# Modeling of Existing and Future Conditions

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Bear Creek Basin Plan

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Goals and Objectives

- Use a hydrologic model (HSPF) to simulate the hydrology and water quality of historic, existing and future conditions in the watershed.

- Identify cost-effective stormwater management strategies using the BMP optimization model (SUSTAIN).

- Strategies could include: capital projects, non-capital programs or actions, and land use regulations.
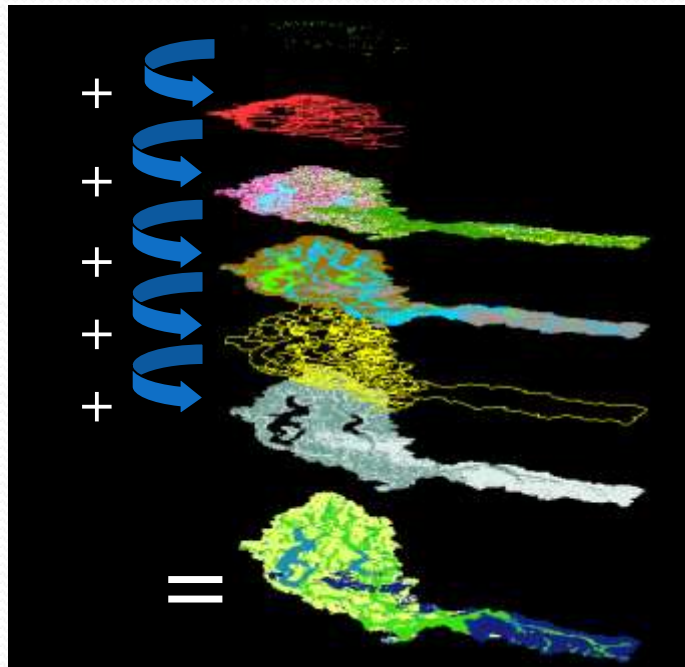
Land Cover
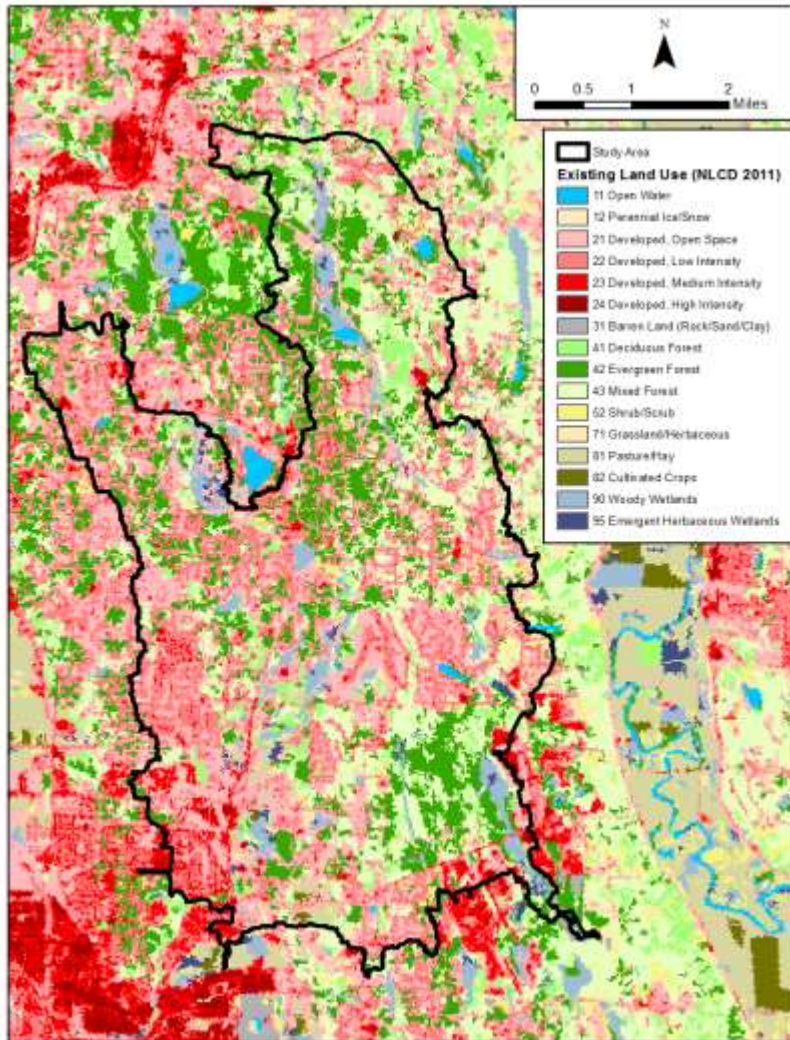
- Existing land use (NLCD 2011)

- Future land use (2040) derived from jurisdiction's comprehensive plans

HSPF Watershed Modeling

- Hydrologic Simulation Program – Fortran (HSPF)

- Simulate current, future and historic (pre-disturbed) conditions of watershed.

- Calibrate model using observed water quality and flow data.

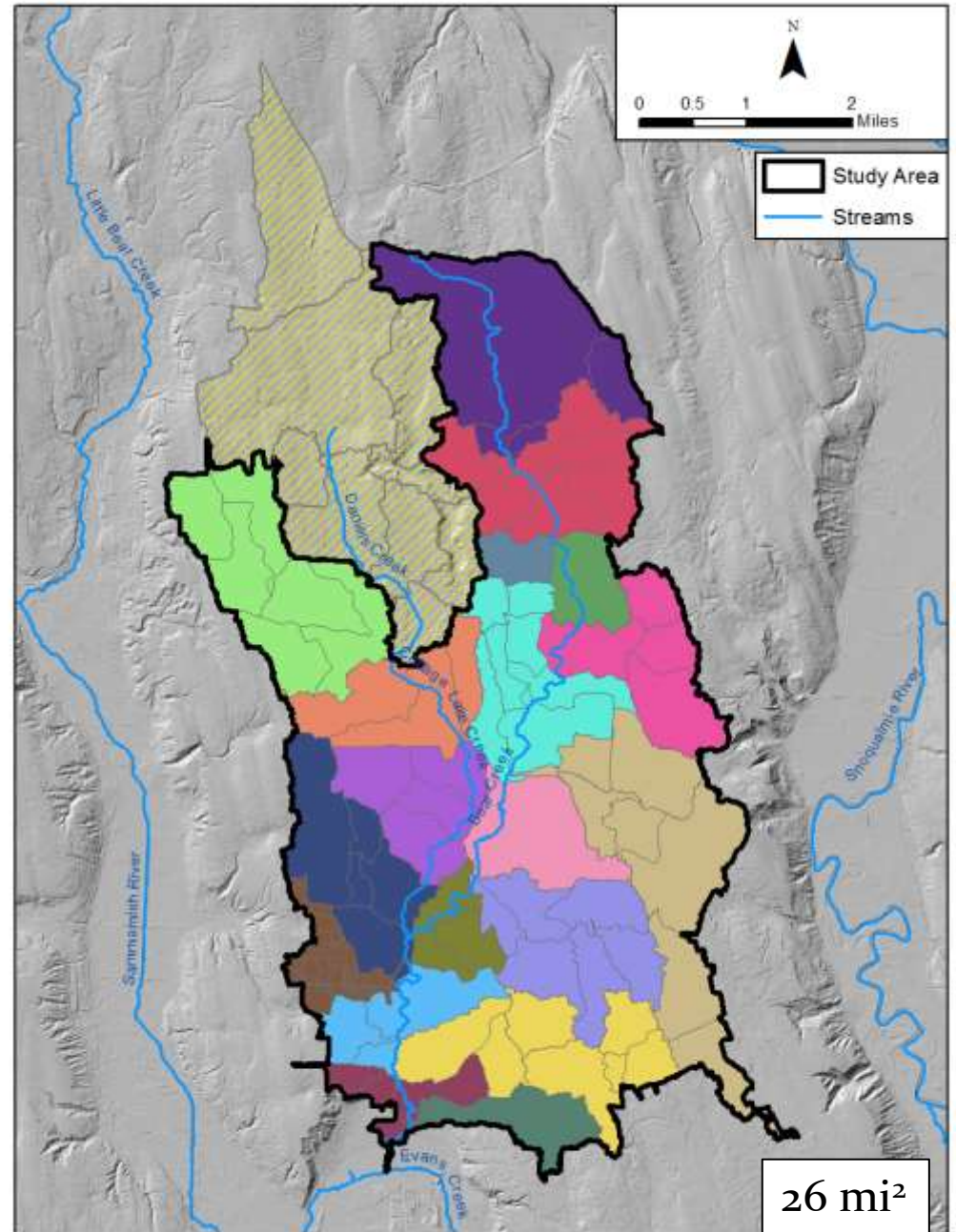Wetlands (NWI)

Impervious land cover

Land Use

Soils

Catchments

Slope Percent

Integrated Layer (HRUs)

Catchment Delineation (in progress)

- Stormwater conveyance information from King County, Snohomish County, Redmond and Woodinville

- Topographic information

EPA SUSTAIN Modeling

System for **U**rban **S**tormwater **T**reatment and **A**nalysis **In**tegration (SUSTAIN)

U.S. EPA model developed to assist stormwater managers in selecting cost-effective stormwater BMPs to meet watershed goals.
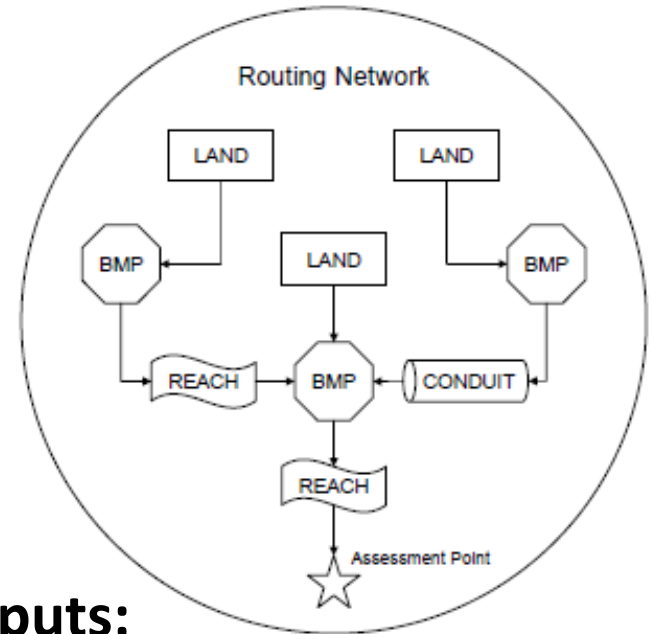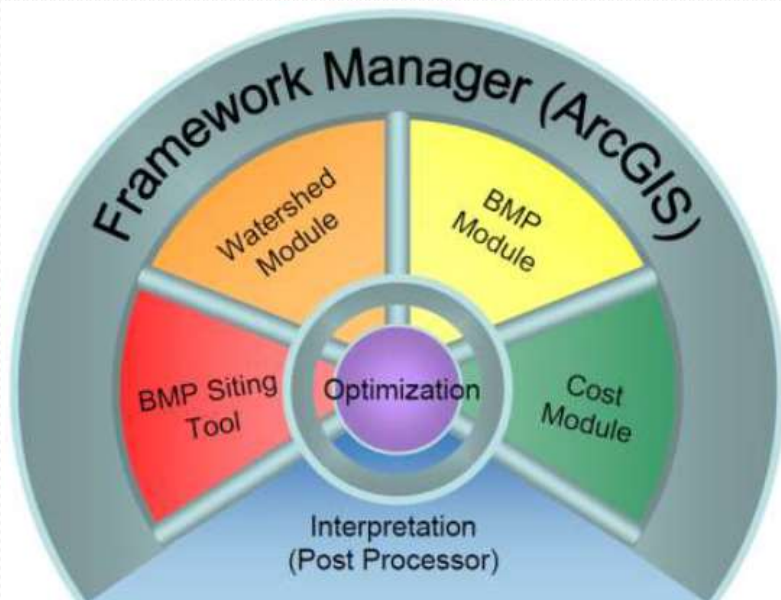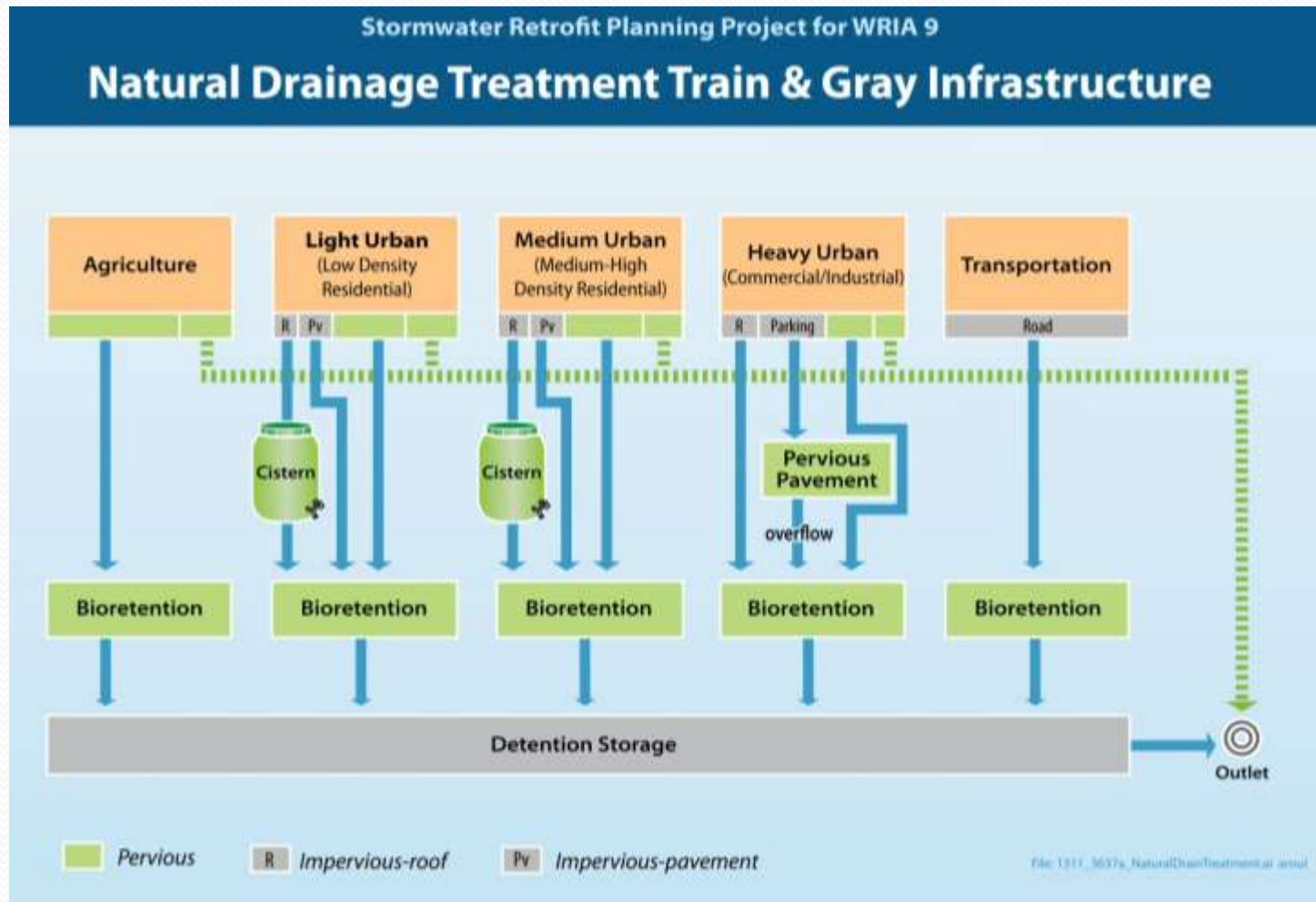

Model Inputs:

HSPF Model Output

BMP Design and Cost Assumptions
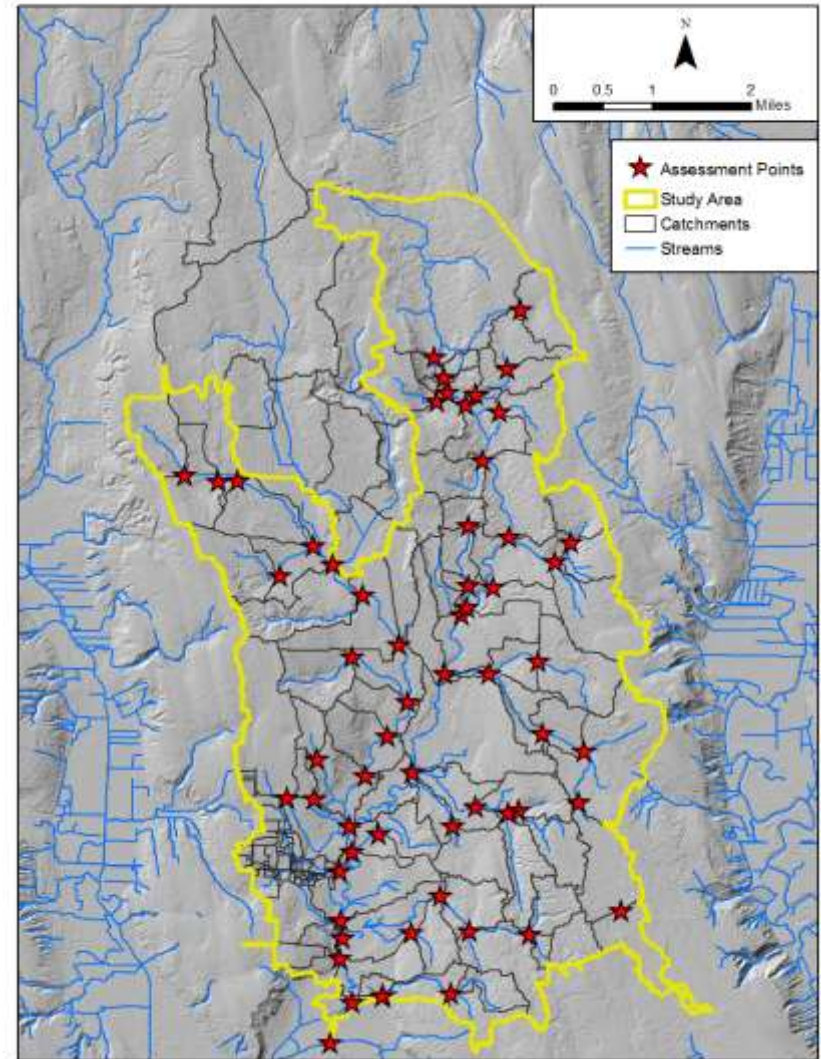
Flow or water quality goals

Stormwater Management Strategies

Example from WRIA 9 Stormwater Retrofit Project (King County, 2014)
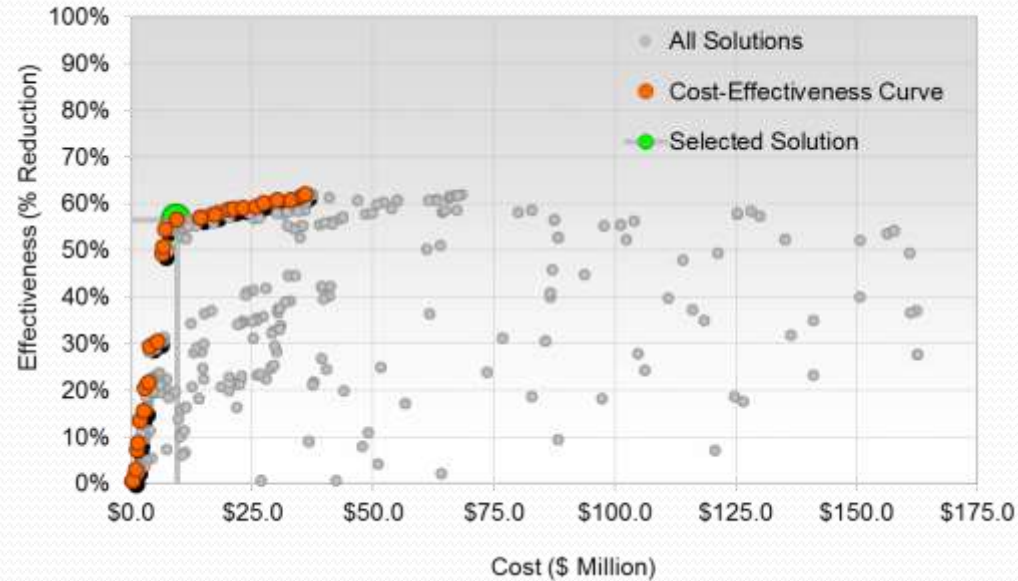
Assessment Points

- Locations in the watershed where results are to be analyzed.

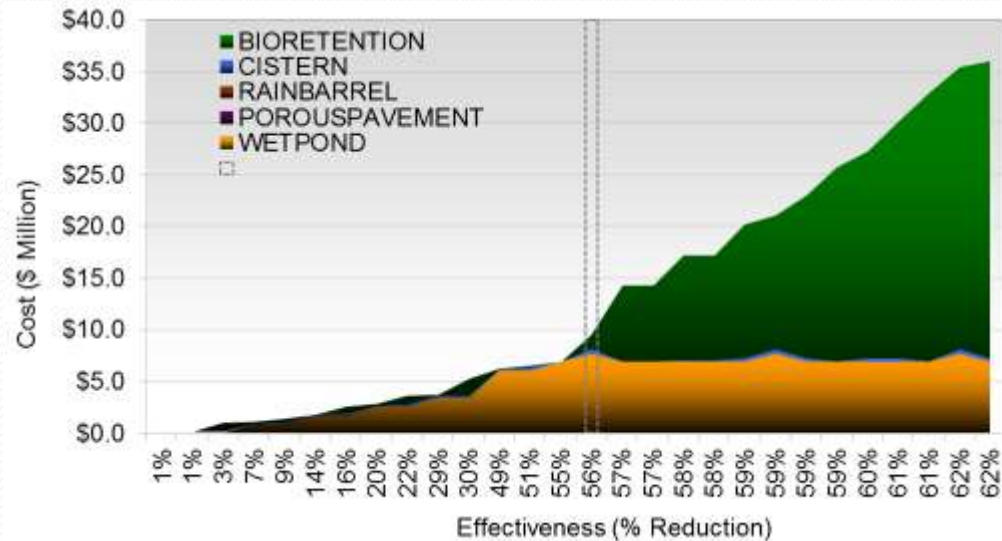- At each location, cost-effective optimization of stormwater strategies to reach watershed goals
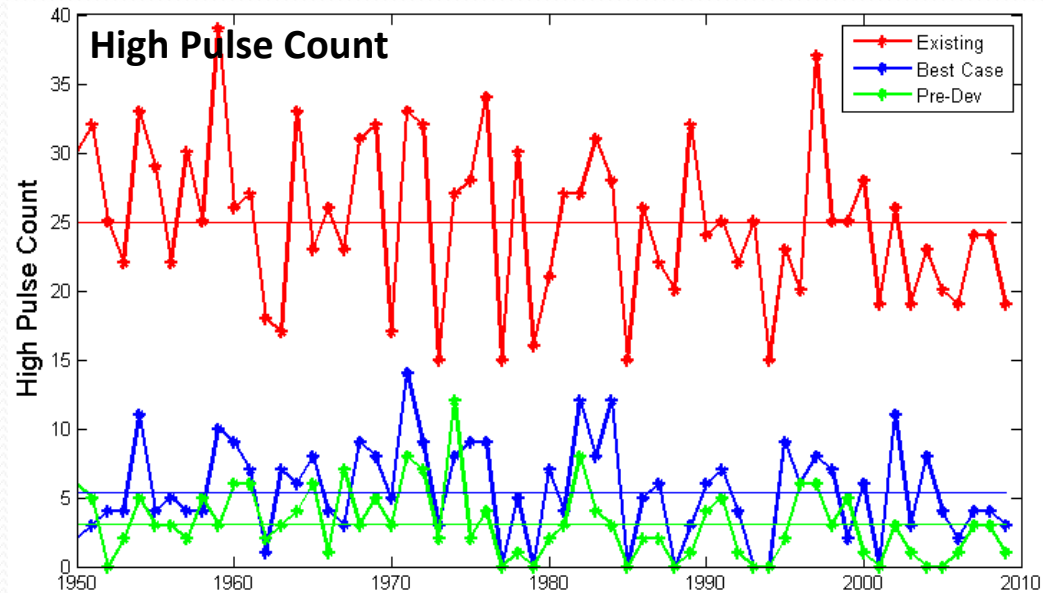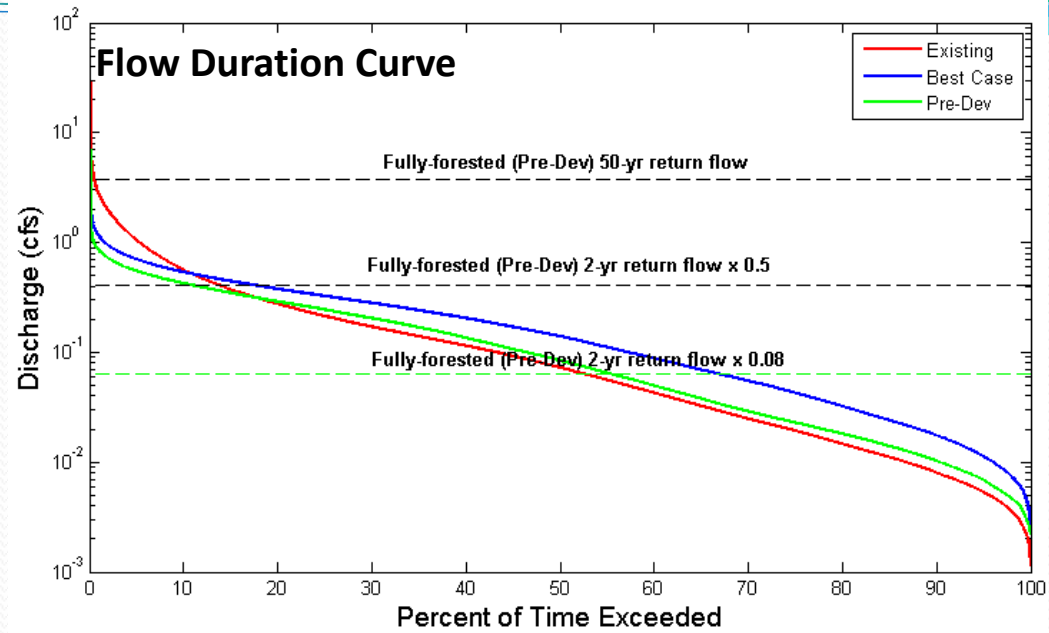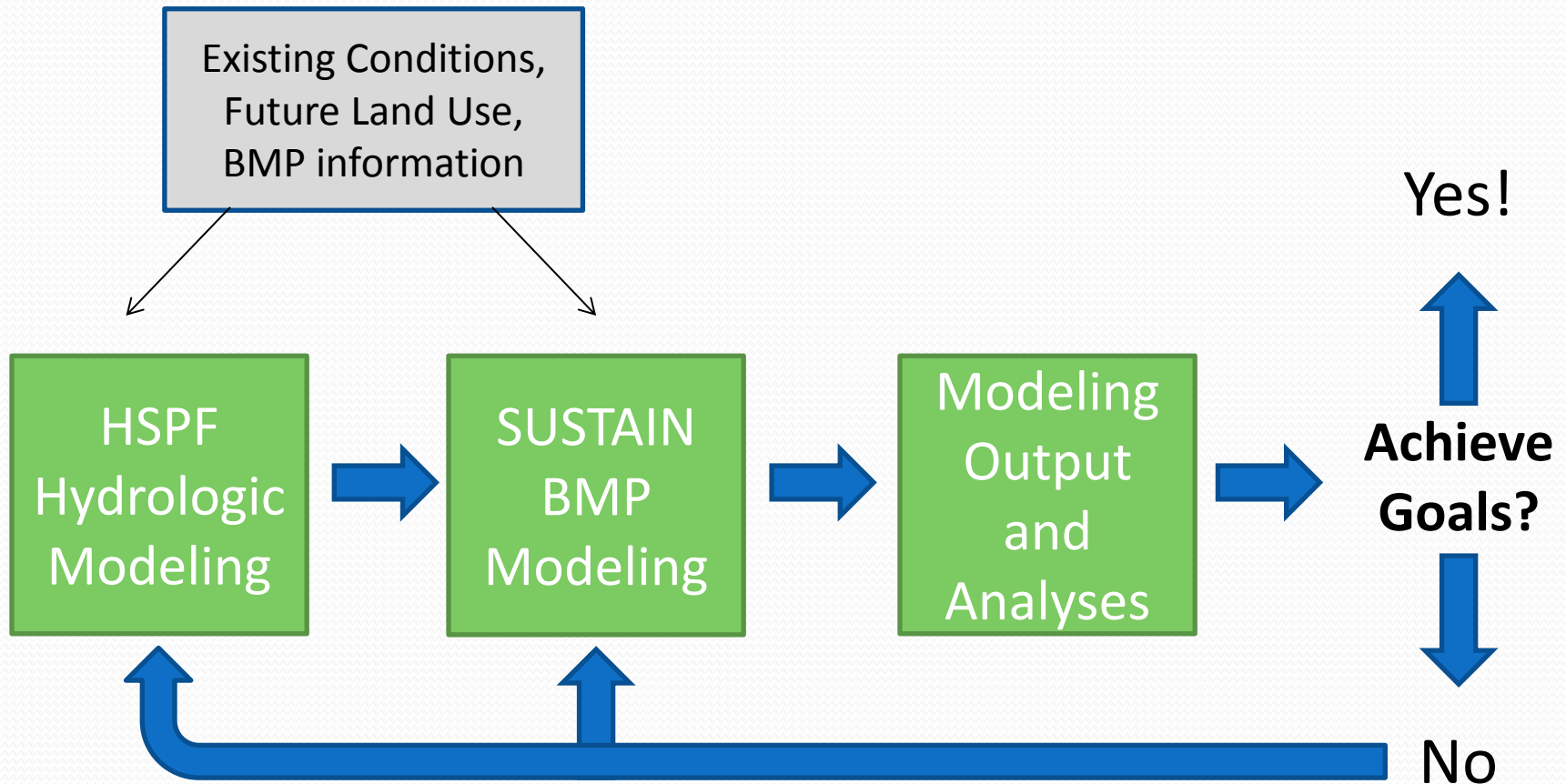
SUSTAIN Modeling Output examples

Cost-Effectiveness

BMP Cost-Distribution

Other measures of success

Flow Duration Curve

High Pulse Count

Modeling Approach Overview

Questions?