

Flow Ways



Watershed Protection

Presentation Outline

- Introduction to flow way concept
- Overview of NSPECT model
- Case studies
 - Pellicer sub-basin
 - Watershed development comparison

Traditional Implementation



Riparian buffers

Flow ways extend
this concept
upstream from
defined stream
channels

- Primary goal: water quality protection through terrestrial and aquatic habitat conservation



Photo credit:
[www.magazine _
.noaa.gov](http://www.magazine_.noaa.gov)

Objective: Maintain hydrologic integrity of the watershed

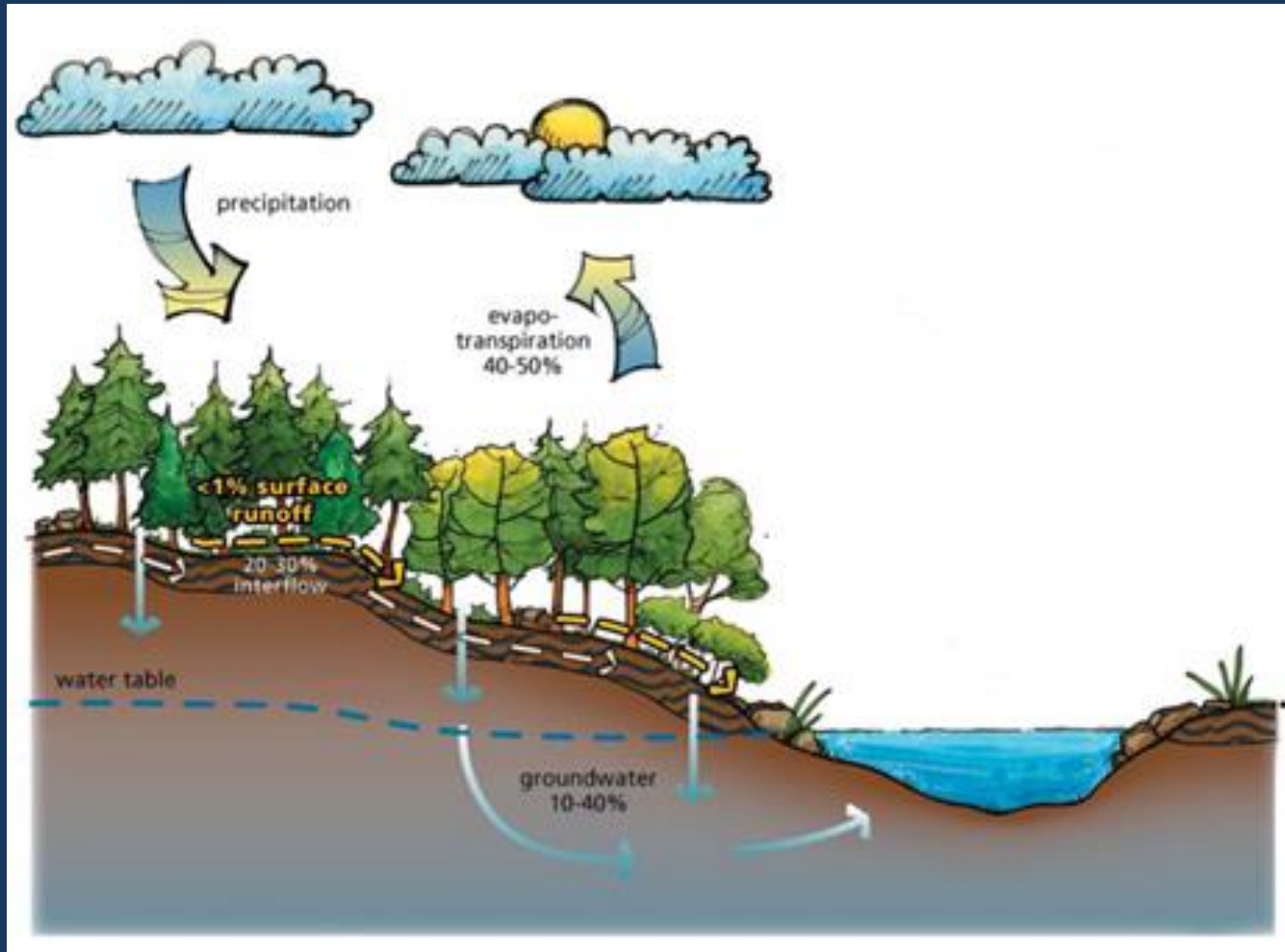


Photo credit:
Oregon State
University
Sea Grant
Program

Objectives: Improved land development planning



Photo credit:
DCCD
Engineering
Corporation

Objective: Reduce the need of structural storm water engineering



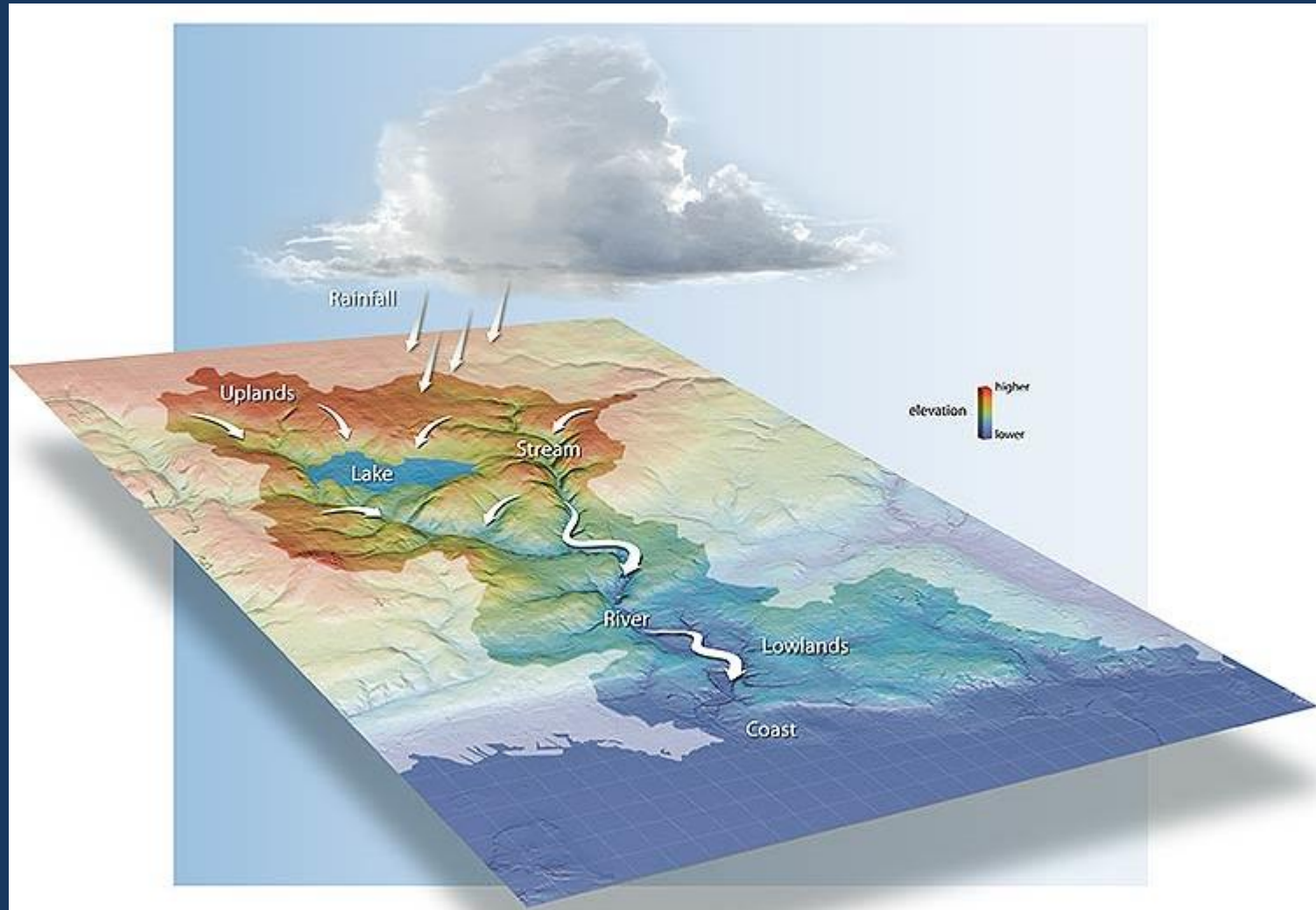
Photo credit:
Landplan
Engineering PA.

Objective: Supplement existing wetland buffer rules



Photo credit:
St Johns County
Environmental
Division

Objective: Support cumulative watershed level view in landuse planning



Graphic credit: Southwest Florida Water Management District

Non-point Source Pollution Erosion Screening Tool (NSPECT)

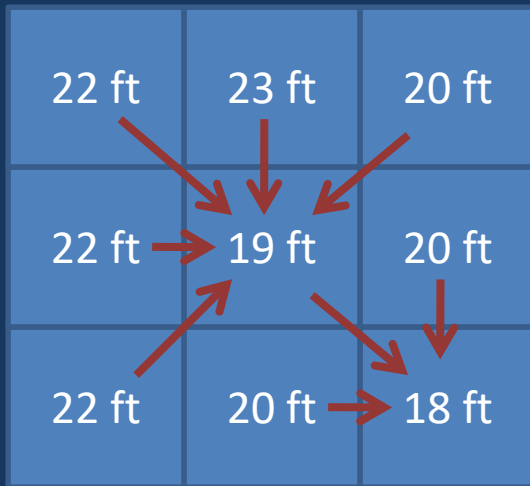


- GIS based model to estimate:
 - Surface water runoff volumes
 - Pollutant Loads
 - Pollutant Concentrations
 - Total sediment Loads
- Tool to help identify areas that might benefit from changes to proposed development strategies
- Designed to analyze landuse change scenarios



NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

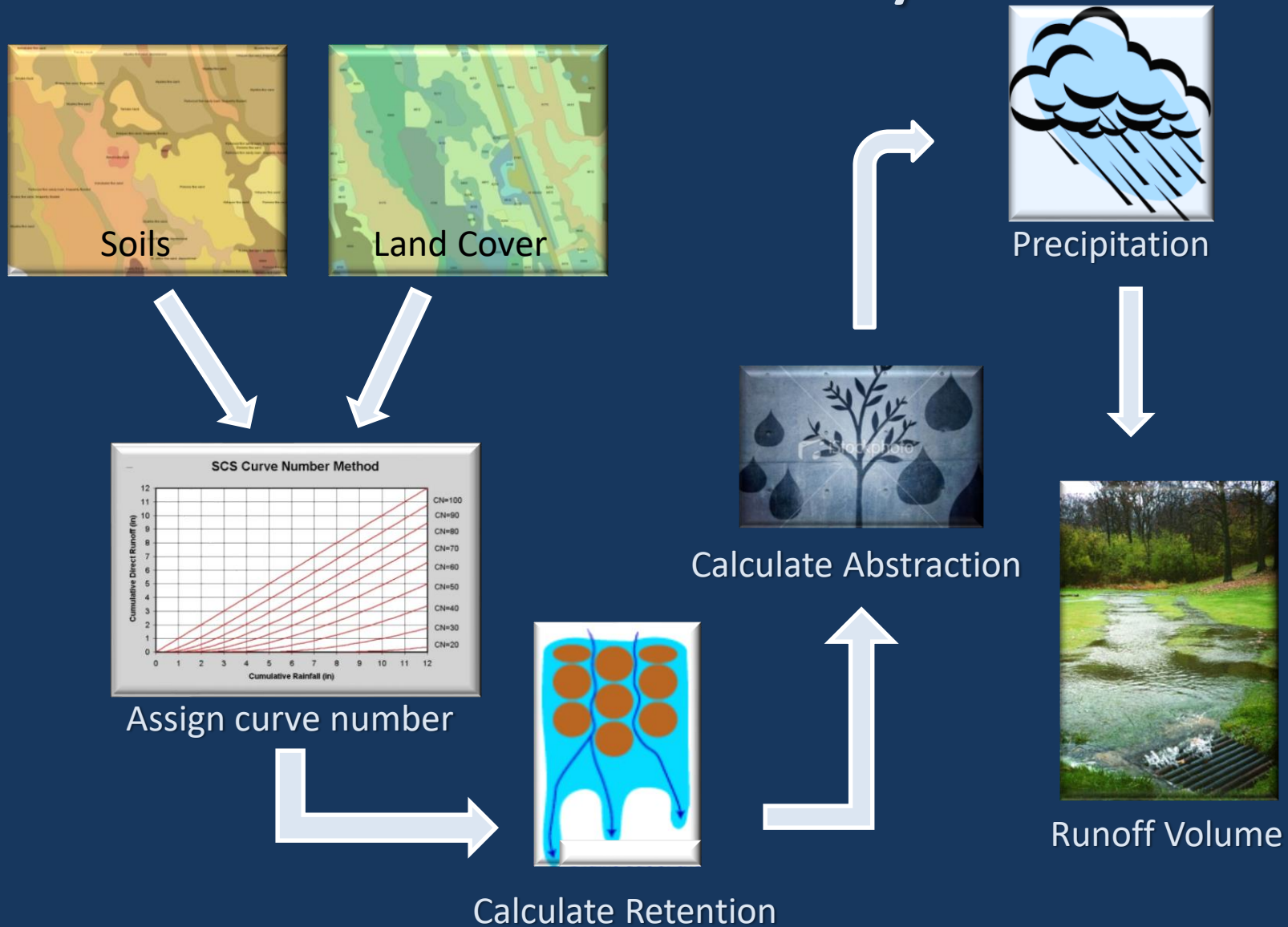
Topographic Flow Routing



Digital elevation model

- Digital Elevation Model determines flow routing direction
- Flow follows steepest slope
- Runoff is accumulated along the path of the flow way from cell to cell
- Accumulation threshold set to define flow way based on size of area drained

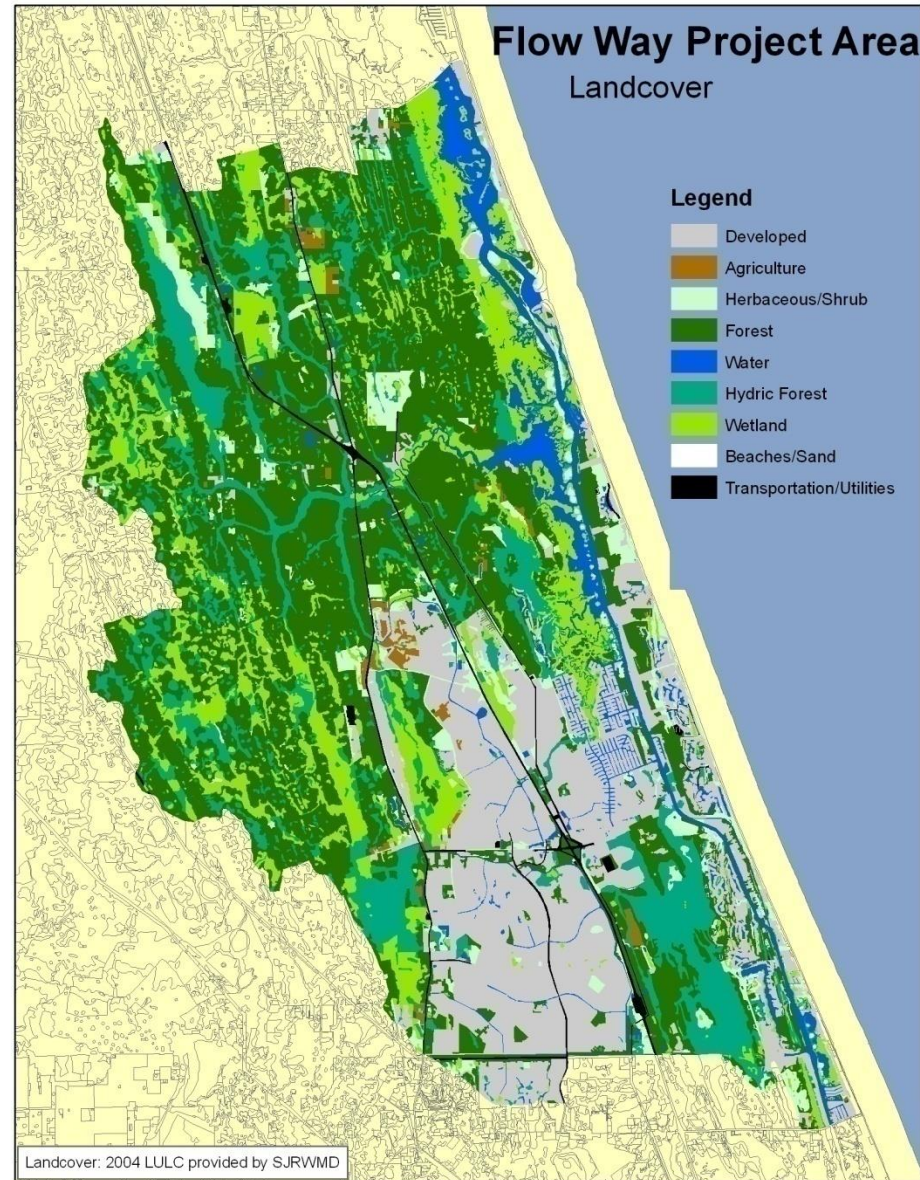
Runoff Calculation by NSPECT



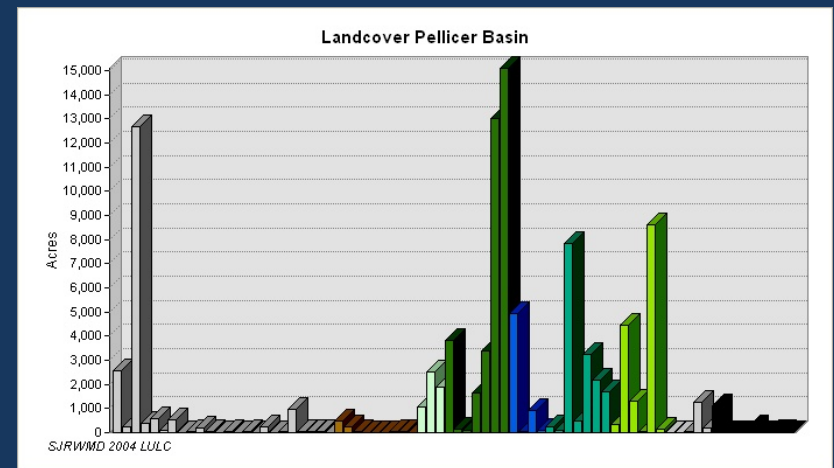
Limitations/Caveats

- Inaccuracies in elevation data
- Engineered ditches, culverts and other modified hydrologic features often not included
- Will not completely replace parcel level surveys at development sites for accurate flow routing

Case Study: Pellicer Sub-basin



- Area: 102,124 acres
- Elevation Range: 0 to 51 ft (msl)
- Average Elevation: 22 ft (msl)



Pellicer Flow Ways



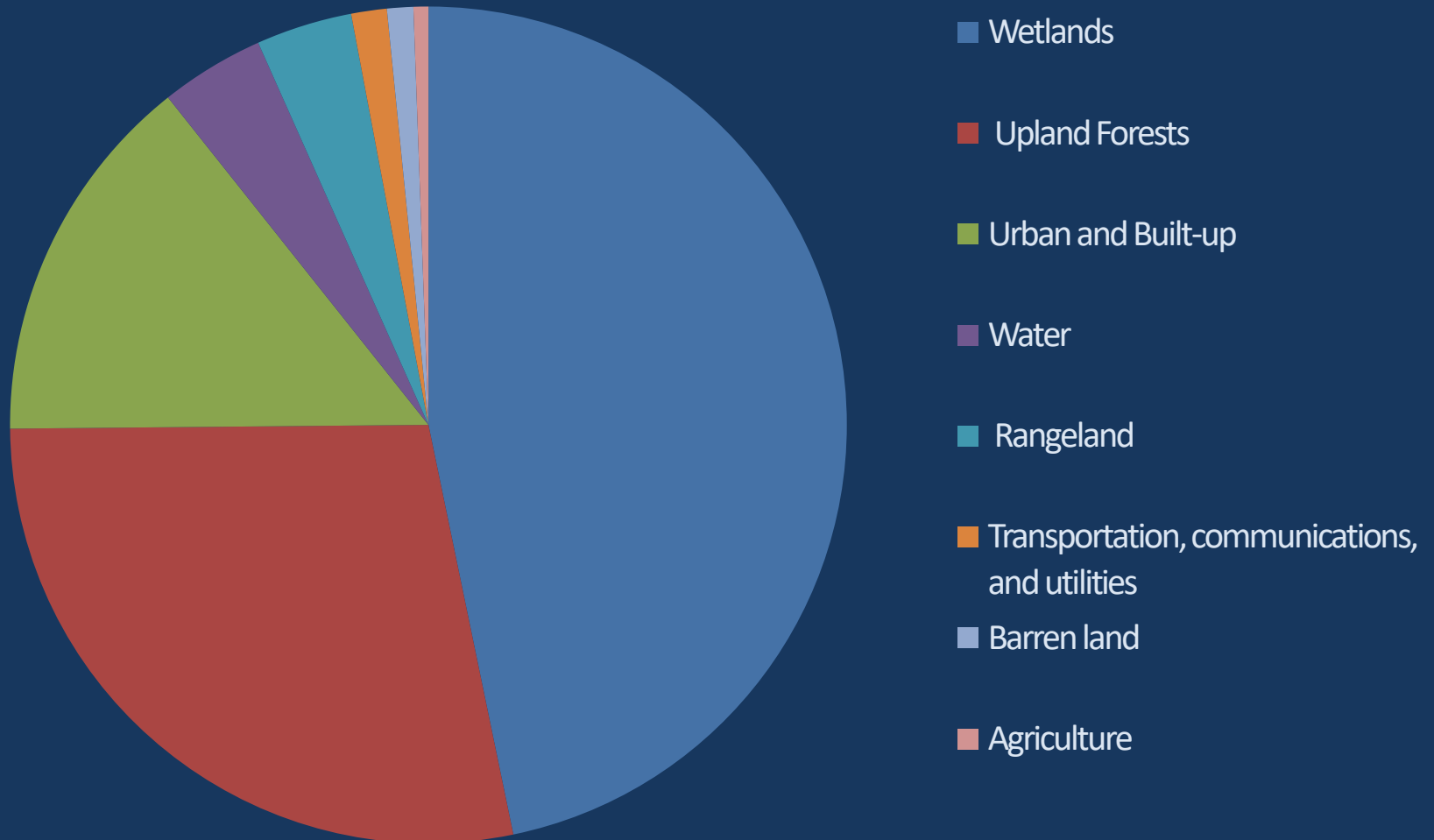
Flow way definition:
Accumulation threshold =
500 cells (12.4 acres)

Sub-basin flow way total
length = 904.4 km (562 miles)

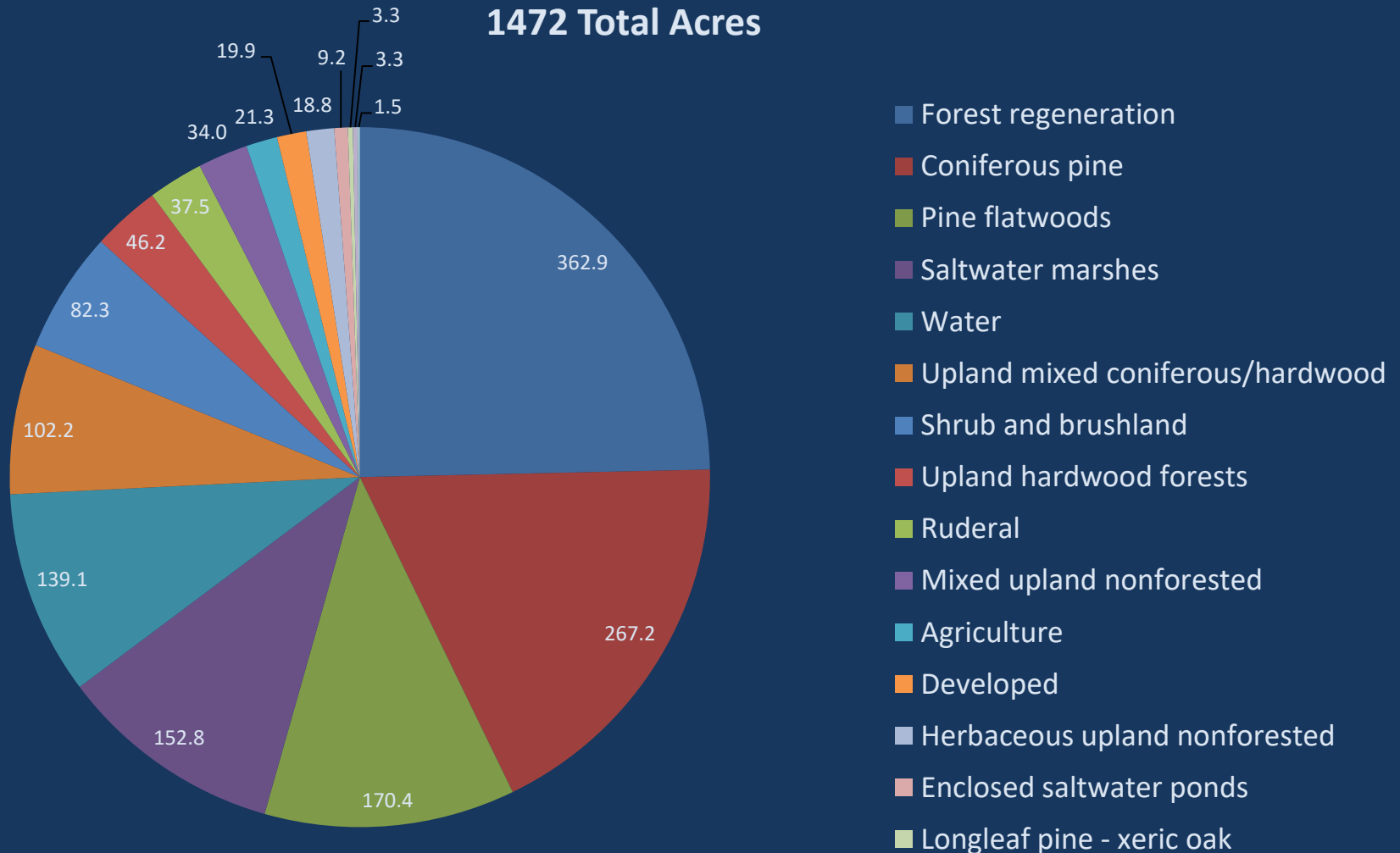
Source DEM: SJRWMD district
wide ANUDEM 5.2

Land Cover Traversed

Percent Land Cover

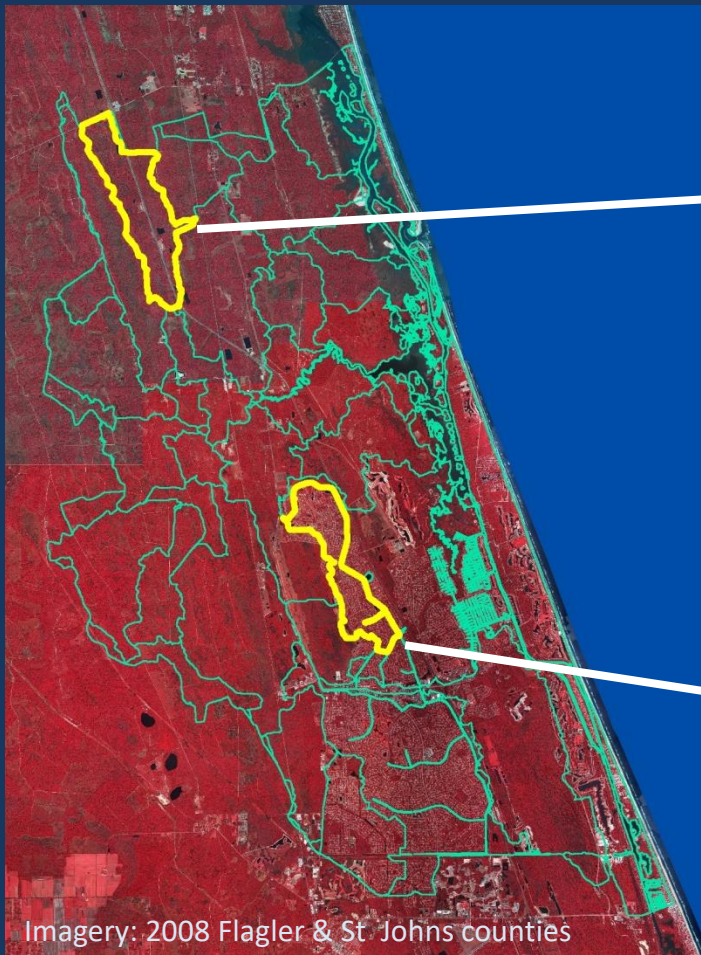


Flow Way Buffer Land Cover



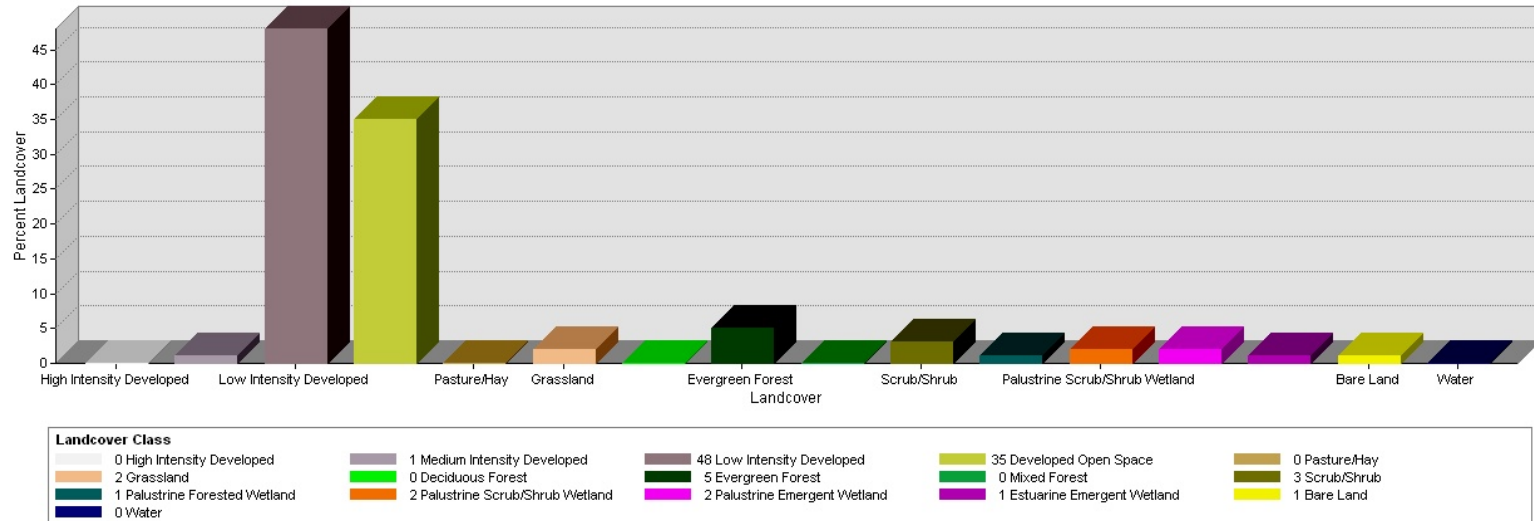
Buffer = 25 ft to either side of centerline. Flow ways not within wetlands. Land cover data: 2004 LULC, SJRWMD

Catchment Comparison



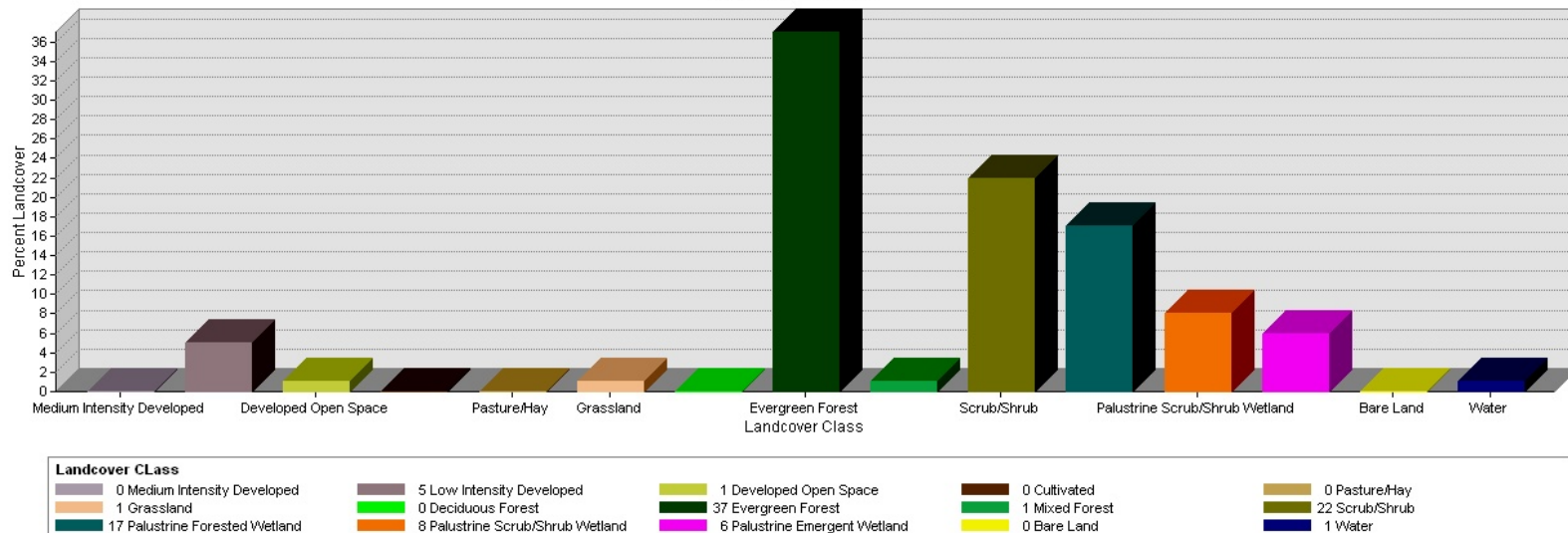
Catchment Comparison

Pellicer South Catchment



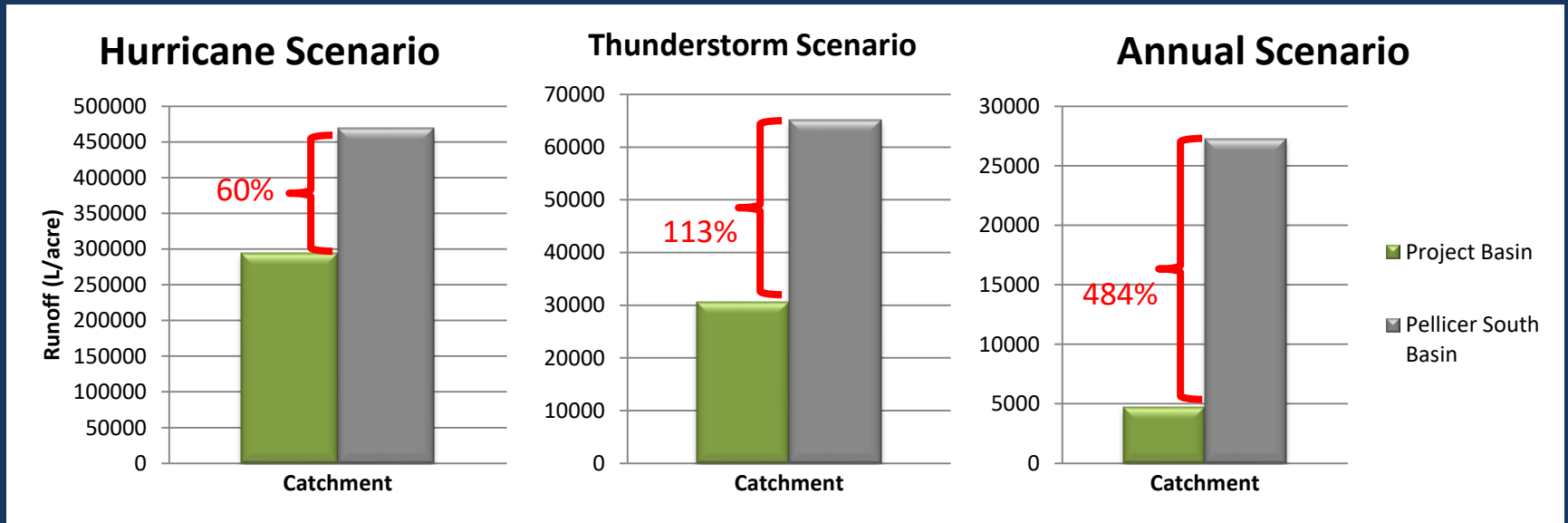
2001 NOAA CCAP Landcover

Project Catchment



2001 NOAA CCAP Landcover

Runoff Scenario Comparison



Hurricane Scenario

Precipitation: 6 inches

Time Period: 24 hours

of Events: 1

Thunderstorm Scenario

2 inches

24 hours

1

Annual Scenario

43 inches

1 year

113

Annual scenario is based on the 6 year average rainfall total and average number of rain days from GTMNERR rain gauge