2011-2012 TRANSDISCIPLINARY PROJECT: CIVIC ENGAGEMENT ON CLIMATE CHANGE IN DORCHESTER COUNTY, MD

DEPARTMENT OF PLANT SCIENCE AND LANDSCAPE ARCHITECTURE
Assistant Professor Victoria Chanse, Ph.D.

We need YOUR help!
Please join us for a CLIMATE CHANGE CHARRETTE

WHAT: The University of Maryland’s Landscape Architecture graduate students from the LARC/48 class need your thoughts to explore potential sea level change and design responses at a local level.

WHEN: 
SESSION I: Thursday, October 27 4:30-6:30 PM
SESSION II: Friday, October 28 9:00 AM-1:30 PM

WHERE: 
Cambridge Library
303 Gay Street
Cambridge, MD

305 Gay Street
Cambridge, MD

WHO: All Dorchester County residents and any others who would like to join us.

Tell us what YOU think!

For more information, please contact Vikki Chanse, Ph.D. at (301) 405-4345
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Flyer designed by doctoral student Jennifer Salazar.
Shifting Scales: Participatory Approaches to Responding to Sea Level Change

NOAA (2010) identified several strategic approaches to fostering behavior change around hazard planning:

1) identifying specific hazard-related data and information needs by working directly with local planners;

2) Developing visualization approaches/communication; and

3) Preparing case studies.
Vasi (2006) demonstrates how the adoption by local municipalities of programs to address global climate change is shaped by social factors and organizational elements.

The growing demand for knowledge-based solutions to the growing complexities of such issues as climate change adaptation and mitigation strategies require transdisciplinary approaches to issues such as climate change (Russell 2005).

One approach to addressing planning in response to sea level change includes involving stakeholders and residents in transdisciplinary participatory processes around visualizing climate change (Sheppard et. al. 2011; Pond et. al. 2010; Schroth et. al. 2009). Participatory stakeholder involvement improves the quality of decisions (Salter et. al. 2010).
Maryland’s Climate Change Responses

• 2007, Governor of Maryland signs Executive Order that created the Commission on Climate Change, tasked to develop a comprehensive Climate Action Plan for the state.
• 2008, January Climate Change Action Plan report released by the Maryland DNR.
• 2008, May National Wildlife Federation’s “Sea Level Rise and Coastal Habitats in the Chesapeake Bay Region” Report
• 2008, September Coast Smart Worcester County and Coast Smart Somerset County Reports
• 2009, May The Coast-Smart Communities Initiative for local governments begins, offering a toolbox of resources to help Maryland counties and towns develop climate-smart management policies and on-the-ground measures.
• 2011 “Comprehensive Strategy for Reducing Maryland’s Vulnerability to Climate Change” Report by the MD DNR and UMD Center for Environmental Science
RISK TO BUILDINGS

LOW RISK
Buildings in 2050: 13,713
Options: Recommended for future development.

MEDIUM RISK
Buildings in 2050: 2,568
Options: Rescue buildings at risk of significant storm surge and flooding. Calculate the building’s future condition. Protect areas of importance that cannot adapt to new conditions.

HIGH RISK
Buildings in 2050: 1,429
Options: Reduce buildings in jeopardy that cannot adapt to change. Protect areas of existing buildings and adapt for new conditions. Initially recommended for future development. Promote relocation where necessary.

OPTIONS FOR THE BUILT ENVIRONMENT

Business as Usual
Build For Resilience
Protect

Rocks
- Allow flooding
- Raised road elevation
- Levee or wall

Shoreline
- Allow flooding
- Living shoreline
- Levee or wall

Houses
- Allow flooding
- Raised house elevation
- Levee or wall

Business as Usual: When investments in resilience or protection is not practical or possible, business as usual allows risk of flooding and sometime the abandonment of facilities.

Resilience: When buildings and other facilities can be rebuilt, or renovated, resilience involves the designing to withstand flooding and storm surges.

Protection: When buildings or facilities cannot be moved or rebuilt, protection involves the building of walls, levees or other structures to protect from flooding.

DORCHESTER WORKSHOP

MLA Students Rosamaria Mora, Matt Sickle, and Michael Boeck
Issues of Concern to Residents and Stakeholders

What is most important to you?
• Roads near home becoming unusable (8)
• Concerned about the quality of wells and septic systems (6)
• Flooding (4)
• Property value (2)

Participation Team:
MLA Students Kory Kreiseder, Allison Jensen, Kim Wharton, and Chris Myers
Dorchester County and Trunk Creek

Trunk Creek flows through a freshwater and brackish tidal wetland and is surrounded by marsh that ranges from 15 to 200 feet wide on either side.

Current Model

2050 Model

The predicted wetland migration scenario for the 2050 model shows wetlands expanding and the first appearance of open water in Trunk Creek.

2100 Model

The 2100 model shows inundated wetlands that have become open water. Shoreline erosion is expected without the protective wetlands.

Existing Nanticoke River and Marshes, Vienna, MD

Trunk Creek, Vienna, MD

Sea Level Affecting Marsh Models (SLAMM)
STUDENT:

MORA, ROSAMARIA

PROJECT:

KINETIC LANDSCAPES
Goal of the Project:
Development of a relocation settlement pattern in Gary Creek Region

Site Selection Criteria
- Dry Land in 2100 yr
- Higher Topography
- Out of Forest
- Out of Flooding Area
- Water Access
- Easily Accessible by Road
- Out of Critical Areas

Potential Relocation Map
Legend
- Critical Areas
- Out of Flooding Area
- Existing Forest
- Main Roads

Where?

KINETIC LANDSCAPES
Migration of the Built and Natural Enviroment
KINETIC LANDSCAPES

Migration of the Built and Natural Environment

COMMUNITY PIER

Current Water Level

Water Level 2050 yr

Water Level 2100 yr

COMMUNITY PIER

Rosamaria Mora 12/13/2011 LARC 748 Instructor: Victoria Chanse Department of Landscape Architecture University of Maryland
KINETIC LANDSCAPES

Migration of the Built and Natural Environment

Relocation Timeline
Based on Rolling Eastment Principles

CURRENT CONDITION
- VULNERABILITY OF THE BUILT ENVIRONMENT TO SEA LEVEL RISE & STORM SURGE
- RICH NATURAL ECOSYSTEM

PHASE 1: ADAPTATION
TEMPORARY PROTECTION TECHNIQUES THAT ALLOWS THE PROGRESSION OF SEA LEVEL RISE
- FLEET STRUCTURES
- LIVING SHORELINE

PHASE 2: MIGRATION
ALLOWS THE PROGRESSION OF SEA LEVEL RISE & MIGRATION OF THE NATURAL ENVIRONMENT

PHASE 3: RETREAT
- STABILIZATION OF THE LAND
- IDENTIFY AREAS LESS VULNERABLE TO STORM SURGE AND SEA LEVEL RISE
- RELOCATION
- CLEANUP OR REMOVAL OF STRUCTURES
- CLOSE SITE FROM GROUND WATER CONTAMINATION

"If some lands most give way to the rising sea, the economic, environmental and human consequence could be much less if abandonment occurs according to a plan rather than unexpectedly."

Source: Rolling Eastment by Emerge Ready Stanford EPA
Confronting Wetland Migration:
Re-envisioning a Changing Blackwater National Wildlife Refuge and Wildlife Drive

STUDENT:
MOYER, KIM

PROJECT:
WETLAND MIGRATION

Described as the “Everglades of the North,” Blackwater National Wildlife Refuge has lost over one-third of its marshland from a combination of sea level rise, land subsidence and invasive species.

Loss of wetlands is predicted to increase dramatically due to climate change trends. Model projections indicate the refuge may nearly vanish by year 2100.

This project examines a strategy to find a replacement location for Blackwater Wildlife Refuge facing a potential three foot sea level rise scenario.

The search for a replacement site begins by examining potential habitat shifts and how the wildland/urban interface may disrupt habitat quality and connectivity. A design response addresses the importance of Wildlife Drive as a way to experience the unique landscape of Dorchester County.
Placement of New Wildlife Drive

Landscape Elements:
- Water
- Topography
- Vegetation
- Structures

Roads
Shore Road will remain safe from future flooding and is a direct connection to the town of Vienna.

Protected Land
Much of the surrounding areas are protected open space. A wildlife management area is located in the center portion of this site.

Wetlands
Wetlands are predicted to change from fresh to salt water marshes.

Cropland & Pasture
Agriculture fields can be planted with crops to feed migratory birds.

Existing Forest
This mixed forest contains freshwater swamp habitat.

Topography
The topography shows enough dry land to build a drive through the proposed site.

Chicomacomico River
This freshwater river is predicted to become saltwater within 40 years.

Site Analysis: Year 2100 (based on SLAMM)
Site Selection Criteria

Marsh Migration | Hubs and Corridors | Urban Interface | Protected Land | Accessibility

3 Foot Sea Level Rise (Year 2100)

Site A

Site B

Both sites show potential for salt marsh migration.
Site A is less desirable for its highly developed neighborhoods. Site B has less development and more potential for marsh migration.

Site A has more interior forest habitat, but less opportunity for connectivity with other areas in the region. Site B follows the Nansecoke River and has more potential to provide connectivity to terrestrial animals.

Site A is close to the existing refuge. It has less protected land and is close to the city of Cambridge posing a barrier to migration. Site B has a significant amount of protected land and less urban encroachment from Vienna.

Site B is a better match for a wildlife refuge

Source: Sea Level Affecting Marshes Model (SLAMM)

Key Wallace Road Flooded Along Blackwater Wildlife Refuge
Placement of New Wildlife Drive

Landscape Elements: Water, Topography, Vegetation, Structures

Roads
Snow Blood Road will remain safe from future flooding and is a direct connection to the town of Forest.

Protected Land
Much of the surrounding areas are protected open space. A wildlife management area is located in the center portion of this site.

Wetlands
Wetlands are projected to change from fresh to salt water marshes.

Cropland & Pasture
Agriculture fields can be planted with crops to feed migratory birds.

Existing Forest
This mixed forest contains freshwater swamp habitat.

Topography
The topography shows enough dry land to build a drive through the proposed site.

Chicamacomico River
This freshwater river is predicted to become brackish within 40 years.

Site Analysis: Year 2100 (based on SLAMM)

- Tidal Flats
- New Salt Marsh
- Mixed Forest
- Dry Land
- Protected Road Route
Wildlife Drive Design Process

Road Design

Carter's Grove Rd.

Edges

Road Vistas

Charrette Findings

Outdoor Recreation
Public access to waterfront
Keep the natural waters clean
Protect habitat and natural space
New Wildlife Drive Masterplan

1. Diverse Agriculture Fields
2. Glade
3. Freshwater Swamp
4. Photo blind
5. Muskrat Village
6. Freshwater Marshes
7. Brackish Water Marshes

Eagle Nesting Sites
Great Blue Heron
Juvenile-Fish and Crab Habitat

New Wildlife Drive
Protecting Against Sea Level Rise
Cambridge Site: "feet Sea Level Rise/Flood"
Integrating creative visualization into the participatory processes for sea level change

• Developing a series of scenarios of adaptation responses (defend, retreat, or other forms of adaptation) for stakeholder workshops.

• Use visuals to engage cross-disciplinary and cross-collaboration with stakeholders, residents, hazard planners in order to:
  a) identify and prioritize areas and issues of concern and
  b) to examine different possibilities. This is particularly pertinent given sense of loss in addressing sea level change in Dorchester County.

• Developing and demonstrating a rationale for planning and design decisions.
Acknowledgments

• Dorchester County, the City of Cambridge, and the Eastern Shore Land Conservancy.
• Anne Roane, Planner and Landscape Architect and Rodney Banks, Hazard Planner (City of Cambridge, MD).
• Thanks to Chris Haynes (NOAA Coastal Services), David Cronrath (School of Architecture), Brad McCrea (SF Bay Conservation and Development Commission, Rising Tides Competition), Olaf Schroth (CALP), Clark Wilson (U.S. EPA), and Zoe Johnson (MD DNR) for their insights, support, and ideas as the project developed.
• Spring 2011 LARC748 MLA Students Allison Palmer, Chris Myers, Kim Wharton, Kory Kreiseder, Matt Sickle, Michael Boeck, and Rosamaria Mora.
• Research collaborators Architecture Professor Luis Diego Quiros and doctoral student Kevin Adams.
• Spring 2012 ARCH403 Sections (Architecture Professors Ronit Eisenbach, Isaac S Williams, and Michael Stanton)
• This work would not have been possible without the financial support of the 2011-2012 Maryland Agricultural Experiment Station Grant.