Palm Beach County Water Utilities Department

Climate Change

From International Cooperation to Infrastructure

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Outline

- Palm Beach County Utilities Background
- National and International Cooperation
- Anticipated Climate Change Impacts
- Adaptation
- Issues and Challenges
- Future

Utility Background

- Florida's 3rd largest water and wastewater utility
- 490,000 residents served
- 598 employees
- $115 million annual operating budget
- Recognized as an industry leader

Major Facilities

- 5 Water Treatment Plants with total capacity of 113 mgd
- Over 100 surficial wells, 8 Floridan wells
- 2 Wastewater Treatment Plants with total capacity of 59 mgd
- 22 mgd Reclaimed Water Facility
- 4 mgd Wetland Treatment capacity
- 869 WW Pump Stations

Local and National Cooperation

- Water Research Foundation
  - Water Industry Climate Change Research Needs Workshop January 7-9, 2008
  - Develop a Dynamic Decision Support System (D2S2) for Water Supply Planning in the Lower East Coast of Florida 2010 (WEAP Model)
  - Incorporating Climate Change Information in Water Utility Planning: A Collaborative, Decision Analytic Approach 2010
  - Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation 2012

Local and National Cooperation

- Southeast Florida Climate Change Compact, Built Environment Work Group
- Florida Water Climate Alliance
- Institute of Sustainable Communities Climate Change Academy, Philadelphia 2013.

USAID, Waterlinks Partnership on Building Climate Resilient Water Service Providers Manila, Philippines

- Manila expanding, main water source in question, drought/excess
- MWSS with Maynilad and Manila Water seek innovations and practical knowledge on furthering capacity
- WaterLinks and USAID ECO-Asia support to:
  - Increase awareness and/or understanding of climate sciences and variability
  - Introduce and test planning tools and processes to MWSS, Maynilad and Manila Water that integrate climate change-related factors
- Established linkage with peers – U.S. Palm Beach County Water Utilities Department and National Center for Atmospheric Research (NCAR)

Partnership Framework

Recipient Partners
MWSS
Manila Water
Maynilad Water

Climate science, climate variability, WEAP, XLRM, climate-proofing

USAID ECO-Asia and WaterLinks facilitate/fund

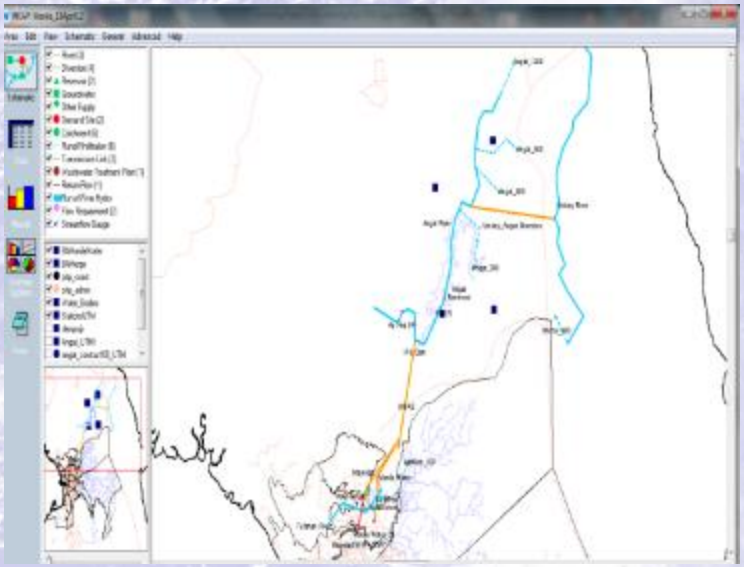
Resource Partners
Palm Beach
NCAR

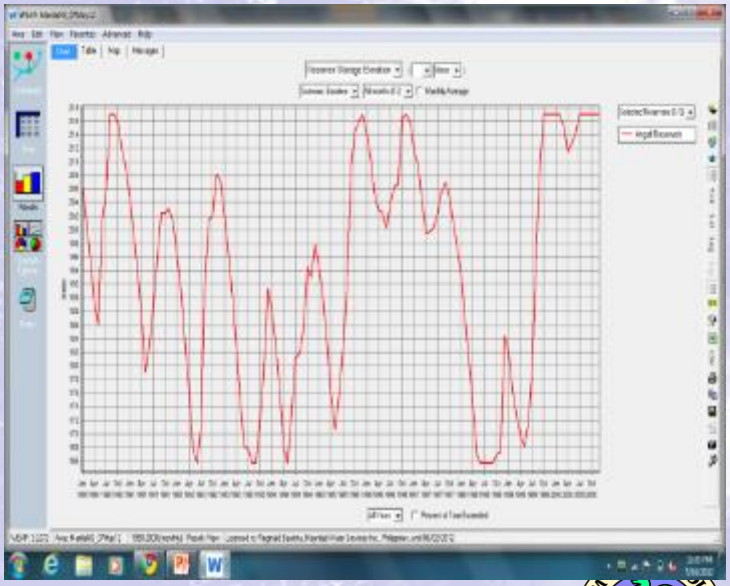
Coordinate and share information

Other partners
PAGASA
National Power Corporation
PAWD

Outputs and Outcome

- Trial model runs for Metro Manila's water system (Angat Dam)
- Confirmed need to collect useful and analyze climate-related data
  - Better linkages with PAGASA
- Increased understanding of CC impacts to operations (inc climate-proofing efforts)
- Opportunity for improved analysis
  - Operations planning for dams
  - Water quality in the dams
  - Tributaries flow in watershed





Anticipates Climate Change Impacts

Palm Beach County Water Utilities (PBCWUD)will be most affected by these climate change impacts:

- Sea Level Rise
  - Salt Intrusion- easterly utilities
  - Flooding
- Tropical Storm Activity
  - Storm Frequency increasing ??
  - Storm Intensity
- Precipitation Patterns
  - Rainfall return periods decreasing, extended dry periods
  - Inflow & Infiltration
- Future Demand Forecast
  - Water demands increase f(temp)
  - Population Growth/Environmental Migration

How has PBCWUD adapted ?

- Diversification of Water Resources
- Climate Resilience
- Salt Water Intrusion/Inland Supply
- Reducing Infiltration/Inflow
- Facility Planning (Noah's Ark)

Diverse Water Resources

- ASR (Aquifer Storage and Recovery)
- C-51 Reservoir (surface water storage)
- Wastewater Reuse (supplement local groundwater, multiple use water)

Climate Resilience

- Hardening of Facilities
- Continued Operations
- Post Disaster Recovery

Hurricane Hardening

We are hardening utility facilities to reduce potential damage during a Hurricane

- $ 1.2 million for Hurricane Hardening in FY 2008 and 2009,
- Improvements made at Water Treatment Plant #3, Southern Region Operations Center, Southern Region Water Reclamation Facility and 2 Pump Stations
- Provisions for Category 4-5 Storms
- Design-build contract for Emergency Rebuilding

Hurricane Hardening Treatment Facilities

Lift Station Plan

- Rotate portable generators among several lift stations
- Provide skid mounted generators at master or high flow lift stations
- 222 generators available

Skid Mounted Generator at Lift Station

Central Monitoring Facility (aka Hurricane Bunker)

- Will contain dispatch services, SCADA and monitoring
- Designed to withstand a Cat 5 Hurricane
- Cost $ 1.9 Million

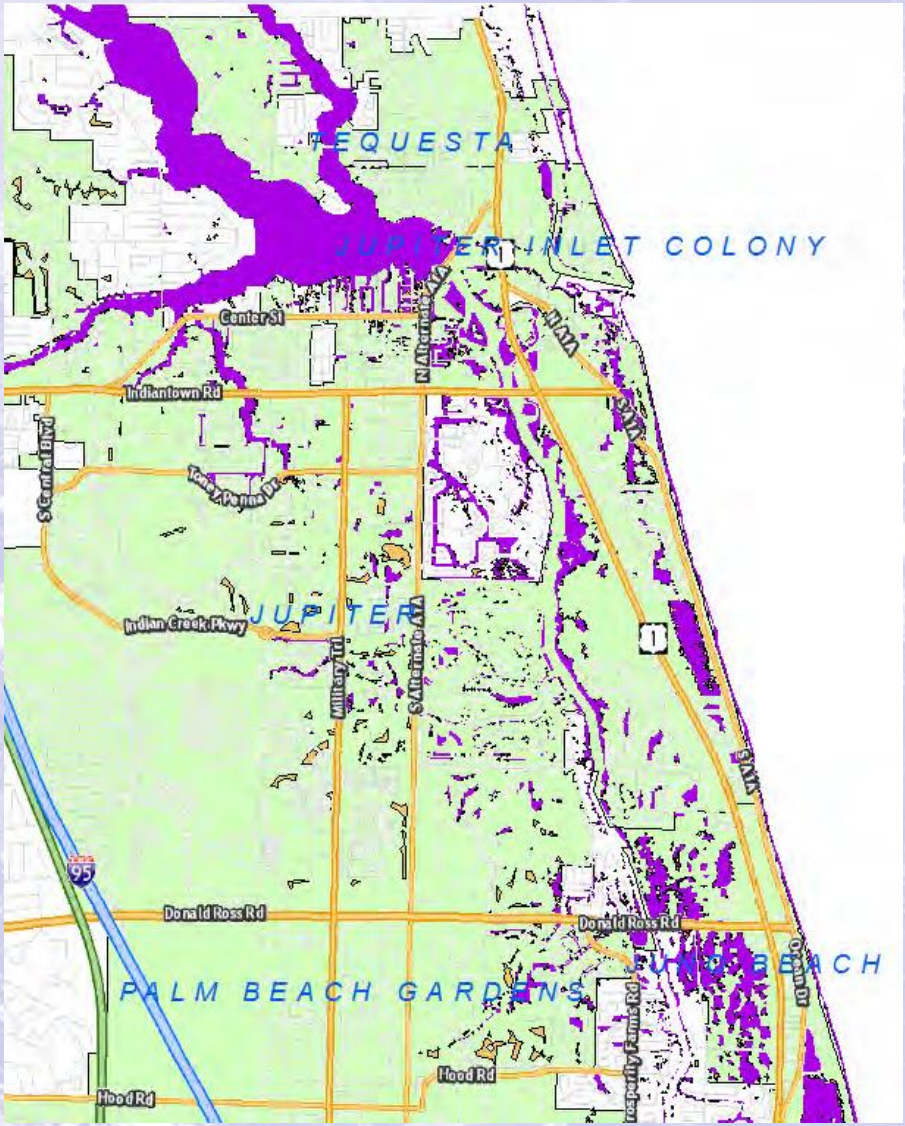
Disaster Recovery Plan

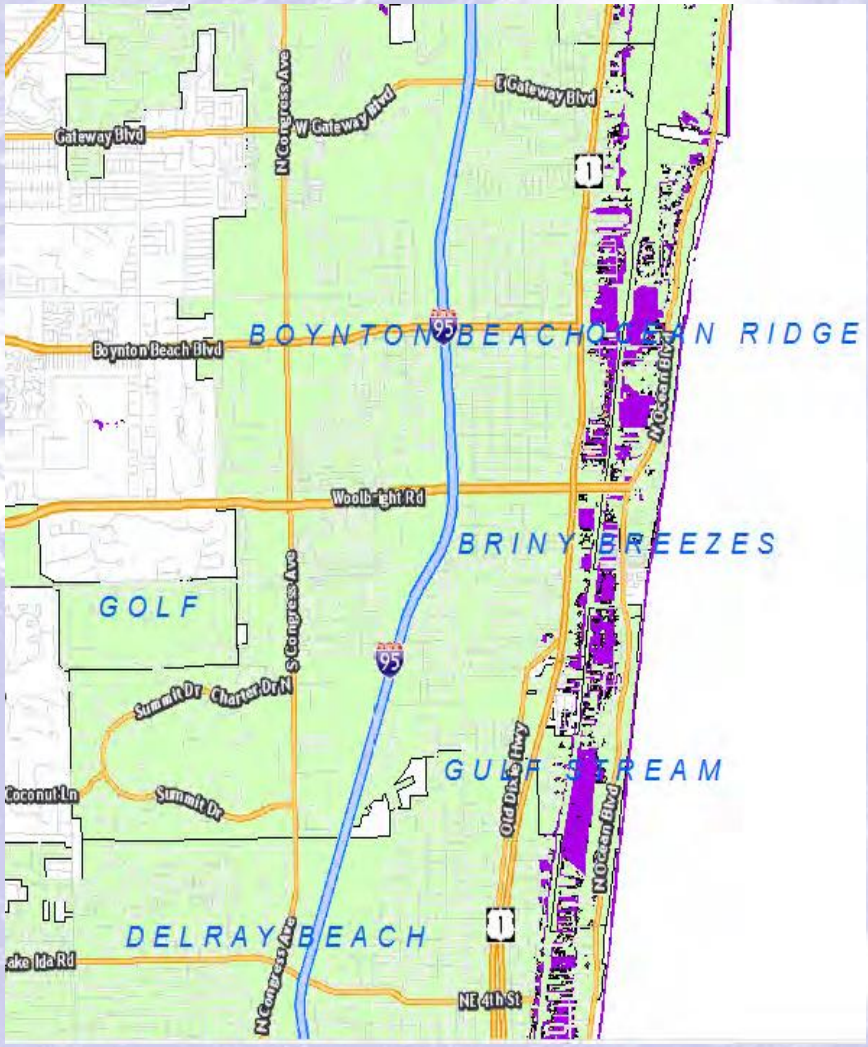
- Disaster recovery through design build contract with CDM Smith. For reconstruction of damaged facilities.
- Service Level for Category 1-3 Hurricane
  - Maintain continuous water pressure
  - No system-wide boil water order
  - Maintain wastewater treatment capability
  - Minimize sewage overflows due to loss of power
- Service Level for Category 4-5 Hurricane
  - Maintain water in storage tanks
  - Provide water for water tank trucks
  - Supply water to emergency distribution centers
  - Isolate plants or key distribution lines
  - Restart/ maintain water plant operation
  - Restart/ maintain regional wastewater plants

Salt Water Intrusion/Inland Supply

- Salt water intrusion will limit water supplies for the coastal utilities.
- Maintain excess water treatment capacity to allow supply of coastal communities with potable water.

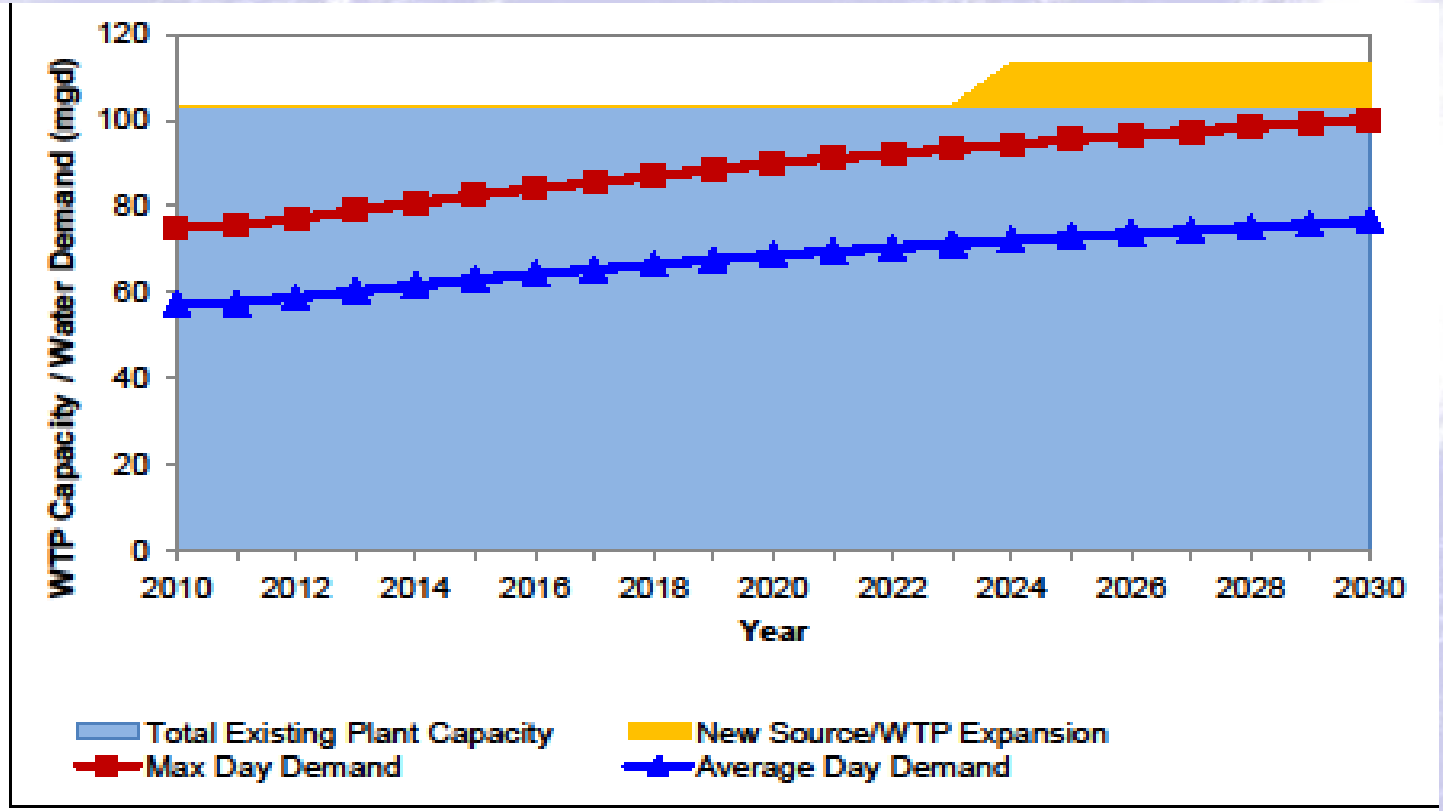
3 foot SLR North/Central County



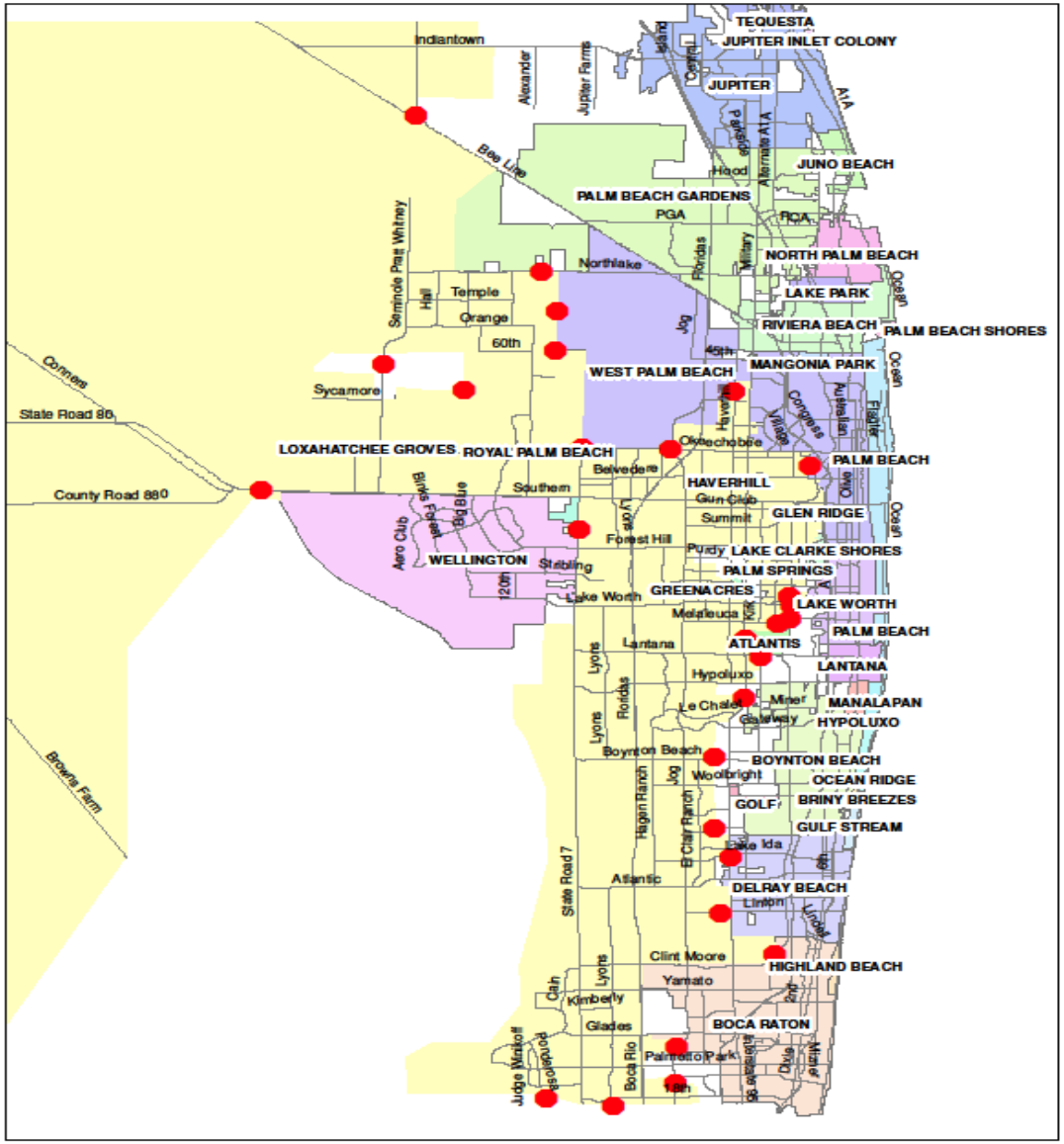


Reference: Southeast Florida Regional Climate Change Compact Inundation Mapping and Vulnerability Assessment Work Group. August 2012. Analysis of the Vulnerability of Southeast Florida to Sea Level Rise

Excess WTP Capacity

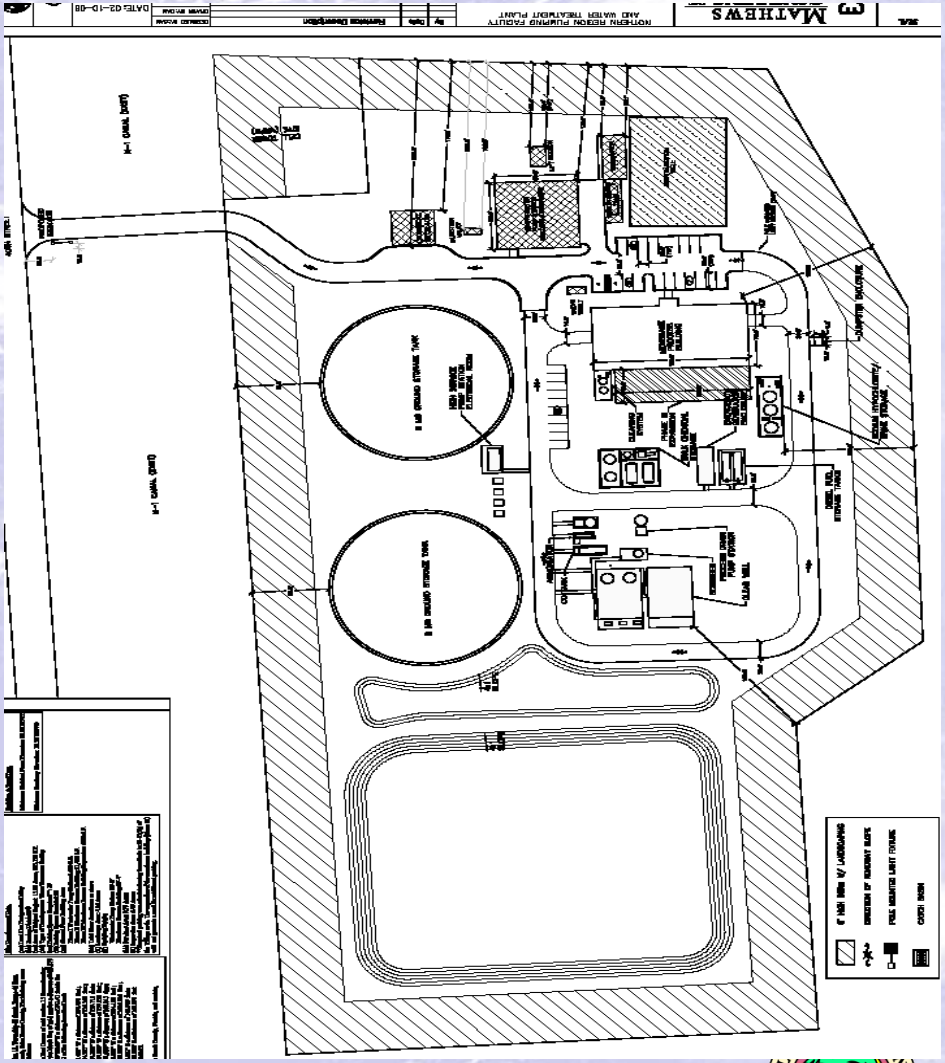


Water Interconnects



Facility Planning

- Have a plan to address rapid increase in population.
  - *Future Northern Region WTP, site plan approved*.



Inventory of Critical Equipment Elevations

Water Facility		Elevation (ft)
WTP#9	FIN. FL. EL. (88)	16.50
Strainers		26.50
HSP/ Feed/ Concentrate Pump		18.83
Cartridge Filter		19.83
Transfer Pump Clearwell		28.66
Bulk Chemical Storage Wall		17.00
Ammonia Meter		21.00
Membrane Building FL.		16.50
Master WW Pump Station		16.34
Chlorine Building EL.		15.88

Issues and Challenges

- Including climate impacts into CIP planning
- Complexity of understanding climate models
- Access to downscaled climate data
- Funding of climate resilience projects
- Political will and commitment

Future

- Inventory of critical facility and equipment elevations and flood risk
- Fund Phase 2 of climate resilience projects
- Cooperate and maintain involvement with local Cities and Counties on Climate Adaptation
- Mentoring of Utilities overseas on climate adaptation and disaster risk reduction
- Build a more stainable climate resilient Water Utility

Questions