Roadmap to Success- Erosion Control: Define, Design, and Deliver

Honolulu Construction Stormwater Quality Workshop 7/18

Roadmap to Success

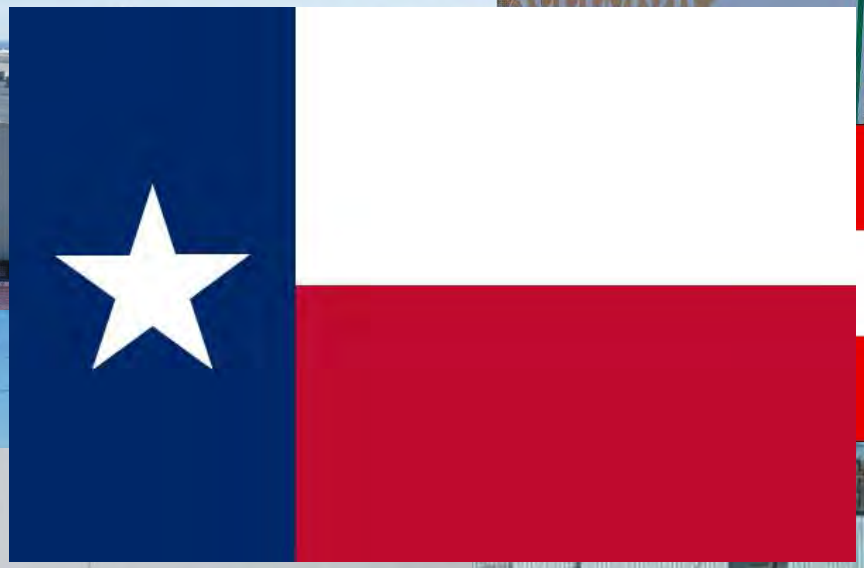
- Introduction
- Definition Phase
  - What is the Problem/Solution?
- Design Phase
  - Rainfall - RUSLE
  - Channel – HEC 15
  - Geotechnical – Multi-Approach
- Case Studies
- Conclusion

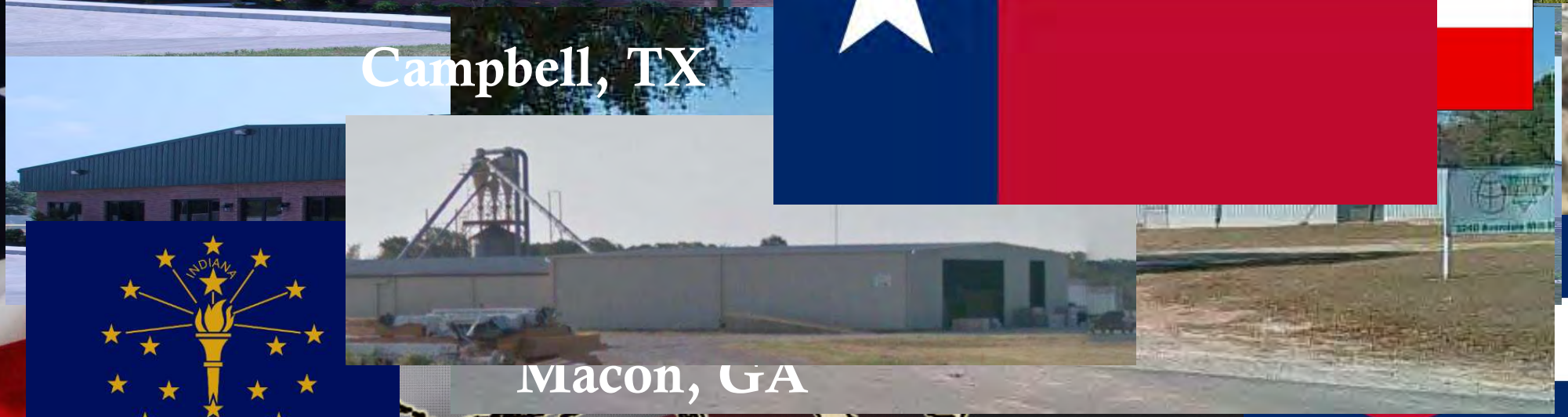
Western Excelsior/North American Green

- Largest Producer of Rolled Erosion Control Products
- Wide Variety of Products and Expertise
- Presenter, C. M. Lipscomb, PE CPESC

WEC / NAG – W

Alto, GA





Campbell, TX

Macon, GA

Planning for Pollution Prevention

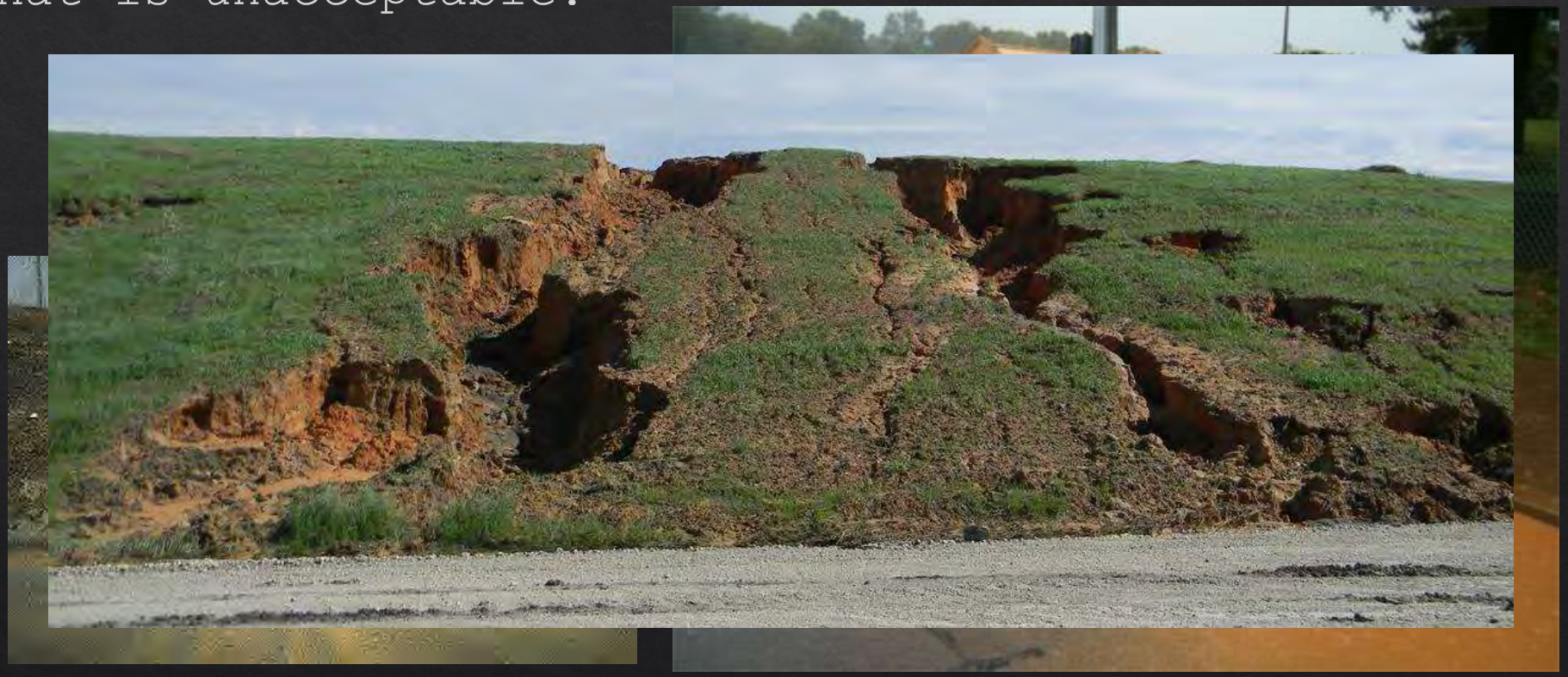
- What is the source of the force?
- Where are the inputs and outputs?
- When will the wind/water come?
- How erodible is the soil?
- Why does this area need to be protected?
- Who needs to be satisfied?

Considerations

- Long term condition
- Global stability
- Vegetation establishment possibilities
- Hydraulic loadings
  - Rainfall / Channelized
- Non-Hydraulic loadings
  - Foot traffic / Vehicle traffic / Debris
- Soil type and conditions
- Aesthetics
- Wildlife
- Vandalism
- Longevity
- Regulations

Defining The Problem

- What is unacceptable?



Motivation

- Erosion-related pollutants cost the United States up to US $13 billion annually.
- United States spends over US $1 billion removing sediment from harbors and waterways Annually.
- EPA estimates that sediment deposition in reservoirs from storm water runoff costs up to US $500 million annually.
- Annual water storage replacement costs from sediment range from US $2 to US $6 billion.

Defining Success

- How do we know when we won?

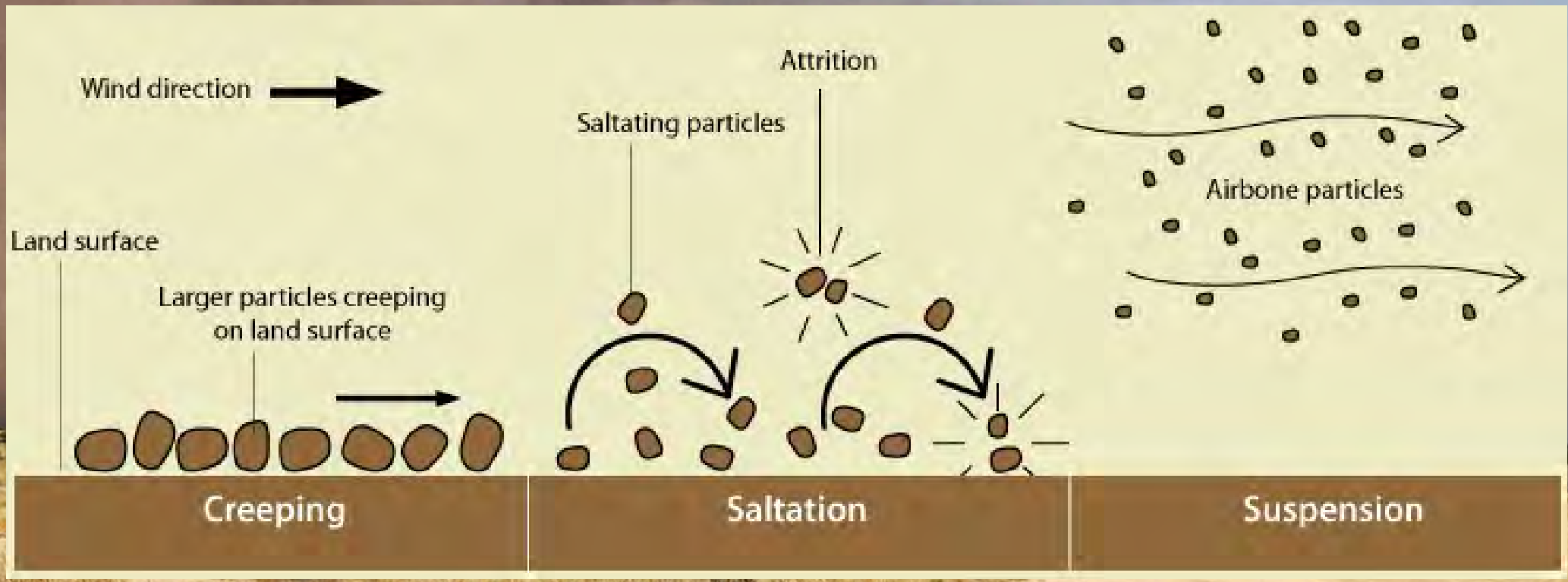
Defining Success

- Context and Location Dependent.

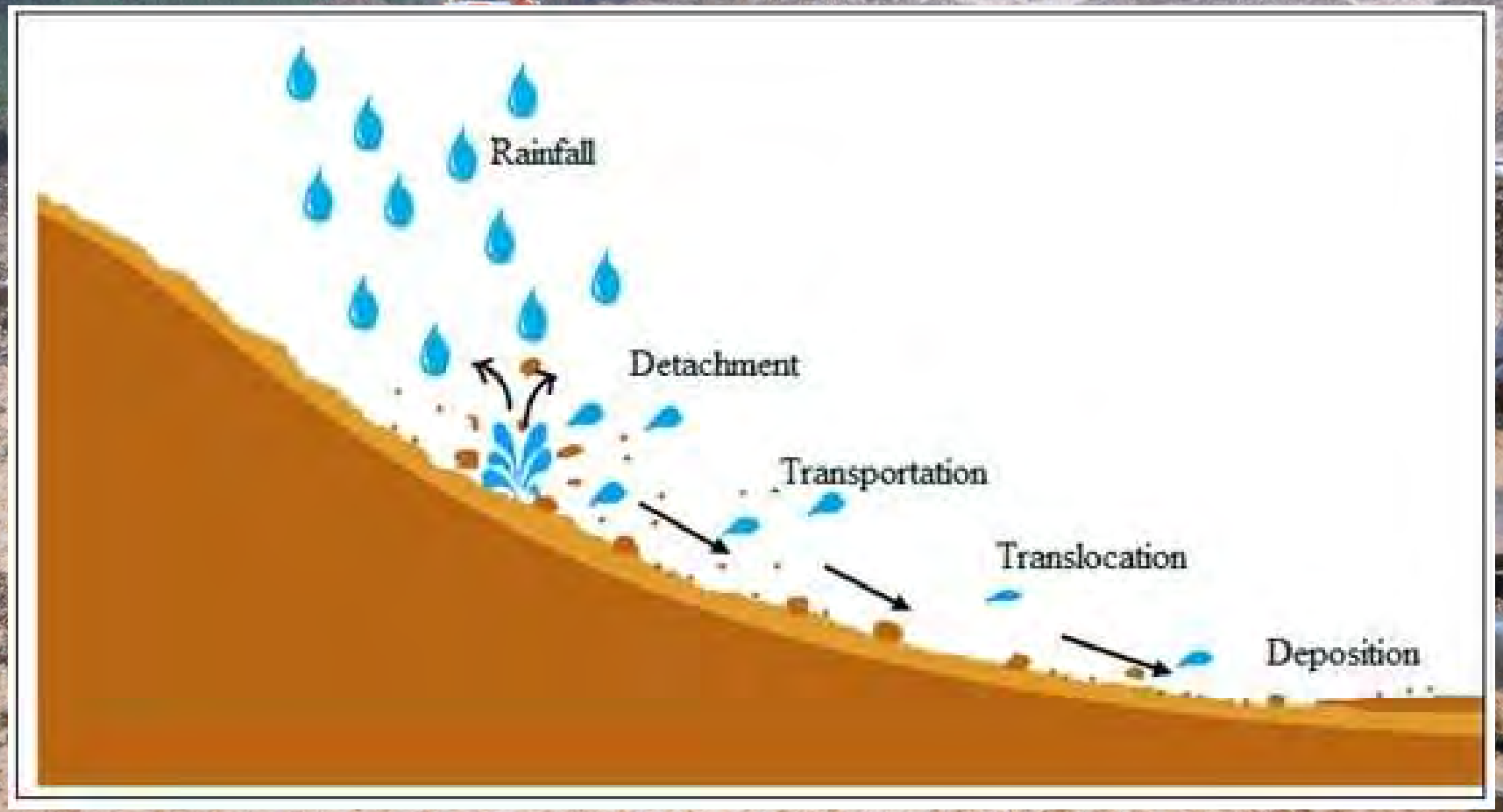
Erosion and Erosion Control

- Erosion
  - Displacement of Soi
- Pollution Preventi
  - Sed
    in
- Eros
  - A p
    mat
- Sedi
  - A p
    dis

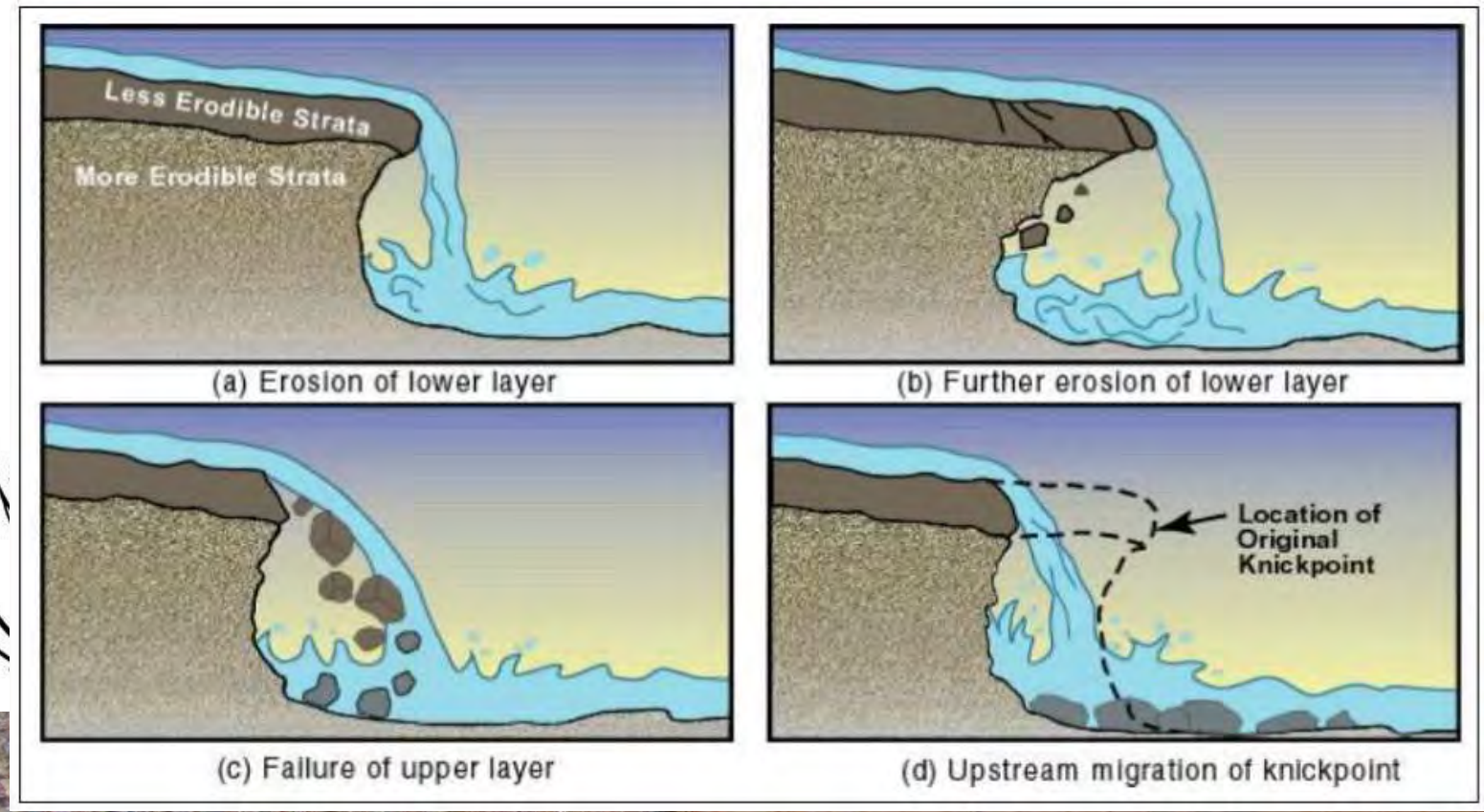
Sources of Erosion - Wind

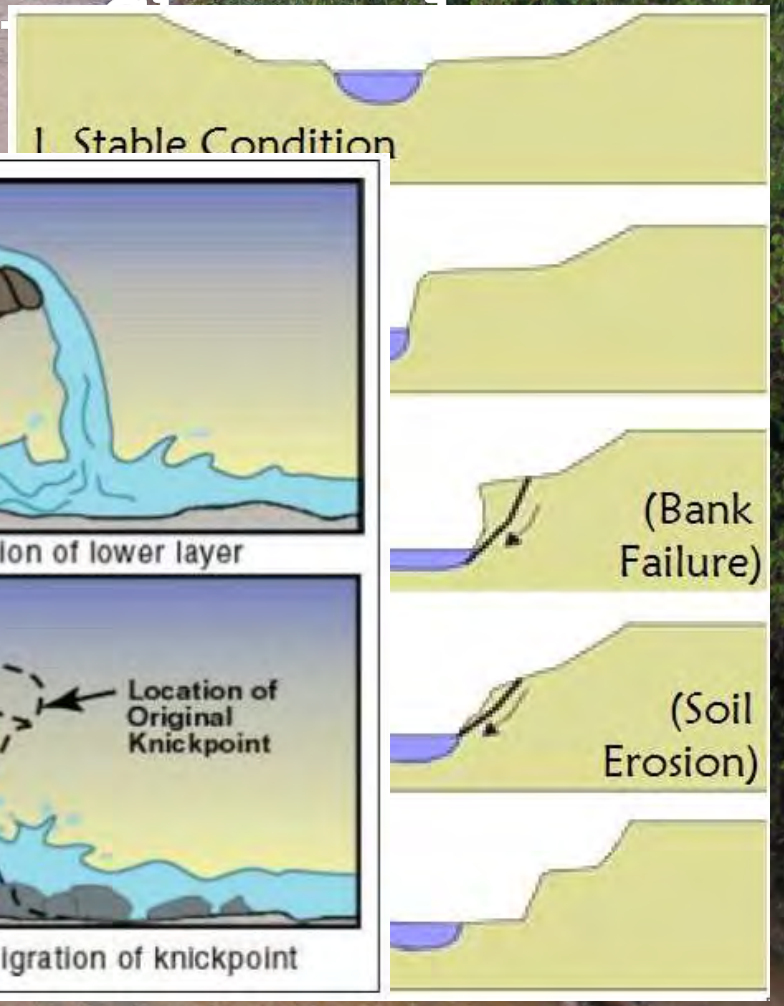


Sources of Erosion - Rainfall

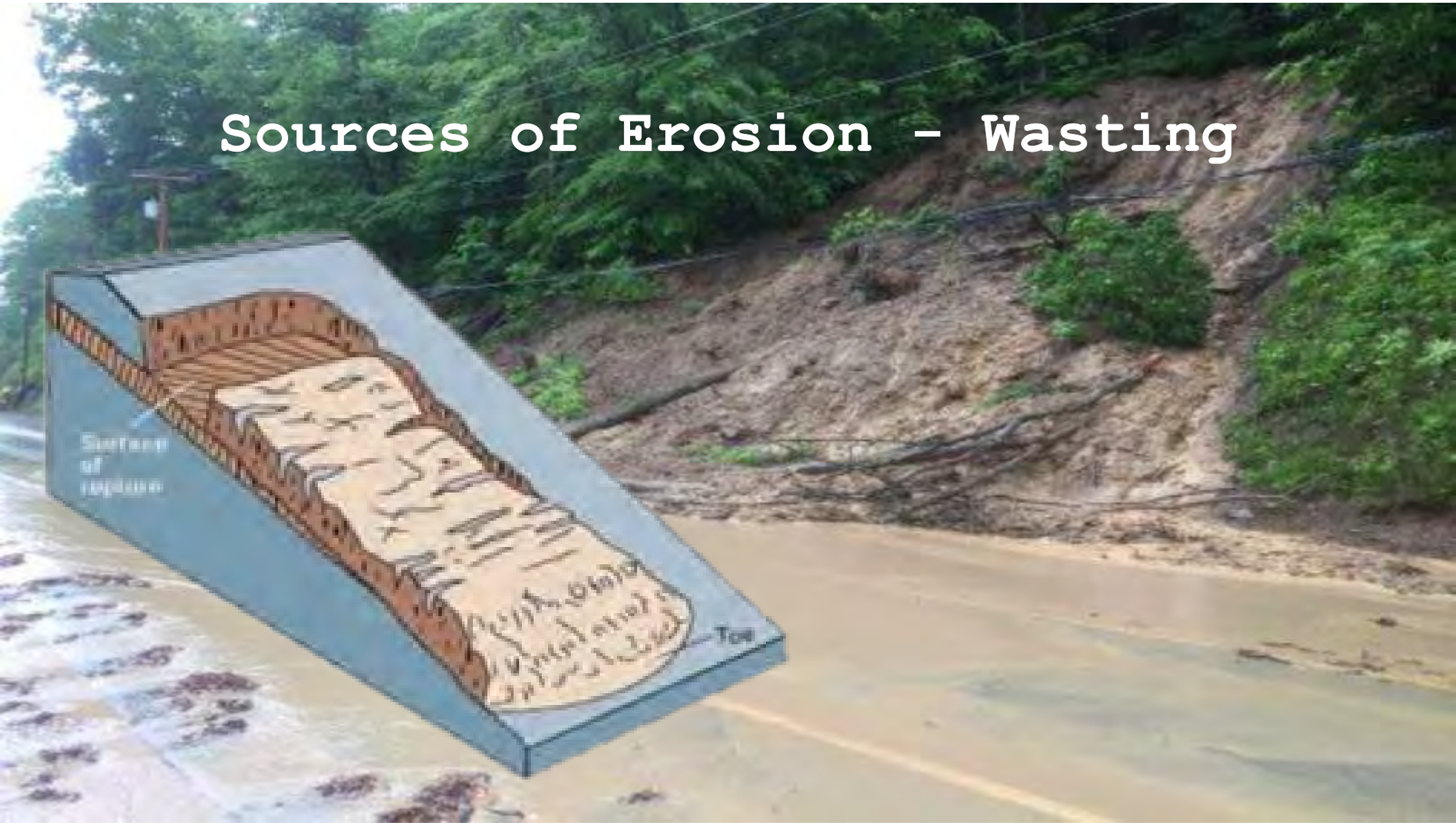


Sources of Erosion



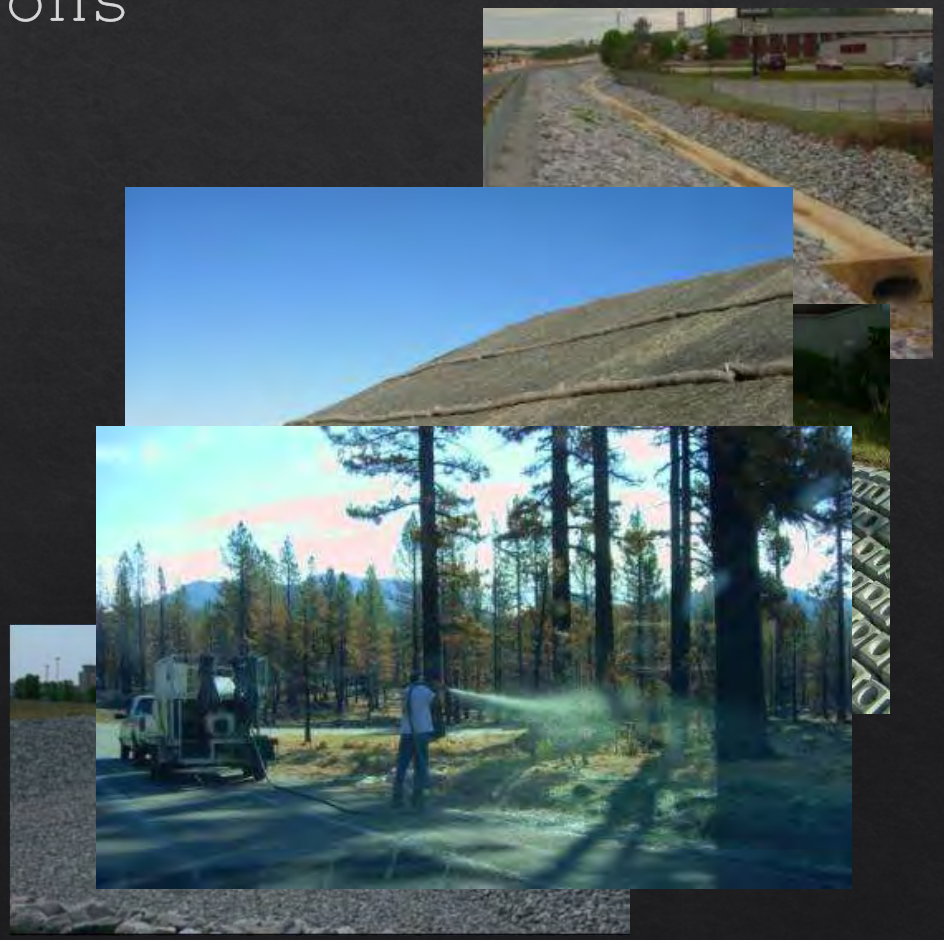


Sources of Erosion - Wasting



Erosion Control Typical Solutions

- Hard Armor
  - Articulated Concrete Blocks
  - Rock
  - Concrete
- Soft Armor
  - Erosion Control Blankets
  - Turf Reinforcement Mats
  - Bio-Engineering
- Revegetation
  - Blown Straw
  - Hydraulic Mulch
  - Bonded Fiber Matrix

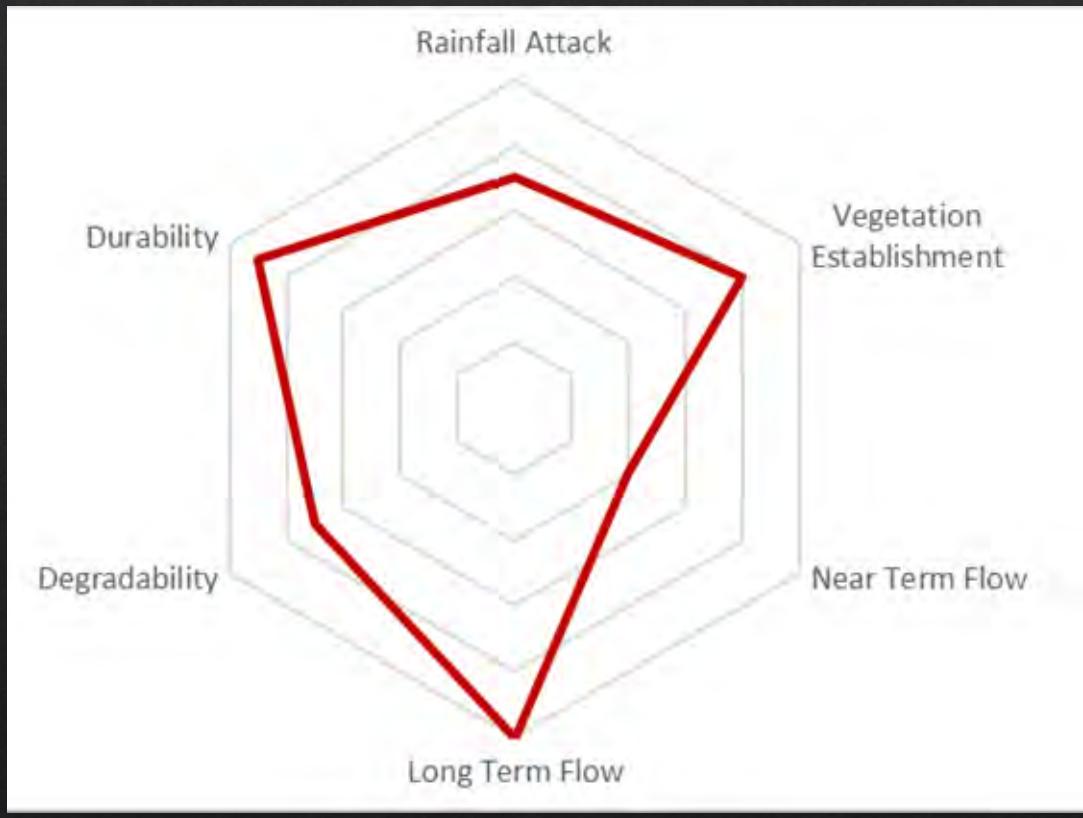


Benefits of Vegetated Solutions

- Less Expensive
- Pollutant Removal
- No Overburden
- Lower Carbon Footprint
- Safer
- Energy Dissipating
- Natural Aesthetic
- Easier Installation

Project Risk Envelope

- Rainfall Attack
- Vegetation Establishment
- Near Term Flow
- Long Term Flow
- Degradability
- Durability

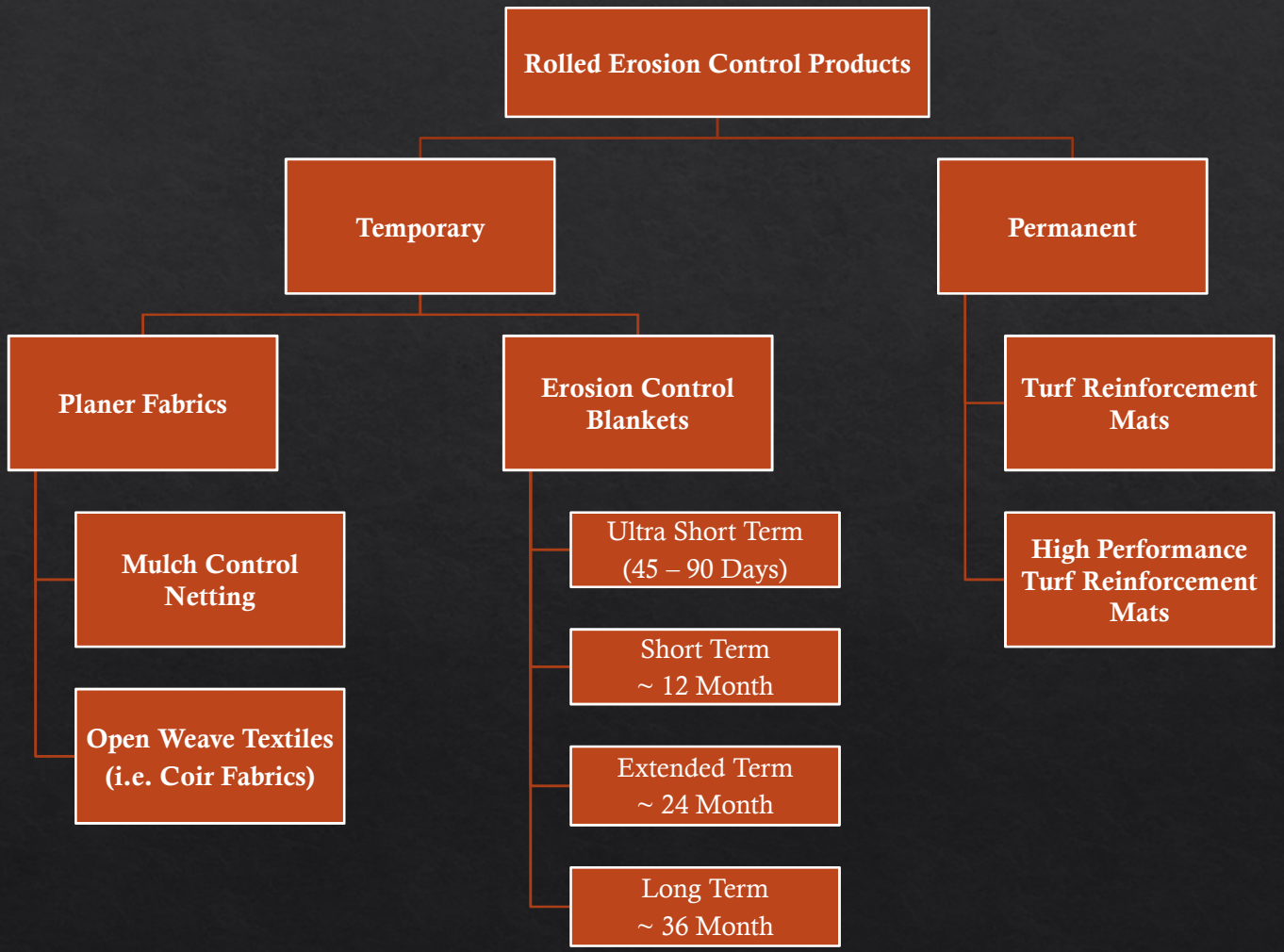


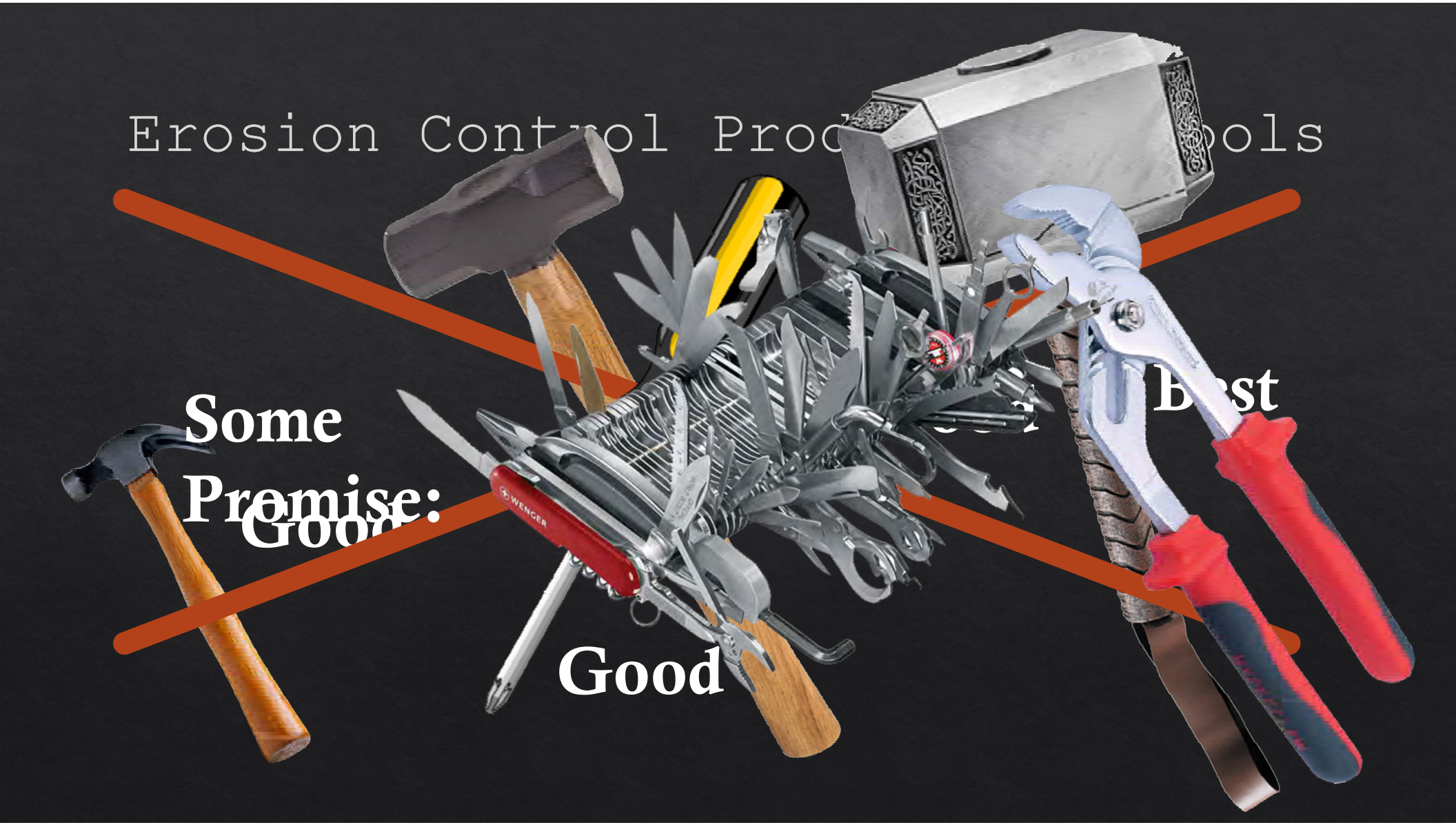
Mulch Project

HECP Examples

HECP Classification

RECP Examples


Rolled Erosion Control Products
Temporary
Permanent
Planer Fabrics
Erosion Control Blankets
Turf Reinforcement Mats
Mulch Control Netting
Open Weave Textiles (i.e. Coir Fabrics)
Ultra Short Term (45 – 90 Days)
Short Term ~ 12 Month
Extended Term ~ 24 Month
Long Term ~ 36 Month
High Performance Turf Reinforcement Mats

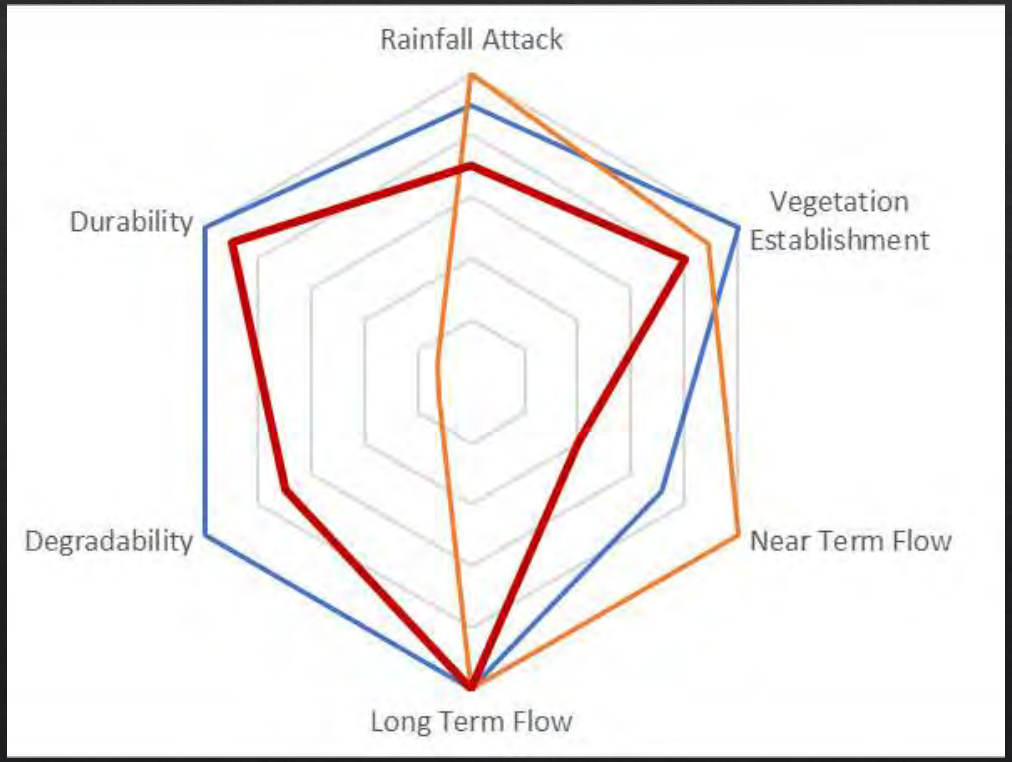

Erosion Control Prod ools
Some
Promise:
Good
Good
Best

ECP Performance Envelope

- C Factor
- Mulching
- Unvegetated Shear/Velocity Resistance
- Vegetated Shear/Velocity Resistance
- Longevity
- Tensile Strength/Elongation

Delivering Performance

- C Factor
- Mulching
- Unvegetated Shear/Velocity Resistance
- Vegetated Shear/Velocity Resistance
- Longevity
- Tensile Strength/Elongation



Design Methods

- Rainfall - RUSLE
  - Unvegetated
- Channel - HEC 15
  - Unvegetated
  - Vegetated
- Slope Stability - Multiple
  - Unvegetated
- Other
  - Pier Scour
  - Channel Bank
  - Coastal
  - Wave Attack