Geology and Water Resources of the San Diego – Tijuana area, USA and Mexico

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Objectives

Gain permission
- From Mexico City, to involve Mexican scientists and managers

Find advocates
- In Mexico, to use and improve our work

Ideally
- Create a bi-national working group
Major accomplishments

1. Found previously unknown fresh groundwater

2. Doubled capacity of a groundwater desalination facility

3. Modified the San Diego – Tijuana Earthquake Scenario
Study area — includes San Diego–Tijuana, USA and Mexico

Study area

Brackish groundwater

Fresh groundwater offshore?
History

Comprehensive, long-term study
- 18 years, $18 million, 5 agencies

Data
- Installed 16 deep, multiple-depth, monitoring well sites, with 88 wells
- Sampled groundwater quality from 100s of wells
- Measured millions of groundwater levels, at 100s of wells

Models
- Created a 3D geologic framework model
- Created a regional hydrologic model

Reports
- Publishing 10 reports documenting the data, interpretations, and models
Geology — Mapped seamlessly across the border

IBWC Binational Summit, April 2019
San Diego – Tijuana Hydrogeology
3D geologic model — Useful for groundwater and earthquakes

Groundwater desalination

Model Geology
- Water
- Quaternary
- Pli-Pleistocene
- Miocene
- Tertiary Volcanics
- Oligocene
- Eocene
- Cretaceous
- Basement

IBWC Binational Summit, April 2019
San Diego – Tijuana Hydrogeology
Hydrologic model — Simulates the entire flow system

All geology
- 6,000 feet thick
- 5 layers

All water
- Precipitation
- Surface water
- Groundwater

All time
- 20,000 yrs ago to present
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