

“Addressing Human Environment Challenges Related to the Need for Clean Water and Sanitation in Puerto Rico: A Silent Tsunami”

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PRESENTATION OVERVIEW

- Need for Clean Water and Sanitation
- Potential Impacts of Climate Change on PR's Groundwater
- Lesson Learned and Recommendations

THOUGHT FOR TODAY

“The opposite of love is not hate, it’s indifference. The opposite of art is not ugliness, it’s indifference. The opposite of faith is not heresy, it’s indifference. And the opposite of life is not death, it’s indifference.”

Elie Wiesel, Romanian-born journalist and author

Environmental Law and Policy

Maxim

‘Whatever we don’t do today, will
affect us tomorrow’

PART ONE

NEED FOR CLEAN WATER AND SANITATION

Planet Water



UN RESOLUTION 64/292 (August 3, 2010)

“Recognizes the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights”

UN Commission for Latin America and the Caribbean

“Water scarcity (due to drought) and excess water (due to more frequent and torrential rainfall) are expected to increase the burden of diarrhoeal disease, which is spread through contaminated food and water....Torrential rainfall can trigger sewage overflows, contaminating groundwater that is often used for crop irrigation and a source of drinking water, causing diarrhoeal diseases....”

PART TWO

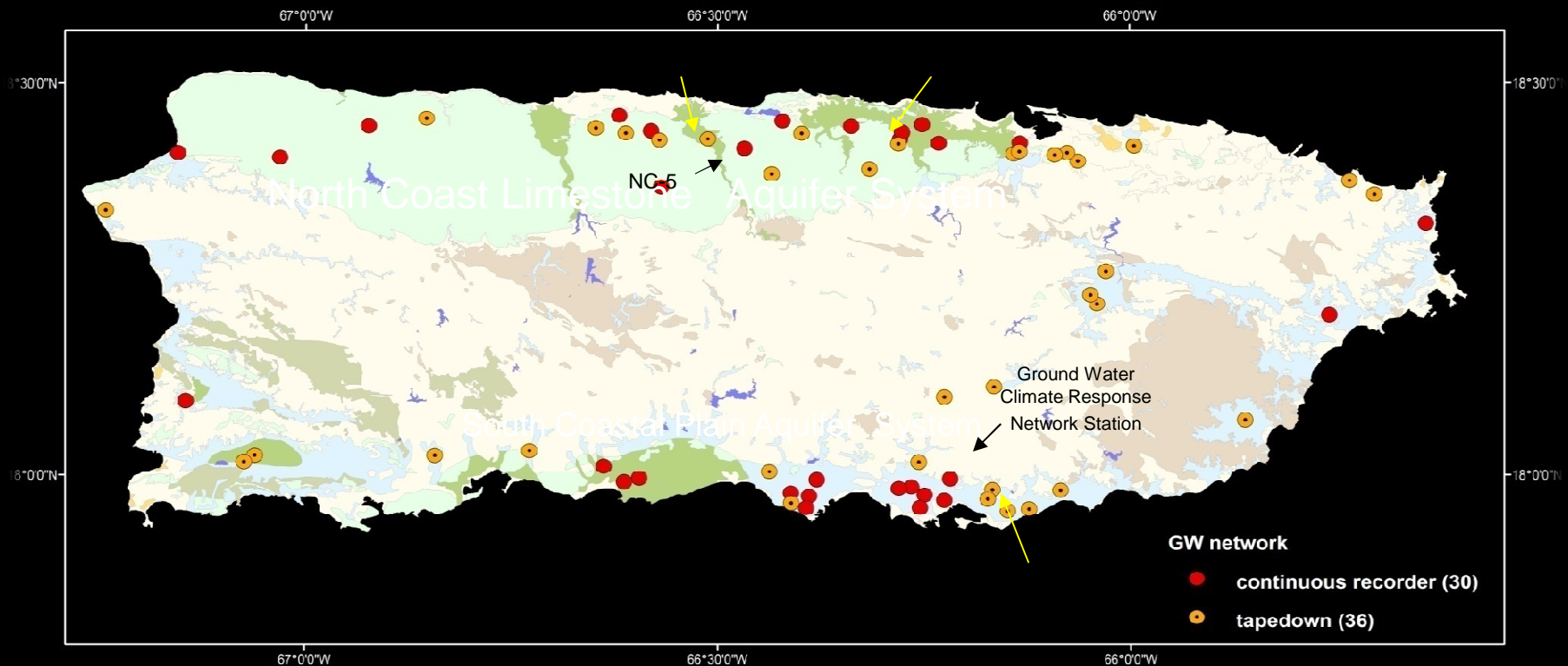
POTENTIAL IMPACTS OF CLIMATE CHANGE ON PR's GROUNDWATER

Puerto Rico

Potential Effects of Climate Change on PR's Groundwater Resources

- Groundwater Monitoring Network (83 municipal wells) (maintained by USGS) (pr.water.usgs.gov)
- USGS survey of private wells (180 industrial/commercial facilities and 500 agricultural facilities)

Active Groundwater Monitoring Network



Hydrogeology

- INTERGRANULAR AQUIFERS
- INTERGRANULAR UNIT OVERLAYING FISSURED ROCK UNIT-SAME AQUIFER
- FISSURED AQUIFERS (NOT INTERGRANULAR) INC KARST AND NON KARST
- LAKE
- PLUTONIC ROCKS LARGELY GRANODIORITE AND QUARTZ DIORITE
- SALINE WATER LAGOON
- STRATA WITH LOCAL AND LIMITED GW RESOURCES OR NO GW RESOURCES
- SERPENTINITE



Conclusions

- **Estimated sea level rise of 0.47 meters will definitely affect groundwater resources in PR (but these effects may not be noticeable immediately, circa 2100)**
- **Additional sea level rise may occur as CO₂ concentration levels are doubled or quadrupled. As a result, sea level rise may move from 1 to 6 meters and the effects on coastal areas and groundwater resources in PR could be devastating**

PART THREE

LESSON LEARNED

Whatever is not done in PR with respect to good environmental governance today, will affect tomorrow PR's ability to achieve sustainable development for its communities, as well as PR's ability to address the actual and expected impacts of global warming on PR's groundwater resources

Recommendation # 1

Support actions of the EPA, the Environmental Quality Board (EQB), and municipalities to adopt and implement sound and best environmental practices in conformity with the sustainable development concept for communities that rely on small water systems, and to give priority attention to this issue

Recommendation # 2

Support actions of the USGS in providing technical data and information to the EPA, the EQB, and municipalities to enhance the quality of governmental decision-making and planning as related to the expected effects of global warming on PR's groundwater resources

Recommendation # 3

Support actions of the EPA, the EQB, and municipalities to become better acquainted with treating different types of wastewater and in reclaimed water reuse, and in different sectors of PR (business/industry, agriculture, etc.)

Recommendation # 4

Support actions of the EQB to undertake a major monitoring program to check, demonstrate and follow-up on performance measures related to promoting awareness on water demand management, and the expected impacts of global warming on PR

Recommendation # 5

Support actions of academic institutions to undertake applied research and studies related to water access and water quality in PR with attention given to environmental protection and sustainable development, and to establish specialized laboratories for the physical, chemical, and microbiological analysis of water and wastewater, as well as the expected impacts of global warming on PR's groundwater resources

Environmental Law and Policy Maxim

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will affect us tomorrow’

