

Sustainable Water Reuse for Agriculture: Identification and Classification of Nontraditional Water Sources

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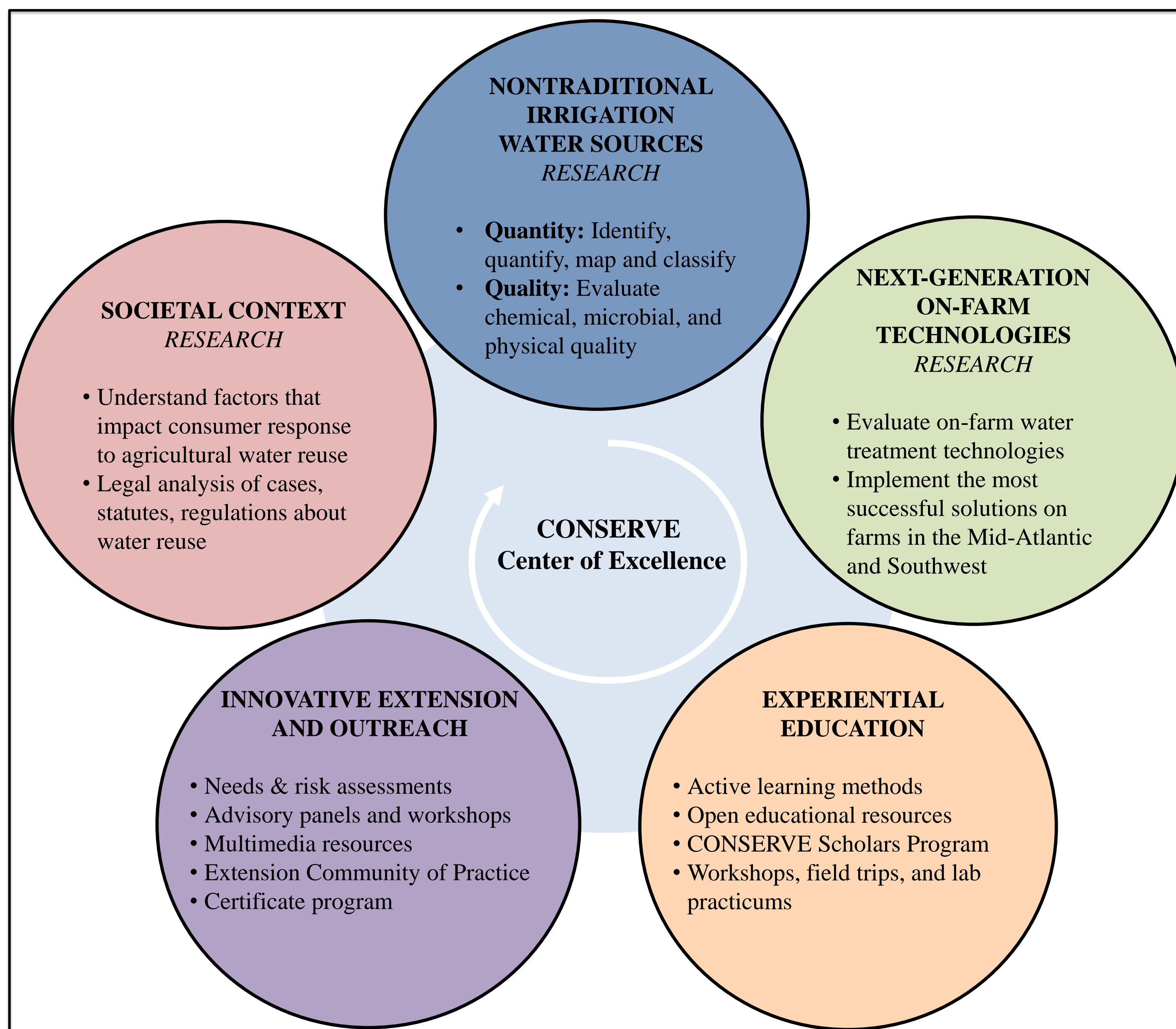
Background

- ❑ Ongoing climate variability is placing severe stress on high-quality water sources used for agricultural irrigation.
- ❑ Water reuse and the exploration of “nontraditional” irrigation water sources have become national priorities.
- ❑ Food Safety Modernization Act is shifting the focus of food safety from responding to contamination to preventing it.
- ❑ Agricultural producers must meet stricter guidelines concerning the quality of irrigation water used on food crops.
- ❑ Sustainable on-farm solutions are needed to enable agricultural producers to conserve groundwater through the safe use of emerging nontraditional water sources.

CONSERVE

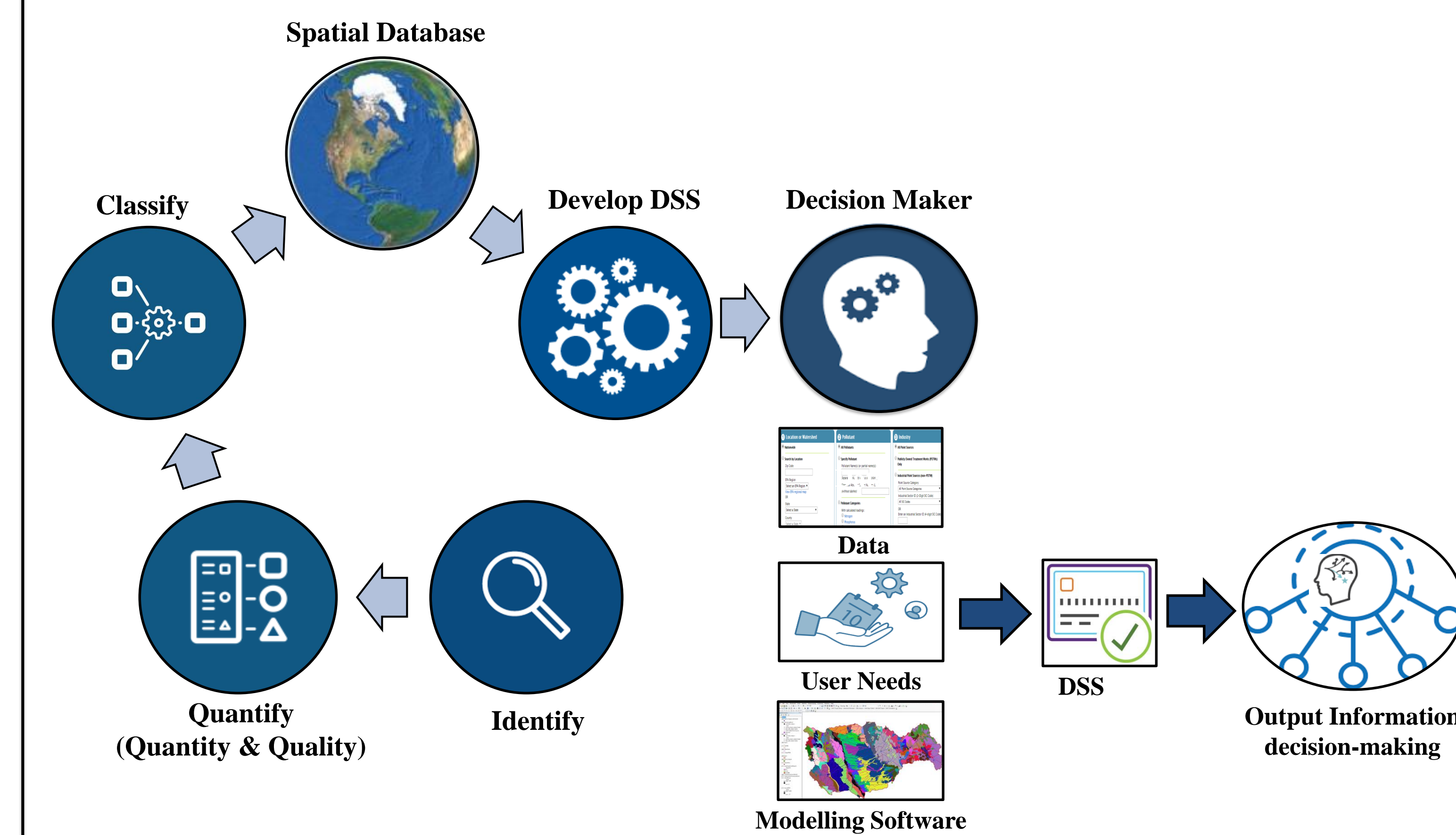
- ❑ **CONSERVE** (COordinating Nontraditional Sustainable waterER Use in Variable climatEs): A Center of Excellence at the Nexus of Sustainable Water Reuse, Food, and Health.
- ❑ The **long-term goal** of CONSERVE is to facilitate the adoption of transformative on-farm solutions that enable the safe use of nontraditional irrigation water on food crops and effectively reduce the nation’s agricultural water challenges that are exacerbated by climate change.
- ❑ **Mission:** To facilitate the adoption of transformative on-farm solutions that enable the safe use of nontraditional irrigation water on food crops.
- ❑ **Vision:** A national resource bringing together research, outreach, and education to effectively reduce the nation’s agricultural water challenges that are exacerbated by climate change.

Approach

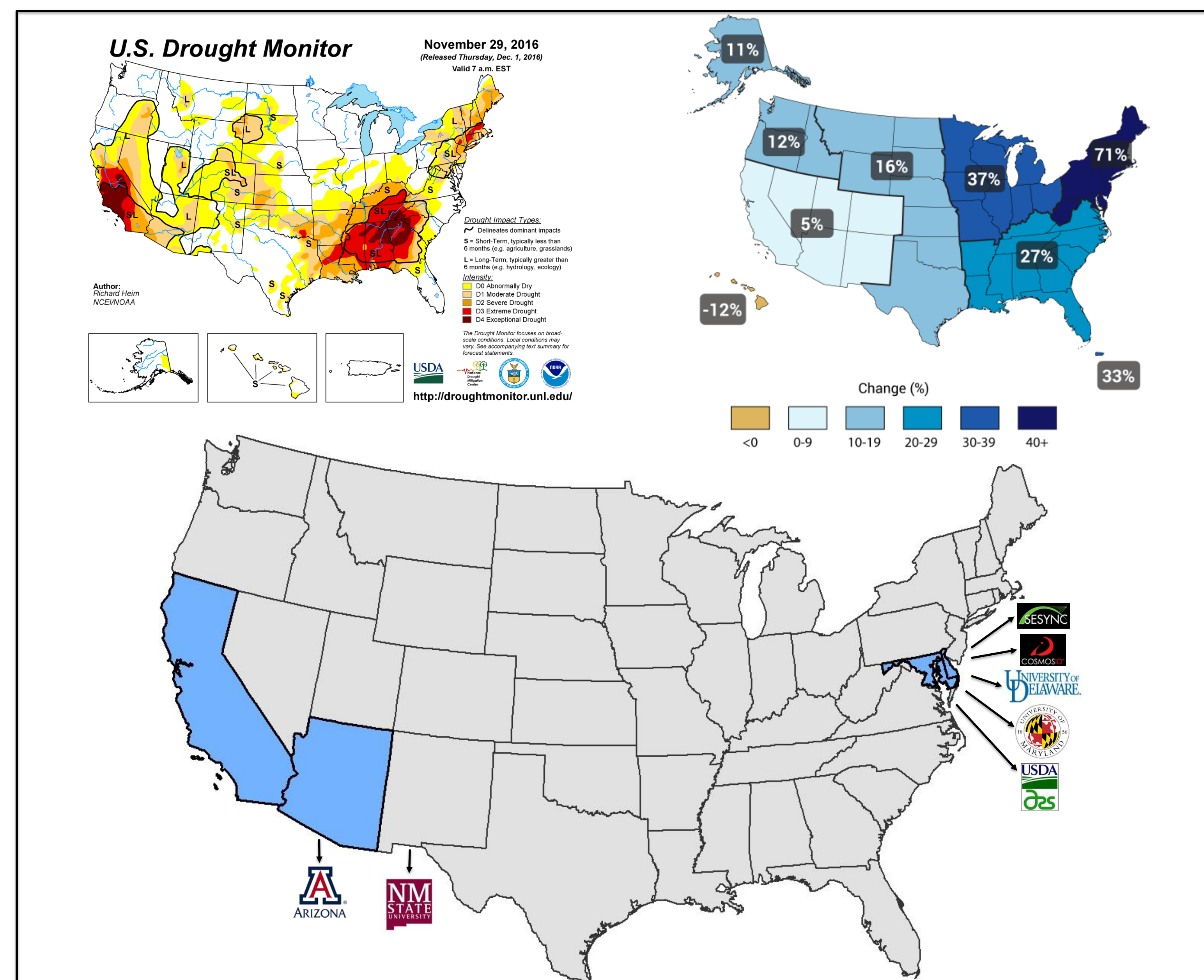


Objective

- 1) Identify potential nontraditional water sources that best meet local or regional water management needs.
- 2) Classify the nontraditional potential water sources in terms of quantity, quality and ease of access.
- 3) Create an user-friendly spatial databases that accessible to the water mangers and researchers.
- 4) Develop Decision Support System (DSS).



Study Region



Case Study Example: California

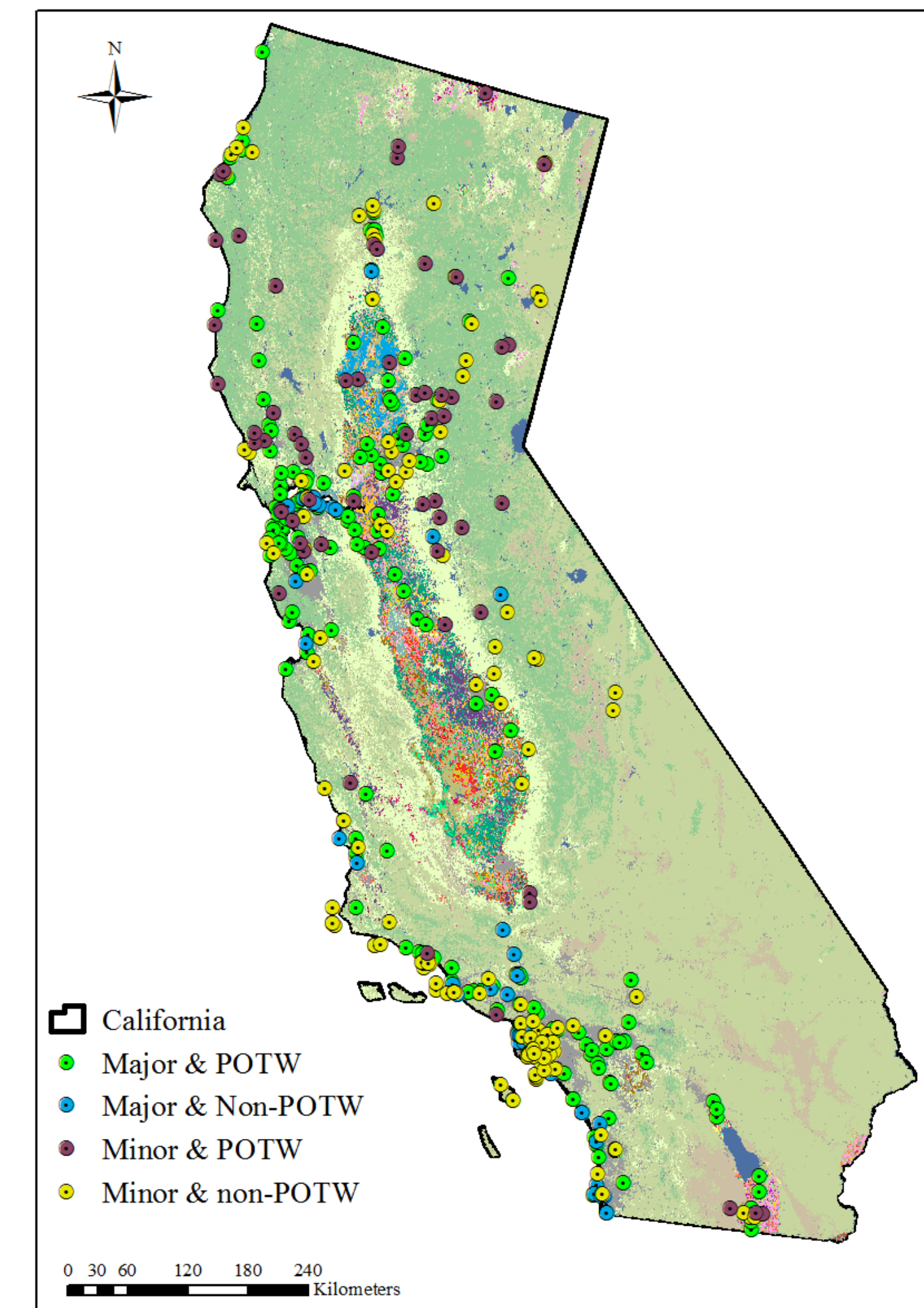
“The Central Valley, where many of the nation’s fruits and nuts are grown, has been most severely affected by the drought!”

Agriculture Sector:

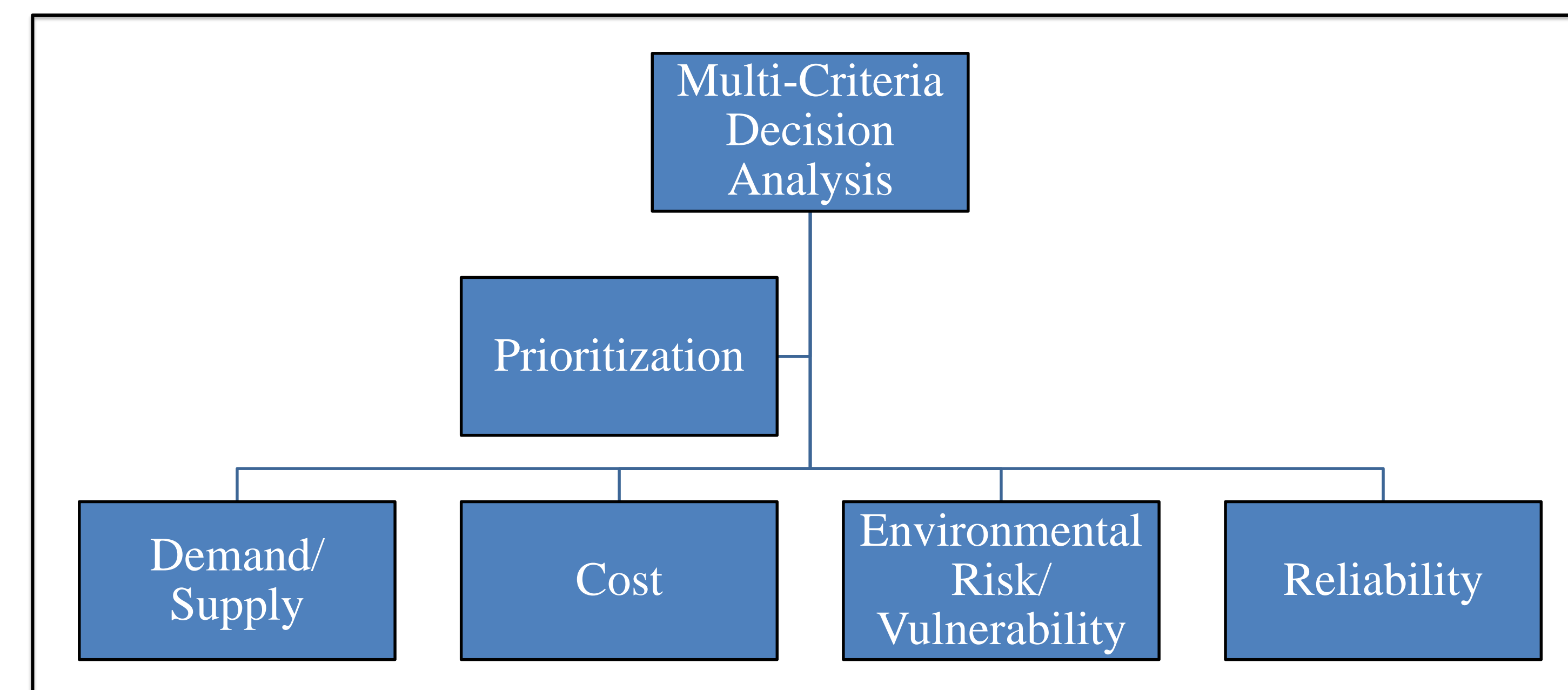
- ❑ Single most productive tract of land in the world
- ❑ 230 varieties of crops
- ❑ Produces two thirds of the nation’s produce
- ❑ 80 % of the world’s almonds
- ❑ Citrus and some of the nuts are grow well in the Mediterranean climate

Non-traditional Water Source:

- ❑ Wastewater Treatment Plant (WWTP)
- ❑ Major Facility (≥1 million gallons/day (MGD)) and Minor (<1 MGD)
- ❑ Publicly Owned Treatment Works (POTWs) are typically owned by local government agencies, and are usually designed to treat domestic sewage.
- ❑ Total 174 Major and POTWs



Multi Criteria Decision Analysis



Future Plan

- ❑ Evaluate the sustainable non-traditional water sources scenario for an agriculture-based watershed through Soil and Water Assessment Tool (SWAT).
- ❑ Develop and rank the decision criteria and sub criteria for non-traditional water supply system.
- ❑ Develop the decision support system (for two different case studies or using two different methods).
- ❑ Analyze the future water demand under different future climate and land use changes scenarios.
- ❑ Evaluate the DSS for future scenarios.