

NJ Water Supply Plan, 2017-2022, DRAFT



NJ Department of Environmental Protection

Overview

- Requirements
 - Key Objectives & Findings
 - Recommended Policies
 - Provide opportunity for comment
-
- 4 Public Meetings, July 11, 12, 13
 - Written comments can be submitted until July 19th to:
watersupply@dep.nj.gov
 - Plan available at
<http://www.nj.gov/dep/watersupply/wsp.html>

Authority

- The 1981 New Jersey Water Supply Management Act (N.J.S.A. 58:1A-1 et. seq.) directs the NJDEP to develop and periodically revise the New Jersey Statewide Water Supply Plan (NJSWSP or Plan) in order to improve the management and protection of the State's water supplies.
- The first NJSWSP was adopted in 1982, followed by periodic updates released in 1983, 1985, 1987, 1991, and 1993.
- The first major revision of the NJSWSP occurred in 1996.
- The most recent update, entitled "Water Supply Action Plan 2003-04," included a progress report on key capital infrastructure projects and water resource evaluations previously identified in the 1996 NJSWSP.

New Jersey Water Supply Management Act Requirements

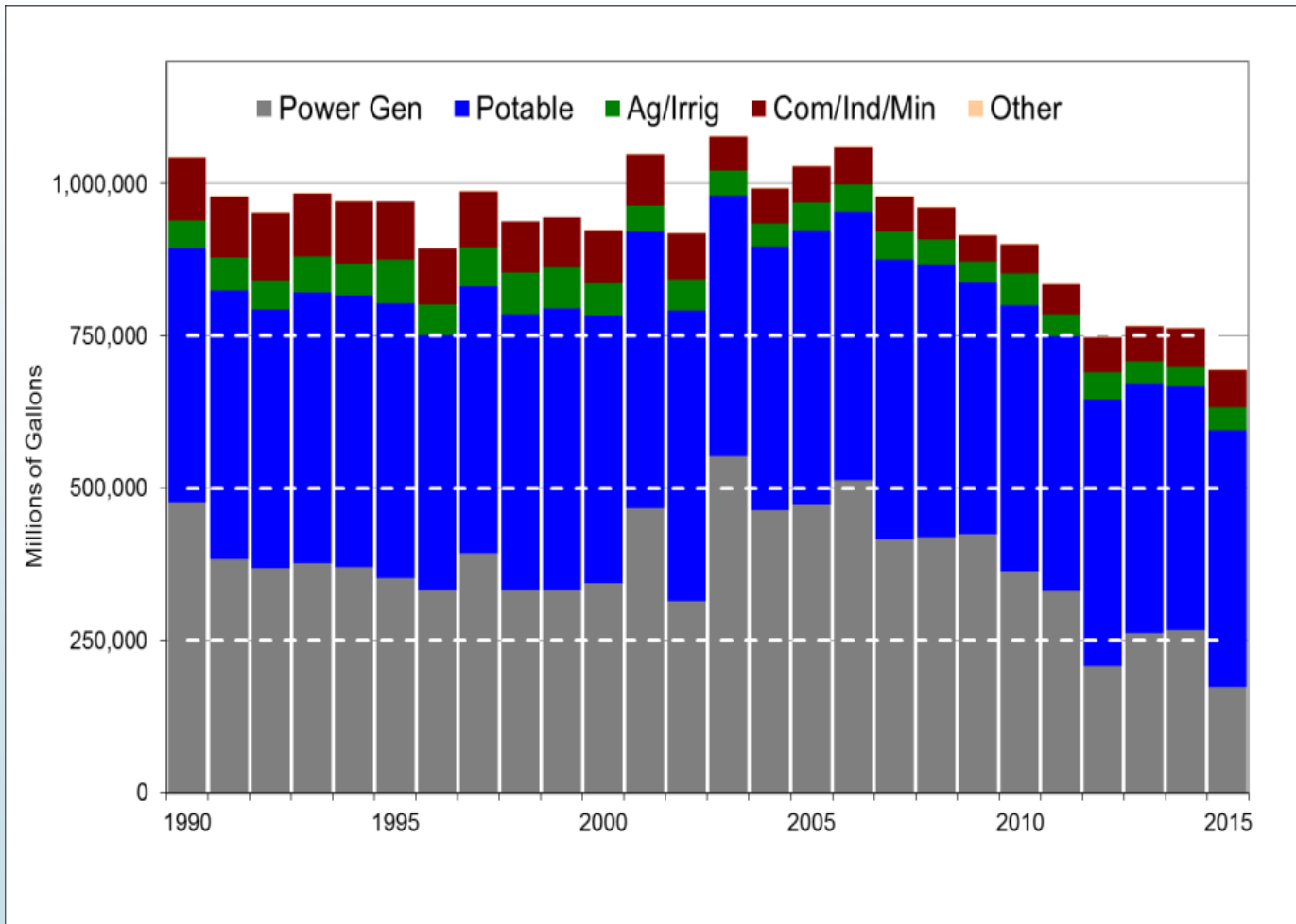
58:1A-13.b. The plan shall include, but need not be limited to, the following:

- Identify surface and ground water sources, current demands, and projections for duration of plan
- Recommend:
 - Improvements, construction and interconnections
 - Aquaculture diversions
 - Legislative and administrative actions to protect watershed areas
 - Identification and purchase of land for water supply facilities
 - Administrative action to protect ground and surface water supply sources

2017 – 2022 Plan

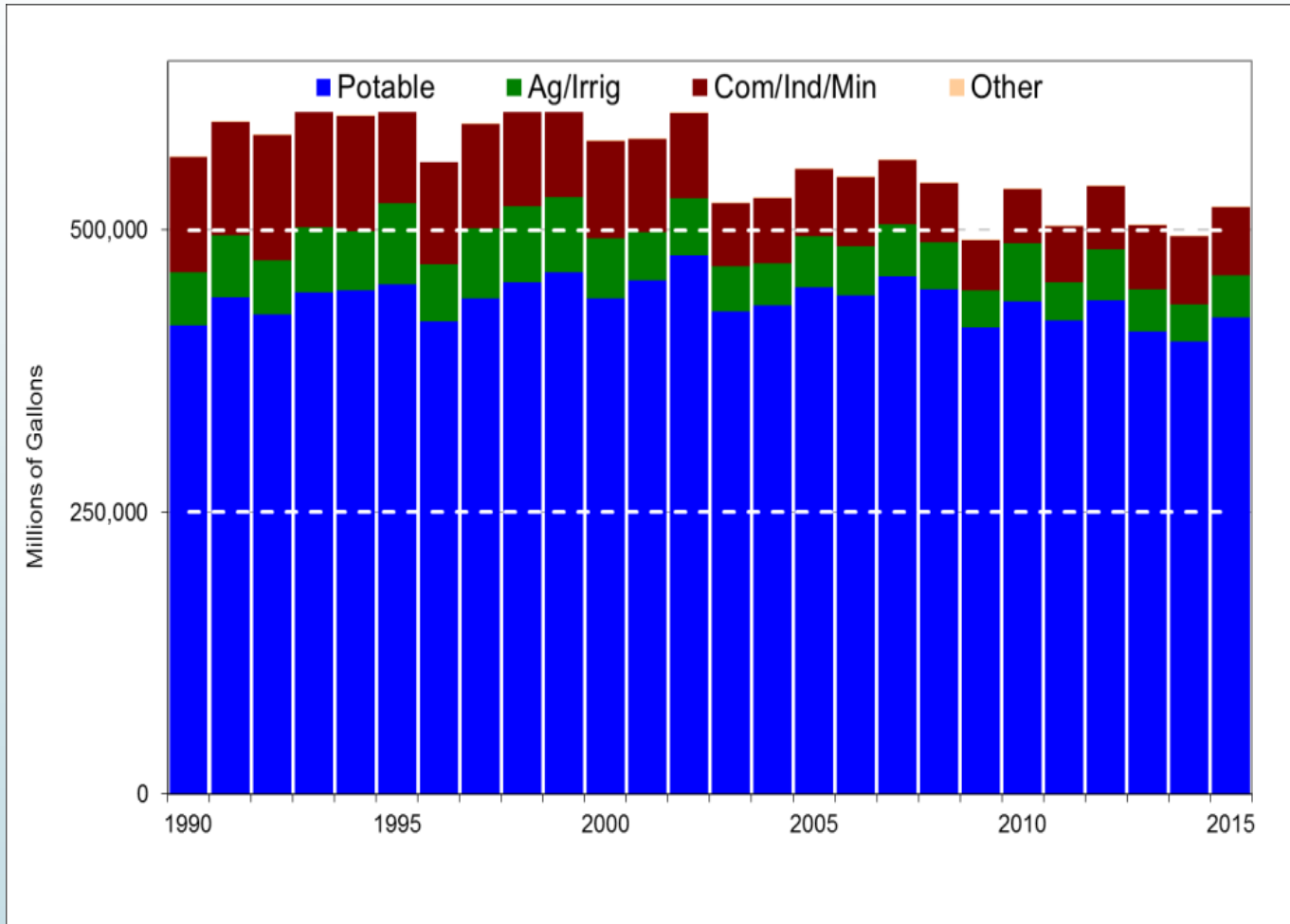
- Emphasizes the need to balance traditional water use with water resource protection, and outlines a range of policy options to achieve that balance amid an array of competing interests and issues.
- Differs from preceding plans as it is designed to allow for continuous technical and policy updates, as ongoing water resource evaluations, water use data, and more refined water demand projections become available.
- The intention is for these, and future releases of the NJSWSP updates to be made available through the DEP's web site (<http://www.nj.gov/dep/>).
- Serves as a tool to guide the management, regulation, conservation, and development of the State's water resources for the foreseeable future.

Key Objectives



- Define current water use trends and quantify the volumes of water used in New Jersey from 1990-2015 (Chapter 2);
- Annual withdrawals by sector
- There are approximately 10 large power generation sources in NJ using ~200-400 bgy:
 - Large variability in hydropower withdrawals
 - Highly non-consumptive water use
 - Skew other water use sector trends
 - Excludes saline diversions

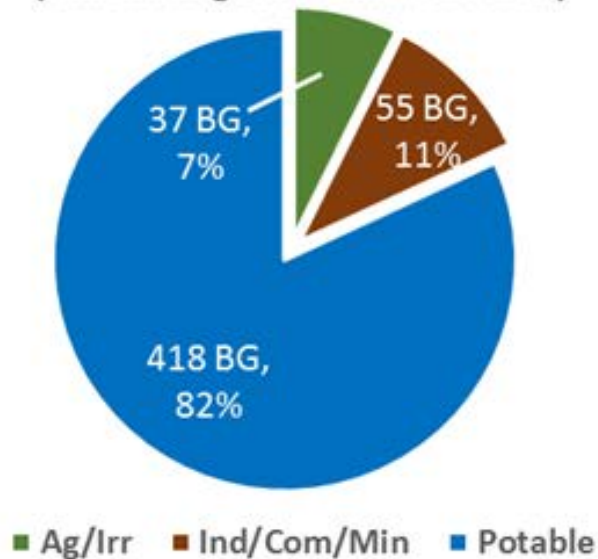
Key Objectives



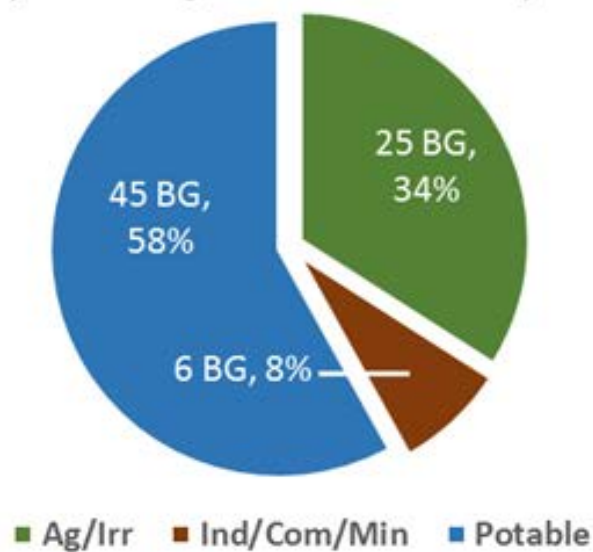
- Define current water use trends and quantify the volumes of water used in New Jersey from 1990-2015 (Chapter 2);
- Annual withdrawals by sector, excluding power generation sources

Key Objectives

2011-2015 Average Total Water Use,
by Sector
(billions of gallons and % of total)



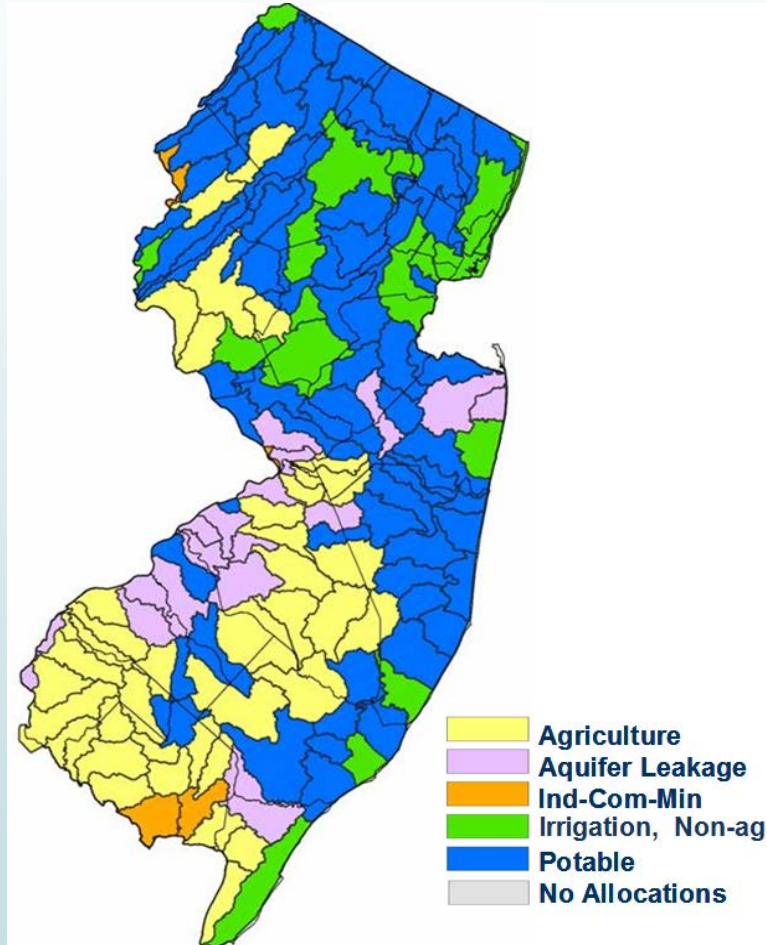
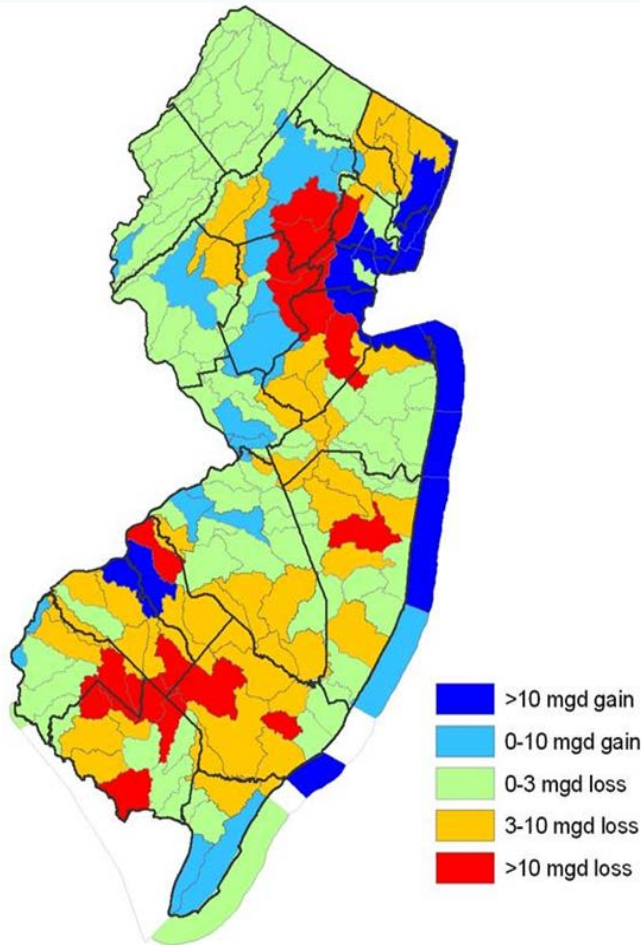
2011-2015 Average Consumptive
Losses, by Sector
(billions of gallons and % of total)



- Define current water use trends and quantify the volumes of water used in New Jersey from 1990-2015 (Chapter 2);
- Comparison of total water withdrawal to consumptive water loss estimates

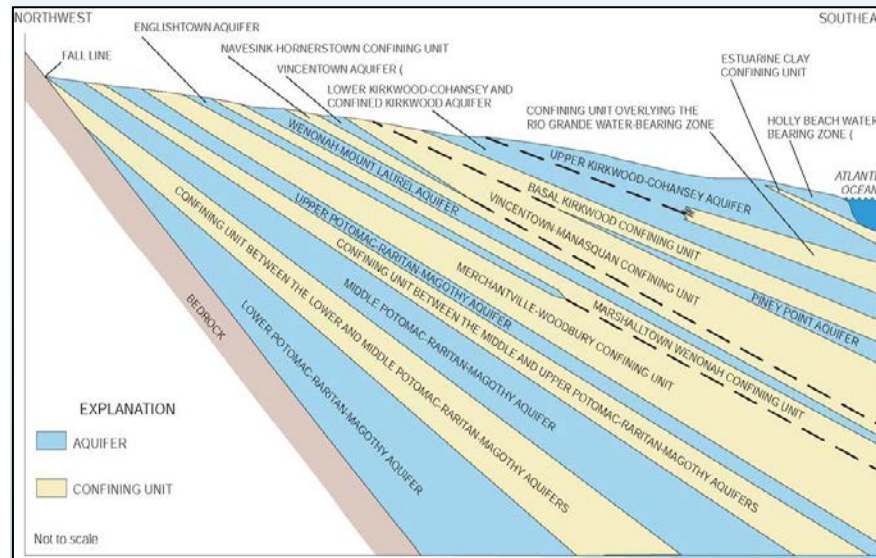
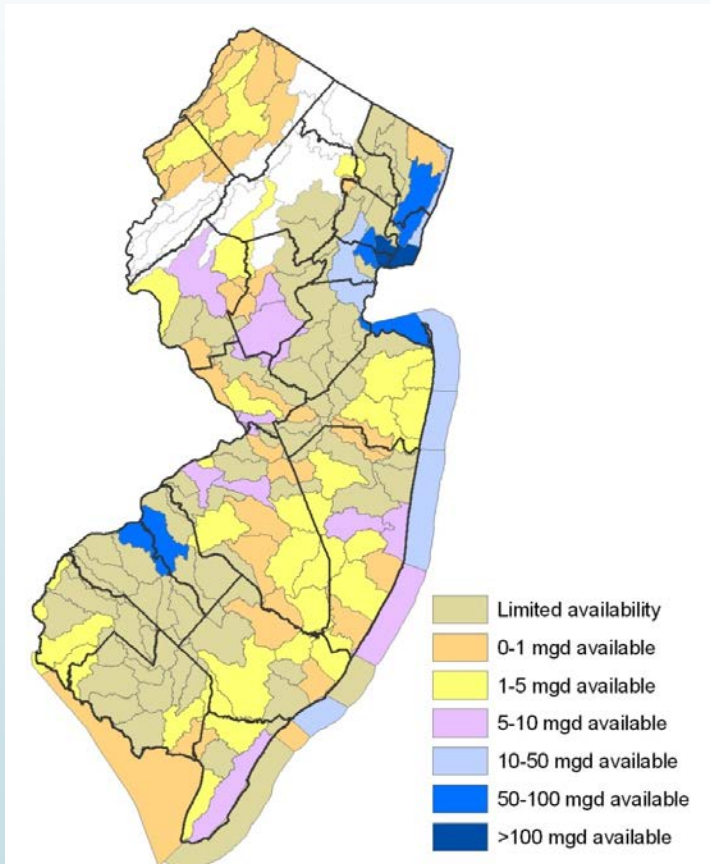
“Consumptive use” is the portion of the water used which is lost to evaporation, transpiration, incorporation in product, etc., and not discharged to any location

Key Objectives



- Calculate current depletive (losses resulting from water or wastewater transfers out of the watershed) and consumptive (losses resulting from evapo-transpiration) water loss values, both positive (net loss) or negative (net gain) (Chapter 3);
 - Left: HUC11 unconfined aquifer and stream flow net loss or gain for peak demand period
 - Right; primary cause of peak loss

Key Objectives

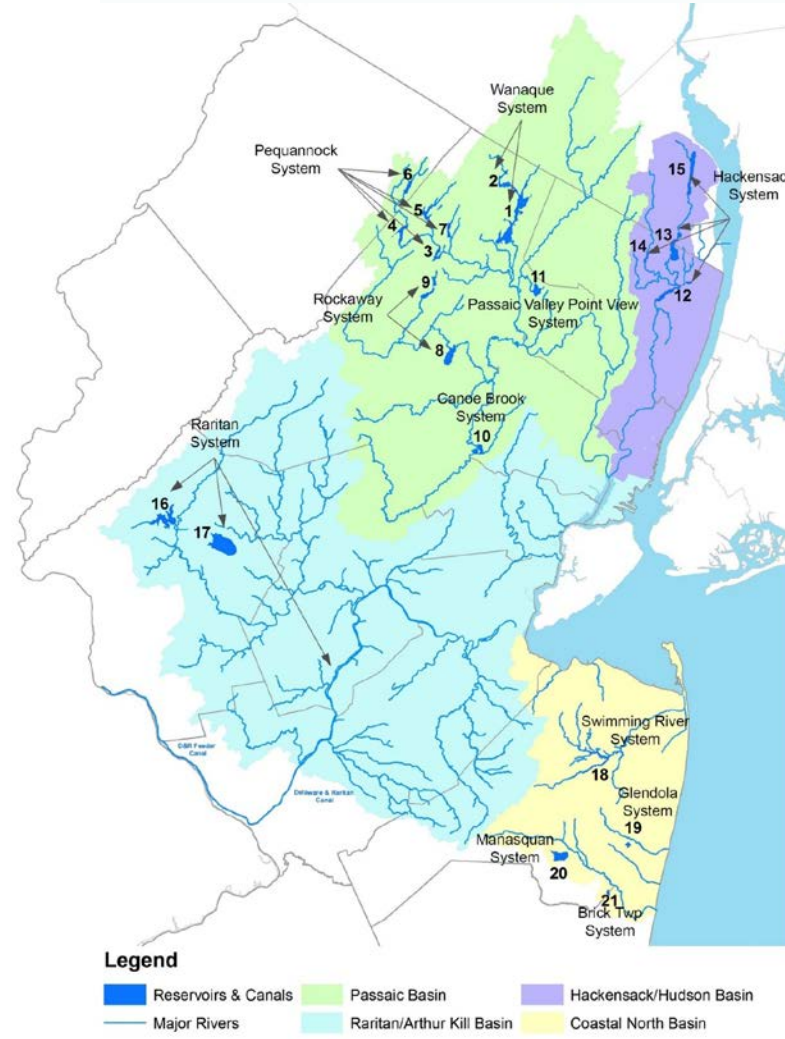
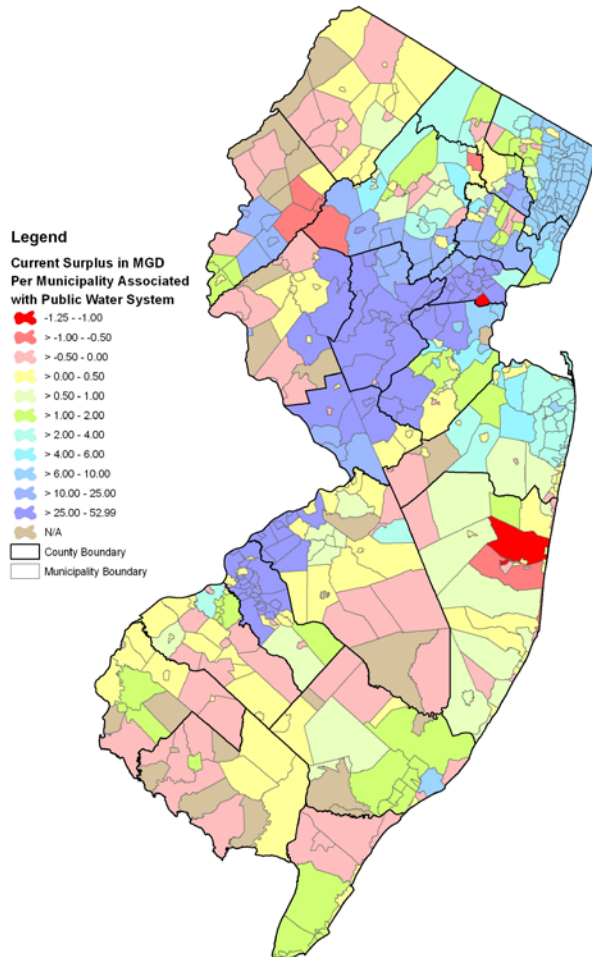


➡ Develop water budgets for each of the 151 HUC11 watersheds and confined aquifer planning areas to determine which areas have exceeded or are in danger of exceeding planning thresholds (Chapter 3);

- Left: HUC11 unconfined aquifer and stream flow remaining availability for peak demand period
- Right: NJ Coastal Plain aquifers

Key Objectives

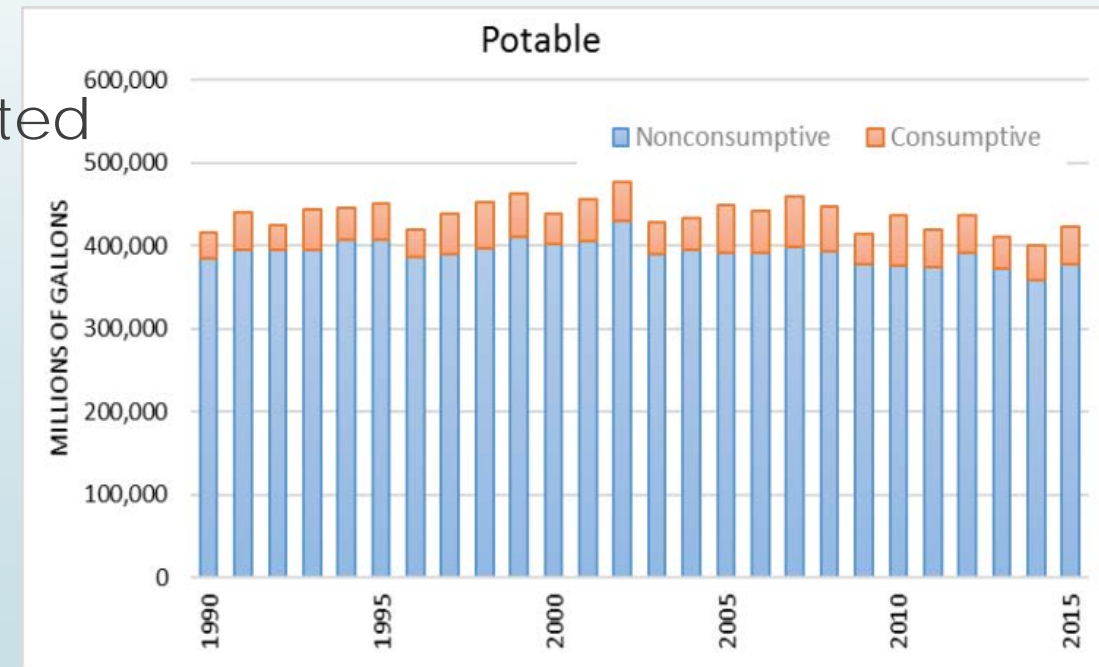
- Determine whether existing approved (allocated) resources and developed water supply infrastructure (firm capacity) can accommodate anticipated growth (Chapters 3 and 7);



- Left: Figure 3.11. Areas of the State with surplus or deficit supplies in relation to currently approved potable supply
- Right: NJ's major surface water reservoir systems

Key Objectives

- Estimate future residential water demands based on population projections (Chapter 3; Appendix D);
 - Potable water trends flat despite increasing population
 - Much of new demand appears concentrated in lower per capita regions
 - Rutgers study underway to develop range of population projections to 2040 and a detailed analysis of per capita use rates due 2017
- “Living Plan” designed for periodic updates



Key Objectives

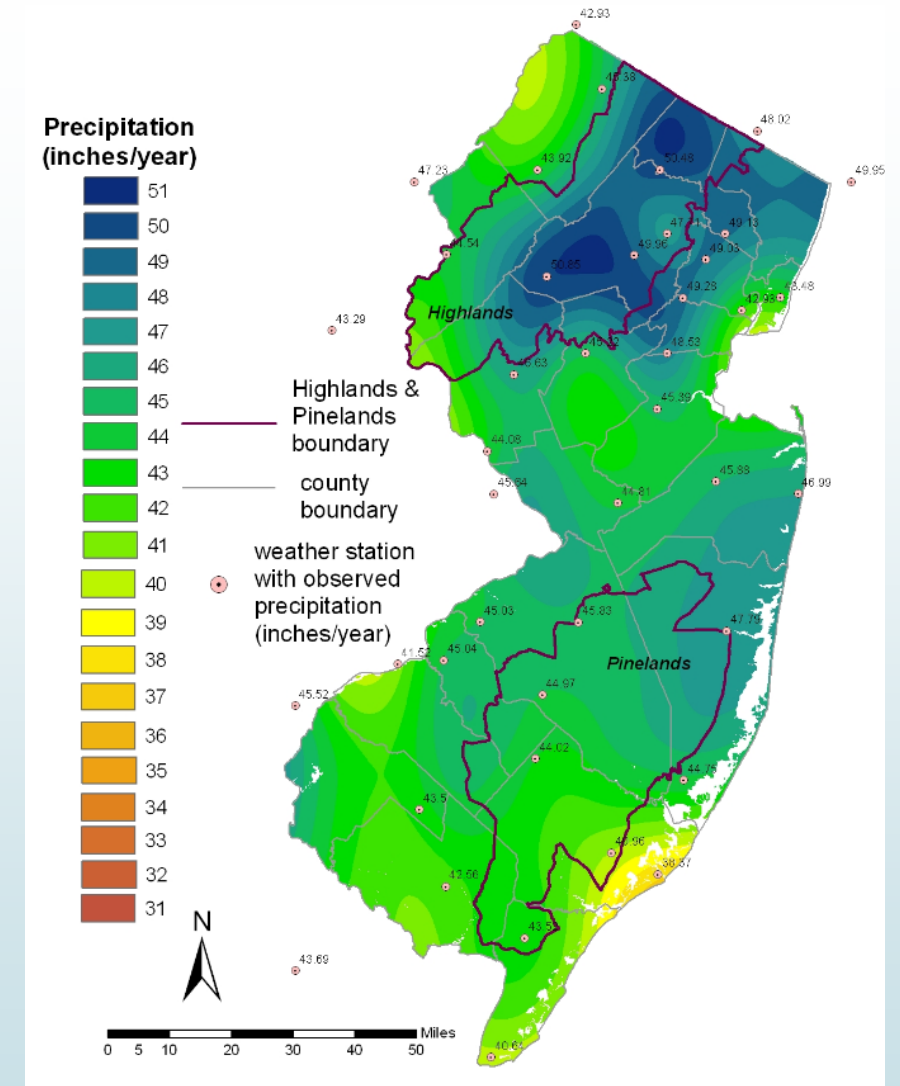
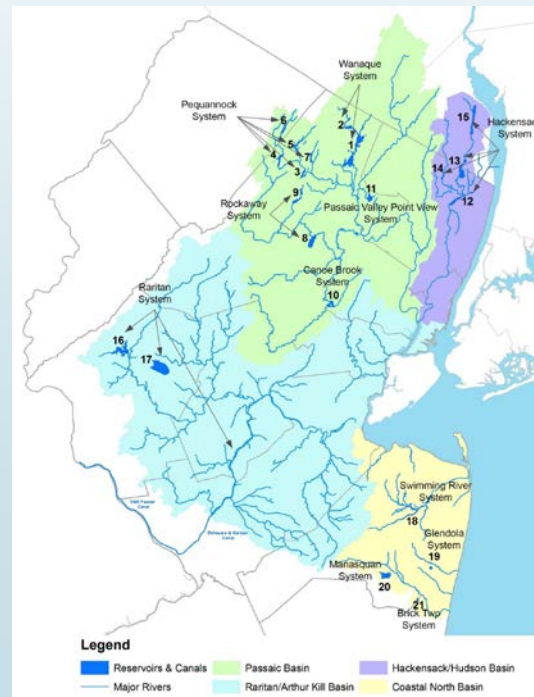
- Identify and quantify the location of potential supplemental sources of supply, including future infrastructure needs, to ensure future demands are satisfied (Chapter 3, 7, 8 and Appendix A);
- Define overarching water supply policies, including the preservation of existing water supplies, water resource and ecosystem protection, and the support of future economic growth and development (Chapters 6 and 7);

Key Objectives

- Identify policy and/or regulatory actions necessary to ensure an adequate and secure statewide water supply to meet anticipated demand and respond in the event of an emergency (Chapters 6 and 7); and
- Provide a support tool to inform and assist local, regional and State planning decisions. (Watershed Management Area (WMA) summaries are included as Appendix A.)

Key Findings

NJ typically has ample average precipitation and the State's geology allows the storage of large quantities of groundwater and supports large reservoirs.



Key Findings

- Generally, NJ has sufficient water available to meet needs into the foreseeable future provided we effectively:
 - Increase water efficiency through conservation and reuse;
 - Promote public education and outreach;
 - Address deteriorating infrastructure and ensure proper operation and maintenance of our water storage, treatment and distribution systems;
 - Pursue key water supply projects, including enhanced system interconnections and regional optimization of system networks and resources; and
 - Fully fund current monitoring efforts/assessment studies

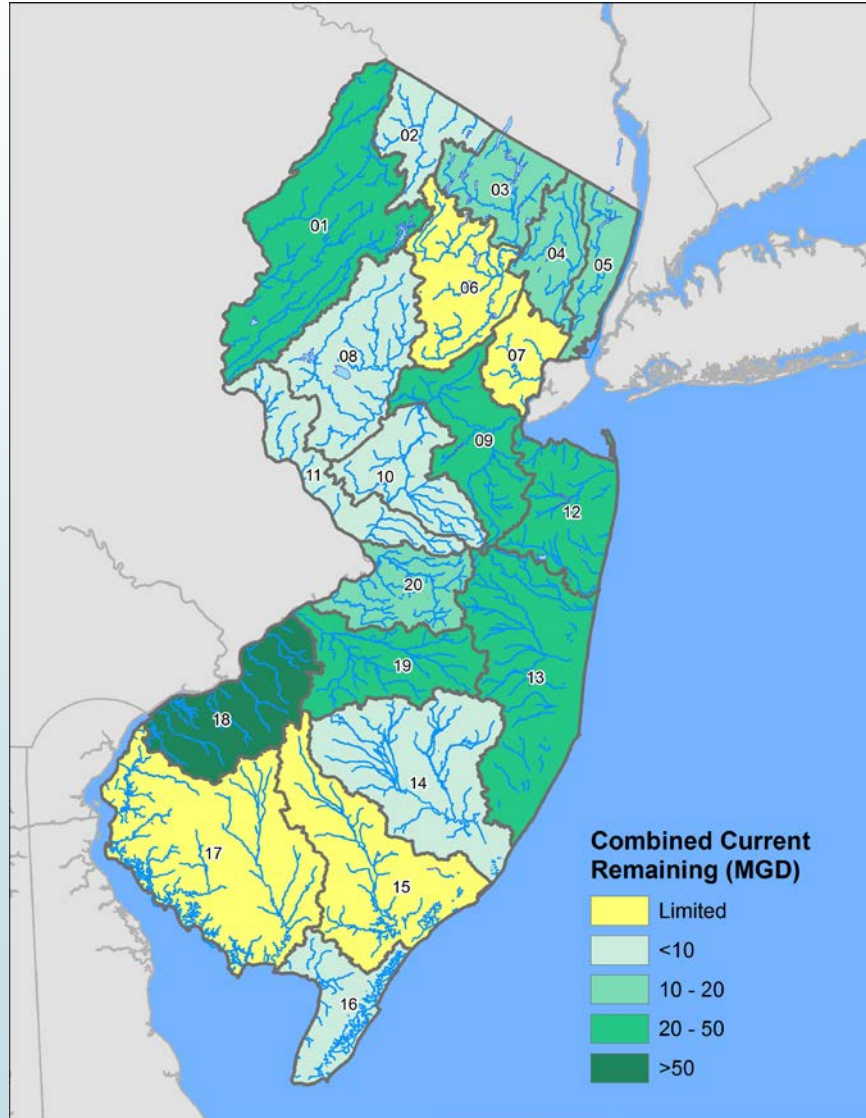
Key Findings

Table 3.2. Natural Resource Availability, net demand and remaining availability, and 2020 estimates of potable use.

WMA#	WMA Name	Natural Resource Availability (mgd)				Net Demand (mgd)				Remaining Availability (mgd)				Estimated increase in potable use by 2020 (mgd)	Estimated remaining water availability in 2020 (mgd)
		Reservoirs	SW intakes/ Unconf GW	Conf GW	Combined	Reservoirs	SW intakes/ Unconf GW	Conf GW	Combined	Reservoirs	SW intakes/ Unconf GW	Conf GW	Combined		
1	Upper Delaware		30		30		6		6		23		23	4.2	19
2	Wallkill		8		8		4		4		4		4	1.7	2
3	Pompton, Pequannock, Wanaque, and Ramapo	187	12		199	168	13		181	19	-1		18	1.9	16
4	Lower Passaic and Saddle	75	10		85	50	16		67	25	-7		18	8.9	9
5	Hackensack, Hudson and Passaic	118	9		127	111	2		113	6	7		13	11.7	1
6	Upper and Middle Passaic, Whippany and Rockaway	72	15		87	65	24		89	7	-9		-2	3.1	-5
7	Arthur Kill		7		7		20		20		-13		-13	12.6	-25
8	North and South Branch Raritan		21		21		12		12		9		9	2.1	7
9	Lower Raritan, South, and Lawrence	241	13	29	283	187	36	17	240	54	-22	11	43	13.1	30
10	Millstone		8	9	16		5	6	11		3	2	5	5.5	-1
11	Central Delaware		8	3	11		2	2	4		6	1	7	2.3	5
12	Monmouth	63	21	29	113	59	10	18	87	3	11	11	26	5.4	20
13	Barnegat Bay	17	49	48	114	8	44	41	93	9	6	7	21	12.9	8
14	Mullica		37	3	40		31	2	33		6	1	7	3.2	4
15	Great Egg Harbor		33	23	56		59	23	82		-25	0	-25	6.1	-31
16	Cape May		6	15	21		-1	15	14		6	0	6	1.4	5
17	Maurice, Salem and Cohansey		47	16	63		120	13	132		-73	3	-70	4.0	-74
18	Lower Delaware		23	138	161		-20	103	83		43	35	78	3.7	74
19	Rancocas		18	27	46		0	23	23		18	5	23	4.5	18
20	Assiscunk, Crosswicks and Doctors		10	22	32		-6	19	13		16	4	20	3.5	16
Total ^f		773	385	362	1,520	649	377	282	1,308					111.8	

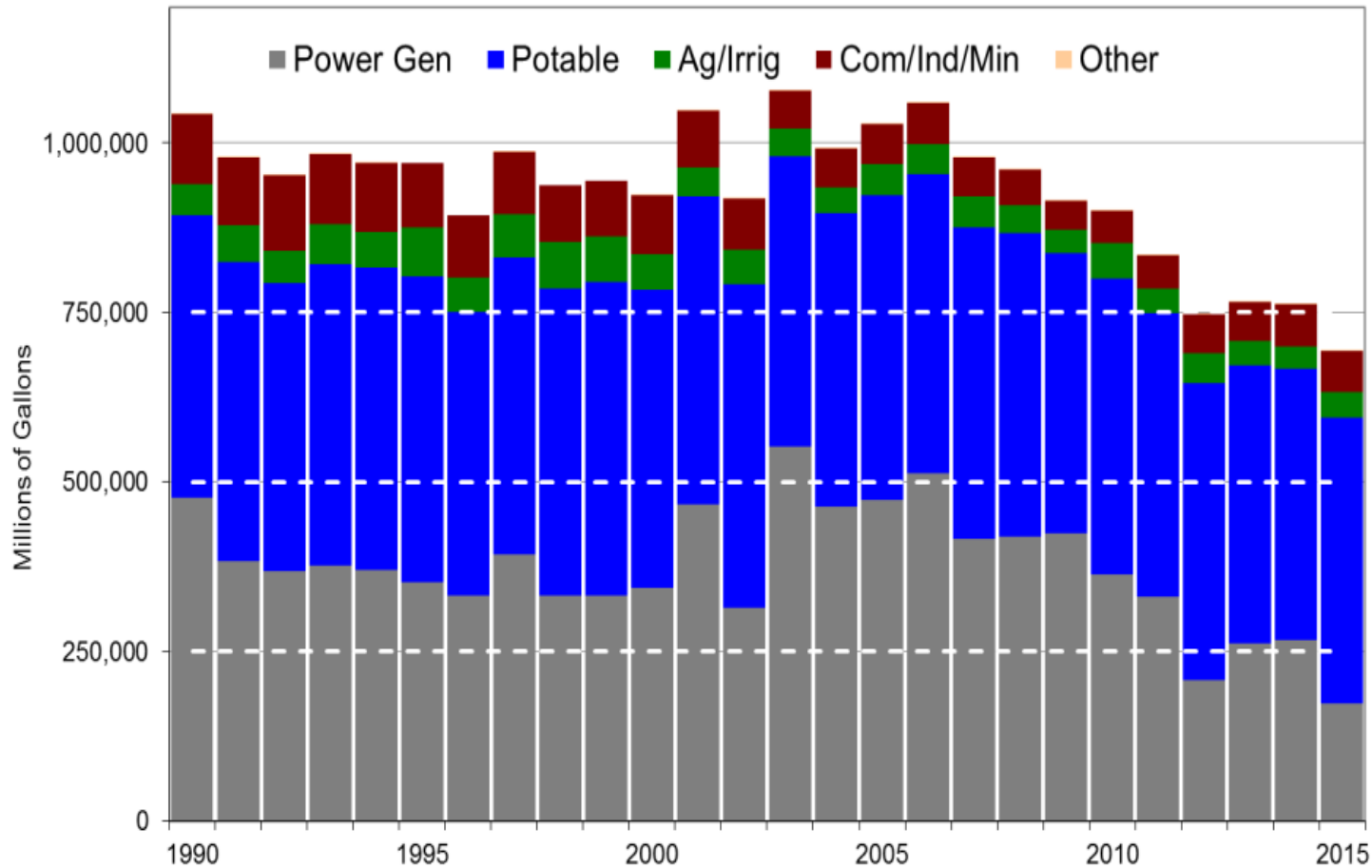
- Using best available analysis of peak demand data, water availability in New Jersey is about 1,520 million gallons per day (mgd) while 211 mgd remains unused. (Tables 3.2 and 3.3)

Key Findings



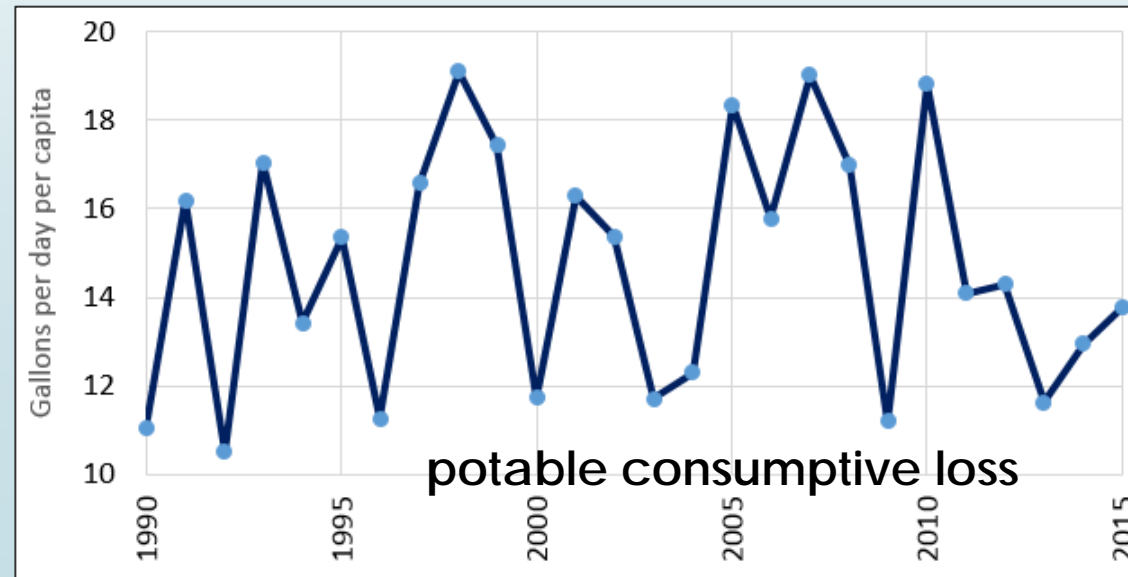
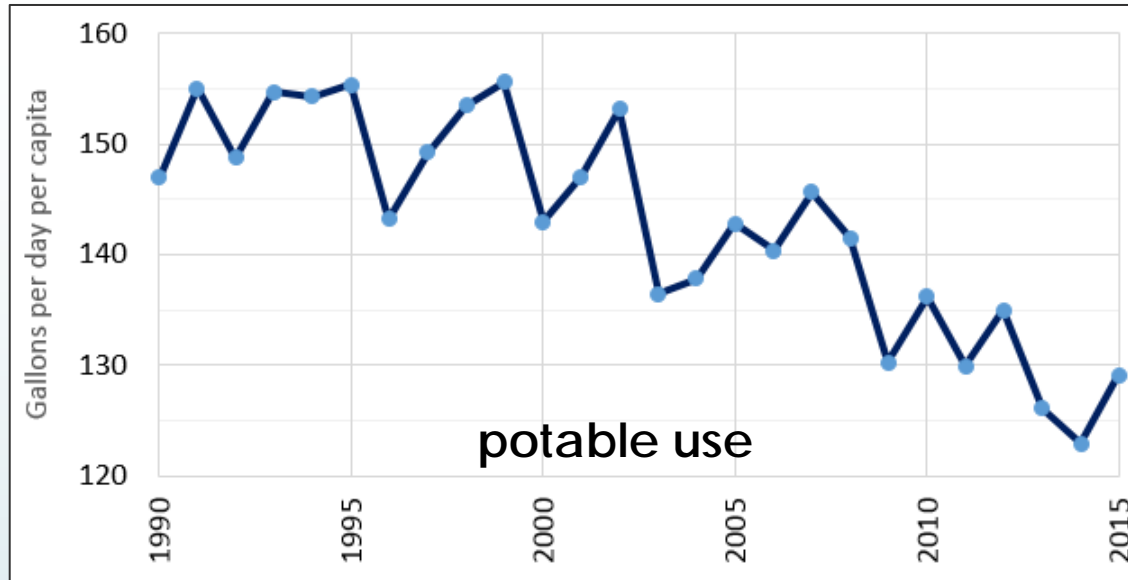
- A water-budget approach to withdrawals from surface water and the unconfined aquifer is necessary to balance human needs while sustaining ecological functions.
- This approach shows that four (4) of the State's 20 watershed management areas are currently stressed and eleven more would become stressed if pumped at volumes authorized under existing permits.

Key Findings



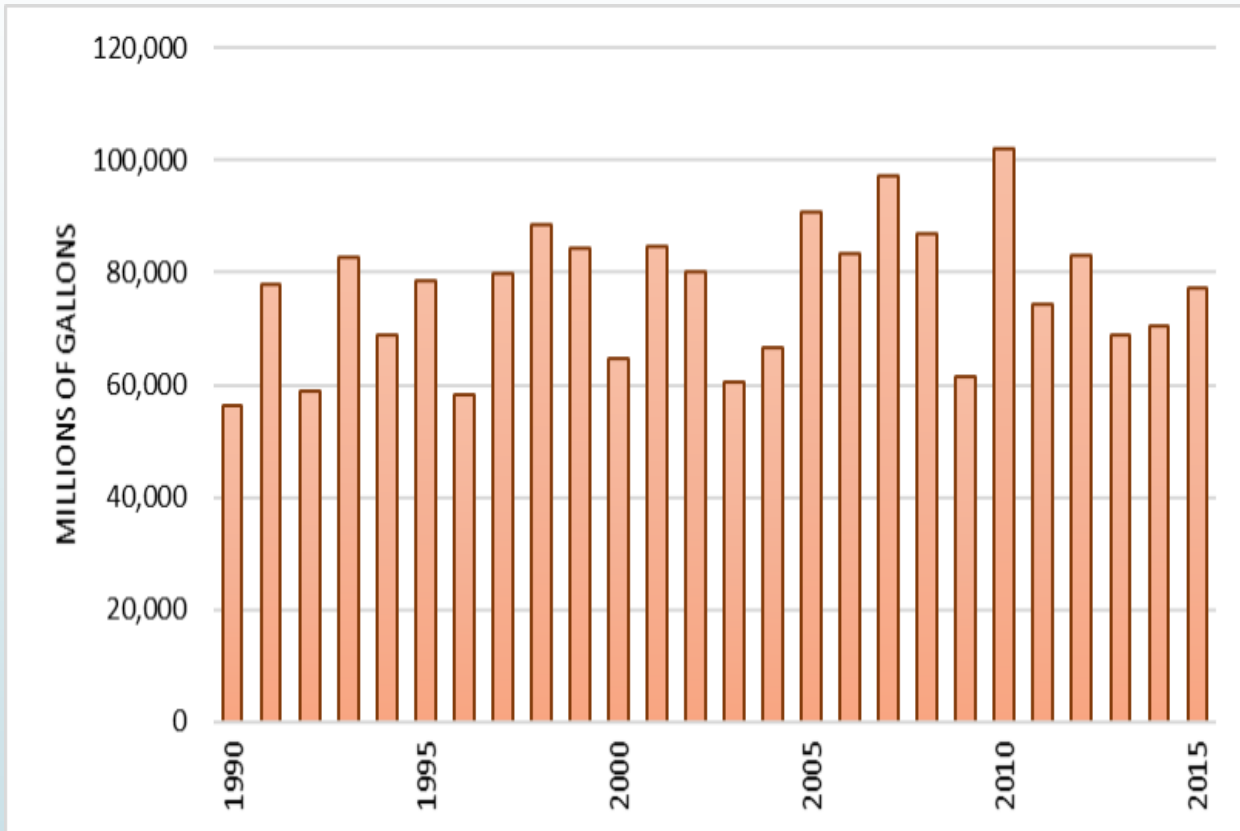
- Annual water use in New Jersey peaked during several years at just over one trillion gallons during the period of 1990-2015.
- Overall usage has decreased in the last few years of this period to about 750 billion gallons annually.

Key Findings



- ▶ Per capita potable water use in NJ decreased from about 155 to 125 gpd between 1990 and 2015, due in part to diminished indoor usage associated with more efficient plumbing fixtures.
- ▶ Consumptive water loss, on average annual basis, is between 11 and 19 gpd per capita.

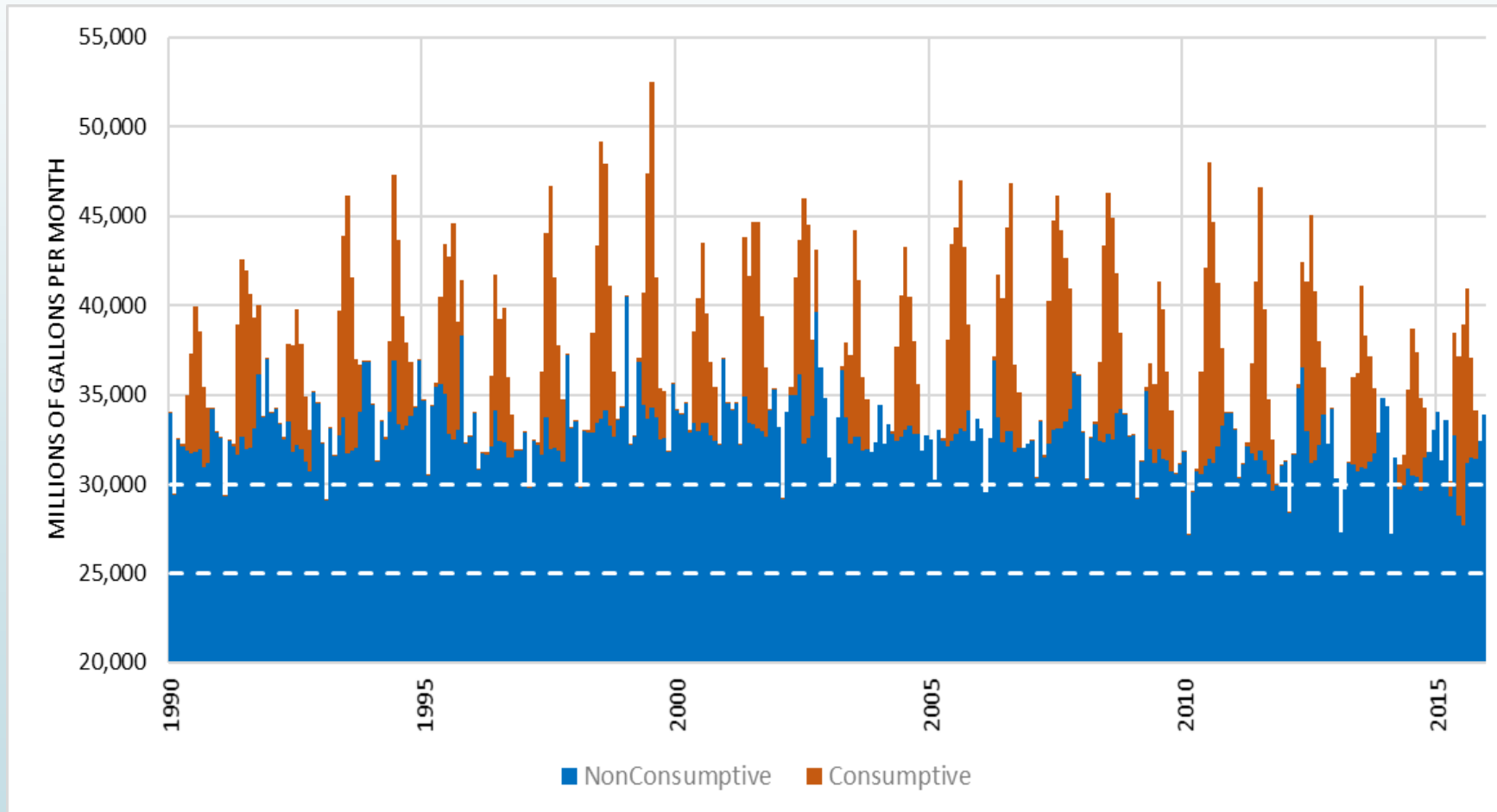
Key Findings



- Consumptive water use, while variable, continues to rise.
- This is largely due to outdoor landscape irrigation
- As much as one-third of all potable water is lost to evaporation to the water cycle in any given peak season month (with considerably higher losses during daily and weekly periods). This can significantly strain water availability when supplies are most scarce and the need for plentiful, high quality water is greatest.

Key Findings

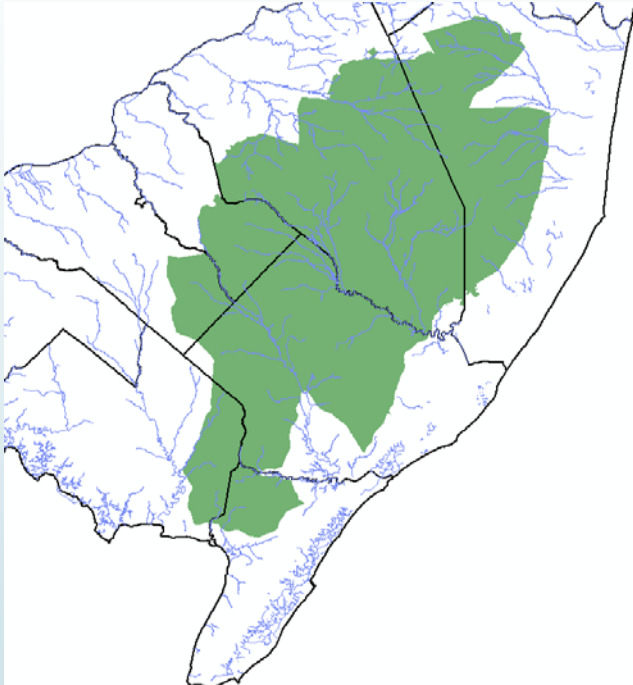
Monthly Potable consumptive and non-consumptive use 1990-2015



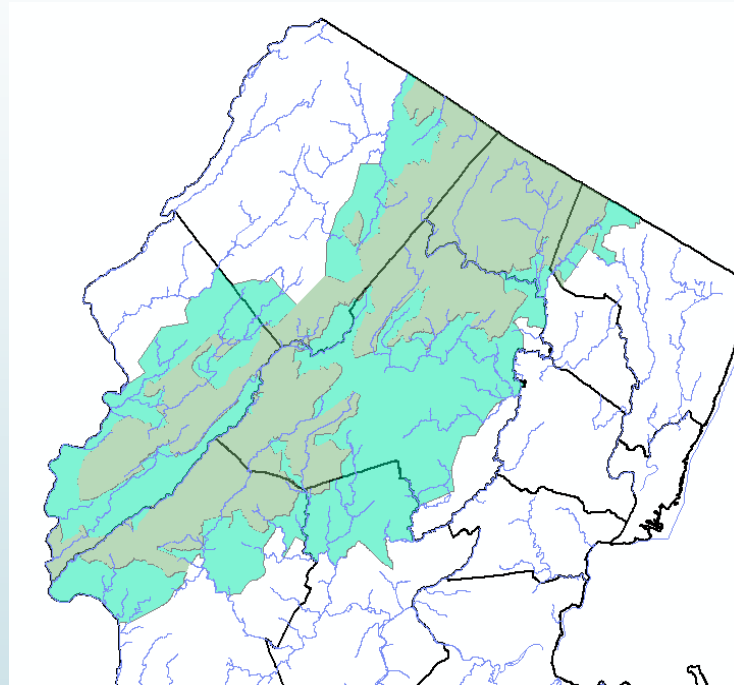
Greatest stresses

- water lost to evaporation through outdoor water use
- out-of-basin wastewater transfers.

Key Findings



Pinelands



Highlands

- ▶ Water availability is a function of all water resources in a specific area and of site-specific resource limitations.
- ▶ Region-specific sustainability thresholds (such as the Highlands Regional Master Plan, Pinelands Comprehensive Management Plan, or watershed-specific water quality management plans) may affect water availability.

Key Findings

- The Plan presents specific findings and recommendations for each of New Jersey's twenty (20) watershed management areas (Appendix A).
- The Plan promotes efficient management and investment into our existing infrastructure assets, enhancing the resilience of our systems to withstand and quickly recover from adverse conditions, and otherwise optimizing the use of available water through innovative techniques and cooperative strategies.
- New data will be evaluated and incorporated into the Plan as they become available to the DEP. New models and methods will be periodically reviewed and, if determined to be appropriate for NJ, will be utilized to revise and improve the Plan and its recommendations.

Policies for Improving the State's Water

1. **Promote the efficient use** of the State's freshwater resource by enhancing water conservation initiatives, encouraging reductions in outdoor water use, and matching highly consumptive non-potable uses with non-potable water sources.
2. **Improve** New Jersey's drought management capabilities and water system **resilience**.
3. **Promote optimized use** of existing water supplies through interconnections, conjunctive use and aquifer storage and recovery (ASR).

Policies for Improving the State's Water

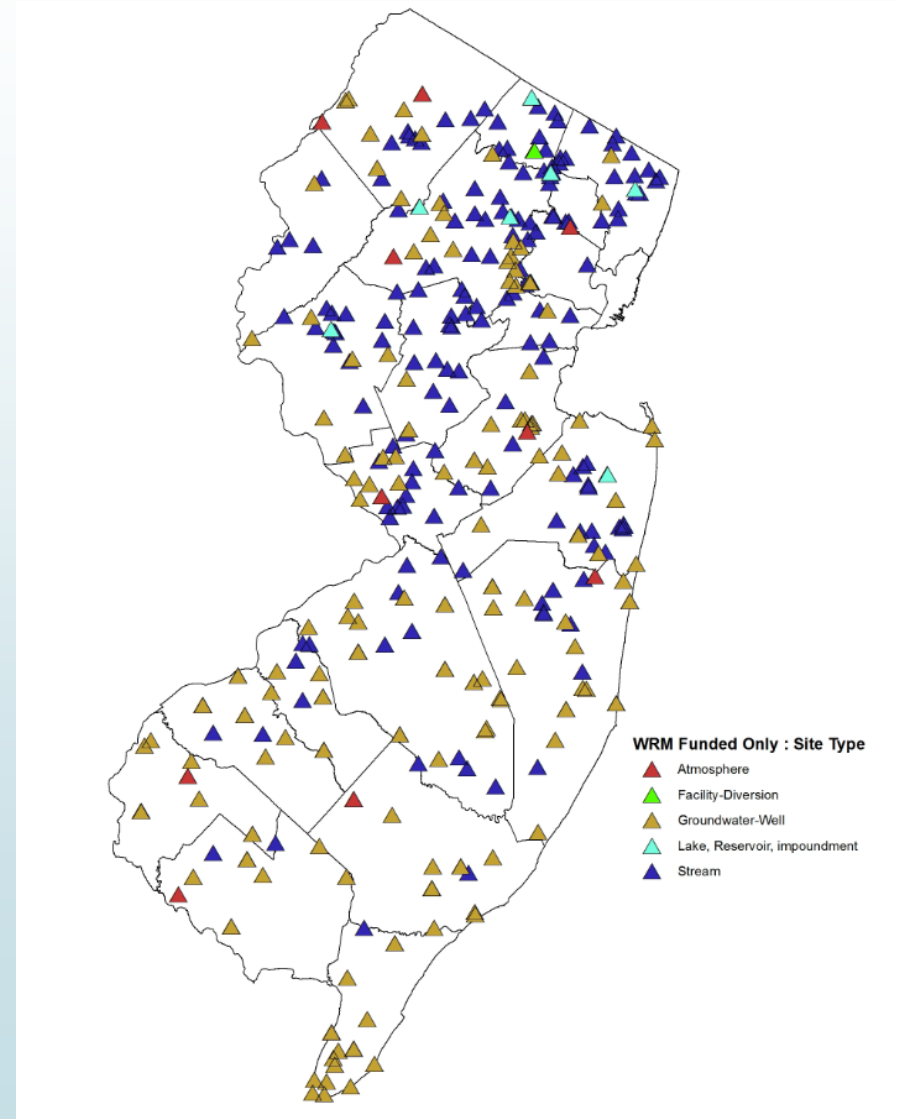
4. Encourage the development of **new and expanded sources of supply**, including the use of **innovative technologies**, especially in deficit areas. Support of new or expanded sources of supply will also be provided to those areas interconnected with deficit areas, where **additional supplies could be transferred to help offset deficits**.
5. Evaluate the **impact of new or increased allocations** for highly consumptive non-potable uses.
6. **Coordinate sustainable water supply policies** with the Highlands Regional Master Plan and the Pinelands Comprehensive Management Plan.

Policies for Improving the State's Water

7. Support **detailed hydrologic regional assessments** to assess the status and sustainability of the resource and identify feasible water supply alternatives that protect New Jersey's natural resources.
8. **Coordinate with the agricultural community** to more accurately assess future agricultural water demands
9. Continue to **assist water systems** in ensuring **adequate financial investment** to improve, repair, rehabilitate, replace and/ or update water supply infrastructure.

Policies for Improving the State's Water

10. **Maintain NJ's extensive surface water, groundwater and drought monitoring systems and assessment tools.** Information obtained from these networks is critical to planning for our future.



What's Next

- 2014 and 2015 water use data updates
- Update water availability analysis
 - Unconfined aquifers and streams (HUC11)
 - Confined aquifers
 - Reservoirs
- Incorporate data and availability results in to draft plan prior to final release

Data & Analysis

Data

DGS10-3 New Jersey Water Transfer Model Withdrawal, Use, and Return Data Summaries

<http://www.nj.gov/dep/njgs/geodata/dgs10-3.htm>

Data Summaries, Statewide

IC - Water Withdrawals in New Jersey 1990 to 1999

<http://www.nj.gov/dep/njgs/enviroed/infocirc/withdrawals.pdf>

IC - Water Withdrawals in New Jersey 2000 to 2009

<http://www.njgeology.org/enviroed/infocirc/withdrawals2009.pdf>

Data Summaries by Watershed

DGS13-1 Computer Workbook Summarizing New Jersey Withdrawals and Discharges on a HUC11 Basis

<http://www.nj.gov/dep/njgs/geodata/dgs13-1.htm>

DGS09-1 Reservoir Storage and Related Diversions in the Passaic and Hackensack River Basins, 1898 to 2011

<http://www.njgeology.org/geodata/dgs09-1.htm>

DGS04-9 New Jersey water withdrawals, transfers, and discharges by WMA, 1990-1999

<http://www.nj.gov/dep/njgs/geodata/dgs04-9.htm>

New Jersey Water Withdrawal, Use, Transfer and Discharge Summary 1990 to 1999 by HUC11

<http://www.nj.gov/dep/njgs/enviroed/HUC11.htm>

Data Summaries, Highlands

Potable Water Supplied in 1999 by New Jersey's Highlands

<http://www.nj.gov/dep/njgs/enviroed/freedwn/highpotwater.pdf>

OFR 15-1 Potable Water Supplied in 2011 by New Jersey's Highlands

<http://www.njgeology.org/pricelst/ofreport/ofr15-1.pdf>

Data Analysis

TM 13-3 Using the Stream Low Flow Margin Method to Assess Water Availability in New Jersey's Water-Table-Aquifer Systems

<http://www.nj.gov/dep/njgs/pricelst/tmemo/tm13-3.pdf>

DGS14-1 Water Availability in New Jersey on a Watershed Management Area Basis

<http://www.njgeology.org/geodata/dgs14-1.htm>

Websites

NJ Geological and Water Survey

<http://www.njgeology.org/>

Public Meetings

- North - Millburn Public Library, Millburn, Wednesday, July 12, 2017 3:00
- Central -, July 11, 2017 1:00
 - 401 East State St, Trenton 1:00
 - USGS, Lawrenceville 6:00
- South - Stockton University, Board of Trustees Room, Campus Center, Thursday, July 13, 1:00
- Written comments submitted until July 19th at watersupply@dep.nj.gov
- Plan available at <http://www.nj.gov/dep/watersupply/wsp.html>