

Agenda

- **Module 1: DRBC Water Loss Accountability Requirements & Water Audits**
 - Kenneth Najjar, DRBC
 - David Sayers, DRBC
 - Russell Titus, NJ American Water
- **Module 2: Conducting the Water Audit & Analyzing Data**
 - George Kunkel, Philadelphia Water Dept.
 - David Sayers, DRBC
- **Module 3: Managing Water Loss**
 - George Kunkel, Philadelphia Water Dept.
 - Russell Titus, NJ American Water
 - Brennan Kelly, Aqua Pennsylvania

Housekeeping

- Logistics for the Workshop
- Packet Information
- CEU Certificates

Water Use Trends

What's Going on Here? Why?

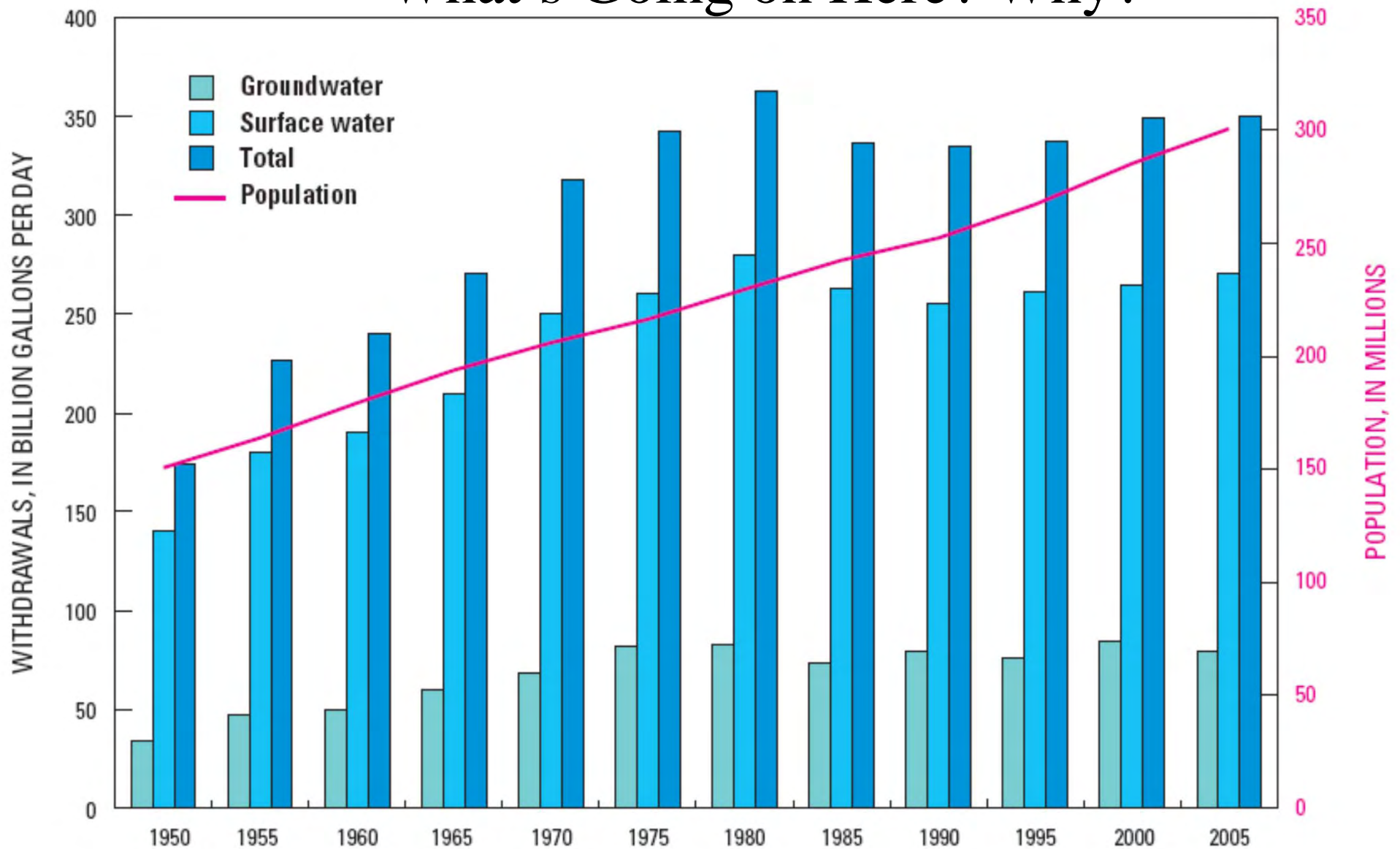
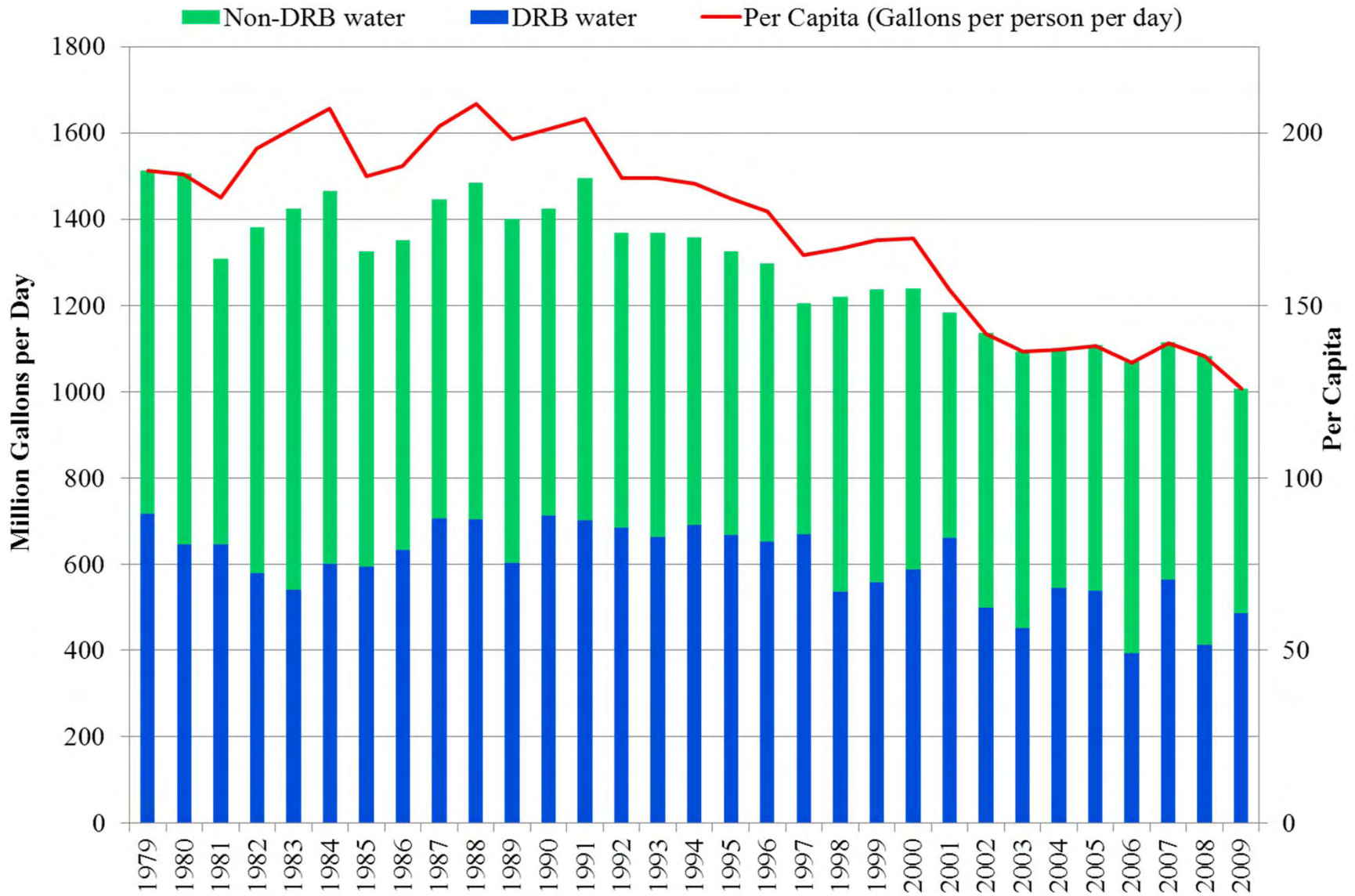


Figure 13. Trends in population and freshwater withdrawals by source, 1950–2005.

Ref: USGS, 2009

What's Going on Here? Why?

New York City Water Use



Explaining Water Use Trends

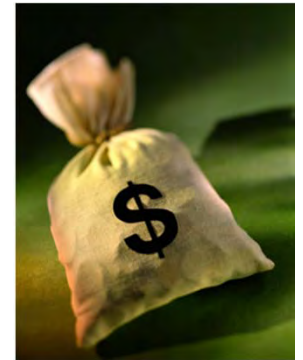
- Population:
 - Declines in urban areas
 - Growth in suburban & rural areas
- Changes in industrial/manufacturing use
- Seasonal/annual changes in irrigation use
- Conservation
- Water prices
- The recession?

What's Missing?

- Water loss management
- Technology for control, measuring
- Water accountability
- Infrastructure maintenance & upgrades
- Revenue management

Why We Need to Manage Water System Losses

- Water losses are big and getting bigger - USGS estimates 6 Billion gallons/day
- Lost Water is Out of Sight & Out of Mind
- Lost Revenues estimated at >\$1 Billion/year
- Conserve our valuable Natural Resource
- Control Indirect Costs
 - Inflow Contributions to sewers/collection systems
 - Catastrophic Failures:
loss of life and property



Catastrophic System Failures



Aging Infrastructure - Unfunded Infrastructure Replacement Needs Over the Next 20 Years...

- EPA's Inf. Report (Sept 2002):
 - \$499 billion to \$929 billion
- Water Inf. Network (WIN) Feb. 2001:
 - \$806 billion
- Cong. Budget Office (CBO) Nov. 2002:
 - \$492 billion to \$820 billion
- ASCE Infrastructure Report (2008)
 - “D-” for Water and Wastewater
 - \$ 1 Trillion over the Next Two Decades

Lost Water Affects Other Uses

- In-stream Uses
 - Trout Fisheries
 - Endangered Dwarf Wedgemussel
 - Tidal Freshwater Marshes
 - Oysters
 - Anadromous Fishes
- Off-stream Uses
 - Irrigation
 - Industry
 - Power
 - Commercial



Water Losses Must Be Reduced!

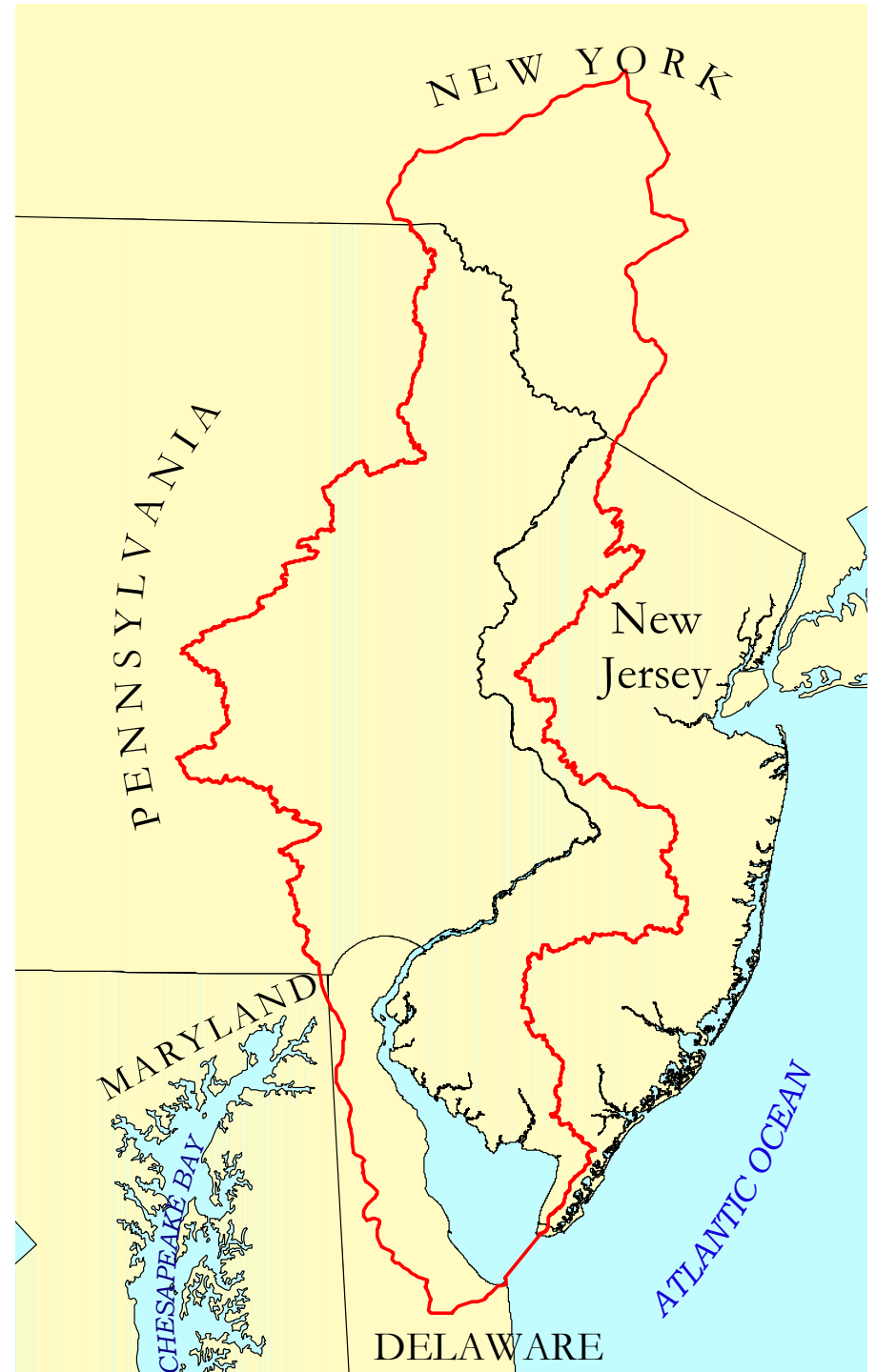
→ Accountability

DRBC Role in Water Loss Accountability

Delaware River Basin Commission



Created in 1961



Why was the DRBC Created?

- Water supply shortages and disputes over the apportionment of the basin's waters;
- Severe pollution in the Delaware River and its major tributaries; and
- Serious flooding.

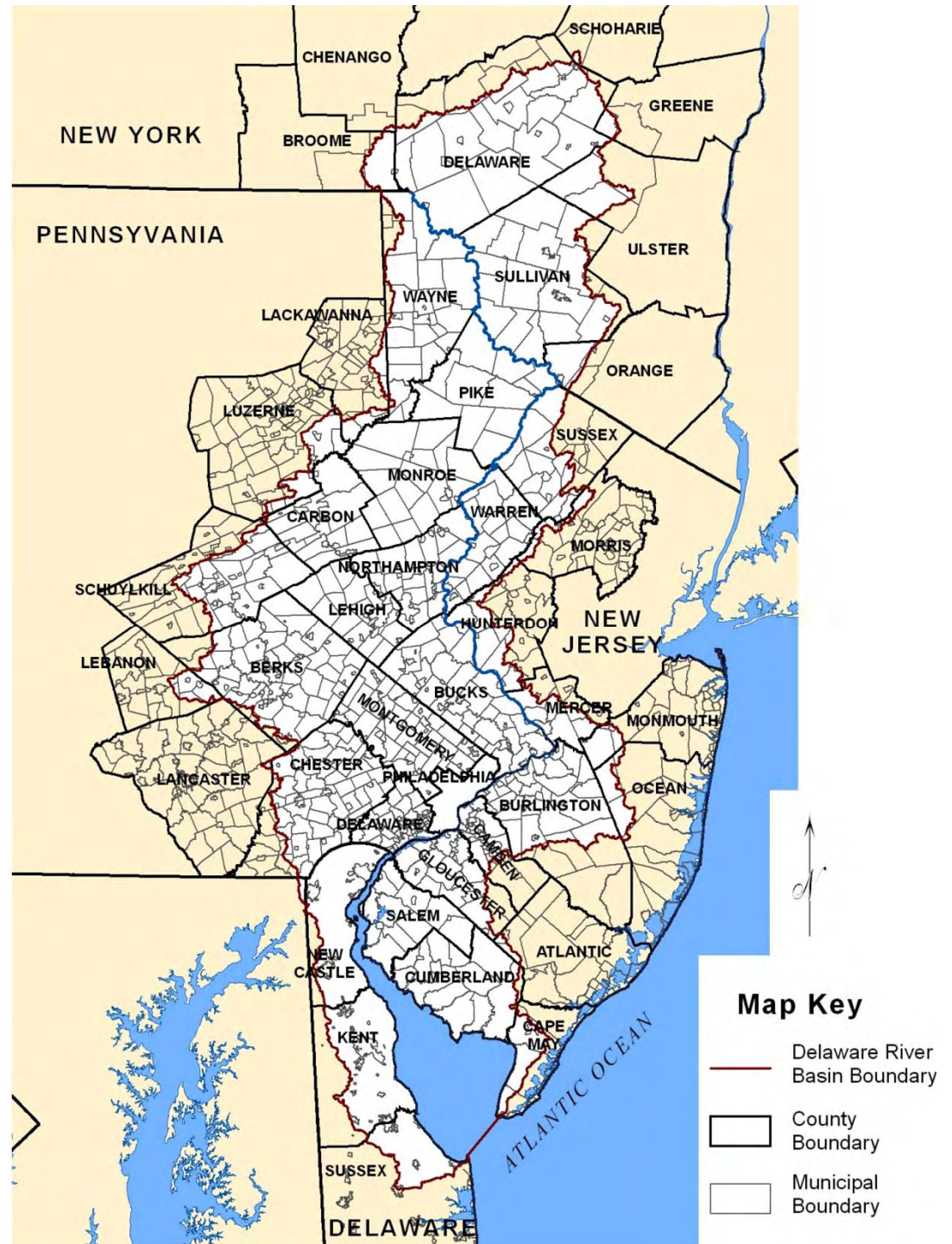
Delaware River Watershed Facts

- ❑ Nearly **15 million** people (about 5% of the U.S. population) rely on the waters of the basin
- ❑ Drains **13,539 mi²** (34,659 km²), or 0.4 of 1% of the continental U.S. land area
- ❑ Flows **330** miles from Hancock, NY to Delaware Bay
- ❑ **216** Watersheds



The Need for Basin-Scale Planning

- 4 States
- 2 EPA Regions
- 25 Congressional Districts
- 42 Counties
- 838 Municipalities

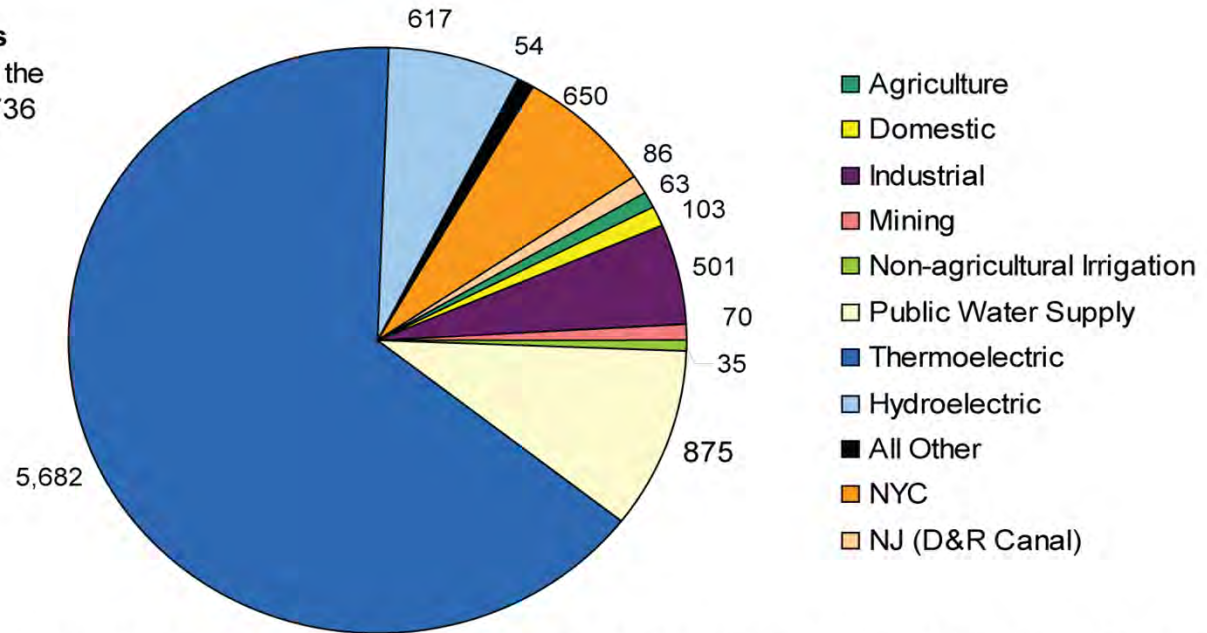


WHAT DOES DRBC DO?

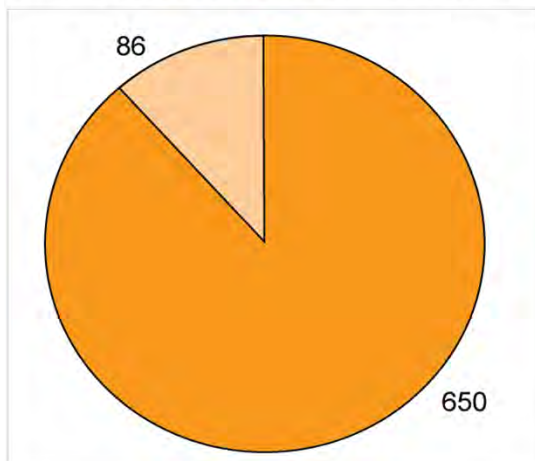
- ✓ Manages Resources on a Watershed Basis
- ✓ Regulates Water Quality & Quantity
- ✓ Directs a Fair Distribution of Water
- ✓ Plans for Best Use of Water Resources
- ✓ Coordinates / Facilitates
- ✓ Educates about Water Resources
- ✓ Is a Forum for Adaptive Management

Basin Water Use

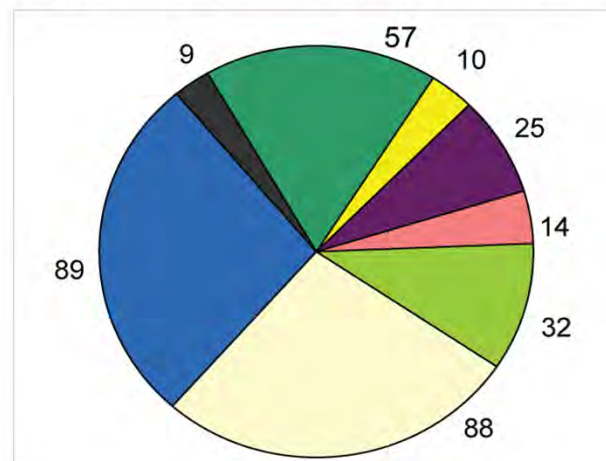
Total Water Withdrawals
(ground and surface) from the Delaware River Basin: 8,736 mgd



Major Exports from the Delaware River Basin: 736 mgd



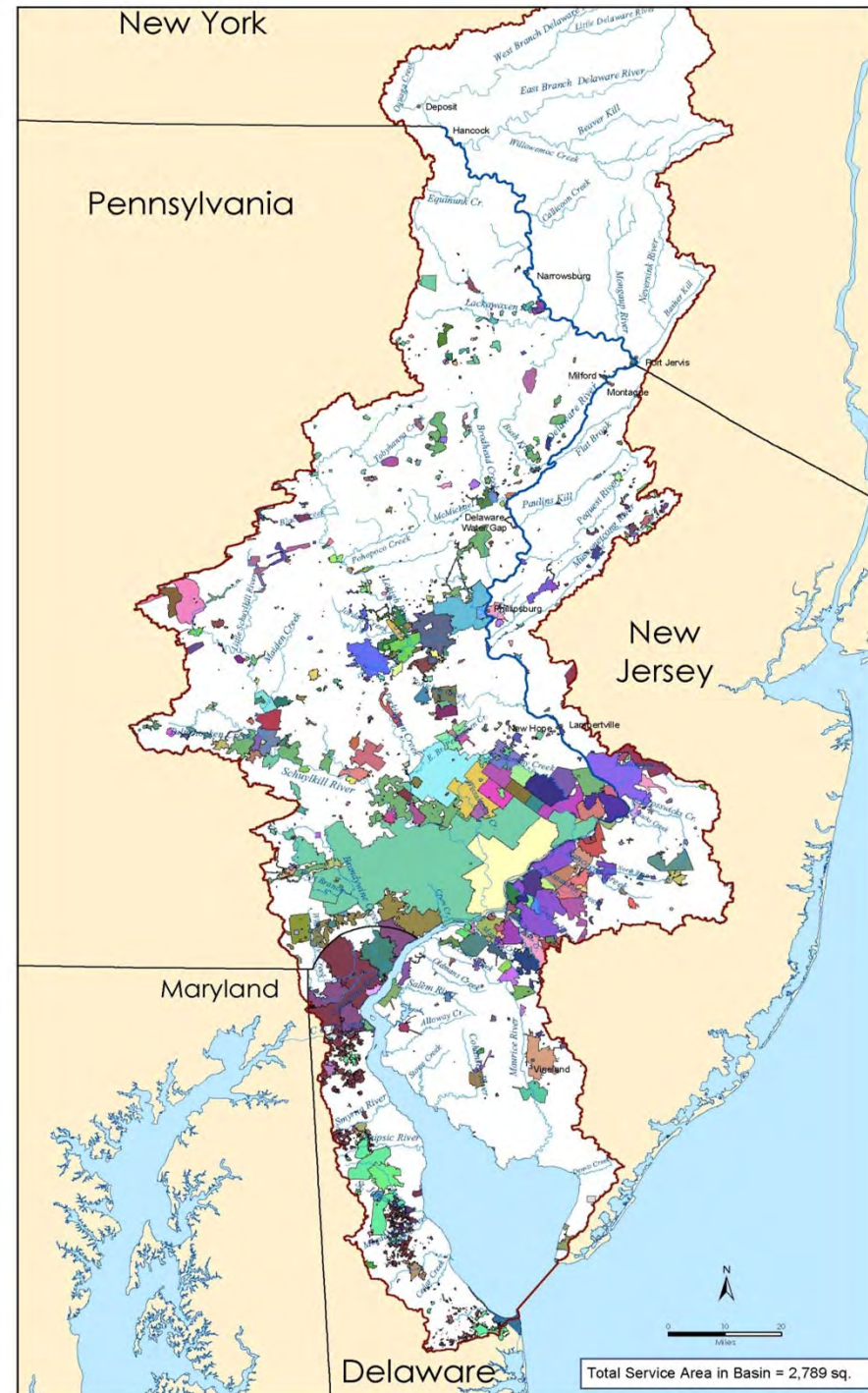
Consumptive Use in the the Delaware River Basin: 324 mgd



Pie chart values in mgd
(million gallons per day)

Water Service area in the Delaware River Basin

- Approx. 21% of Basin covered by service area
- Approx. 750 “systems”
- 2nd largest water use sector in the Basin
- Total PWS withdrawals:
 - **875 MGD**
- Largest 38 (5%) account for 80% of PWS demand





Water Loss in Delaware River Basin

- An estimated 150 million gallons per day is physically lost from public water supply distribution systems in the Basin
- DRBC Water Loss Accountability Rulemaking



WATER SYSTEM AUDITS AND WATER LOSS CONTROL

Questions?

Rutgers EcoComplex
Bordentown, NJ
April 13, 2011