Chesapeake Bay
National Estuarine Research Reserve
Maryland

List of Accomplishments: October 2006-September 2008

Mission: Improve coastal resource management by increasing scientific understanding of estuarine systems and making estuarine research relevant, meaningful, and accessible to managers and stakeholders.

"Sound Science…Finding Solutions…Wise Decisions"

Photo by Bart Merrick: Plummer House after renovations completed, in preparation for dedication, April 2008.

Prepared by:
Chesapeake Bay National Estuarine Research Reserve in Maryland
Watershed Services, Maryland Department of Natural Resources

CBNERR DNR STAFF

Beth Ebersole – Reserve Manager – bebersole@dnr.state.md.us
Bart Merrick – Education Coordinator – bmerrick@dnr.state.md.us
Patricia Delgado, Ph.D. – Research Coordinator – pdelgado@dnr.state.md.us
Sasha Land – Coastal Training Program Coordinator – sland@dnr.state.md.us

CBNERR SITE MANAGERS

Shanna Jay – Otter Point Creek
Greg Lewis – Jug Bay, Prince George's County
Chris Swarth – Jug Bay, Anne Arundel County
Bill McInturff – Monie Bay

Website Address: http://dnr.maryland.gov
Toll Free in Maryland: 1-877-620-8DNR, ext: 8730
Out of State call: 410-260-8730
TTY users call via the MD Relay: 711 (within MD)
Out of State call: 1-800-735-2258

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PARTNERS

CBNERR-MD, Maryland DNR, Tawes Building, E-2, 580 Taylor Avenue, Annapolis, MD 21401

ACCOMPLISHMENTS SUMMARY

Accomplishment Highlights

- Climate Change Research information added with new surface elevation table and marsh vegetation studies
- Coastal Training Program launched (October 2007)
- Management Plan completed (2008)
- Zooplankton module added to education program
- Real Time Water Quality and Weather Data continue to be available online

Annual Statistics (Oct 2007-Sep 2008)

- 1,377 acres added for a total of 4,949 acres protected
- 28 research programs
- 10,109 students served by 601 education programs
- 12,770 volunteer hours
- 2,370 training hours to decision-makers delivered via nine Coastal Training Program workshops

Research

- Surface elevation table (SET) studies resurrected
- Marsh emergent plant studies begun
- Water quality and weather monitoring continued with real-time data available at four stations
- Biomonitoring for bay grasses, fish, amphibians, reptiles, and birds continued

Education and Coastal Training

- Launched Coastal Training Program (CTP) for decision-makers October 2008
- Held nine training workshops covering sea level rise/climate change, development in the critical area, social marketing, and green initiatives
- Organized first Patuxent River Teen Paddle, a five day educational foray for teens
- Helped develop national curricula (Estuaries 101)
- Added zooplankton module to education programs using new wet lab

Stewardship

- Wild rice restoration project
  - fencing
  - planting
  - resident Canada geese control
- Partnership with National Aquarium in Baltimore's Minority Student Summer Conservation Program. Student volunteers assisted in:
  - purple loosestrife control
  - phragmites mapping
  - osprey banding
- Plant vegetation studies to investigate effect of water level changes

Otter Point Creek (Harford County Anita C. Leight Estuary Center and Izaak Walton League Bosely Conservancy)

- Leight Estuary Center certified as a Maryland Green Center (May 2008)
- Completed Self-Guided Canoe Trail
- Launched invasive plant removal program, focusing on purple loosestrife and multiflora rose
- Initiated Home School Science and Nature program for ages 8-14

- Started a Student Mentoring Program with Aberdeen Science and Math Academy to assist with Senior Capstone Research Projects
- Began annual marsh bird breeding survey and marsh plant survey

Jug Bay Natural Area/Patuxent River Park (Maryland-National Park and Planning Commission)

- Opened "Patuxent Water Trail" a cooperative project of state and local agencies, conservation organizations, and the business community.
- Developed "Eyes on Jug Bay" water quality program for school groups

Jug Bay Wetlands Sanctuary (Anne Arundel County)

- Held first Sanctuary volunteer research conference
- Completed Plummer House renovation for Reserve office space and public contact center
- Contributed two chapters to book on the ecology and science of freshwater tidal wetlands
- Held first Sanctuary Bioblitz
- JBWS and FOJB worked with Anne Arundel County to (1) achieve purchase of 30-acre Wayson's Preserve (potential big box shopping center site) and (2) plan deer management strategy including managed hunt at Sanctuary
- Published 3 highly informative articles in Marsh Notes about local implications of sea level rise and global warming

Monie Bay

- Provided estuarine education to 300 4th graders at the 15th Annual Wetlands and Wildlife Field Day
- Initiated emergent vegetation monitoring
- Held "Living Green to Save Green" workshop for the public at Somerset Intermediate School

ADMINISTRATION

CBNERR-MD is managed through a cooperative approach involving the Maryland Department of Natural Resources (DNR), Harford County Parks and Recreation, and Harford County Chapter of the Izaak Walton League of America, Maryland-National Capital Park and Planning Commission (MNCPPC), Anne Arundel County Recreation and Parks.

General Administration

- CBNERR-MD Management Plan was approved by NOAA in August 2008.
- Contracts with Anne Arundel County, Harford County, RAS, Maryland State Department of Education, and Towson State University were managed.
- All needed computers and office furniture were procured following state procurement procedures.

Staffing

- All core CBNERR DNR staff were hired bringing CBNERR up to full staff for first time since 2004 (Education Coordinator, October 2006; Manager and Coastal Training Program Coordinator, November 2006; Stewardship Coordinator, February 2007; Research Coordinator, April 2007).
- The Coastal Training Program Coordinator position began receiving full state benefits (June 2007).
- The Research Coordinator position was elevated from a Natural Resources Biologist III to a Natural Resources Biologist V (November 2007).
- Three seasonal contractual Research Interns have been hired to help with the research program.
- A seasonal contractual Monie Bay Outreach Intern has been hired to help augment education and volunteer programs at Monie Bay.
- A seasonal contractual Stewardship Intern has been hired at Otter Point Creek to help achieve the volunteer coordination part of the Stewardship Program.
- CBNERR-MD staff participate in national programs. All CBNERR-MD staff attended the 2007 and 2008 NERRS annual and sector meetings and also participate in appropriate workgroups.
- The CBNERR DNR staff knows how to submit state paperwork without getting yelled at too much.

Staff Training and Professional Development

- All core CBNERR DNR staff completed First Aid and CPR safety training.
- Research Coordinator completed Introduction to the SAS Enterprise Guide (January 2008).
- SWMP Technician and Research Coordinator completed NERR Technician Training Workshop (January 2008).
- Research Coordinator completed SLAMM (Sea Level and Marsh Migration Model) Workshop held at the University of Maryland. February 2008.

- SWMP Technician and Research Coordinator completed Geodetic and Tidal Datums Training 101 organized/offered by NOAA ERD, NGS, and COOPS (2008).
- Coastal Training Program Coordinator completed Social Marketing course.

Facilities Enhancement

Adequate facilities and equipment allow the Reserve to implement its research, education, stewardship, and coastal training programs and to fully participate in NERRS national priorities. Through support from NOAA and other sources, CBNERR-MD added the following from October 2006-September 2008:

- Otter Point Creek
  - The purchase of the Hirchauer property in Harford County was completed. This property abuts Leight Park and assures protection for the Estuary Center from development, adds approximately 860 linear of feet of shoreline and a pier to the component and provides additional access to Otter Point Creek for activities.

- Jug Bay
  - The wet lab for estuarine education programs at Jug Bay (Patuxent River Park) was completed and outfitted in 2007.
  - Plummer House dedication was held April 2008. The Plummer House renovation was completed with $85,000 in NERRS acquisition and construction funding and $115,000 in Anne Arundel County match. The Education Coordinator worked with Maryland Correctional Enterprises to identify and purchase environmentally responsible office furniture.

- Reserve-wide
  - A traveling exhibit about the Reserve was created to publicize the Reserve at events such as the Annual Tributary Strategies Team meeting.

RESEARCH AND MONITORING PROGRAM

Monitoring Activities

NERRS System Wide Monitoring Program (SWMP):

- Successful operation of five continuous water quality monitoring stations. Three stations are located in Jug Bay/Patuxent River Park, one in Otter Point Creek, and the last one at Little Monie Creek.

Physical parameters measured: water temperature, specific conductivity, salinity, percent saturation, dissolved oxygen, depth, pH, and turbidity. Measurements are taken every 15 minutes.

Nutrient analyses: NH_4, NO_2, $NO_{2/3}$, PO_4, Chl a, TSS/TVS, TN, and TP. Samples are taken year round (twice a month for most samples).

- On time submission of SWMP data to the NERRS Centralized Data Management Office and DNR eyesonthebay website.

- Completed the upgrade of most SWMP sondes to V2 technology as required by NOAA/NERRS.

- Successful operation of two weather stations, one located in OPC and one in Jug Bay.

- On time submission of the Jug Bay weather station information to the NERRS Centralized Data Management Office. Data from the OPC weather station is kept as part of Reserve's data sets.

Discrete Water Quality Sampling:

- Successful sampling of six discrete water quality sampling stations at OPC and ten at Monie Bay. Samples are taken twice a month from April to October. Data is kept as part of Reserve's data sets.

  Physical parameters measured: water temperature, specific conductivity, conductance, salinity, percent saturation, dissolved oxygen, and depth.

  Nutrient analyses: NH_4, NO_2, $NO_{2/3}$, PO_4, Chl a, TSS/TVS, TN, and TP.

Biomonitoring:

- Secretive marsh bird monitoring: Completed surveys of secretive marsh birds in the three Reserve components. This effort is part of a national effort lead by USGS and U.S. Fish and Wildlife Service and it follows established protocols by these agencies. Twelve sampling sites were monitored in Jug Bay, ten in OPC, and eight in Monie Bay. Two to four surveys were conducted during the summer time. This effort is coordinated by the research coordinator and executed by volunteers.

  Variables measured: Presence/absence; approximate location distance; habitat description.

- Submerged aquatic vegetation (SAV): Established and measured six 60 m long transects (six sampling stations per transect) in the Patuxent River and five similar transects in OPC. Transects are sampled during June, August, and October. Sampling is conducted by volunteers and research staff and follows DNR established protocols.

  Variables measured: water quality parameters (water temperature, specific conductivity, conductance, salinity, percent saturation, dissolved oxygen, depth, and sechi depth), species present, wet biomass (measured by water displacement), and dry biomass (estimated through water displaced vs. dry biomass curves).

- Marsh emergent vegetation: Established and measured 15 transects (with 5 plots per transect) at each Jug Bay and Otter Point Creek components. These transects were sampled once during the peak of the growing season and followed established NERRS protocols.

  Variables measured: species present, species cover, stem count, maximum height.

- Monitoring the presence of yellow perch eggs: Completed, with the support of staff from MDNR Fisheries and volunteers, a survey of yellow perch eggs along the coastline of the Bush River and Otter Point Creek.

  Variables measured: presence/absence.

- Monitoring of invasive species: Completed the mapping of *Phragmites* patches in OPC. This information will be used to monitor spatial changes through time. Data was collected by volunteered students from the Baltimore Aquarium' Summer Internship Program for minority students.

  Variables measured: GPS location; width and length of patch.

  Established four plots in Jug Bay to monitor the success of mechanical removal of purple loosestrife in this marsh. This project was conducted by research staff and volunteers.

  Variables measured: Stem count.

Research Activities

- Tidal freshwater marsh emergent vegetation transect data: Re-measured nine transects in Jug Bay (2007-2008), which were originally established in 1995 to determine spatial and temporal changes in species composition and distribution. Two plant surveys were conducted by research staff and volunteers during the peak of the growing season. Data collected will be entered in a database and analyzed; a peer-reviewed paper will be written with the results. These transects will not be measured again.

  Variables measured: species present, position along transect, width along transect.

- Marsh Surface Elevation Dynamics: Re-measured twelve Surface Elevation Tables (SETs) located in Jug Bay. Also, established and measured three marker horizon plots at each of the SET stations. SETs were measured twice during 2007 and three times during 2008. Marker horizons were measured once in 2008. Starting in 2009, SETs and marker horizons will be measured seasonally (four times a year).

Variables measured: SET pin height, vegetation observations, depth from surface to marker horizon.

- Deal Island Impoundment, Monie Bay: Established a research/monitoring set up at the Monie Bay Deal Island Impoundment to monitor the status of water quality, marsh vegetation, and SAV. As part of this effort two main ponds (Main Pond and Snag Pond) were sampled; five transects that started at the marsh and continued into the water were established at each pond study site. Each transect was composed of a total of 10 plots, 5 within the emergent vegetation and five in the SAV. Water quality was measured within each of the SAV plots. All parameters were measured once during the peak of the growing season.

  Variables measured for water quality: water temperature, specific conductivity, conductance, salinity, percent saturation, dissolved oxygen, and depth. Nutrient analyses: NH_4, NO_2, $NO_{2/3}$, PO_4, Chl a, TSS/TVS, TN, and TP.

  Variables measured for vegetation: species present, species cover, stem count, maximum height.

  Variables measured for SAV: species present, percent cover, stem count, presence/absence epiphytes.

- Graduate Research Fellow's research: Completed successfully the reviewing process for Graduate Research Fellowship proposals submitted during 2007 and 2008 as part of the NERRS-GRF program. GRFs submitted reports, presented posters and oral presentations in local and professional meetings.

- Bioblitzes: Annual 24-hour Bioblitzes conducted at Jug Bay and Otter Point Creek.

Research Presentations

Oral Presentations:

- Title: "The Water Quality Status of the Bush River." Audience: Staff from the Aberdeen Proving Grounds Base, Bush River.

- Title: "CBNERR-MD Research and Monitoring Program". This presentation was given at different venues: a) Horn Point Laboratory, University of Maryland Eastern Shore; b) Freshwater SAV Partnership Workgroup; c) Morgan State University; d) Latin American Delegation.

- Title: "The effect of storm events and wastewater treatment plant overflows in Patuxent River's water quality". Venue: 2008 Annual Tributary Meeting.

- Title: "Climate Change and the Chesapeake Bay: A Local Perspective on Climate Change and its Implications. Venue: 2007 CBNERR-MD In-Service Meeting.

- Title: “Climate Change Research in the Chesapeake Bay”. Venue: 2007 CBNERR-MD In-Service Meeting.

Posters:

- Title: “Land Use and Water Quality Trends within the Jug Bay Component of the Maryland Chesapeake Bay National Estuarine Research Reserve”. Authors: Patricia Delgado, Matthew R. Hall, Christopher J. Trumbauer, Chris Swarth, and T. Mark Trice. Venue: Estuarine Research Federation meeting, Rhode Island, November 2007.

  Same poster was also presented at:

  The 13th Annual Maryland Water Monitoring Council Conference, 2007.
  The 2007 NERR Technician Training Workshop. Myrtle Beach, SC.

- Title: “A Preliminary Analysis of Commercial Fishery Records in the Patuxent River Estuary with Emphasis on the Jug Bay area, Chesapeake Bay National Estuarine Reserve”. Authors: Rachel Dickey, Chris Swarth, and Patricia Delgado. Venue: Atlantic Estuarine Research Society Meeting (AERS), Spring 2008.

- Oral Session Accepted: “Tidal freshwater marshes: Impacts and response to a changing environment”. Co-Chairs: C. Swarth and P. Delgado. To be organized for the Coastal and Estuarine Research Federation Conference in Portland, Oregon. November, 2009.

Other Research Activities

- Research Coordinator serves on the NERSS SWMP External Review workgroup that coordinated the completion of the external review for this national program.

- Research Coordinator is a member of the Maryland Sea Grant Academic Advisory Panel. In April 2008 participated in an all-day meeting to review pre-proposals submitted to the Maryland Sea Grant research competition.

- Hired and coordinated activities for two to three CBNERR-MD research interns.

- Developed and coordinated contracts with DNR Resource Assessment Services (SWMP contract), Towson University Center for GIS (Jug Bay wild rice delineation project), and University of Maryland Chesapeake Bay Laboratory (CBNERR-MD discrete water quality sampling).

- Research Coordinator is a member of the Chesapeake Bay Regional Event Response Workgroup. This workgroup coordinates regional capacities for a coordinated event response in the Chesapeake Bay watershed.

- Submitted 2007 NERRS SET proposal to the NERRS strategic committee.

- Provided support to the CBNERR-MD Education Coordinator in the Wetlands Wildlife Field Day at Monie Bay.

- Completed data entry for all research and monitoring data collected during 2007-2008 for all Reserve components. Including data for SAV, emergent vegetation, discrete water quality sampling, and SET project.

- Participated in 2007 NOAA restoration day organized at the Patuxent River Park and Jug Bay. Provided support in the National Geodetic Survey activities in Jug Bay, including elevation profiles and referencing of SETs.

- Active member of the Freshwater SAV Partnership.

- Coordinated and provided support for the installation of three NGS markers in Jug Bay, including a commemorative mark at the new field station in the Plummer House.

- Served as a reviewer of the following documents:

    - Patuxent 20/20: The need for effective action and effective solutions. Patuxent River Commission.
    - Manuscript to be published in a special NERRS issue of the Journal of Coastal Research: "The invasion and spread of *Phragmites australis* during a period of low water in a lake Erie coastal wetland".
    - Manuscript to be published in the Estuarine, Coastal and Shelf Science Journal: "Patterns of Leaf Herbivory in a Tropical Mangrove Forest Impacted by Human Disturbance".

EDUCATION PROGRAM

K-12 Education

Developed and refined education programs at Otter Point Creek and Jug Bay
CBNERR EC worked with components to refine and develop education programs that better utilize Reserve science and staff strengths. Examples include:

- The Lab Program at Patuxent River Park
- A watershed focused program at Jug Bay Wetlands Sanctuary's Glendening Preserve
- The Otter Point Creek Environmental Survey

On-site program implementation at Otter Point Creek and Jug Bay
Generally, the EC worked with sites on Wednesdays and Thursdays helping to deliver programming to school students. Most of the programs were for 15-25 students in the Middle and High School Grades.

Continued successful Wetlands and Wildlife Field Day
In addition to numerous field based programs at the Reserve components, CBNERR-MD has continued to work with its State partners to bring Somerset County students Wetlands and Wildlife field day (September 2007 and 2008). This program introduces local students to unique and abundant natural resources in their own backyards and how our actions impact those resources. Approximately 300 4th grade students were served by this program each year.

New Ocean/Estuarine Literacy Program in Somerset County
In Somerset County CBNERR-MD helped to implement an Ocean/Estuarine Literacy Program in Washington High School and Crisfield High School. In addition to supporting the curricula CBNERR also delivered field programming to Crisfield High School.

New multi-day field programs at Otter Point Creek and Jug Bay
CBNERR-MD has also helped to organize multi-day field programs for students that focus on the estuarine environment and the human impact on that environment. At the Jug Bay component we hosted the Patuxent River Youth Sojourn. This program guided 10 high school students down the Patuxent River exploring the estuary and conducting restoration projects intended to help improve this environment. At OPC we helped to design and implement "Estuarine Adventures" a week long summer camp that explored the watershed and educated participants about the interaction between the human and natural systems in the Chesapeake Bay.

Curriculum Development
Throughout 2007 and 2008 CBNERR-MD participated in the development, piloting, and revision of the Estuaries 101 curriculum, Chesapeake 102 (Chesapeake Exploration) curriculum, and the new estuaries.gov web site. These curricula and web pages support teachers in their efforts to teach about estuaries using authentic research and data.

Maryland Green Schools Program
CBNERR-MD helped to support the Maryland Green Schools Awards Program in 2006, 2007, and 2008. The Maryland Green School Awards Program is a holistic, integrated approach to authentic learning that incorporates local environmental issue investigation and professional development with environmental best management practices and community stewardship.

Teacher Professional Development

In August 2007, CBNERR-MD conducted a three-day teacher professional development workshop for six teachers from the region. This workshop explored helped the teachers to incorporate real science and hand-on field experiences into their classrooms.

In November 2007 CBNERR-MD presented at the North American Association for Environmental Education Conference. This presentation was focused on the Estuaries 101 curriculum and incorporating real data into the classrooms context.

In January 2008 CBNERR-MD gave a similar presentation at the Maryland Association for Environmental and Outdoor Education conference.

In August, 2008 CBNERR-MD in partnership with CBNERR-VA and the Delaware NERR supported a multi-day professional development course for 18 Maryland, Delaware, Washington DC, and Virginia teachers on the new Estuaries 101 curriculum. This professional development program also brought together NOAA's Chesapeake Bay Office and the National Geographic Society to compliment their efforts in the development of curricula that utilize web-based data exploration tools.

In November 2008, the Education Coordinator participated in a teacher professional development program focused on National Geographic's Fieldscope tool (www.fieldscope.us). This program supplied MD teachers with the resources to gather, display, and incorporate authentic, student gathered data, into their curricula.

Community/Public Education

The CBNERR web page was completely overhauled in 2007 and is now regularly kept up to date.

CBNERR-MD education and coastal training staff collaborated to hold three workshops and one presentation on Green Living and strategies to help individuals reduce their environmental footprints. These workshops were held at Otter Point Creek, Somerset Intermediate School, and the Annapolis Friends Meeting House and a presentation was give at the Marshy Point Nature Center in Baltimore County. This program was delivered to approximately 65 individuals.

The Education Coordinator assisted in the organization and implementation of DNR's first Green Week for DNR staff.

Special Events

In June of 2007 CBNERR-MD hosted and helped to organize NOAA Restoration Day for over a hundred NOAA employees.

In August of 2007 CBNERR-MD hosted congressional staffers at the Jug Bay Component. Staffers took a guided kayak and pontoon boat tour to the Western Branch Wastewater Treatment plant outfall, where the treatment plant manager made a presentation and answered questions.

In August and October 2008 CBNERR-MD had the opportunity to work with partner organizations and host NOAA Sea Grant Fellows and the NOAA Education Partnership Program on a tour of the reserve and an introduction to the NERRS Program.

Outcomes Summary

The Chesapeake Bay region has many opportunities for teachers, students and the public to learn about the Chesapeake Bay and its issues through both experiences in the field and professional development workshops. CBNERR-MD is well positioned to support these experiences through targeted issue-based investigations and programming and fill in the gaps, especially in regards to data-driven estuarine investigations. Additionally, CBNERR-MD has worked hard to develop partnerships with other organizations involved in

environmental education to more effectively utilize limited resources and provide linkages between programs.

COASTAL TRAINING PROGRAM (CTP)

The CBNERR-MD Coastal Training Program aims to facilitate informed and improved decision-making by making relevant and cutting-edge estuarine research relevant, meaningful, and accessible to managers and stakeholders through targeted workshops. Following are some accomplishments of the Reserve's CTP.

Coastal Training Program launched October 2007

CBNERR-MD's Coastal Training Program was approved by NOAA in 2007 and launched on October 1, 2007. Program approval required development, submission and approval of CTP planning documents. The primary CTP target audiences include municipal and county elected and appointed officials and their staff. CTP will initially focus in the counties near the Reserve components, but will look to the future possibility of all coastal counties. The primary topic area will be helping local governments plan for and respond to 1) population growth and development; and 2) climate change/subsidence/inundation.

Nine Coastal Training Program workshops conducted in first year for a total of 2,370 contact hours

1. Name of Program: Bush River Partnership Meeting
Date: November 6, 2007
Location: Anita C. Leight Estuary Center
Number of Attendees: 22
Type of Training: Science Understanding
Speakers: Fed, State & Local Partners who participate in Bush River Management and Research & Restoration
Workshop Summary: To provide the partners involved in Bush River Management and Restoration an overview of existing efforts and a discussion on next steps.

2. Name of Program: Climate Change InService
Date: December 11, 2007
Location: Jug Bay Wetlands Sanctuary
Number of Attendees: 19
Type of Training: Science Understanding
Speakers: Pati Delgado, CBNERR Research Coordinator & Zoe Johnson, MD Coastal Program
Workshop Summary: To give component staff relevant and up to date climate change science and demonstrate ways to incorporate that information into educational programs

3. Name of Program: Living Green to Save Green
Date: January 19, 2008
Location: Anita C. Leight Estuary Center
Number of Attendees: 32
Type of Training: Public Education (Coastal Decision Maker Workshop)

Speakers: Bart Merrick, CBNERR Education Coordinator & Sasha Bishton, CBNERR CTP Coordinator
Workshop Summary: Through a series of activities and energy audits demonstrate to participants how their individual actions can affect climate change and how they can make their everyday lives more sustainable.

4. Name of Program: Living Green to Save Green
Date: March 15, 2008
Location: Somerset Intermediate School, Crisfield
Number of Attendees: 15
Type of Training: Public Education
Speakers: Bart Merrick, CBNERR Education Coordinator & Sasha Bishton, CBNERR CTP Coordinator
Workshop Summary: Through a series of activities and energy audits demonstrate to participants how their individual actions can affect climate change and how they can make their everyday lives more sustainable.

5. Name of Program: Maryland Training Providers Outreach Forum
Date: April 11, 2008
Location: Chesapeake Bay Foundation, Annapolis
Number of Attendees: 45
Type of Training: Partnership Building increasing outreach effectiveness
Speakers: Martin Kearns, Green Media Toolshed
Facilitated By: Judy Brown UMD, Martin Kearns and Jack Greer, MD Sea Grant Steering Committee helped plan
Workshop Summary: To bring together agencies, organizations and universities providing outreach, training, and technical assistance on land use, natural resource conservation and water resource issues to local governments, watershed organizations and other local level decision makers in Maryland communities. The exchange will foster information sharing and explore collaboration opportunities.

6. Name of Program: Critical Area Commission Spring Workshop
Date: May 22, 2008
Location: Quiet Waters Park, Annapolis
Number of Attendees: 78
Type of Training: Science Understanding, Technical, & Policy
Speakers: Tom Schueler, Chesapeake Stormwater Network: Mark Burchick & Leslie Wood, ESA: Scott Macomber, Angler: Patrick Naehu, Nature Conservancy: Margaret McHale, CAC
Workshop Summary: An overview of the 2008 legislation passed and what that means for critical area management. Management of the 100 buffer and options for vegetation; Living Shorelines, and stormwater management in the IDA.

7. Name of Program: Living Green to Save Green
Date: May 31, 2008
Location: Friends Meeting House, Annapolis, MD
Number of Attendees: 23
Type of Training: Public Education
Speakers: Bart Merrick, CBNERR Education Coordinator & Sasha Bishton, CBNERR CTP Coordinator
Workshop Summary: Through a series of activities and energy audits demonstrate to participants how their individual actions can affect climate change and how they can make their everyday lives more sustainable.

8. Name of Program: Critical Area Commission Spring Workshop
Date: June 12, 2008
Location: Chesapeake College, Wye Mills
Number of Attendees: 88
Type of Training: Science Understanding, Technical, & Policy
Speakers: Tom Schueler, Chesapeake Stormwater Network: Mark Burchick & Leslie Wood, ESA: Scott Macomber, Angler: Patrick Naehu, The Nature Conservancy: Margaret McHale, Critical Area Commission
Workshop Summary: An overview of the 2008 legislation passed and what that means for critical area management. Management of the 100 buffer and options for vegetation; Living Shorelines, and stormwater management in the IDA.

9. Name of Program: Using Social Mapping and Marketing Tools
Date: July 22&23, 2008
to engage local communities in Chesapeake Bay Watershed Restoration
Location: Rocky Gap Lodge, Cumberland
Number of Attendees: 50
Type of Training: Social Marketing, Increasing Outreach Effectiveness
Workshop Facilitators: Theresa Trainor, OPM: Jack Wilbur, Utah Food and Ag & Eric Eckl, Water Words that Work
Workshop Summary: The goal of the training is to teach Bay jurisdiction representatives how to develop approaches and create communication tools that make Bay and watershed restoration more relevant to local communities. The training will help each jurisdiction develop and refine their messages related to the focus areas they have selected to engage local communities. It will also help the participants create messaging to be compatible with or support the needs and interests of the target audience.

STEWARDSHIP AND VOLUNTEER PROGRAMS

Protection

- CBNERR-MD added an additional 1,377 acres to its protection with the approval of the Management Plan in August 2008. This brings the total of CBNERR's protected wetlands and uplands to 4,949 acres.

Restoration

- March Clean-up: The Otter Point Creek Annual Marsh Cleanup Day at Bosely Conservancy was held in March 2007 and 2008.

- Wild Rice Restoration: Citizens participated in efforts to restore wild rice at Jug Bay. Working with staff at Patuxent River Park, they repaired and installed fences and planted seeds.
  - Volunteers helped maintain the SAV grow out tanks and helped propagate plants in the greenhouse. They also assisted with restoration and research activities.
  - Conducted workshops for citizens to grow various species of tidal, freshwater submerged aquatic vegetation and then hosted planting days.
  - Developed a fish monitoring program at Otter Point Creek which includes protocol from the Department of Natural Resources and coordinated program with Jug Bay. Data collected is used by biologists to assess fish populations in the Bush River.
  - Organized Amphibian Calling Surveys and training for volunteers at Jug Bay and Otter Point Creek. These surveys provide information to a national database that tracks amphibian populations.
  - Using protocol from Jug Bay, developed the Herp Search program to identify and count amphibians and reptiles at Otter Point Creek.
  - Initiated a Water Quality Monitoring Program for volunteers at Otter Point Creek in 1997 with a complete revision and reconfiguration of the sites sampled in 2002.
  - Worked with site staff at Monie Bay to initiate plans for a volunteer program at this component. Identified and contacted key citizens to assist with implementation.

- Jug Bay Wild Rice Delineation: A Historical Change Analysis: A contract was finalized with the Towson University Center for GIS (TU-CGIS) to conduct the delineation of wild rice in Jug Bay for different time periods. Then, conduct a habitat change analysis to determine the success of wild rice restoration. Delineation has been completed for 1989 and 1999.

- Removal of invasive species: During 2007 and 2008 removed plants of the invasive species purple loosestrife from the Jug Bay/Patuxent River Park's tidal freshwater marshes. This effort was executed by Reserve staff and volunteers.

- Reserve habitat classification and land use: Habitat classification for the three MD-CBNERR components using the NERRS classification system was completed using 1995 imagery. The GIS work was done by Dave Foreman from DNR-GIS.

Volunteers

- Volunteers spent 12,770 hours in the last year (October 2007-September 2008) conducting research, restoration, education, maintenance, construction, and administrative tasks.
- Volunteer Appreciation Events were held annually at Jug Bay Wetlands Sanctuary and at Otter Point Creek.