Risk-Based Approach for Construction Projects Requiring An Erosion and Sedimentation Control Plan

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Talking Points

- Description of the problem
- Risk factors
- Approach
- Next Steps

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Description of the Problem

- Increased rainfall and rainfall intensities across NC.
- The actual 10-year recurrence interval storm is larger than the current predicted volume.
- Can overwhelm erosion and sedimentation control (ESC) measures designed to standard (15A NCAC 04B .0108).

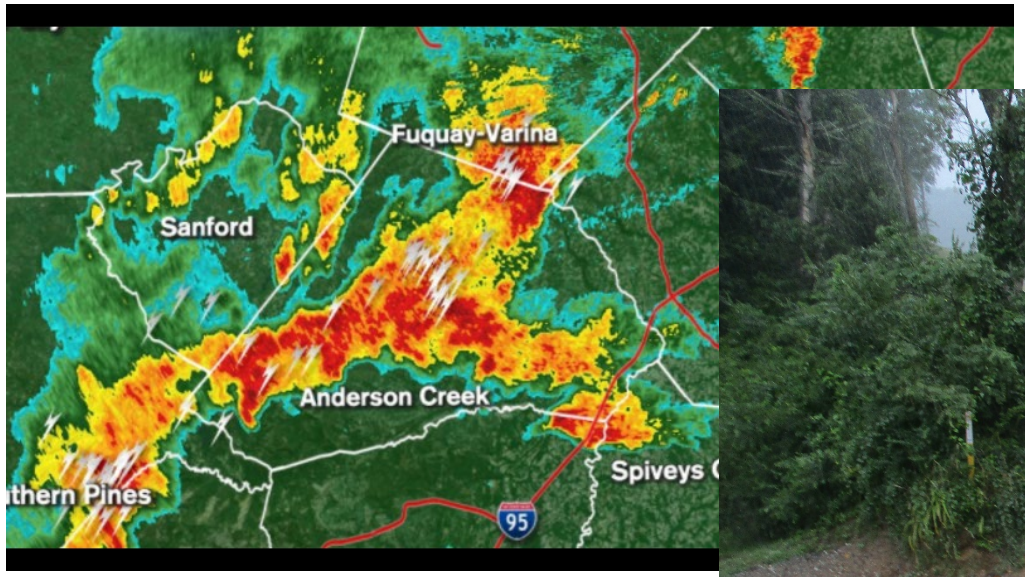

Image: ABC11 Raleigh-Durham

Contributing Factors

- Steep slopes
- Large projects size (more disturbed area, lack of vegetation)
- Sensitive receptors – streams, wetlands, species
- Soil characteristics
- Duration of project
- Level of active grading

Photo: Scott Taylor

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Storm Studies, IDF Curves and Probable Maximum Precipitation

- NC Office of Recovery and Resiliency (NCOOR)
- Intensity, Duration, and Frequency
- Probable Maximum Precipitation

NCORR
NORTH CAROLINA OFFICE OF RECOVERY AND RESILIENCY

Image: NOAA

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Environmental Preservation Recovery Support Function Group of NCORR (RSF7)

- Working group of the North Carolina Disaster Recover Task Force.
- Toby Vinson, PE, DEMLR Program Operations Chief / DEQ NCORR Liaison, Chair of RSF7.
- Membership is made up of NCWRC, USDA, NCDA&CS, DHHS, NCEM, NCCE, DNCR, DWR, DMS, DOT, NCSU and several NGO/NPOs.

Proposed Studies to Address Risk Based Design and Resilience

- Intensity, Duration and Frequency (IDF) study to update NOAA's Atlas 14.
- Current data within this system is 15 years old. Need to improve and update design storm information used by designers for Erosion and Sedimentation Control, Stormwater, hydrology, wastewater etc.
- The goal is to address issues seen with multiple annual recurrence of design storms. This results in under-designed ESC plans and long-term infrastructure, among others.
- Project to be headed by NCDOT and NCSU.
- DEQ/DEMLR is represented on the Advisory Committee for this study.

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Proposed Studies to address Risk Based Design and Resilience

- Study of rainfall statistics to project future IDF curves.
- Ensure infrastructure investments can withstand rainfall design frequencies over the lifetime of a project design (50-75 years).
- Current Statistics and Design Criteria do not account for Climate Change.

Photo: Chris Seward

Photo: Gerald Herbert

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Proposed Studies to address Risk Based Design and Resilience

- Probable Maximum Precipitation (PMP) modeling for North Carolina.
- Intended to address worst-case scenarios for design, location, and planning activities for long-term infrastructure.
  - government and non-government organization (NGO) planning activities
  - utilities
  - dam impoundment and spillway capacity
  - watershed planning
  - local development and resilience planning
  - university research
  - other construction and maintenance uses
- Project to be headed by DEMLR.

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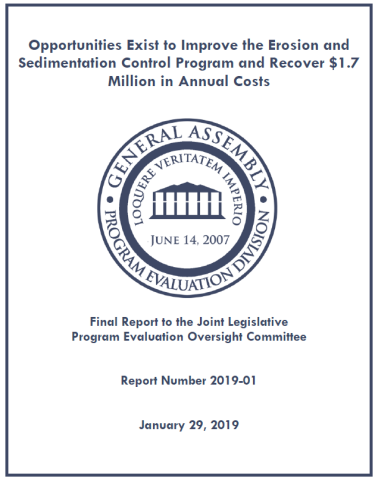
Program Evaluation Division Report

- The 2019 Program Evaluation Division report on DEMLR's erosion and sedimentation control program made several observations:
  - Regional office workloads have increased.
  - Inefficiencies exist in plan reviews ($/approved plan, approval rates).
  - Efficiencies could be gained by providing technical support to the regulated community.
  - DEMLR does not use a risk-based approach for inspections.
    - DEMLR has had a risk-based approach since 2010, but not well defined.
- And recommended:
  - Developing a risk-based approach for conducting inspections.


Opportunities Exist to Improve the Erosion and Sedimentation Control Program and Recover $1.7 Million in Annual Costs

GENERAL ASSEMBLY · LOQUERE VERITATEM IMPERIO · JUNE 14, 2007 · PROGRAM EVALUATION DIVISION

Final Report to the Joint Legislative Program Evaluation Oversight Committee

Report Number 2019-01

January 29, 2019

Risk-Based Inspection Study

- Initiated as part of the PED report recommendations.
- Purpose is to refine priorities for conducting inspections in the Erosion and Sedimentation Control Program.
- Began July 1, 2018.
- Projects statewide were grouped into three size ranges (percentile determination) based on disturbed area and into a variety of project types (e.g., single family developments, solar farms).
- Compliance data will be analyzed by project size and project type to determine vulnerability and risk .
- The completion date and the final report is anticipated in January 2021.

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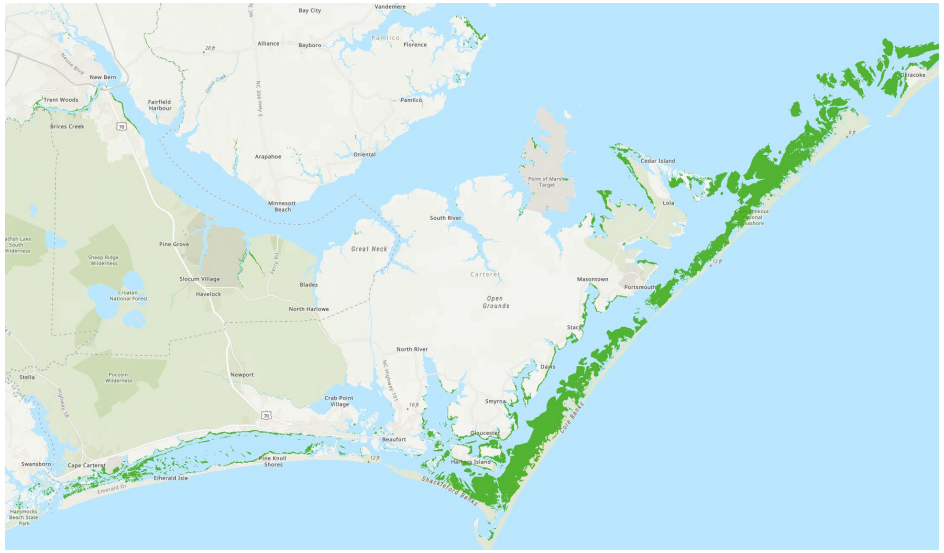
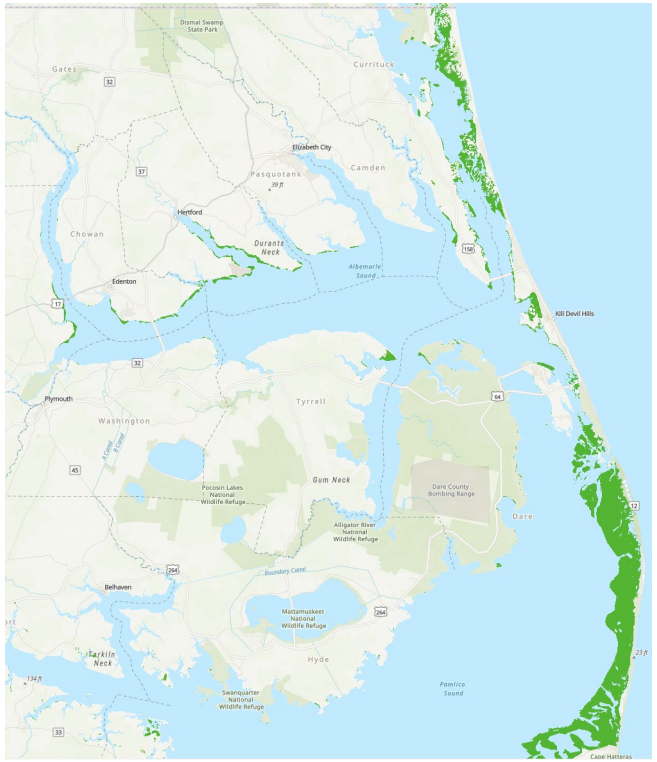
Efficiencies

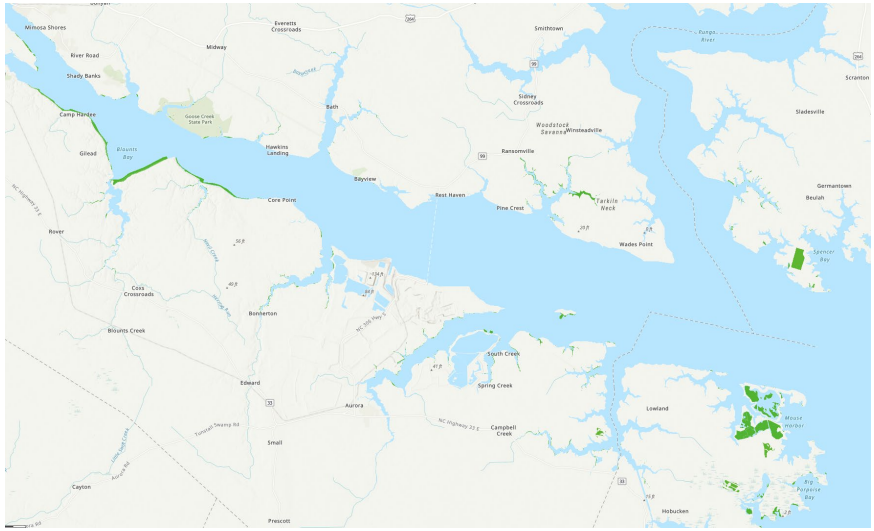
- PED report noted that non-compliant sites take a lot of staff time and energy.
  - Repeat site visits
  - Development of compliance and enforcement paperwork
  - Legal/violator communication
- If non-compliance can be reduced, then more time available for providing technical assistance and pre-application coordination.

Critical Risk Factors

- Project size – projects 10 acres or greater (PED Tracker study preliminary results)
- Predominant slopes – 20% or greater (mountains and western piedmont primarily)
- Sensitive receptors – within 1 mile and draining to mapped submerged aquatic vegetation (SAV) beds (coastal)







Maps courtesy of APNEP, NCDMF, and NOAA

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Coastal Habitat Protection Plan

DEQ has developed a Coastal Habitat Protection Plan (CHPP) that identifies four goals and recommendations essential for healthy fish populations:

1. Improve effectiveness of existing rules and programs protecting coastal fish habitats.
2. Identify and delineate strategic coastal habitats.
3. Enhance and protect habitats from adverse physical impacts.
4. Enhance and protect water quality.

The CHPP specifically names DEMLR and the Sedimentation Control Commission as partnering agency/commission.

Submerged Aquatic Vegetation

- The CHPP identifies 6 habitats as crucial to coastal fishery species:
  - Hard bottom, soft bottom, shell bottom, **submerged aquatic vegetation (SAV)**, water column, and wetlands.
- SAVs are home to a variety of shellfish, crabs, and fish (flounder, sea trout, grouper).
- SAVs are extremely sensitive to sedimentation which attenuates light penetration for photosynthesis.

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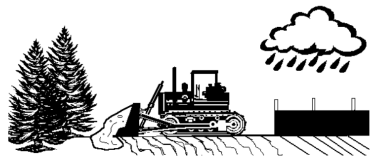
Risk Mitigation Approaches

- Pre-Construction Meetings
  - Set expectations for owners, contractors
  - Answer questions and provide clarification
- Quarterly Inspections
  - Identify issues early
  - Increased accountability
- Enhanced Design
  - Use of best practices
  - Factors of safety
  - Increased design standards



Erosion & Sediment Control
Designer Packet

Land Quality Section

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Criteria Thresholds and Risk Mitigation Approaches for Mountain Area Projects

Criteria Description	Criteria Threshold	Risk Mitigation Approach
Project Size	>10 acres	Pre-Construction Meeting, Quarterly Inspections
	>25 acres	Pre-Construction Meeting, Quarterly Inspections, and Enhanced Design Approach
Slope Steepness	>20%	Pre-Construction Meeting, Quarterly Inspections
SAV	Project within 1 mile and draining to SAV bed	Pre-Construction Meeting, Quarterly Inspections
Combined Criteria (size and slope or size and SAV)	>10 acres and >20% >10 acres and SAV	Pre-Construction Meeting, Quarterly inspections, and Enhanced Design Approach

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Next Steps

- Continue coordination and advisory capacity with various rainfall studies.
- Refine inspection priorities.
- Include pre-construction meeting requirements in plan approvals.
- Education of plan designers and reviewers and delegated local programs.
- Potential development of temporary rules.

Questions?

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