



A DESIGN AID FOR VEGETATIVE FILTER STRIPS (VFS)

Ramesh Rudra, Neelam Gupta, Saleh Sebti,
Bahram Gharabaghi,
Trevor Dickinson, and Hugh Whiteley

Objectives:

To develop a computer model suitable as an aid for cost-effective design of VFS

based on site-specific characteristics of upland area, design storm, pollutants in overland flow, and water quality objectives for the given water course



Introduction:

Vegetative Filter Strips can improve surface water quality by partial removal of sediments, sediment-bound pollutants and other chemicals in stormwater runoff.

- How (*what are the key mechanisms*)?
- When (*under which circumstances*)?
- To What Extent (*removal efficiency*)?



How is trap efficiency affected by:

- **Flow rate**
- **Sediment characteristics**
- **Soil and Filter characteristics**
- **Seasonal variability**



Methodology:

- **Field Experiments**

Storm peak flow rates: 0.30, 0.65, 1.00, and 2.00 L/s

Pollutants: sediments, phosphorous, nitrogen and bacteria

Vegetative filter lengths : 2, 5, 10, and 20 m

Seasons: spring, summer, and fall conditions

- **Computer Modeling**



Guelph Turfgrass Institute



RECP

Natural VFS

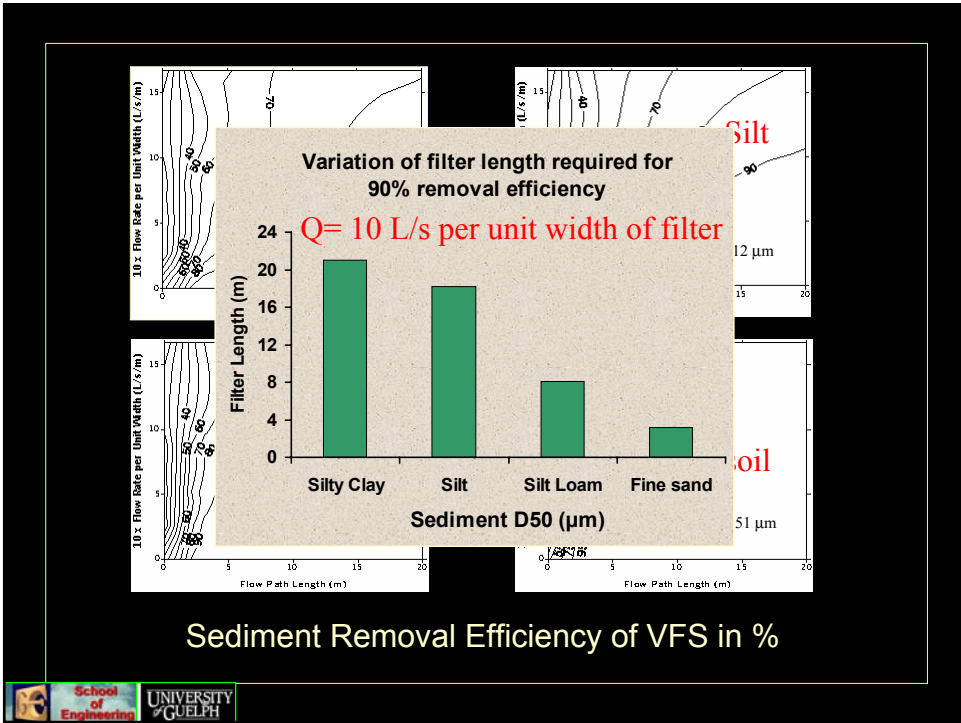
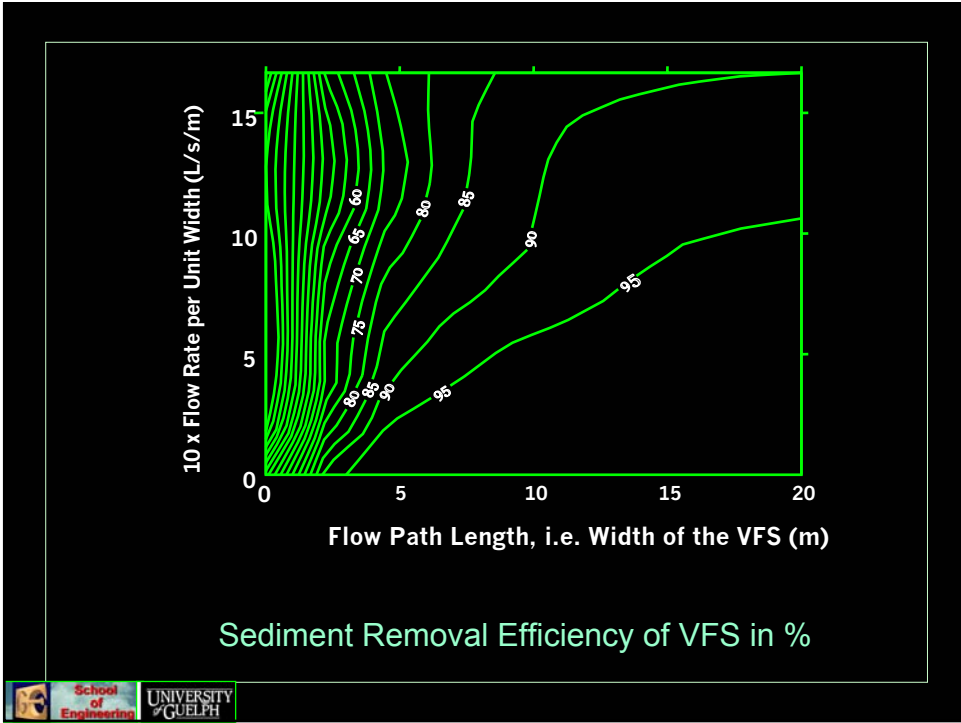


Carol Creek



Field Equipment at Site





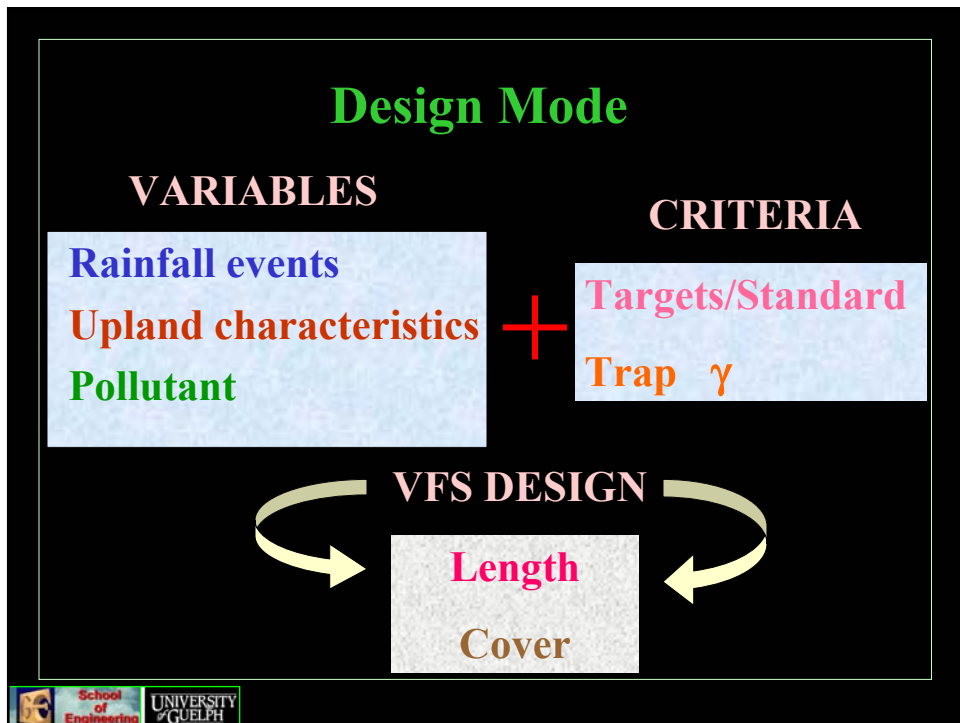
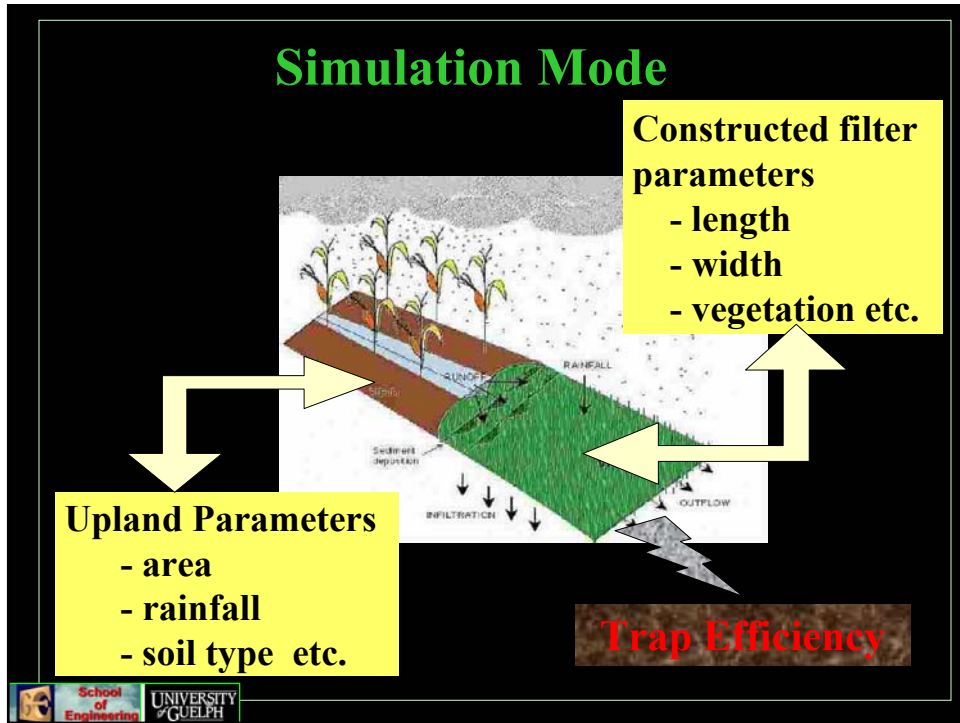
VFS Design Tool Components



- Upland Hydrology Model (UH)
- Phosphorus Component of the UH Model (UH_P)
- Vegetative Filter Strip Model (VFS)
- Phosphorus Component of the VFS Model (VFS_P)

Model Inputs:

- Upslope area characteristics
- Design Storm/Event hyetograph
- VFS length and slope
- Soil characteristics in filter strip
- Vegetation characteristics



Application Aims:

- User – friendly
- Knowledge
 - Soil properties and hydrology
 - Windows operating system
- Water Management Specialists
 - Engineers, Environmental Scientists, Planners....
 - in Private Practice or Federal, Provincial or Municipal Agencies or NGOs



Remaining Issues:

- Spring conditions
- Concentrated flow conditions
- Location in watershed
- Constructed filter areas
- Other pollutants from various sources
- Target/standard e.g. TDML/System Capacity



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