New Jersey Highlands

Delaware River Basin Commission

Water Management Advisory Committee
Groundwater Management Workshop

Thursday, October 22, 2015

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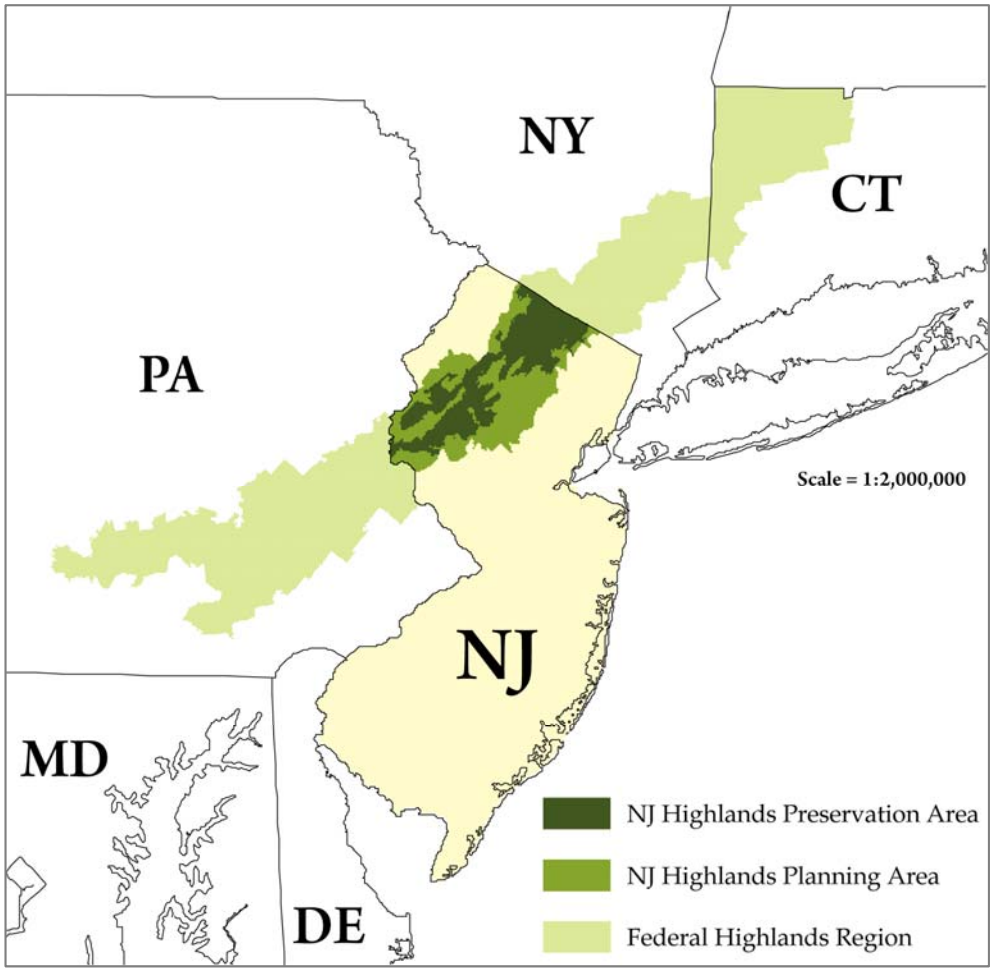
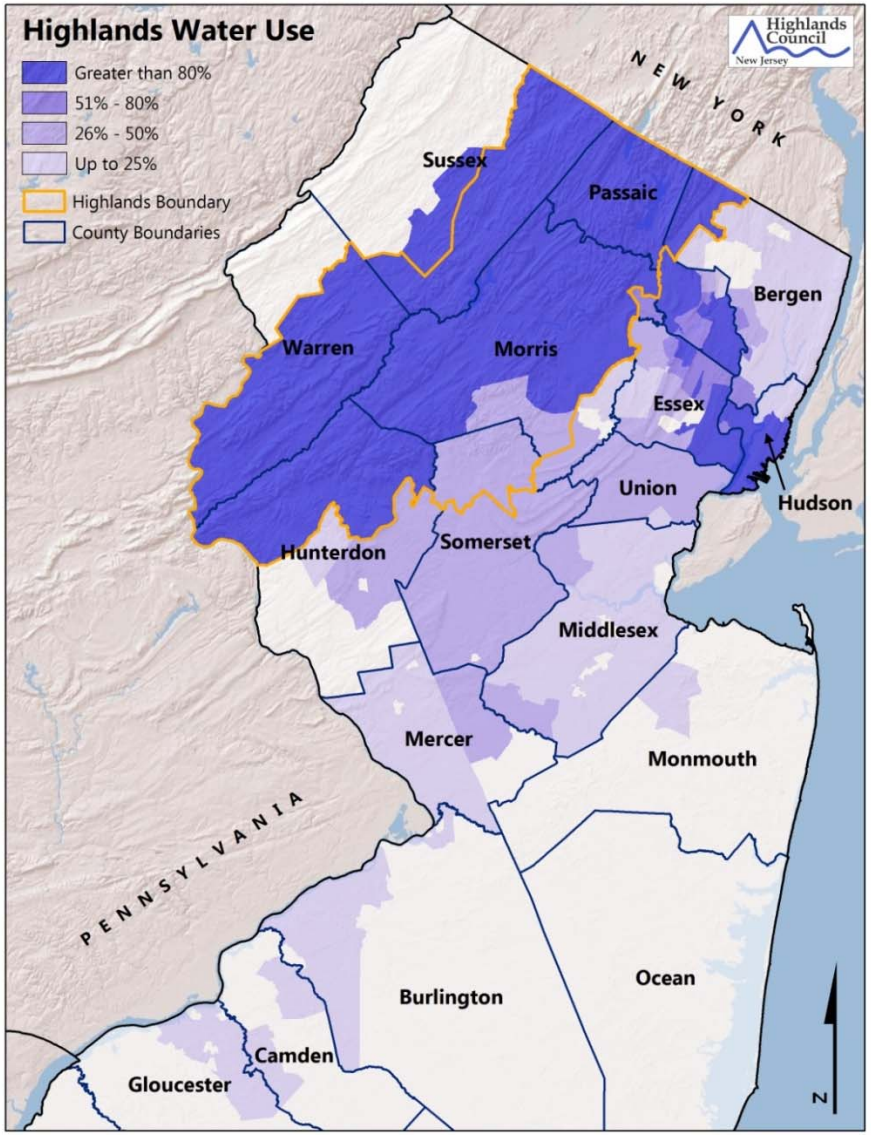
Highlands Council
New Jersey

The Highlands Region



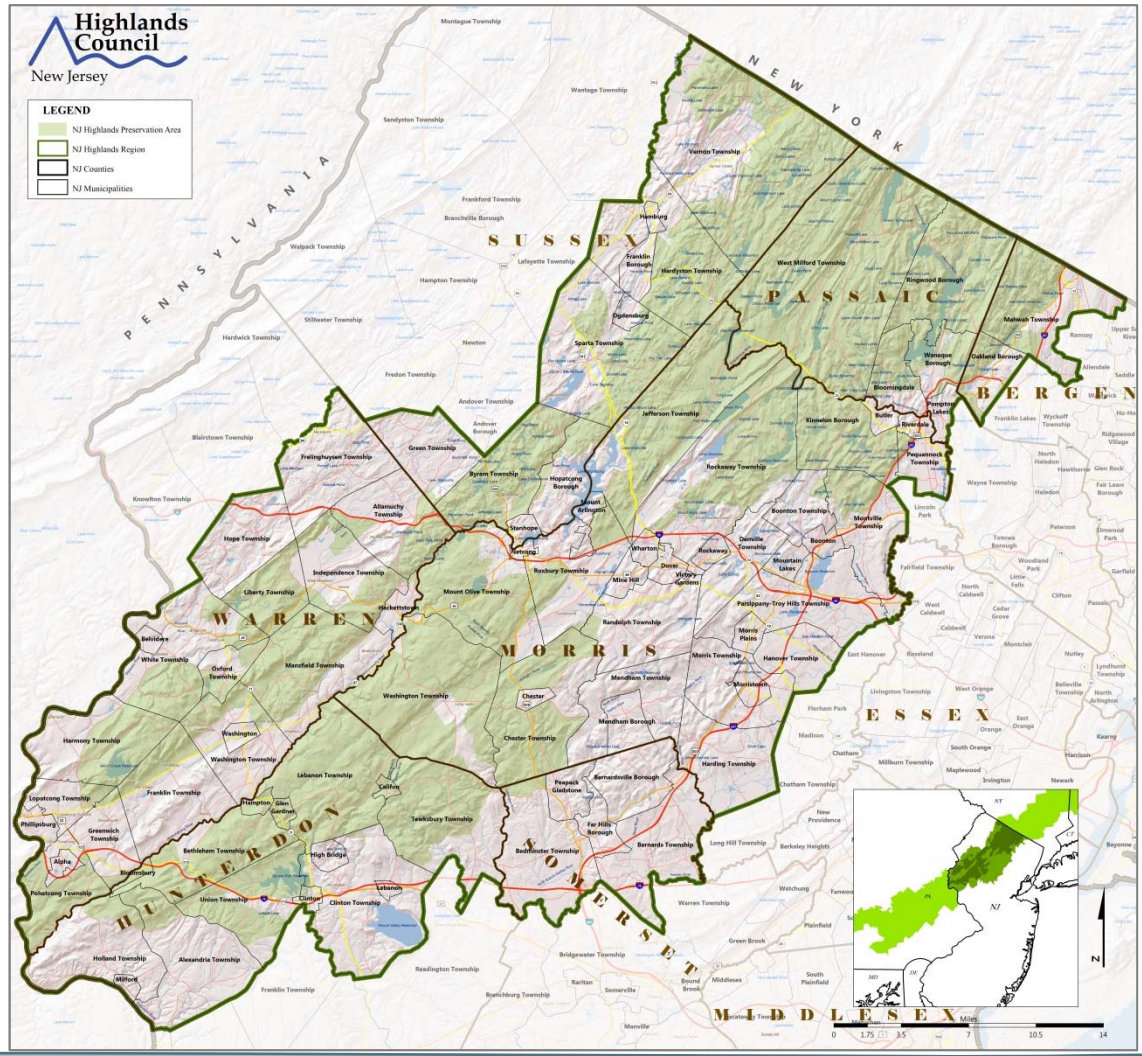
- US Forest Service study of Highlands Region in Pennsylvania, New Jersey, New York and Connecticut, 1992, updated 2002
- Federal Highlands Conservation Act, November 2004
- New Jersey Highlands Water Protection and Planning Act, August 2004



Water Supplies of the Highlands

- Less than 15% of state land, but provides drinking water for more than half its residents.
- Local needs largely met through wells tapping local aquifers

New Jersey Highlands

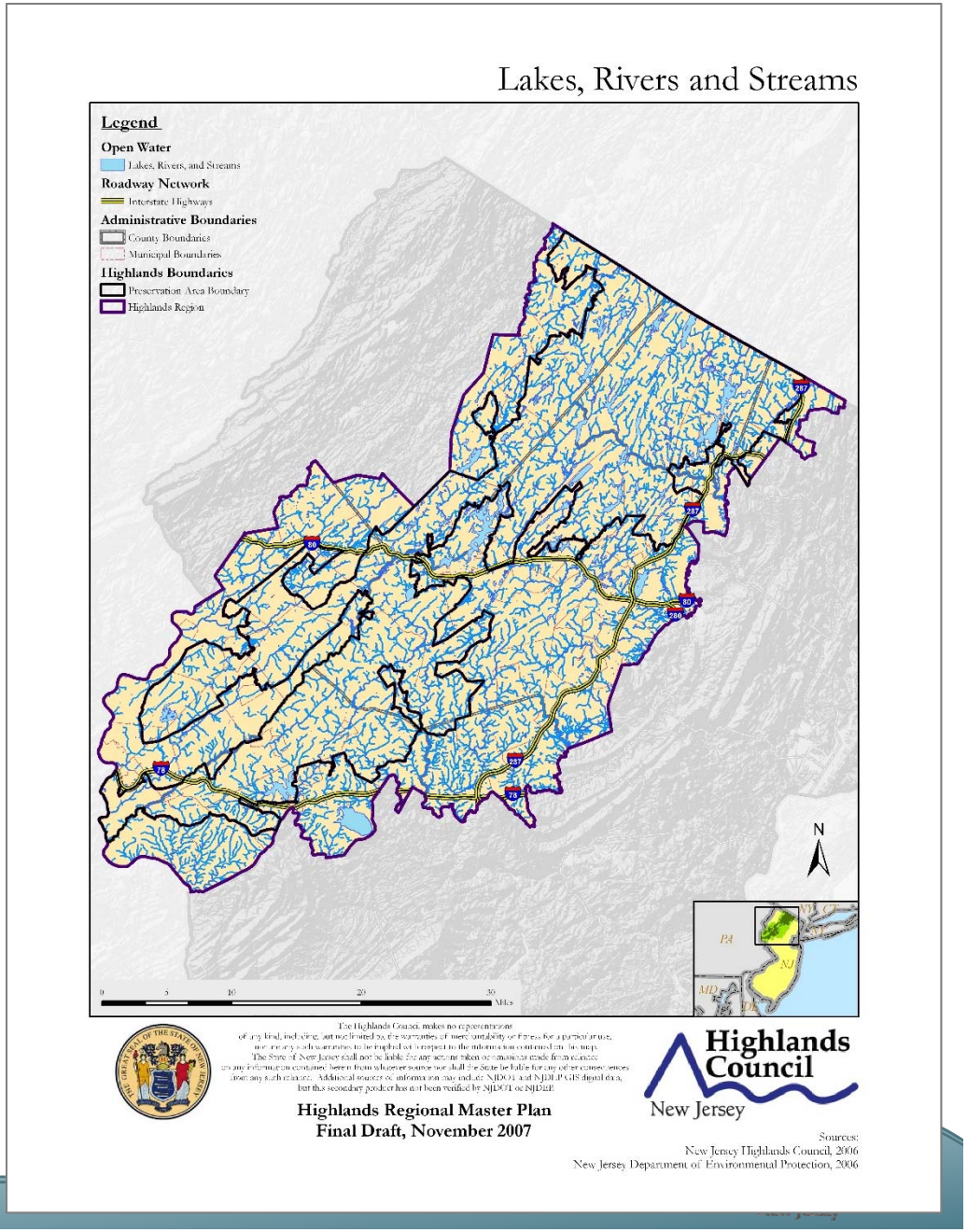


- Boundaries defined by Highlands Act
- 88 municipalities
- 7 counties
- Divided into Preservation Area and Planning Area in the Highlands Act.

Lakes, Rivers & Streams

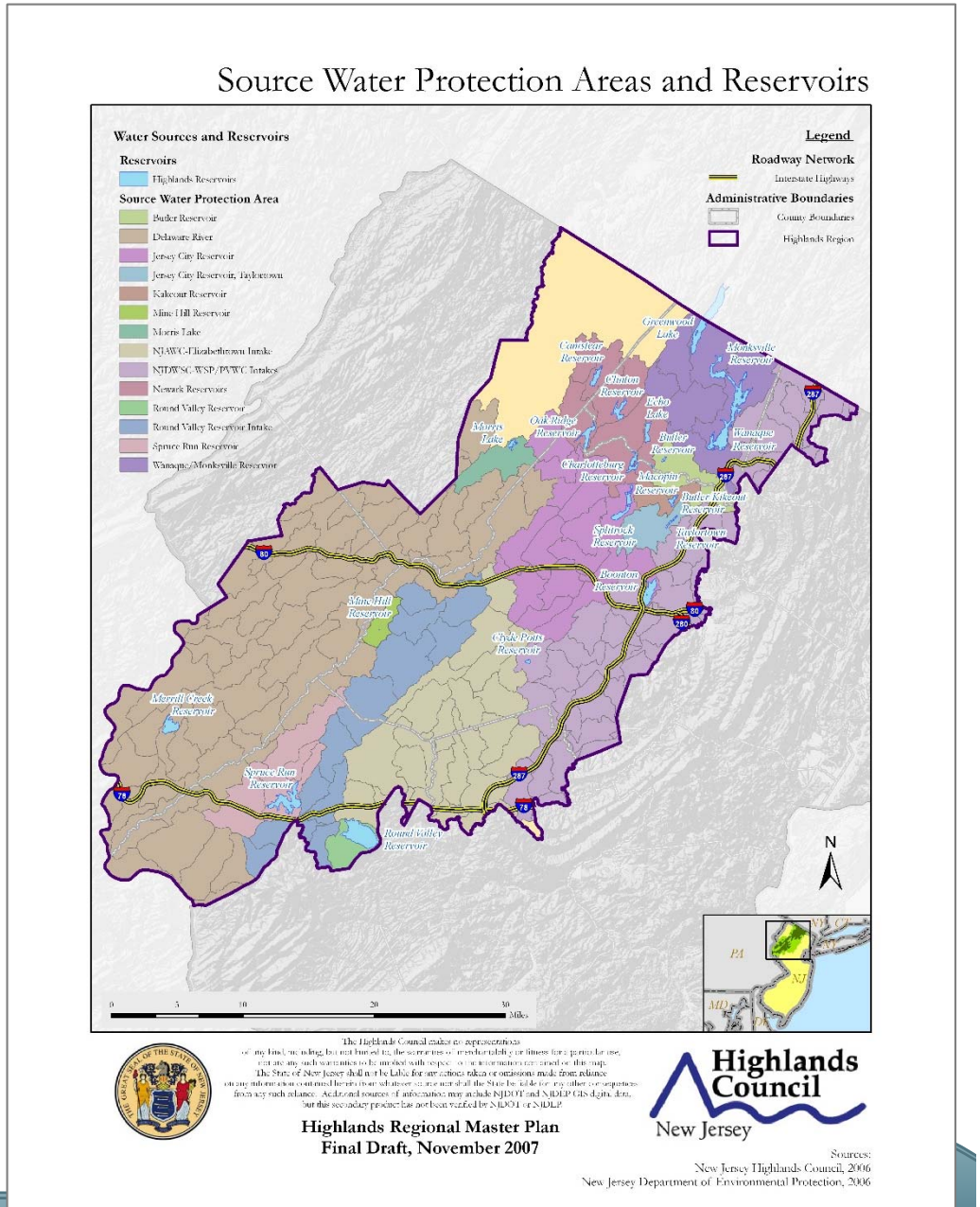
- More than 75%, or 2,700 miles, of Highlands streams are Category 1 or equivalent

- More than 90,000 acres of wetlands



Reservoirs

- >115 billion gallons of Highlands water diverted annually
- Highlands reservoir systems account almost 626 million gallons per day
- Projected demands through 2030 may exceed the safe yields of several Highlands reservoirs

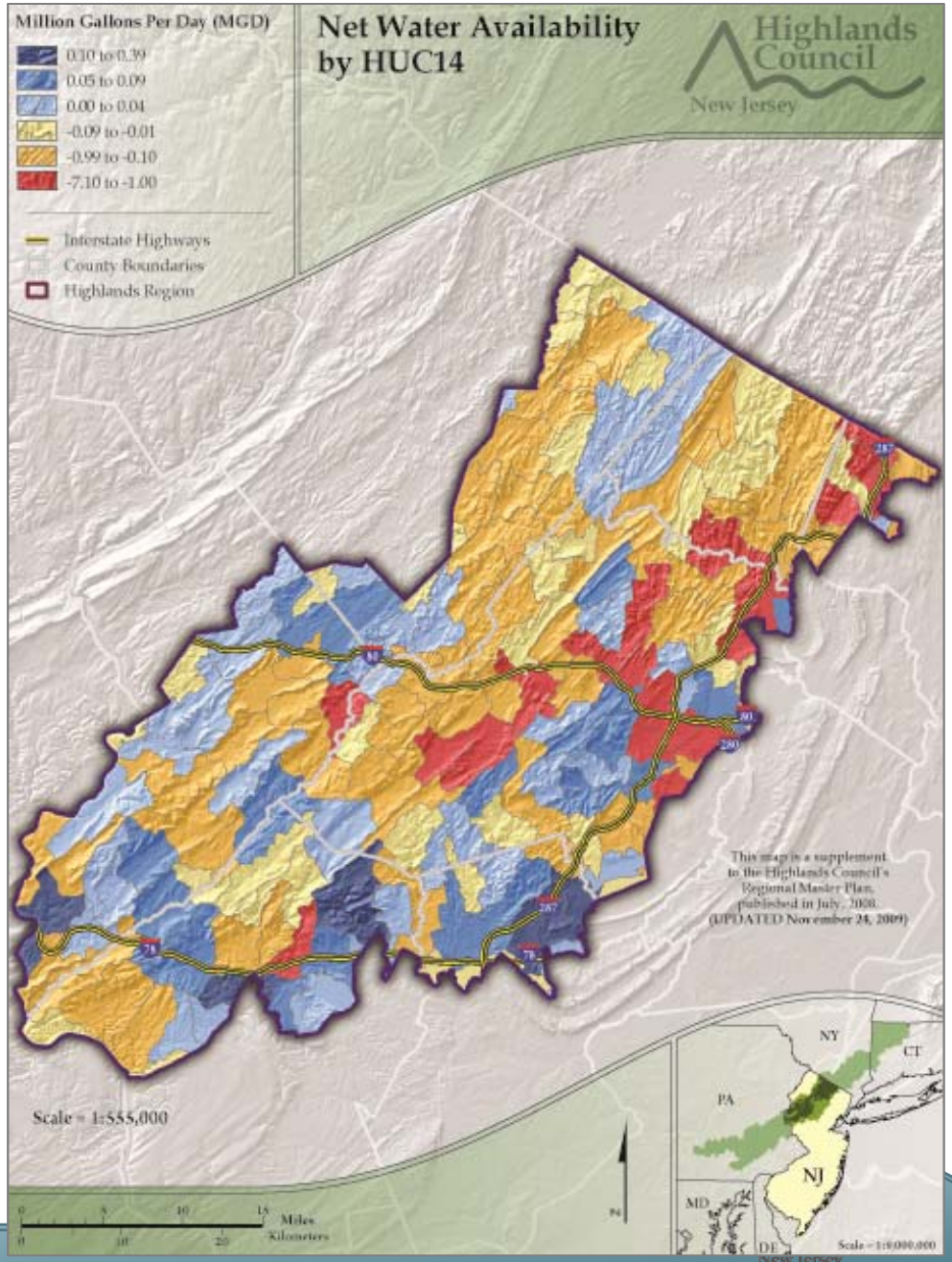


Highlands Milestones

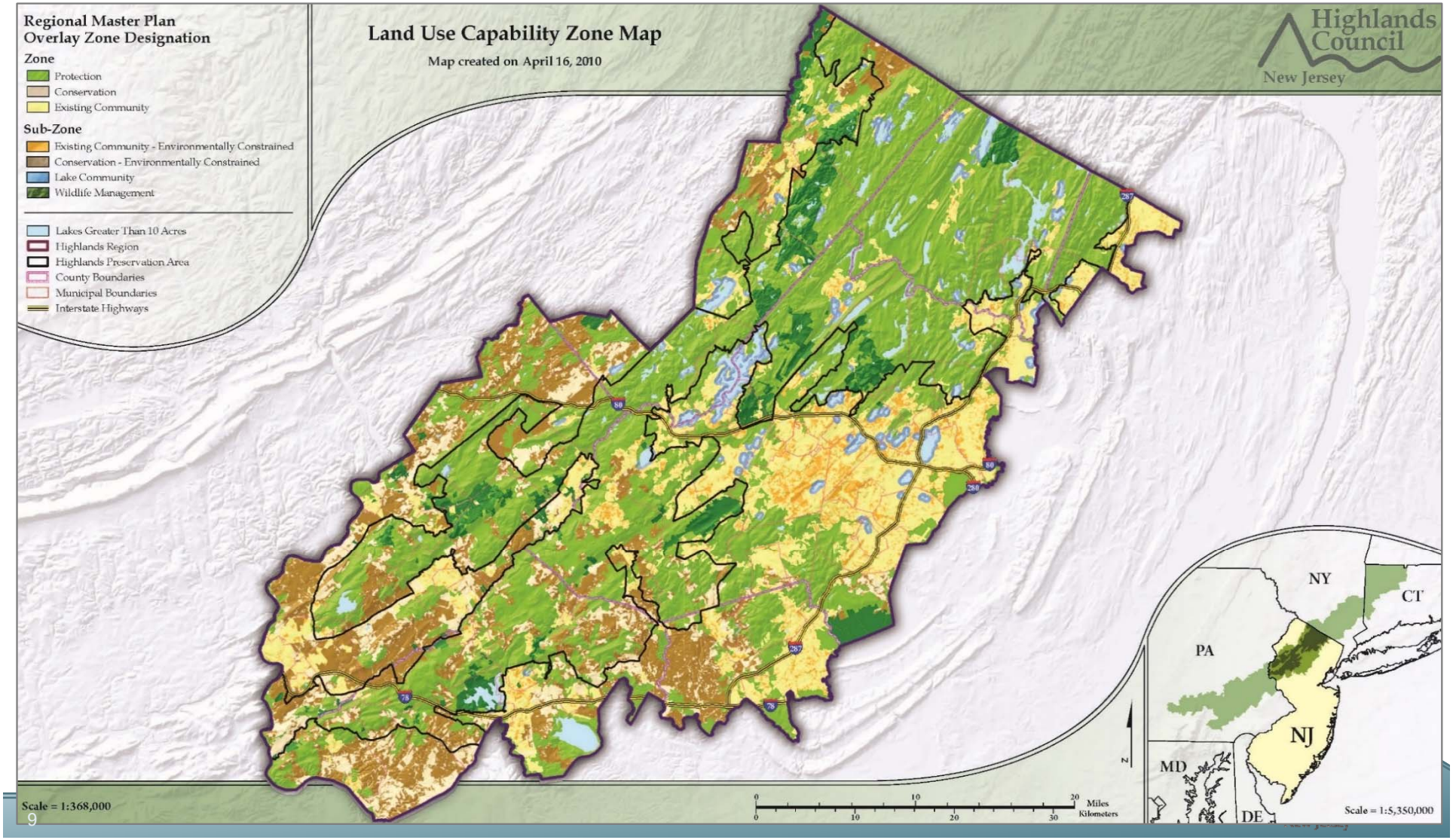
- 1992, 2002: US Forest Service studies
- 2004: Federal Highlands Conservation Act and New Jersey Highlands Water Protection and Planning Act
- 2008: Regional Master Plan (RMP) and associated Technical Report adopted by Highlands Council
- 2010: First municipal petition for Plan Conformance Approved
- In progress: RMP Monitoring Program

Critical Water Issues

- 114 of 183 HUC14 Subwatersheds in water deficit, from small to very large
- Some public water supply systems exceed capacity
- Relating new water demands from growth to source areas difficult



Land Use Capability Zones



Implementation of RMP

- 48 municipalities with HC-approved Plan Conformance petitions working on implementation
- Local adoption of resource management plans addressing:
  - Water Availability and Use
  - Wastewater Management
  - Lake and Stream Management
  - Stormwater Management
  - Prime Groundwater Recharge Areas

How Much Water?

- Fundamental question leading up to RMP adoption.
- Highlands aquifers are sub-regional or local in scale.
- Reservoirs depend on high flows for storage, and on maintenance of incoming stream low flows to offset required releases
- Determine water capacity by HUC 14 subwatershed as part of the total water budget for ground water resources

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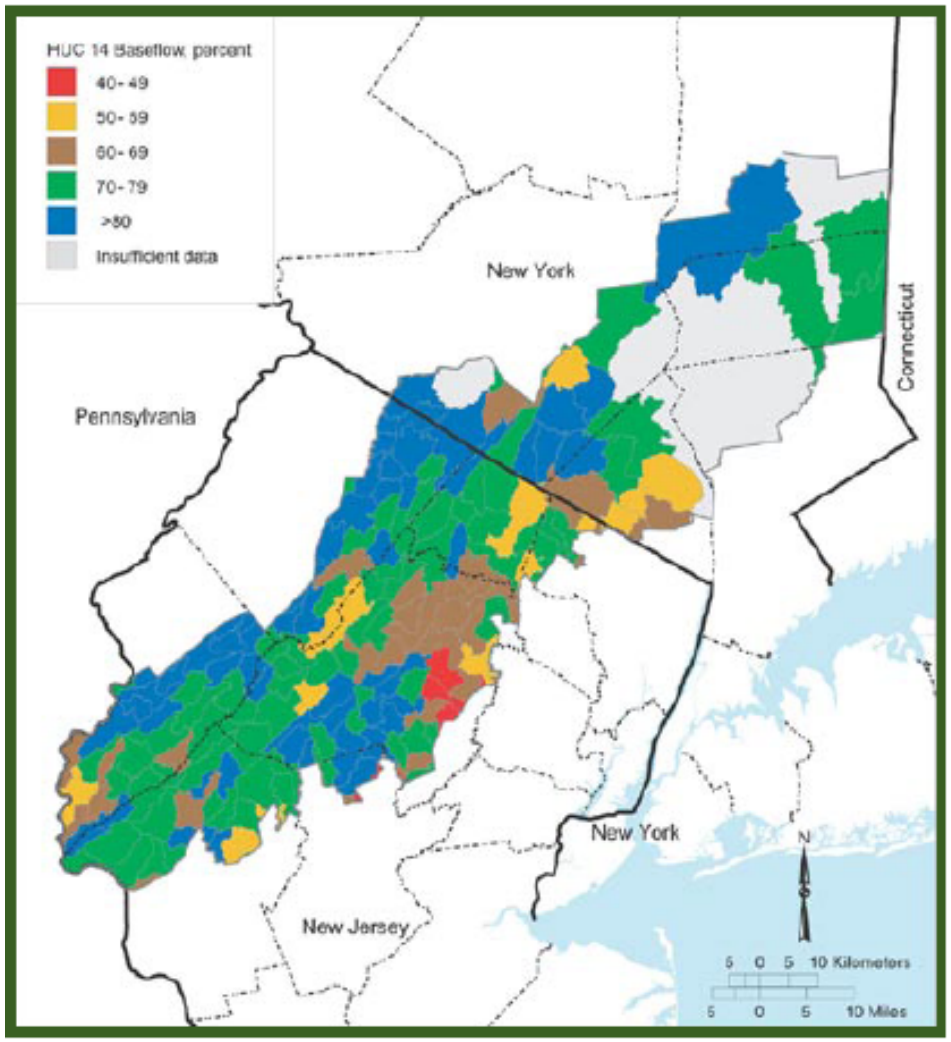
Ground Water Methods Assessed

- Aquifer Models
- Recharge
- Baseflow Recurrence
- Flow Analyses
- Low Flow Margin of Safety

See Water Resource Assessment Technical Reports, Vol. II: (www.nj.gov/njhighlands/master)

Importance of Baseflow

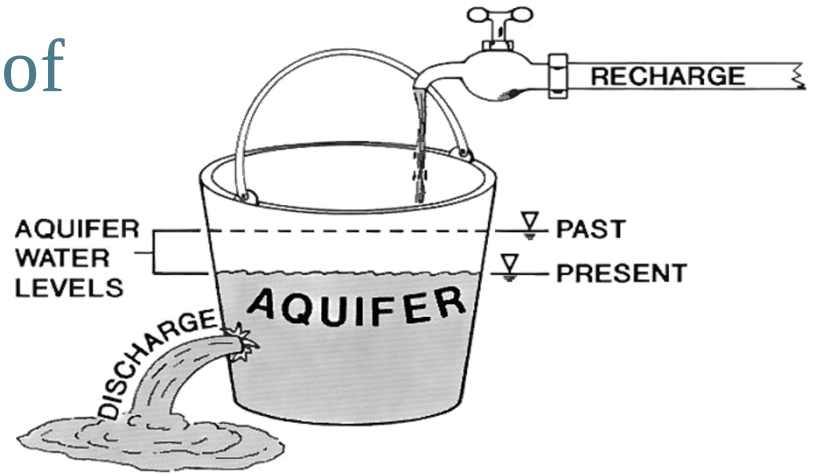
- U.S. Forest Service report indicates that baseflow comprises 73 percent of total stream flow, on average
- Influenced by geology, development intensity, well field locations



USFS, 2002

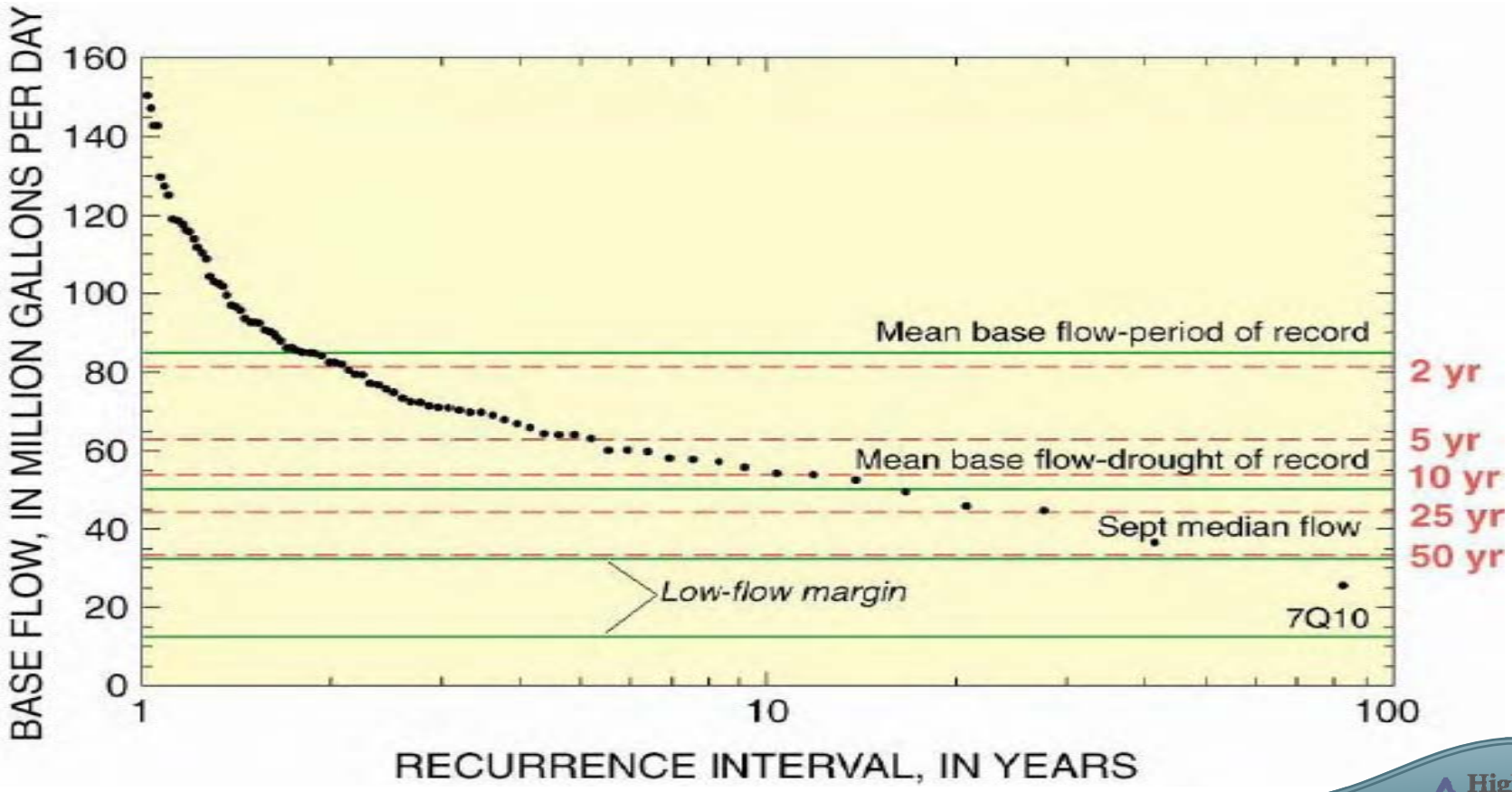
Highlands Approach to GW Management

- Ground Water Availability=Stream baseflow
- Stream ecosystems depend on low flows for survival during drought, and mix of flows to maintain community structure
- Emphasizes maintenance of stream flows, focused on unconfined aquifers and direct stream withdrawals

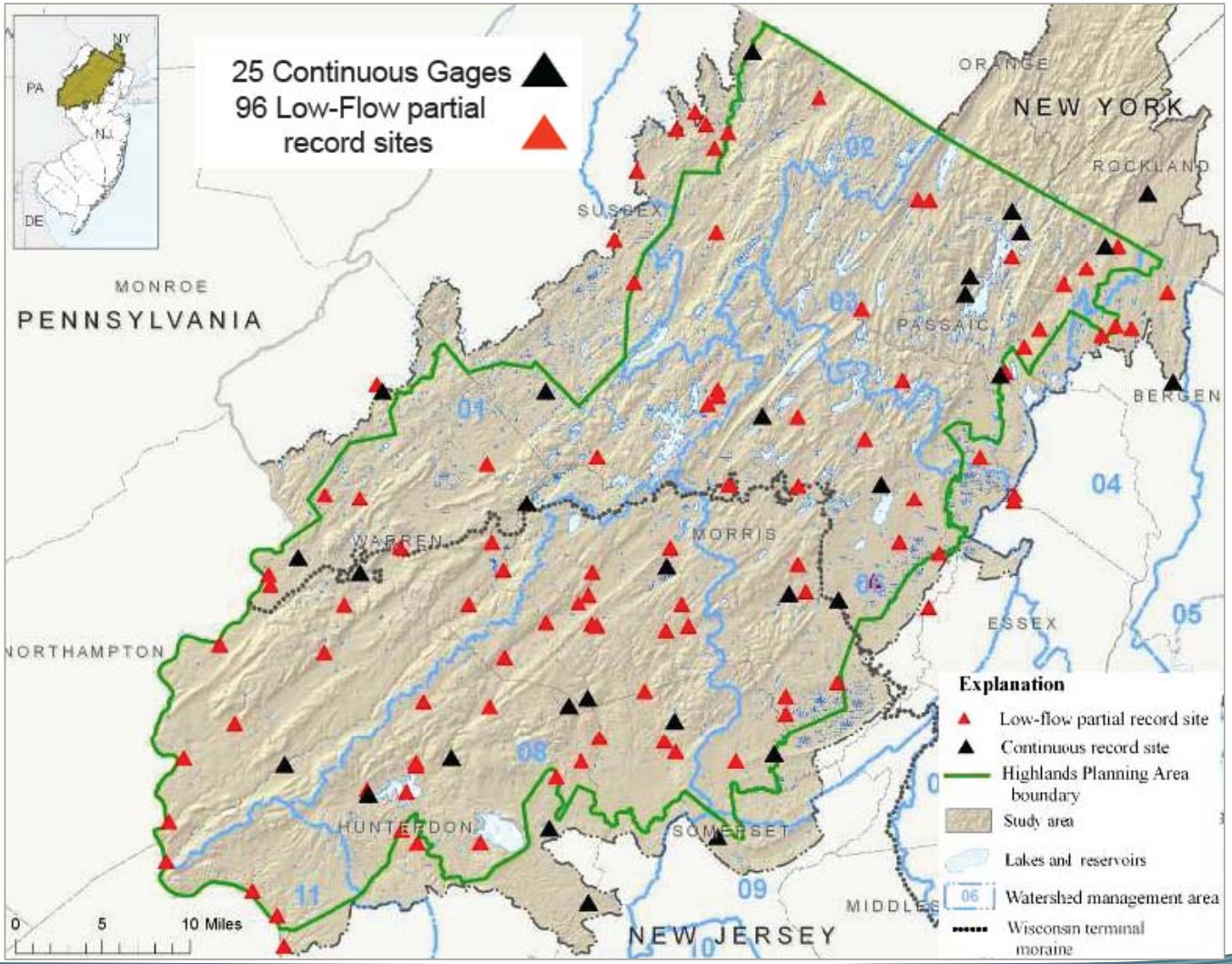


Low Flow Margin Method

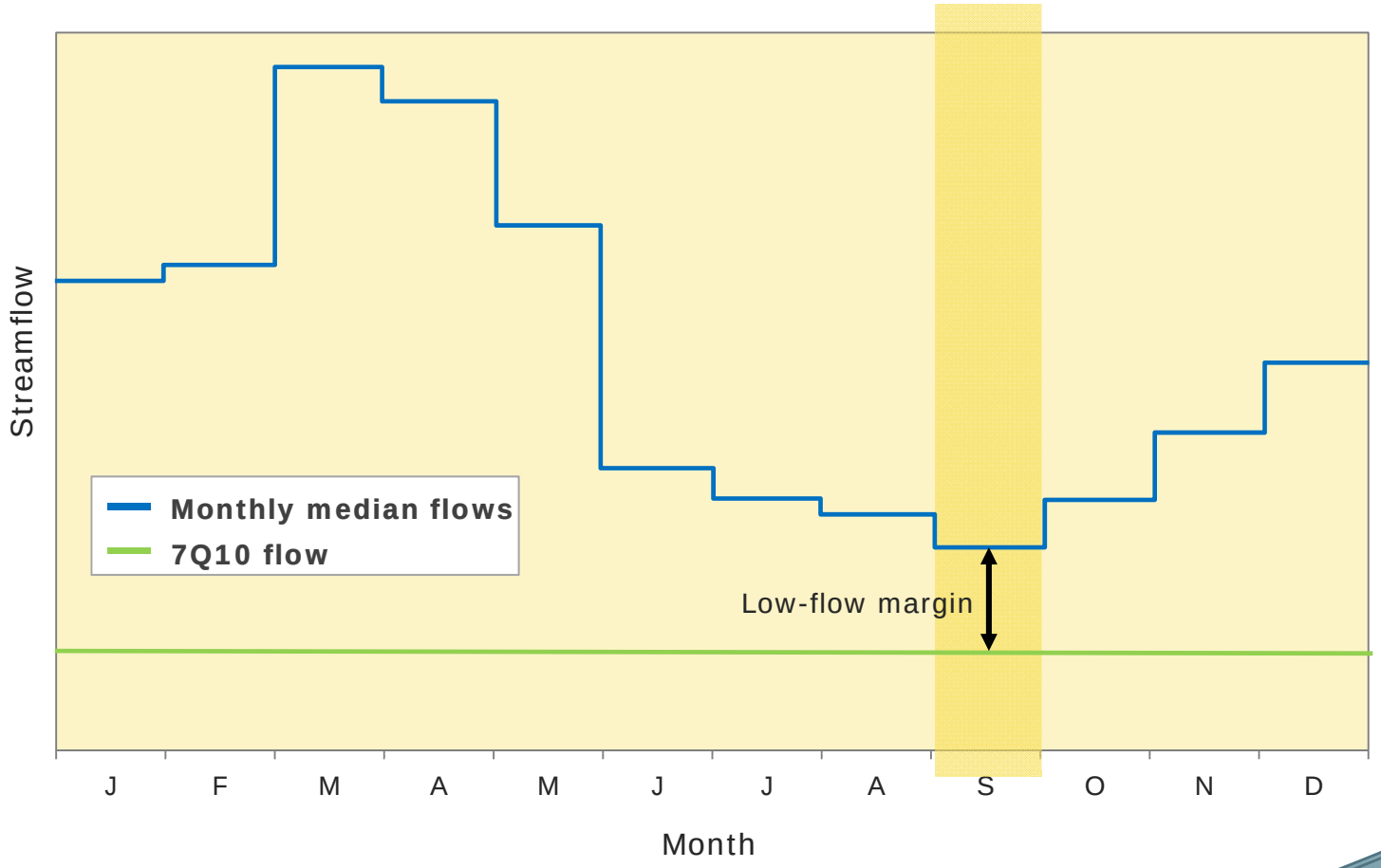
"Low Flow Margin" = Sept. median flow – 7Q10 flow
= Ground Water Capacity



USGS Analysis – 121 Stations

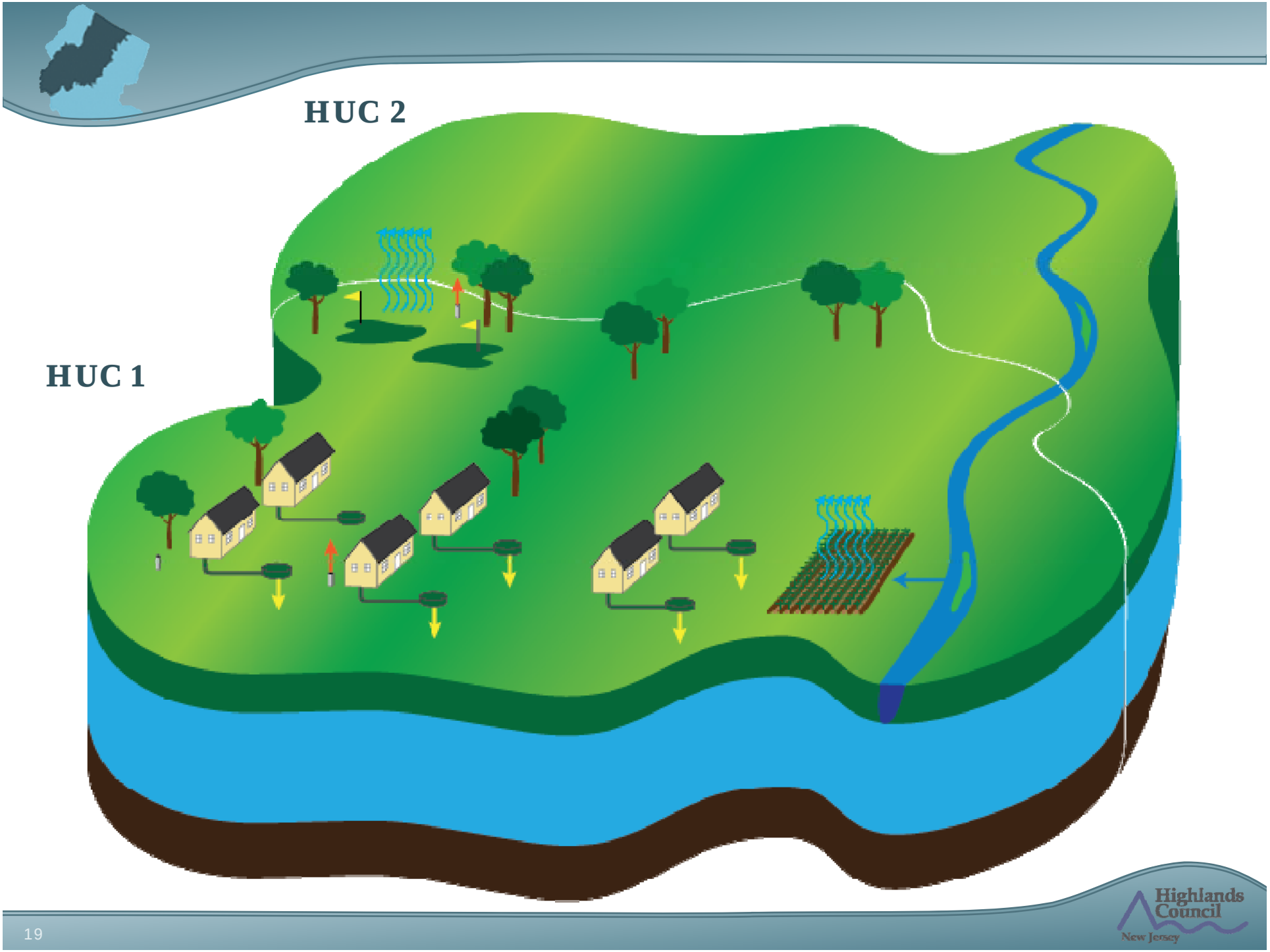


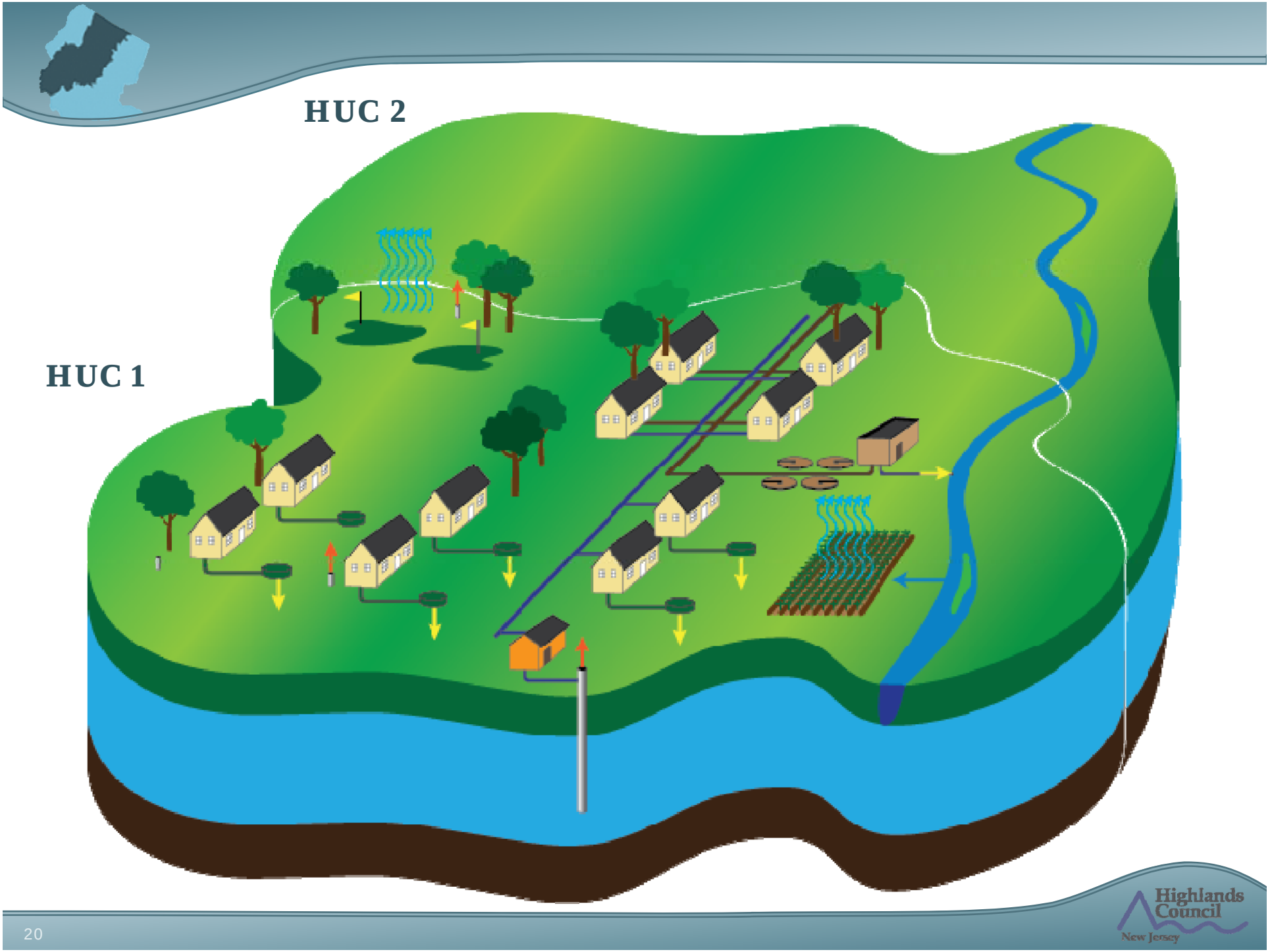
Low Flow Margin



Ground Water Availability

- Uses NJHAT, a.k.a. EcoFlow Goals.
- Hydrologic statistic for ecological impacts.
- Percentage of LFM available for consumptive or depletive human use (e.g., potable water, industry, agriculture, recreation)
- Percentage established based on environmental sensitivity of RMP Zone:
  - Protection Zone = 5% LFM
  - Conservation Zone = 5%/10% LFM
  - Existing Community Zone = 20% LFM


HUC 2
HUC 1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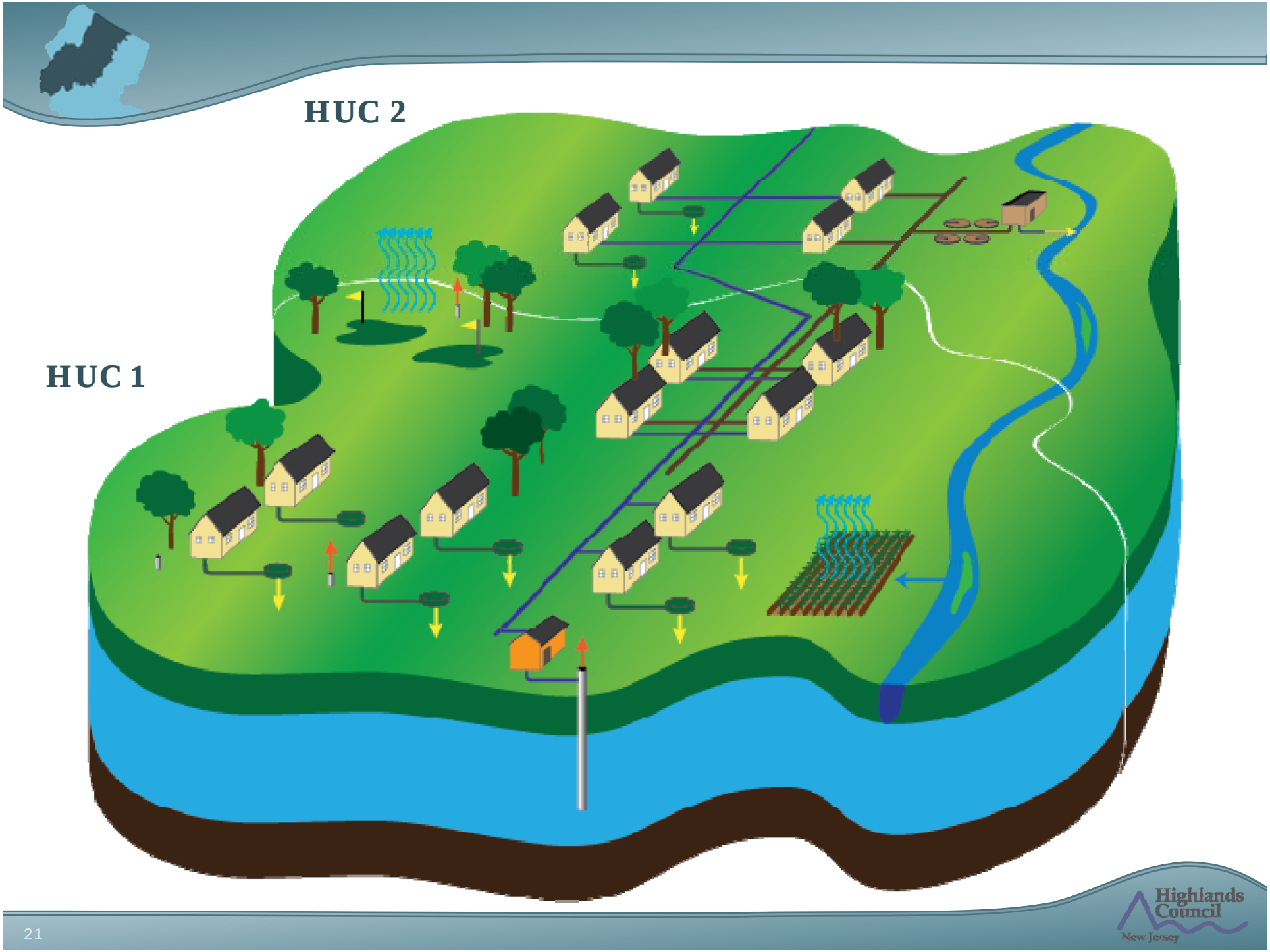
HUC 2
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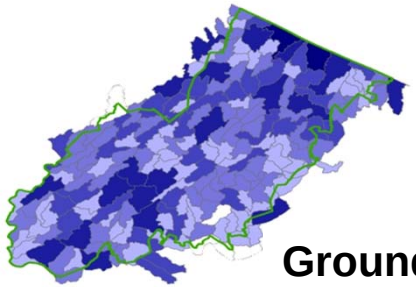
Net Water Availability

- Compare water availability to current demands that remove water from the system
- The difference between Ground Water Availability and C/D uses is deemed Net Water Availability.
- If C/D uses exceed Ground Water Availability, then the HUC14 is considered to be in deficit (Current Deficit Areas).



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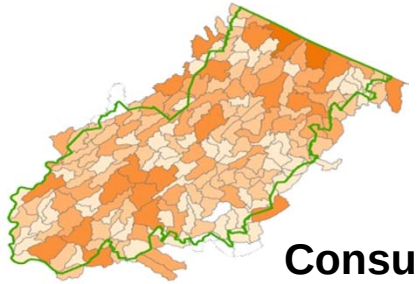
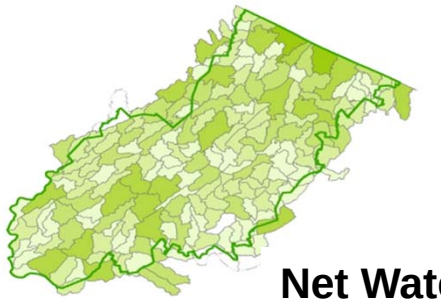


Consumptive/ Depletive Uses



Net Water Availability

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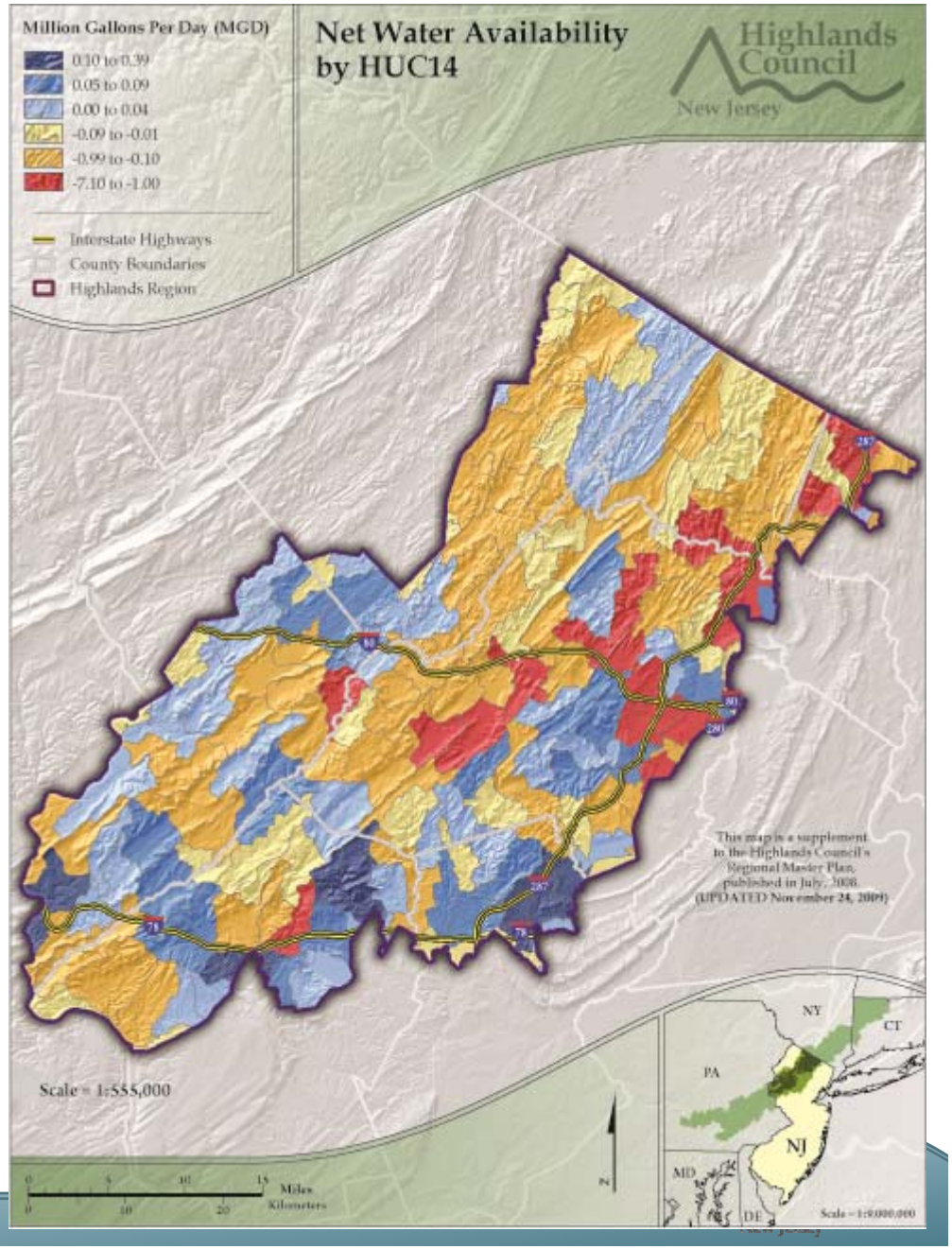
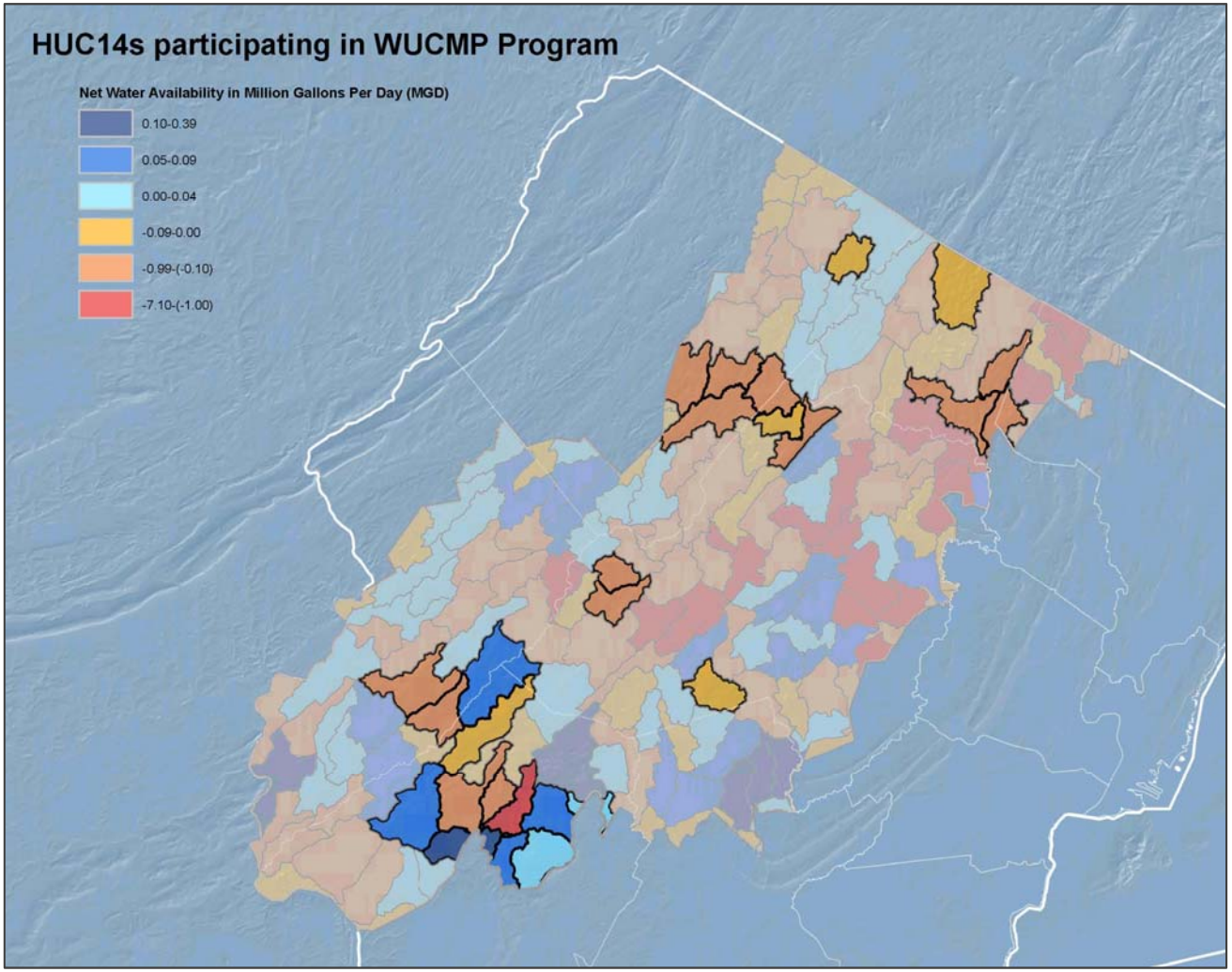


RMP Goals Related to Water

- Protect the water supplies that exist, including reservoirs and associated safe yields
- Identify where existing water withdrawals exceed sustainable levels
- Reduce or eliminate water deficits to maximum extent feasible
  - Water Use and Conservation Management Plans (WUCMP) required for all areas

WUCMP Program



- 9 original pilot areas
- 27 HUC14 subwatersheds
- Additional participation by conforming towns.

WUCMP Program Status

- WUCMPs developed from 9 study areas; final plans delivered to stakeholders September 2015
- Plans will serve as model documents for towns.
- Key findings:
  - NWA variable based on C/D uses for period of record
  - Mitigation targets must be specific and measurable
  - Local involvement from stakeholders is a must

Questions?

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