

Modeling Water Sustainability effects on Resource Extraction in the New Mexico Permian Basin



PRESENTED BY

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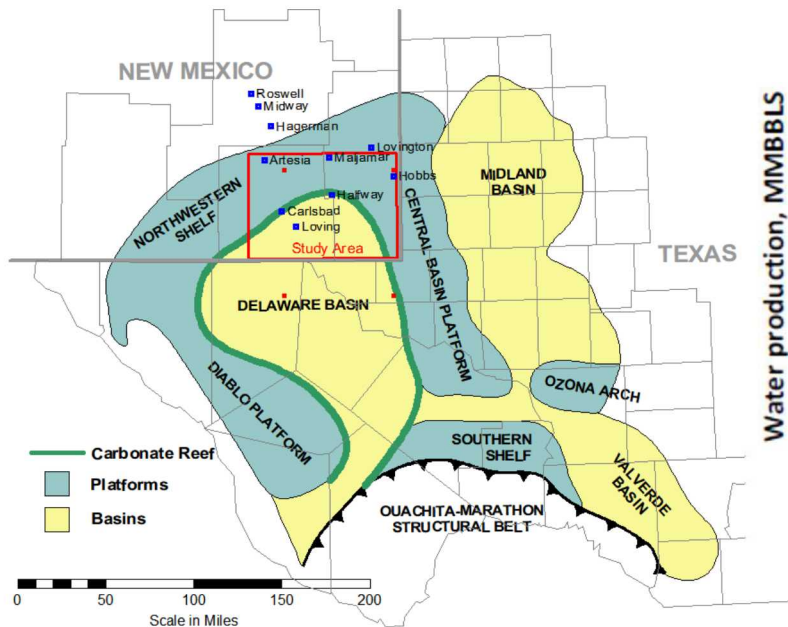
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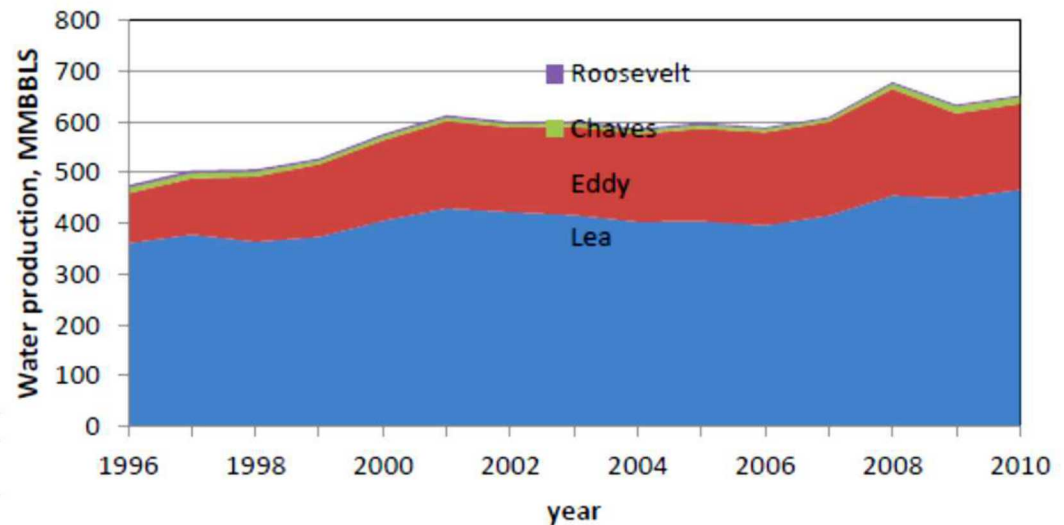
Problem Statement

With the increase in drilling activity and hydraulic fracturing in particular, there is **need to insure** the regions ability to **meet increasing water demands** in a manner that is **sustainable while also avoiding unintended, localized impacts**



Study Location

Water production by county



Engler T.W., R. Balch, and M. Cather, 2012, *Reasonable Foreseeable Development (RFD) Scenario for the B.L.M New Mexico Pecos District*, Final Report submitted to Jim Stovall, Project Manager Carlsbad Field Office, 55p

Approach or Dynamic Hypothesis

Multi-disciplinary approach to identify, assess, and evaluate the **cumulative** impacts of future water demands. Of key importance is **determining the risk to water sustainability** and estimating the risk under different future scenarios

1. Data Collection
2. Field Verification
3. Field Testing and Monitoring
4. System Dynamics Modeling

Simulate the increase in drilling activity and water demand relative to each formation and water source to identify the areas/users/formations that are most vulnerable and to estimate the risk to water quantity and quality

Permian Basin Water Model (PBWater)

- Captures dynamics between aquifers (deep & shallow) and surface water
- Simulates water availability & demands over different future scenarios
 - Statistical projection
 - Static projection
- Assess localized, cumulative impacts

