

Living Shorelines for Contractors and Project Designers

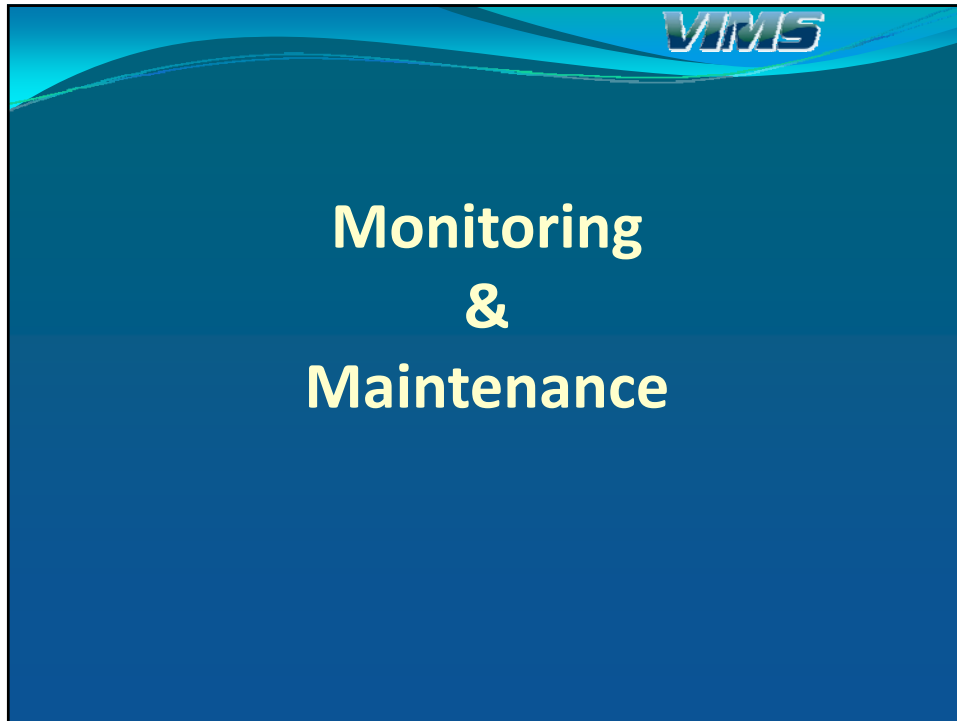
Karen A. Duhring
Marine Advisory Scientist
Center for Coastal Resources Management
Virginia Institute of Marine Science
College of William & Mary

April 9, 2010



Living Shorelines for Contractors and Project Designers Part 3

- Why We Need More Living Shorelines
- Alternatives Analysis
- Site-Specific Designs
- Construction Planning
- **Monitoring and Maintenance**
- **Permit Process**
- Field Site Visit



Monitoring & Maintenance

Graded Banks

- Inspect new plantings
- Irrigate woody plants during first growing season
- Remove nuisance, invasive species
- Allow recruitment of native species
- Use only permeable materials for access paths

Monitoring & Maintenance

Planted Marshes

- Replace washed out plugs
- Survey elevations at failed areas, re-grade and re-plant as needed
- Remove tidal debris & trash at least annually
- Irrigate high marsh during dry spells until established
- Prune overhanging branches
- Remove nuisance, invasive species
- Do not mow
- Avoid using lawn chemicals nearby

Monitoring & Maintenance

Fiber Logs

- Inspect frequently
- Pound loose stakes back into ground ASAP

Hybrid Structures

- Inspect revetments after storms
- Replace scattered stones
- Modify tidal openings if needed
- Raise sill height if bank erosion continues

Professional Service Opportunities

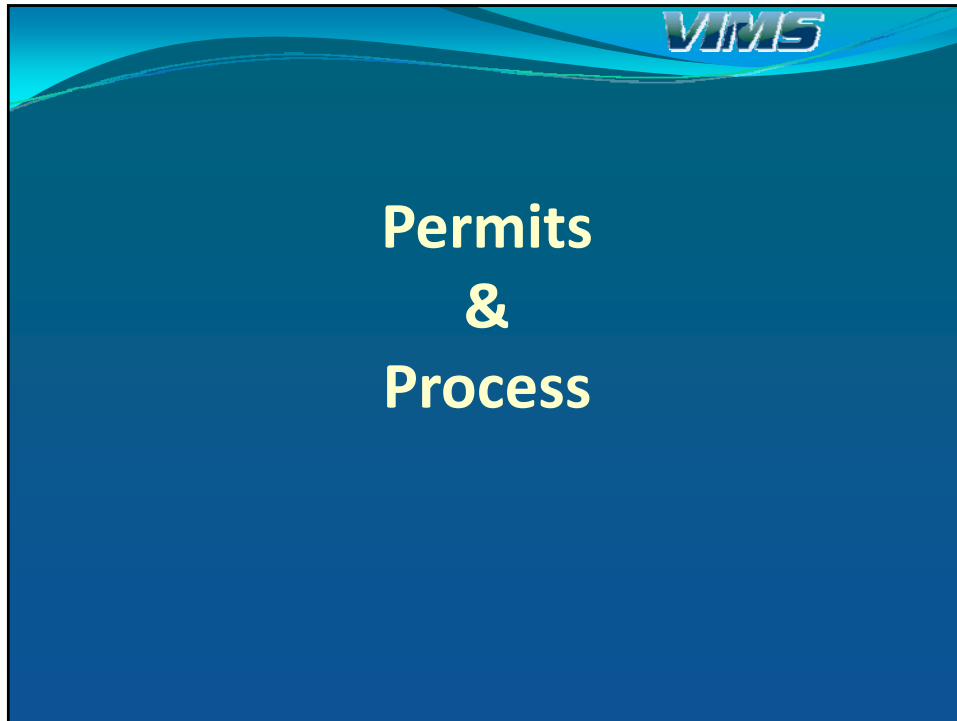
Design & Construction

- Alternatives analysis
- Concept drawings
- Permit applications & coordination
- Construction management
 - Sub-contractors for installing fiber logs, planted marshes
- Post-construction surveys
 - To confirm design standards, permit compliance

Professional Service Opportunities

Long-Term

- Routine inspections and maintenance
- Planted area enhancements
- Invasive species management
- Storm damage assessment and recovery



Permits & Regulations General Guidelines

Design projects based on shoreline conditions & desired level of protection, not jurisdictional boundaries

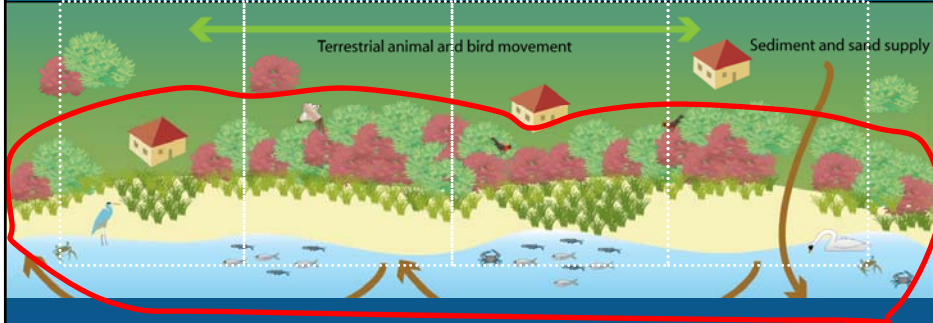
Pre-application review with regulatory agencies encouraged

Concept plans may have to be adjusted as permit review process takes place

Allow at least 2 months, more likely 4-6 months for complicated projects

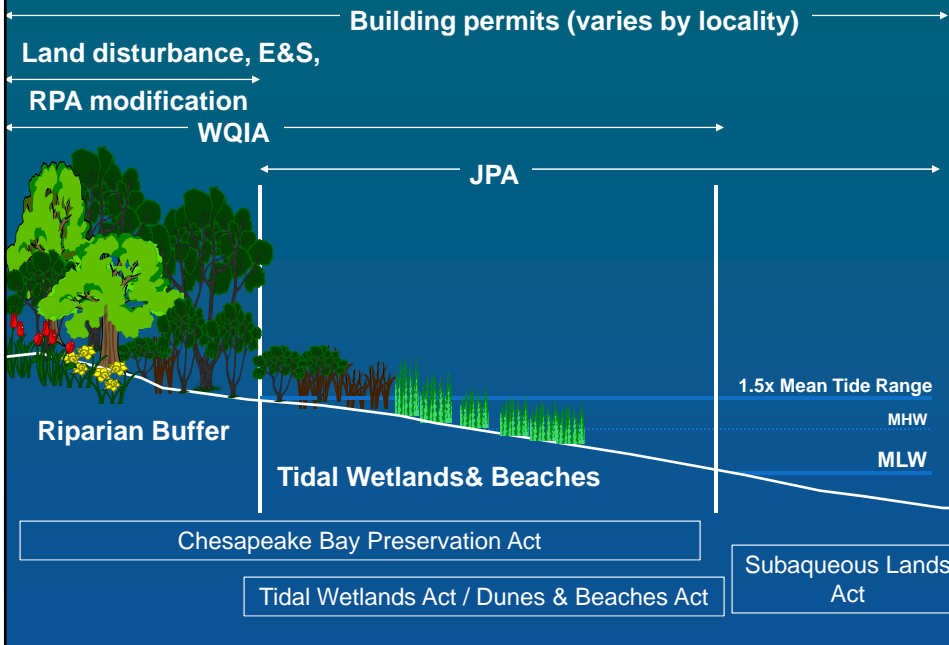
Check with the local county or city environmental office BEFORE doing ANY shoreline work

Integrated Shoreline Management



- Mutually beneficial approach
- Take advantage of natural erosion and flood buffers across property lines and across habitat types
- Will the permit process allow for it ???

State & Local Permit Requirements



Acronyms

- E & S Erosion & Sediment control

- RPA Resource Protection Area
- CBPA Chesapeake Bay Preservation Act
- WQIA Water Quality Impact Assessment

- JPA Joint Permit Application

- VMRC Virginia Marine Resources Commission
- VIMS Virginia Institute of Marine Science
- USACOE US Army Corps of Engineers

Permitting Agencies - Local Chesapeake Bay Preservation Act

Riparian buffer
modifications

Permits and Forms
that may be required

- | | |
|---|---|
| <ul style="list-style-type: none"> • Tree pruning • Tree removal • Bank grading • Upland retaining structures | <ul style="list-style-type: none"> • Land disturbance • Erosion and sediment control (E & S) • Riparian buffer modification • Water quality impact assessment • Landscape restoration agreement • Building permit |
|---|---|

Permitting Agencies - Local Chesapeake Bay Preservation Act	
CBPA Resources of concern	Potential Conflicts
<ul style="list-style-type: none"> • Water quality 	<ul style="list-style-type: none"> • Tree removal for access and bank grading
<ul style="list-style-type: none"> • Riparian buffers 	<ul style="list-style-type: none"> • Acceptable landscape restoration
<ul style="list-style-type: none"> • Non-tidal wetlands adjacent to shoreline 	
<ul style="list-style-type: none"> • Tidal wetlands 	

Permitting Agencies – Local Tidal Wetlands/ Dunes & Beaches Act	
Tidal wetlands or beach modifications	Permits and Forms that may be required
<ul style="list-style-type: none"> • Sand fill • Beach nourishment • Install fiber logs • Marsh sills • Breakwaters 	<ul style="list-style-type: none"> • Joint permit application (JPA) • Local Wetlands Board permit <p>Public hearing required</p>

**Permitting Agencies – Local
Tidal Wetlands / Dunes & Beaches Acts**

Resources of concern

- Tidal wetlands
- Sand dunes and beaches
- Land erosion

Potential Conflicts

- Adjacent shoreline effects
- No net loss of wetlands policy
- Adjacent property owner protests
- Setback requirements

**Permitting Agencies - State
Virginia Marine Resources Commission**

Subaqueous land modifications

- Sand fill channelward from mean low water elevation
- Beach nourishment
- Marsh sills
- Offshore breakwater systems

Permits and Forms that may be required

- Joint permit application (JPA)
- Subaqueous lands permit

Public hearing required if costs exceed \$50,000 or if project is protested

Permitting Agencies - State Virginia Marine Resources Commission

Resources of Concern

- Submerged aquatic vegetation (SAV)
- Productive shellfish areas
 - Baylor grounds
 - Private leases
 - Restoration reefs
- Benthic habitats
- Anadromous fish

Potential Conflicts

- Navigation interests
- Riparian access and apportionment
- Shellfish lease holders

Permitting Agencies - Federal U.S. Army Corps of Engineers

Wetland and subaqueous land modifications

See previous lists

Permits and Forms that may be required

- Joint permit application (JPA)
- Nationwide or regional permit
- Individual permit

Permitting Agencies - Federal U. S. Army Corps of Engineers

Resources of Concern

- Waters of the United States
- Threatened and endangered species
- Tidal and non-tidal wetlands

Potential Conflicts

- Navigation interests
- Exceeding thresholds of regional permit allowance
- Time of year restrictions for northeastern beach tiger beetle

Special Thanks to Bobbie Burton and Katie Register also Longwood University



For sharing this public demonstration project
and being a supportive community partner

Contact Information:

**Karen Duhring
Center for Coastal Resources Management
Virginia Institute of Marine Science
PO Box 1346
Gloucester Point, VA 23062
(804) 684-7159
karend@vims.edu**