

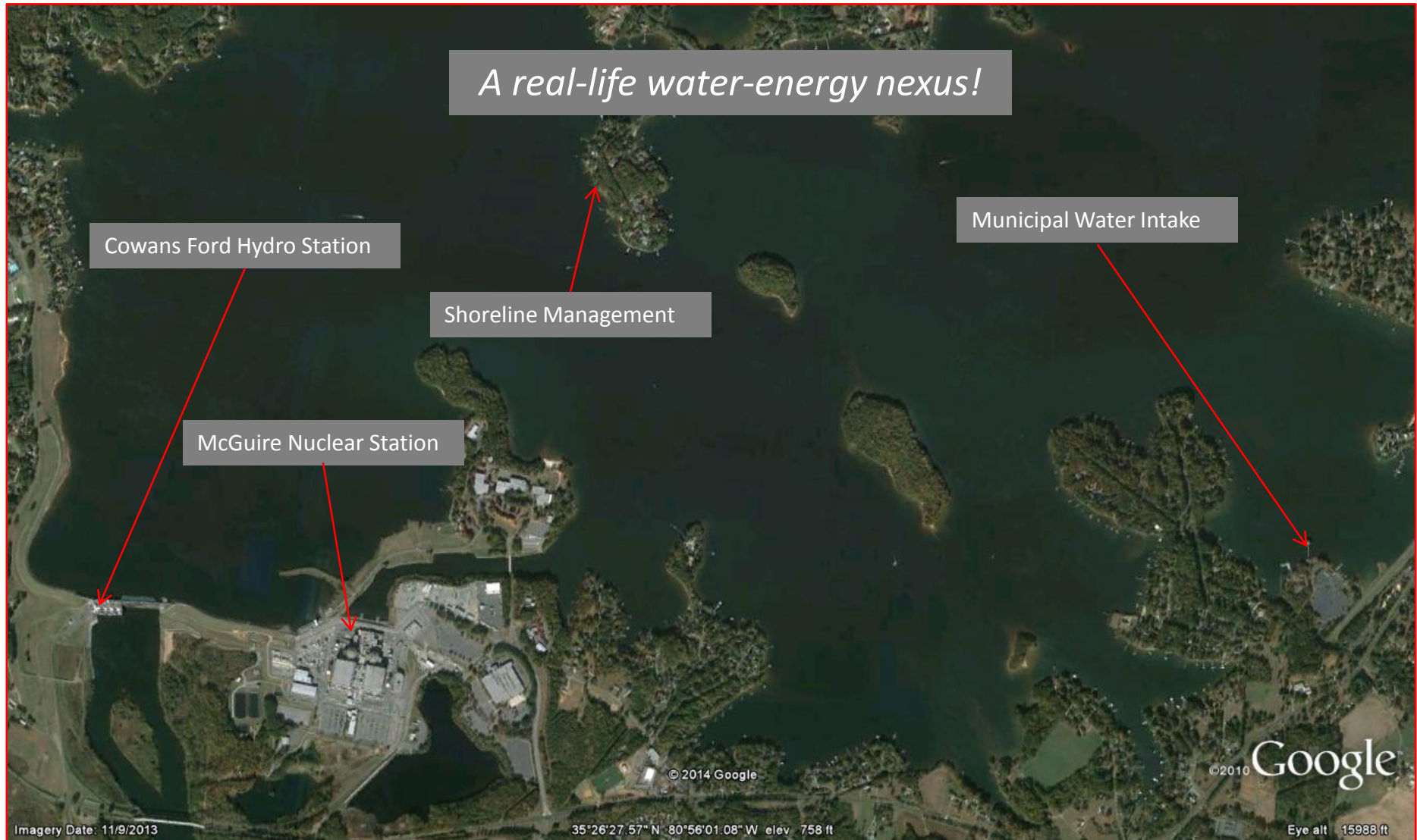
# Water - Energy Nexus

*NC EMC – Water Allocation Committee  
July 12, 2017*

A high-speed photograph of a water droplet suspended in mid-air above a pool of water, creating a crown-shaped splash below it. The background is a blurred blue.

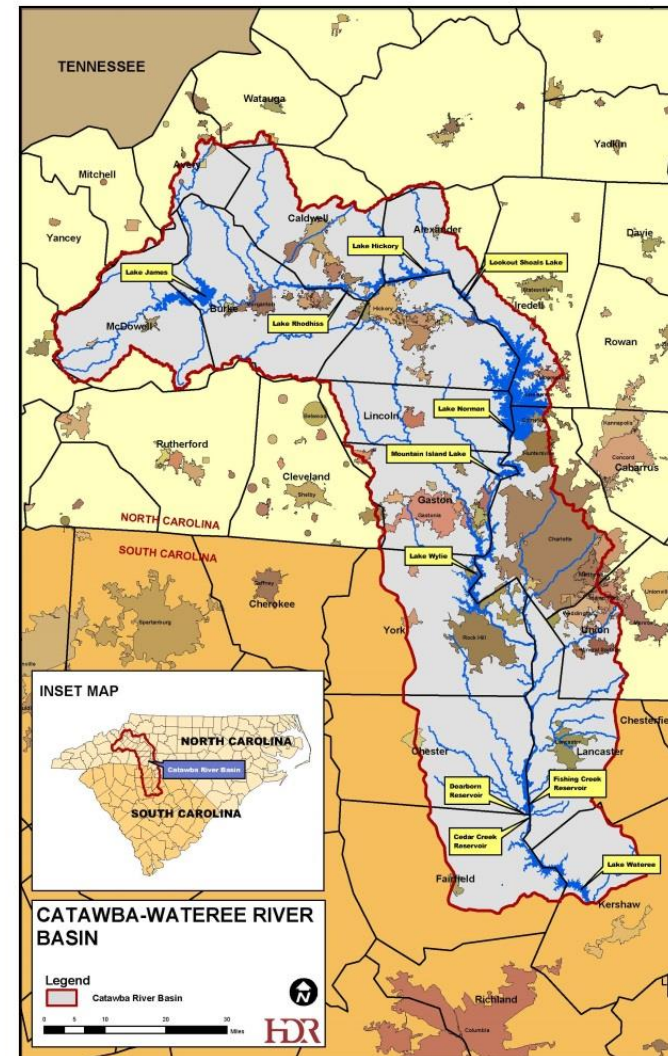
Presented by:  
**Jeff Lineberger, PE**  
Director, Water Strategy and Hydro Licensing  
Duke Energy

# Catawba-Wataree (CW) River Basin – Lake Norman

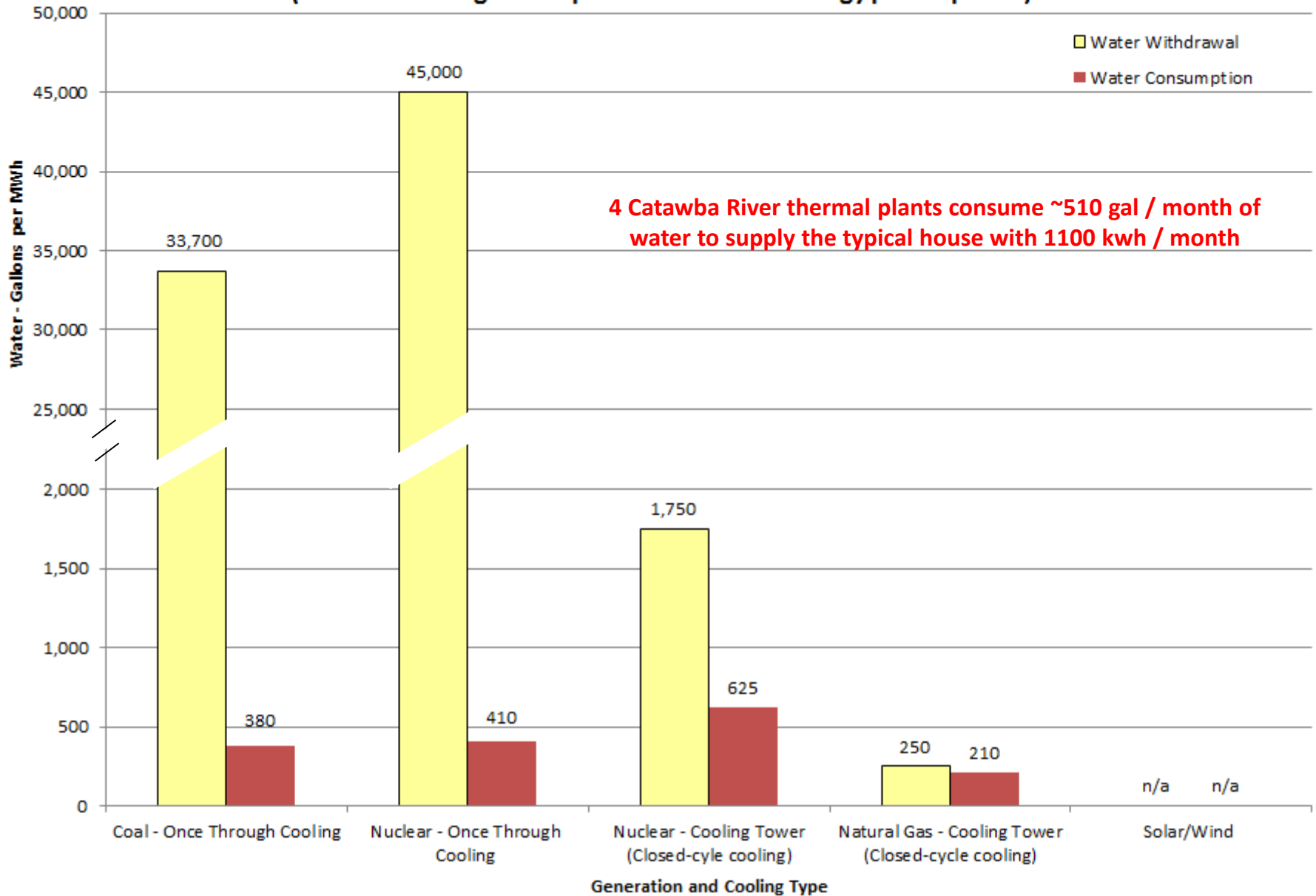


# CW River Basin – Balancing the Needs

- **11 interconnected reservoirs licensed by the Federal Energy Regulatory Commission (FERC)**
  - Completed 1904-1963 (spanning 225 river miles)
  - 79,895 surface acres, 1,795 miles shoreline
- **Modest water availability**
  - Avg. inflow – 3,752 million gallons per day (MGD)
  - Avg. annual precipitation – 42 inches
  - ❖ **Usable Storage = 776,747 acre-feet = 252 billion gallons ≈ 7% of annual basin precipitation**
- **Duke Energy electric generation – 8,587 MW (25% of our Carolinas' generation capacity)**
  - 13 conventional hydro stations (805 MW)
  - 2 nuclear stations (4,626 MW)
  - 2 coal-fired stations (3,156 MW)
- **Lots of people**
  - Most densely populated river basin in NC
  - 2 states, 17 counties, 30+ cities
  - Over 25,000 lake neighbors (property values)
  - Over 10 million recreation visits per year
  - Several large industrial water intakes
- **Reservoirs serve as the raw water source for 18 public water systems (2 million customers)**
- **New License for Catawba-Wateree Hydro Project balances the issues (fish, wildlife, water quality, lake levels, flow releases, recreation, etc.)**



## Gross Water Withdrawal and Consumption for Thermal Electric Generation Cooling (based on averages of representative Duke Energy power plants)



# Partnerships to Sustain the Region

- **Catawba-Wateree Water Management Group (CWWMG)**
  - Non-profit corporation focused on long-term water management
  - 18 public water utilities and Duke Energy
  - \$550,000/year member dues
  - Since 2007
    - ✓ **25** completed projects/contracts
    - ✓ **\$3.9 Million** invested (incl. **\$1.3 Million** in grants/in-kind services)
    - ✓ **86%** of dues go directly to technical projects
  - Water Supply Master Plan takes action to get us to 2100
  - [www.catawbawatereewmg.org](http://www.catawbawatereewmg.org)
  
- **Catawba-Wateree Drought Management Advisory Group**
  - Oversees Low Inflow Protocol (LIP) implementation to manage droughts
  - Public water utilities, industries, resource agencies, Duke Energy
  - **LIP is single most important drought management tool in the river basin**
  - [www.duke-energy.com/lakes](http://www.duke-energy.com/lakes)



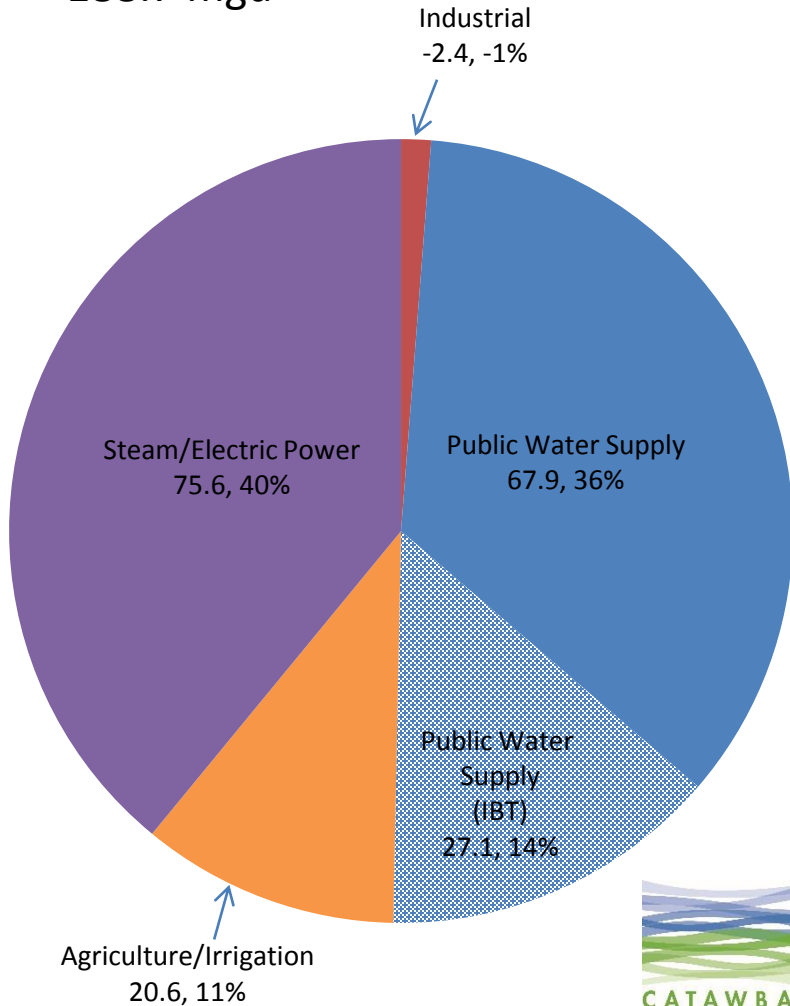
*Rocky Shoals Spider Lilies at Fishing Creek Reservoir*

# Forecasting Water Supply Needs in the Catawba-Wateree River Basin

- **Electricity (Duke Energy)**
  - **Integrated Resource Plan** (15-yr look-ahead)
    - Oversight by NC Utilities Commission
    - Defines capacity needs by technology (demand management, plant retirements / replacements / new plants)
  - Extend to match water supply planning horizon (2065)
  - Assign plants to lakes / rivers
- **Public Water Supply (Public Water Systems)**
  - **Local Water Supply Plans** (projections to 2060)
    - Oversight by NC Department of Environmental Quality
    - Define capacity needs, account for Inter-Basin Transfers
  - Extend to match water supply planning horizon (2065)
- **Direct Industrial / Ag / Irrigation Supplies**
- **Catawba-Wateree Water Management Group**
  - Provides benefits of peer review
  - **Water Supply Master Plan** (WSMP) brings it all together

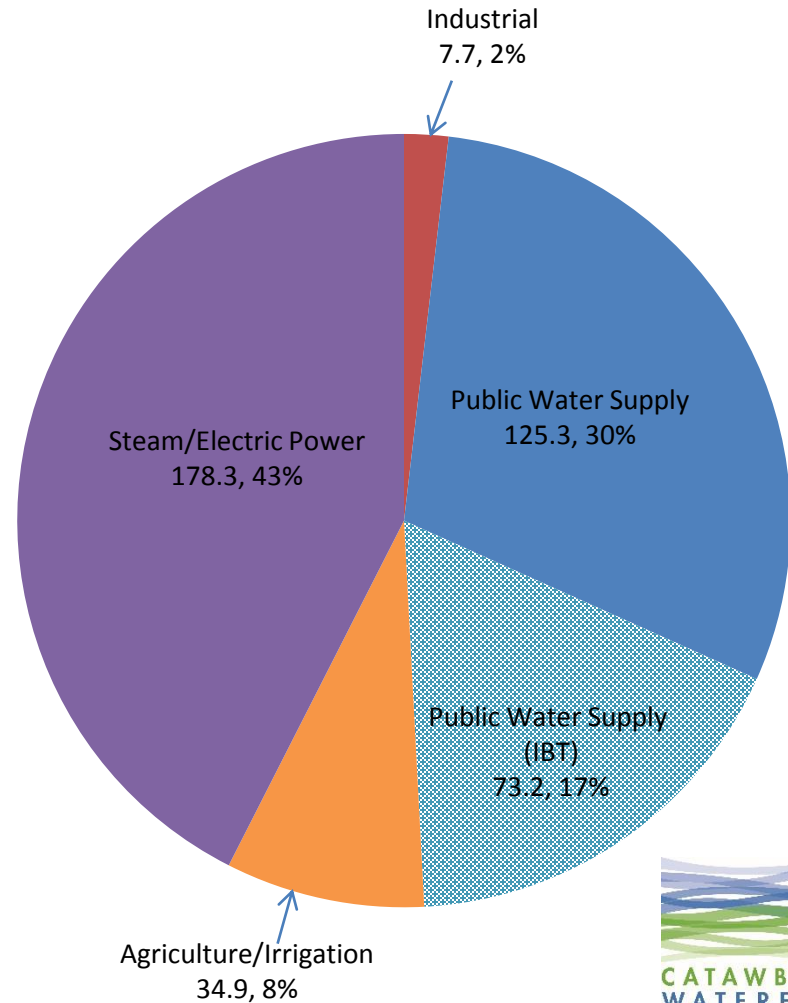
# How is Water Currently Used (2011)

- Million gallons per day consumed and percent of total 188.7 mgd



# How Water will be Used (2065)

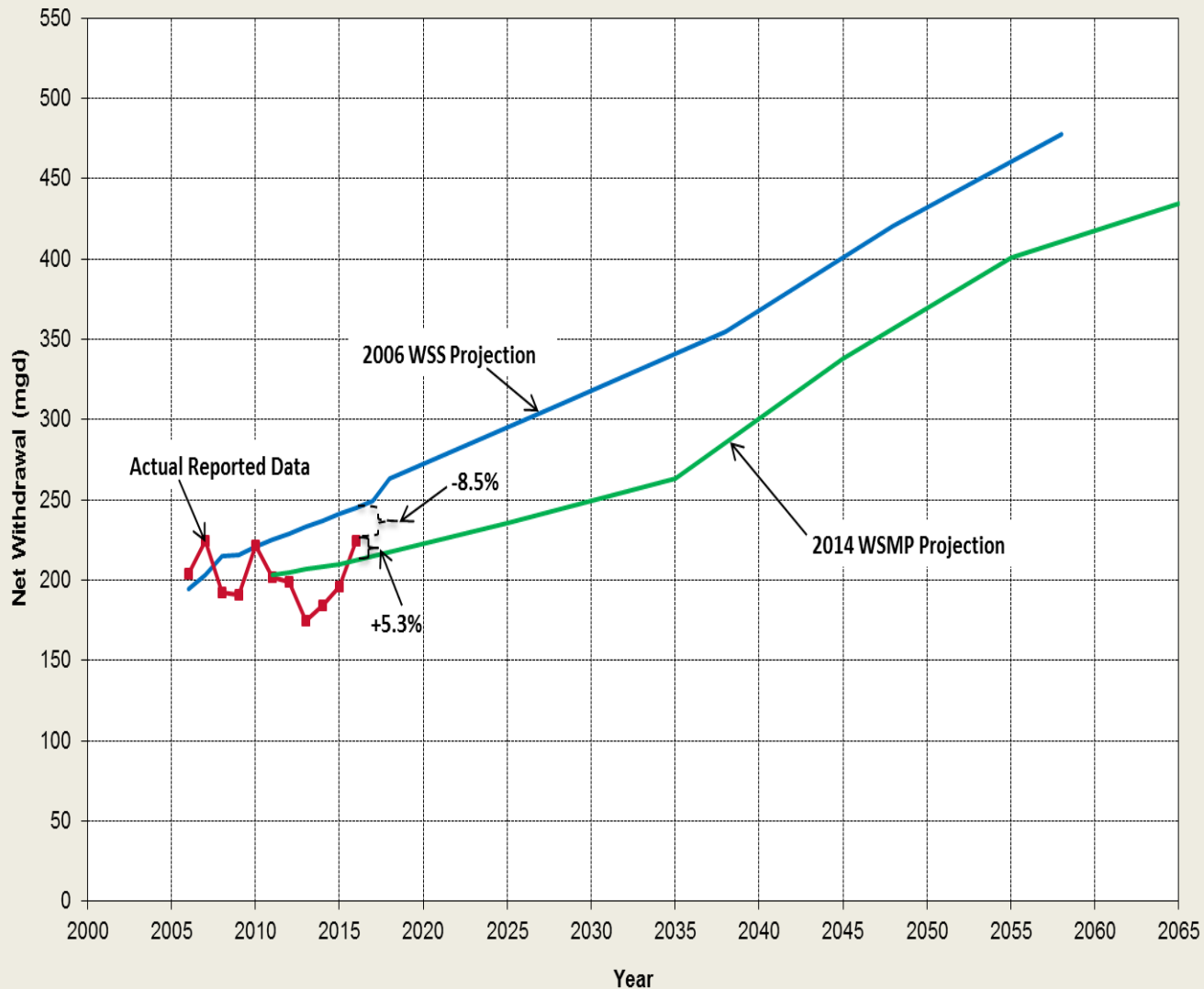
- Million gallons per day consumed and percent of total 419.4 mgd



# Water Use from the Catawba-Wateree River – Updated through 2016



Figure A2 - Comparison of Projected Net Withdrawal to Actual Net Withdrawal





# Key Recommendations of the WSMP

- Increase water use efficiency
- Lower critical water intakes/elevations
  - Power plant
  - Public water supply
- Raise target lake levels during summer months
- Enhance drought responsiveness through Low Inflow Protocol



# River Basin Planning Organizations (RBPO)

- **Existing Variations** (*incl. headwaters rivers with growing populations*)
  - Catawba-Wateree Water Management Group (2007)
  - Jordan Lake Partnership (2008)
  - Yadkin-Pee Dee Water Management Group (2016)
  - Others?
  
- **2009 Water Allocation Study Report (Holman & Whisnant) recommended RBPOs**
  - Assumed NC headed toward “regulated riparian system”; (SC has one)
  - Very good basic concepts
  - Needed to distinguish levels of stakeholders
  
- **Challenges**
  - Assurance of clear and meaningful roles for the RBPO and NCDEQ
  - Leadership from within the river basin
  - Right stakeholder involvement over long period of time
  - Affordable initiatives with equitable cost sharing
  - “Certification” of a River Basin Water Supply Plan in absence of regulated riparian system
  
- **RBPOs are coming together – State should help them succeed**



*Wylie Hydro Station*

# WATER - Balancing all interests

A Shared Resource



A Shared

Responsibility

