NOAA, Marine Architects and Naval Designers, marine scientists and the private sector

Format: 1.5 days workshop with invited presentations on various aspects of green ships and ports: design, technology, best practices.

Funding: UNOLS, NSF, ONR,BOEM, USGS,USCG;

Host institutions: Duke Univ., URI; OSU;

Other: 11th Hour Racing, Braemer Energy, Utilidata, Peterson Cat, Port of Portland

Green Boats and Ports for Blue Oceans

OBJECTIVES

1) Promoting environmental sustainability within UNOLS;

2) Development of guidelines for construction, operation and recycling of vessels and future port development;

3) Promote environmental awareness on UNOLS ships by scientists;

4) Ocean Class and Regional Class Vessel Construction

Ocean sustainability: Solutions to environmental problems

Important Topics

- Ship Design
- Propulsion and Fuel
- Energy Monitoring and Conservation
- Noise Pollution
- Compliance
- Recycling
- Emerging Technologies
- Port Sustainability
- Certification

Green Workshop Findings

1. Sail-assist vessels with a small environmental footprint can be used for particular operations.

2. Hybrid power systems and new technologies should be considered as options for future vessels.

3. Vessel energy management consisting of detailed energy audits and on-going monitoring can be carried out with existing vessels.

4. Biofuels and bio-lubricants and an environmental management plan can reduce a vessel's environmental impact and may be appropriate for some vessels.

R/V Tara


tara


A smaller, faster, cheaper route to fusion energy p. 854
Sport, sex, and testosterone go to court p. 858
Making C–N bonds from nitro groups pp. 863 & 886
Science
$10
22 MAY 2015
sciencemag.org
AAAS
A world of plankton
Marine biodiversity surveyed by the schooner Tara
pp. 865 & 873

The Derek M. Baylis is one of the first modern hybrid concept research vessels, and along with the rotor ship Alcyone (Cousteau) serves as one end-member of a range of prototypes for our vessel design. The vessel LOA is 65'

Speed under power: 10 knots

Speed under sail: 18+ knots

Fuel consumption (power) at 9 knots = 1.6 gph.

We used this vessel in 2010 for a 21 day cruise, mapping the northern San Andreas Fault.

Total fuel consumption 489 gallons in 21 days!

Green Workshop Findings

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Foss Marine, Seattle
Carolyn Dorothy: First hybrid tugboat
CAROLYN DOROTHY
FOSS
CAROLYN DOROTHY

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Green Workshop Findings

5. Development of an environmental classification system, similar to LEED, is underway (Tim Leach, Glosten Assoc.) and will help operators and agencies identify environmental issues and successes in the fleet.

6. Environmental sustainability of UNOLS support facilities and ports should be considered in parallel with vessels.

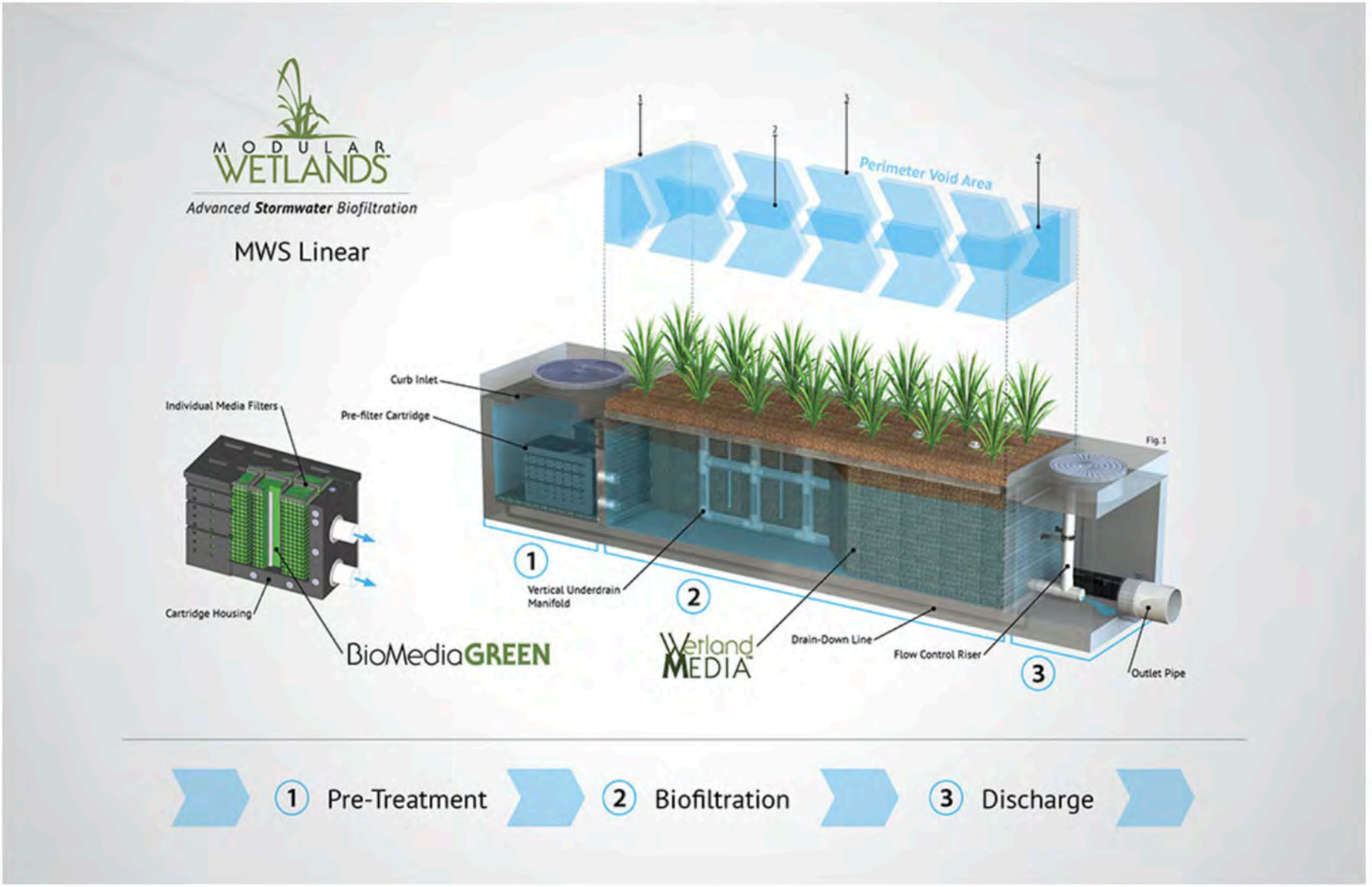
7. Environmental sustainability can be enhanced by incorporating both technological innovation and attitude changes (green culture) amongst ship operators and users.

Around the Pier: Scripps Now Powering Point Loma Ship Facility with the Sun

on OCTOBER 7, 2012 · 2 COMMENTS

Nimitz Marine Facility installs photovoltaic system

Bioclean Modular Wetland



The University of Rhode Island

Narragansett Bay Campus

The Ocean University Initiative

Campus Master Plan

OCEAN ENGINEERING

Graduate School of Oceanography

R/V Endeavor

University of Rhode Island

Graduate School of Oceanography
R/V Endeavor
University of Rhode Island

Master Plan Components and Sequence

10 year; $285M

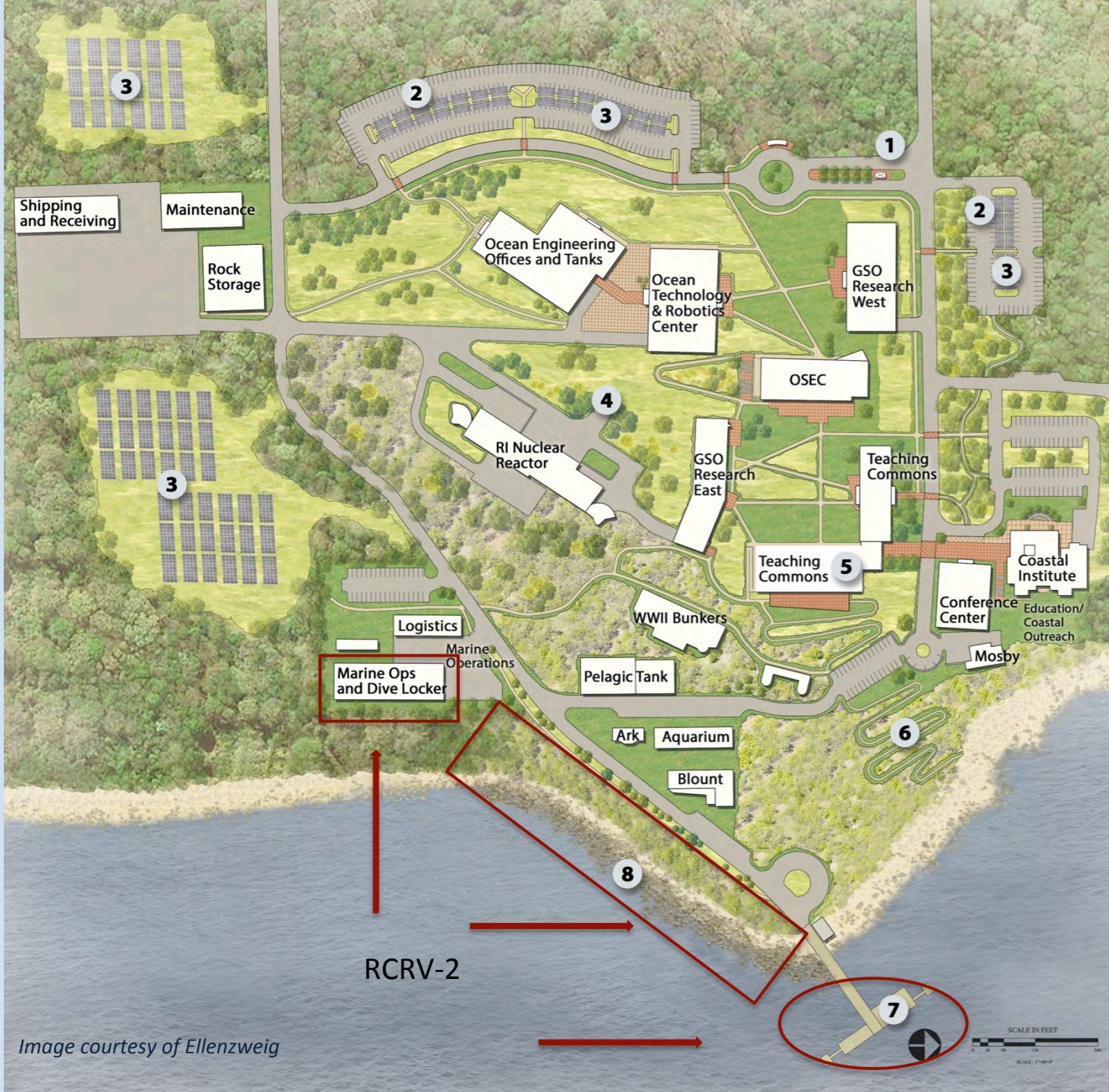
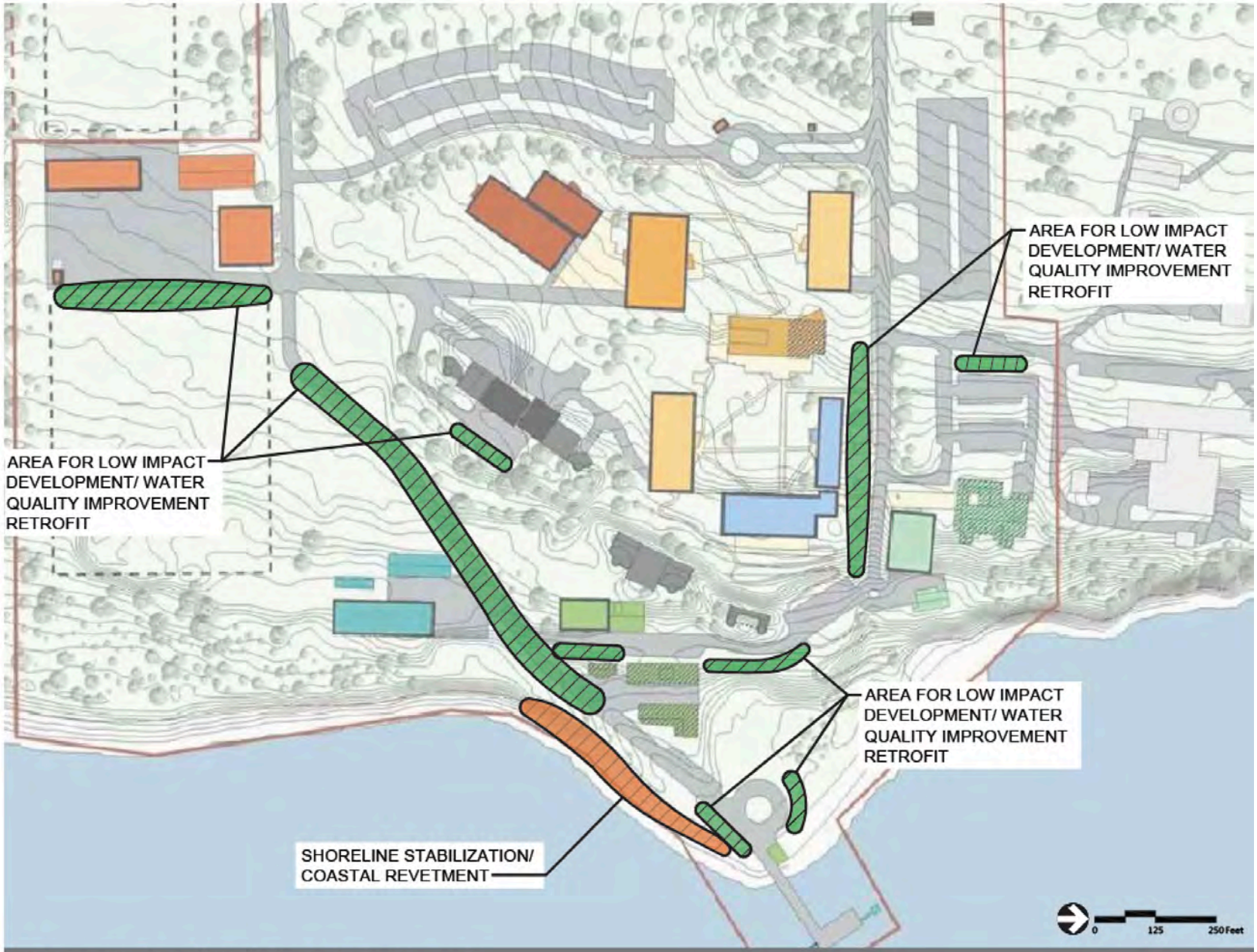


Image courtesy of Ellenzweig

Master Plan Recommendations



Stormwater Quality Improvements

Coastal Buffer

A coastal buffer area should be established as the first line of defense to any coastal flooding that may occur, to increase campus resiliency, and to create a sustainable and low maintenance plant community. This will be a densely planted native plant community able to withstand periodic flooding and providing important habitat value. Pathways crossing through this area will provide access to the beach area as well as provide a unique and memorable experience of the landscape.

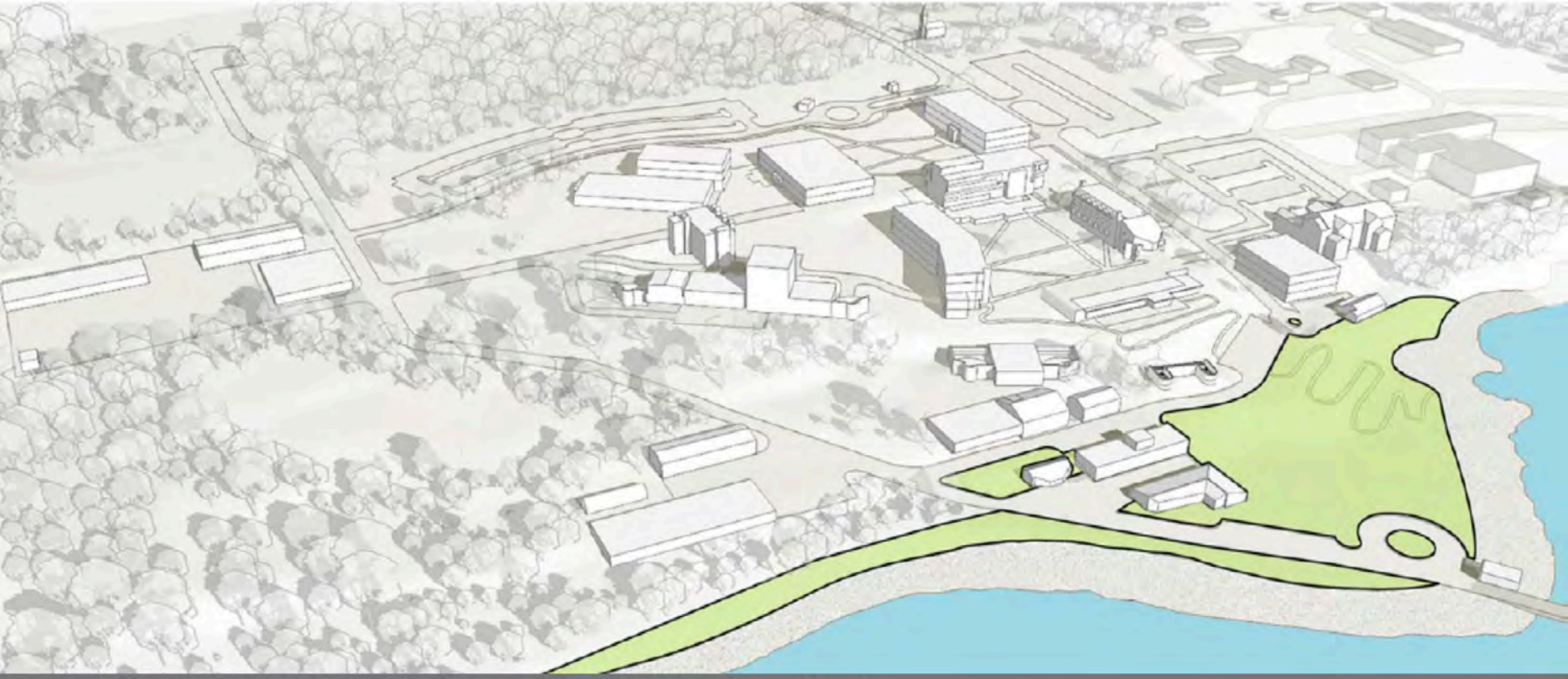


Diagram showing the location of proposed coastal buffer in the context of the proposed Master Plan

Master Plan Recommendations

COASTAL BUFFER

TREES

Juniperus Viginiana (Eastern Red Cedar)
Sassafras albidum (Sassafras)
Fagus gradifolia (American Beech)
Pinus rigida (Pitch Pine)

SHRUBS

Myrica pennsylvanica (Bayberry)
Rhus copallinum (Winged Sumac)
Rhus glabra (Smooth Sumac)
Rosa virginiana (Virginia Rose)
Vaccinium angustifolium (Lowbush Blueberry)
Vaccinium corymbosum (Highbush Blueberry)
Ilex glabra (Inkberry Holly)
Viburnum dentatum (Arrowwood Viburnum)
Rosa virginiana (Virginia Rose)
Amelanchier arborea (Shadbush)
Rhus copallinum (Winged Sumac)
Rhus glabra (Smooth Sumac)

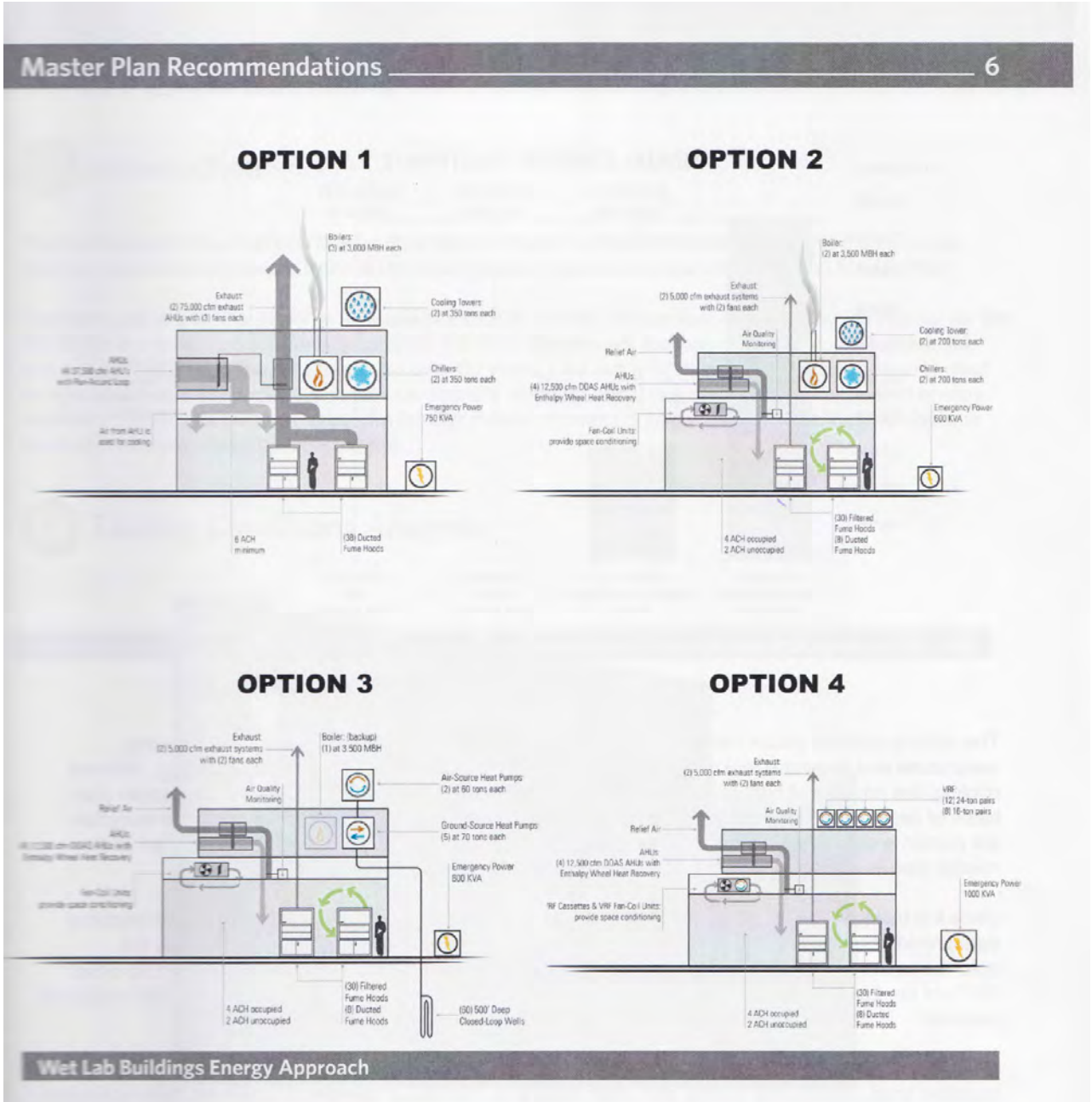
PERRENIALS AND GRASSES

Sporobolus cryptandrus (Sand Dropseed)
Eragrostis trichodes (Sand Lovegrass)
Andropogon gerardi (Big Bluestem)
Schizachyrium scoparium (Little bluestem)
Elymus canadensis (Canada Wild Rye)
Bouteloua curtipendula (Sideoats Grama)
Festuca rubra (Creepig Red Fescue)
Sorghastrum nutans (Indiangrass)
Panicum virgatum L. (Switchgrass)
Eutrochium purpureum (Joe Pye Weed)
Verbena hastata (Blue Vervain)
Filipendula ulmaria (Meadowseet)
Aster Novae-angliae (New England Aster)

Illustrative cross-section of coastal buffer area

Net Energy Feasibility Study

Net Energy Feasibility Study: Wet labs



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Solar Reflective Paints:

Reduces the HVAC loads by 30% in average use

- Available in every color except Flag Blue
- No power to run it
- Cost similar to conventional paint
- Application can be done in any existing paint facility
- Can easily be retrofitted into existing vessel
- Cooler to the touch on decks etc
- Same warranty as conventional paint
- **……..And it is "Greener"**

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ELECTROCHROMIC GLASS IN THIS APPLICATION WILL REDUCE HVAC LOADING BY 40%.
IT ALSO ELIMINATES THE NEEDS FOR BLINDS AND IS MAINTENANCE FREE

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MAIN SALON WINDOWS ARE ELECTROCHROMIC TO REDUCE HEAT LOADING.
AIR CONDITIONING THROUGH PHASE CHANGING MATERIALS
ALL LIGHTING IS SOLAR POWERED

GREGORY C. MARSHALL

NAVAL ARCHITECT, LTD.

Acknowledgments and Thanks

NSF: Bob Houtman

NSF: Tim Schnoor

UNOLS: Jon Alberts, Annette DeSilva, Alice Doyle, Karen Besson, Caitlin Mandel, Dennis Nixon

Green Boats and Ports IV: OSU, Roberta Marinelli, Don Hilliard, Clare Reimers, Demian Bailey

Sponsors: 11th Hour Racing, Peterson Cat, Port of Portland, NOAA, USGS, USCG, BOEM

Green Workshops

Developing collaborations between UNOLS, ship operators, and the private sector has been and will be beneficial to the UNOLS fleet.