Stormwater Primer
Justin Kenney, Vermont Department of Environmental Conservation
Overview

- Watersheds and the hydrologic cycle
- Traditional methods of stormwater management
- Low impact development and green stormwater infrastructure
Stormwater runoff is the leading cause of water pollution in the United States.
Stormwater and land use are intricately linked
The relative distribution of water within the cycle is a result of many factors (canopy cover, climate, soil permeability, slope, etc.)

While there is a lot of variability, generally under natural forested conditions:

- 40% evapotranspiration
- 10% runoff
- 25% shallow infiltration
- 25% deep infiltration

Understanding Hydrology
Understanding Hydrology

- Generally, under urbanized conditions:
  - 30% evapotranspiration
  - 55% runoff
  - 10% shallow infiltration
  - 5% deep infiltration
1” rain storm over 1 acre

Forest runoff = 2,715 gallons

Urban runoff = 14,934 gallons +

1” storm over Burlington

148,145,280 gallons

225 Olympic size swimming pools
Sedimentation
Nutrient Loading
Bacteria
Trace metals
Trash and Debris
Hydrocarbons
Chlorides
Flooding
Traditional Stormwater Management
Traditional Stormwater Management

- Treats stormwater as a waste, not a resource
- Considers stormwater last in the design process
- Utilizes pipe and convey strategy
- Centralized
- Looks mostly at surface runoff
- Manages peak flow
- Reliant on large infrastructure
Traditional Stormwater Management
Traditional Stormwater Management
Traditional Stormwater Management
Low Impact Development
Minimize Total Disturbance
Minimize Soil Compaction
Reduce Impervious Surfaces
Protect Natural Flow Patterns
Protect Riparian Buffers
Protect Sensitive Areas
Disconnect Stormwater
Conservation Development
Green Stormwater Infrastructure