SB X2-1
Nitrate in Groundwater
Report to the Legislature

OVERVIEW AND KEY OUTCOMES

Interagency Task Force Meeting

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UCD Project Team Leaders

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- Graham Fogg, Subsurface Hydrology
- Thomas Harter, Subsurface Hydrology
- Richard Howitt, Agricultural Economics
- Katrina Jessoe, Water Quality Economics
- Jay Lund, Water Resources Management
- Jim Quinn, Spatial Data Mgmt. in Environmental Policy
- Stu Pettygrove, Soils and Nutrient Management
- Tom Tomich, Agricultural Sustainability Institute
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FUNDING PROVIDED BY:

- **Proposition 84 / SB X 2-1 => CDPH => SWRCB**

UCD Project Team

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- Mimi Jenkins
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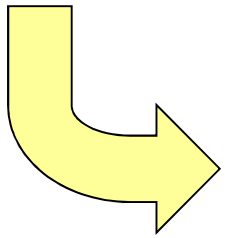
- Vivian Jensen

- …many undergraduate students….

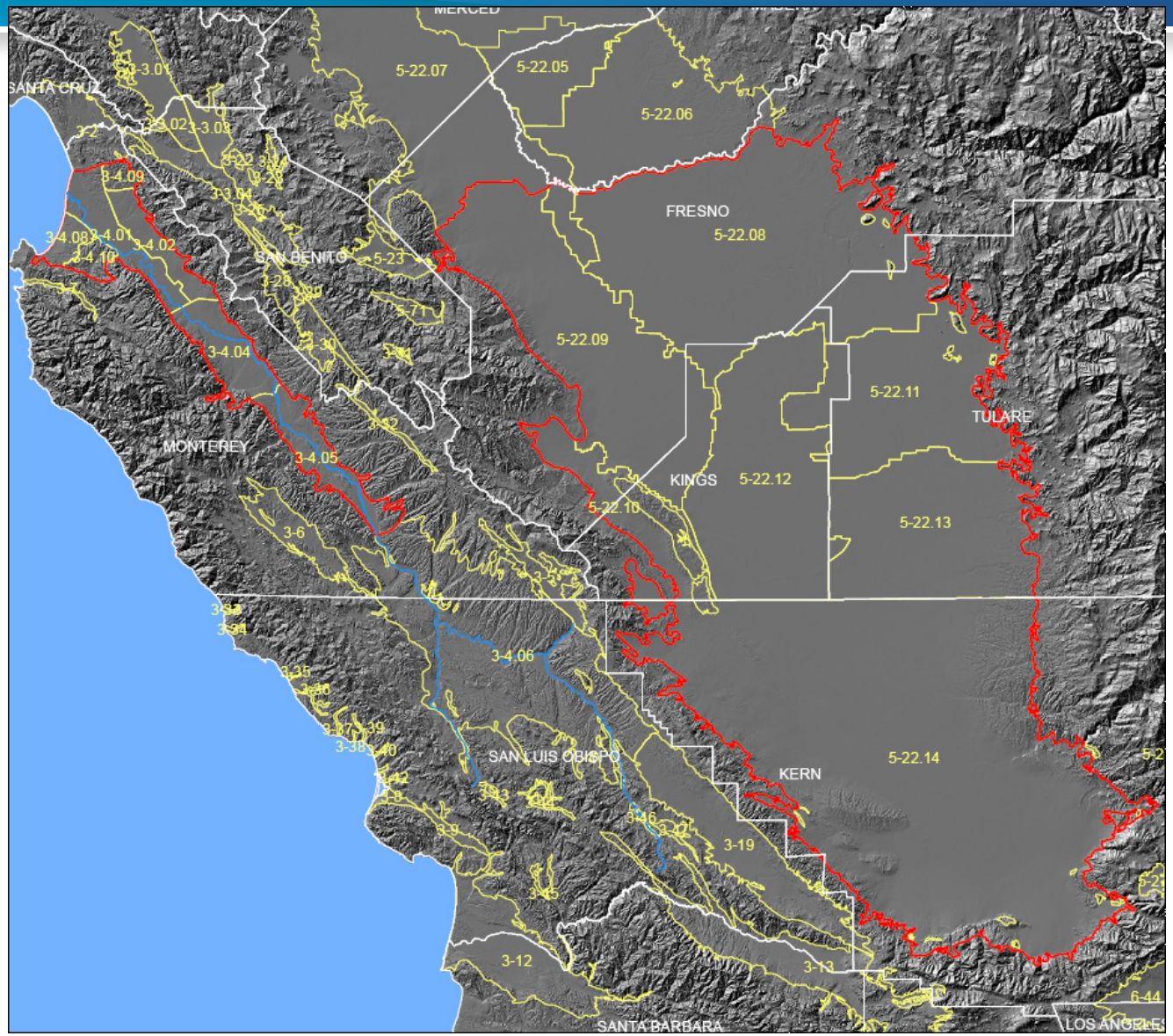
Motivation

- Nitrate most common groundwater pollutant
- Tulare Lake Basin and Salinas Valley among most affected groundwater basins in CA
- Domestic well water typically untreated / unknown quality
- High nitrate costly to treat for small / disadvantaged communities

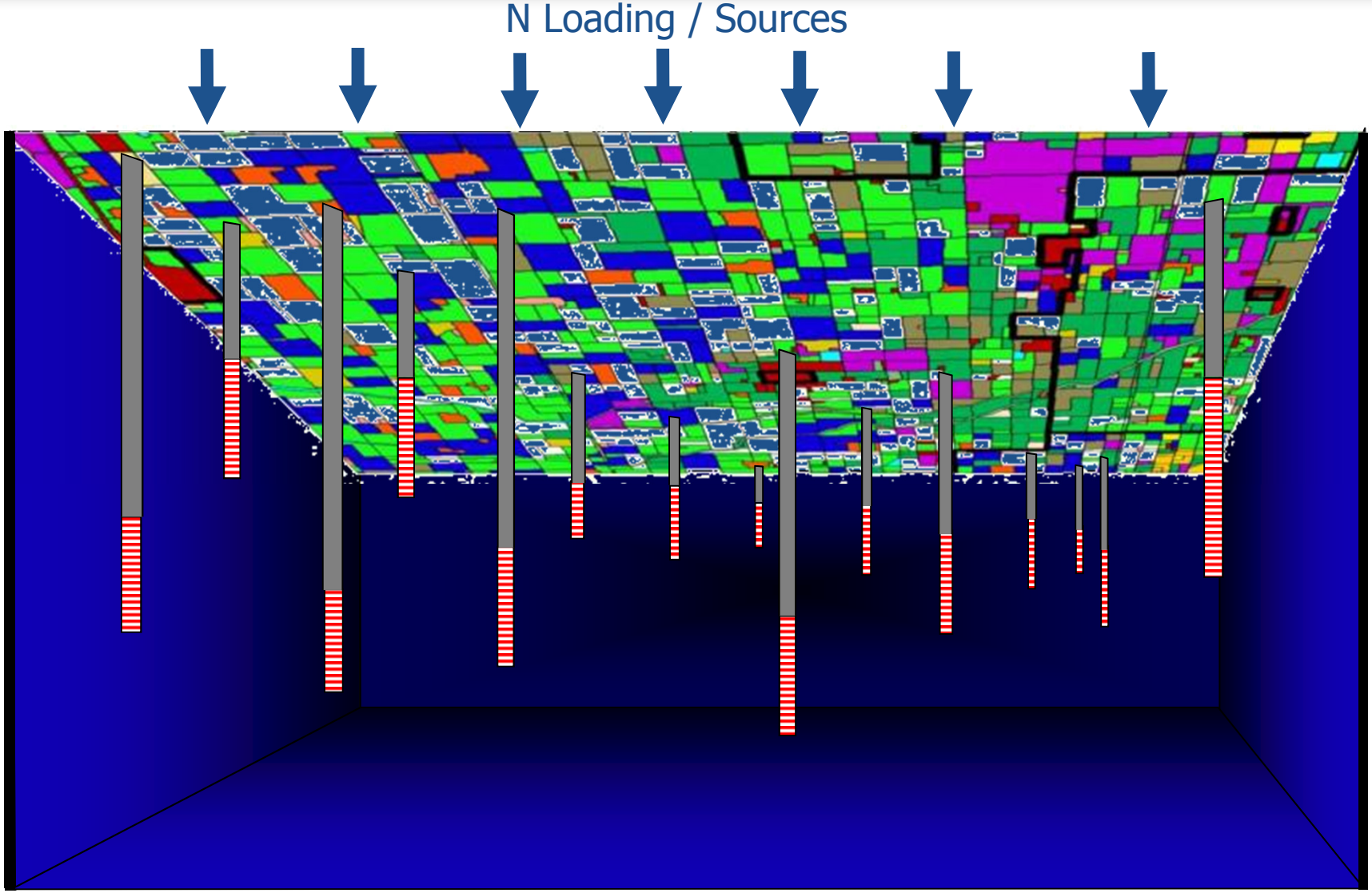


How can this be best fixed?

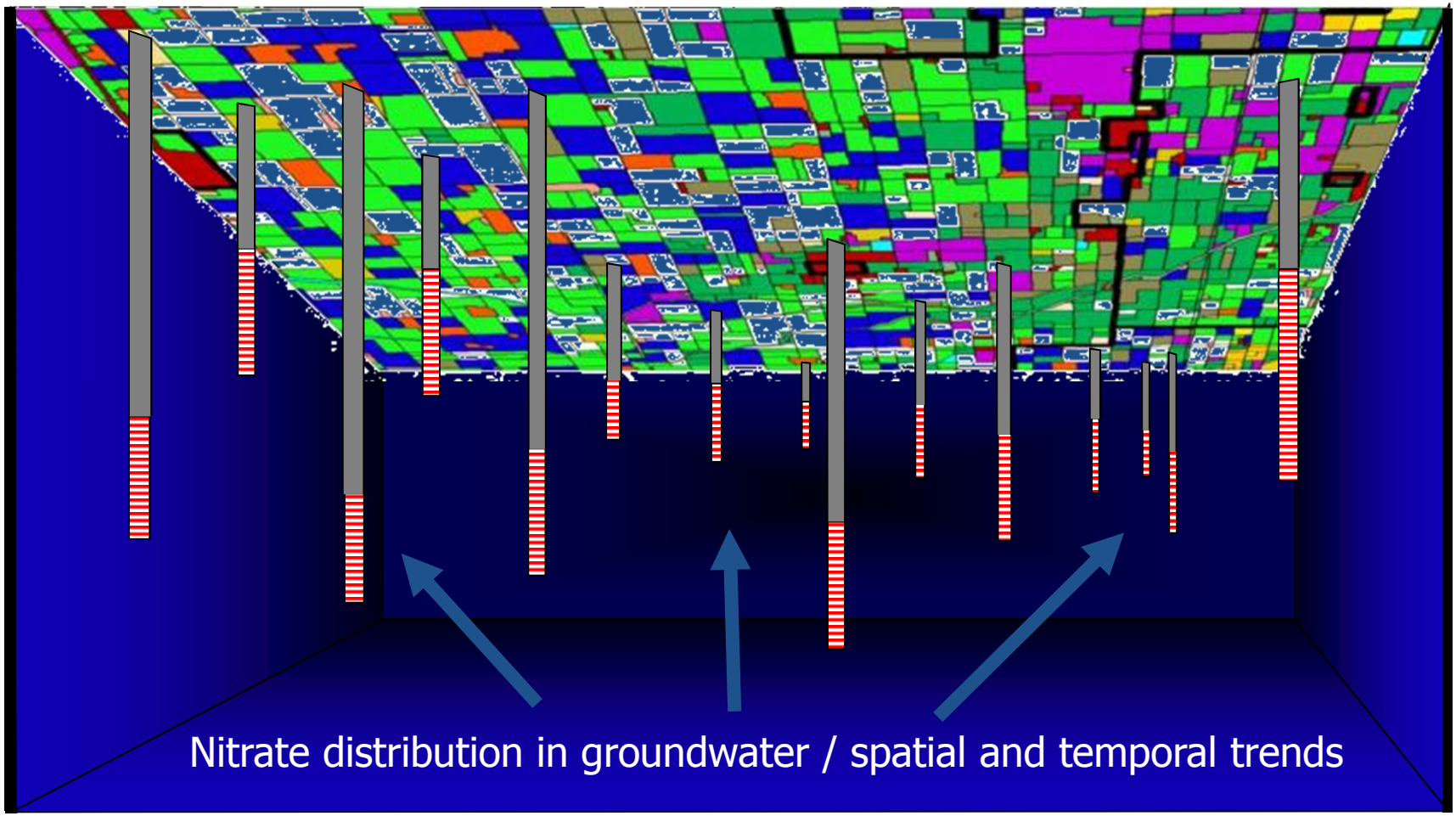
Project Area



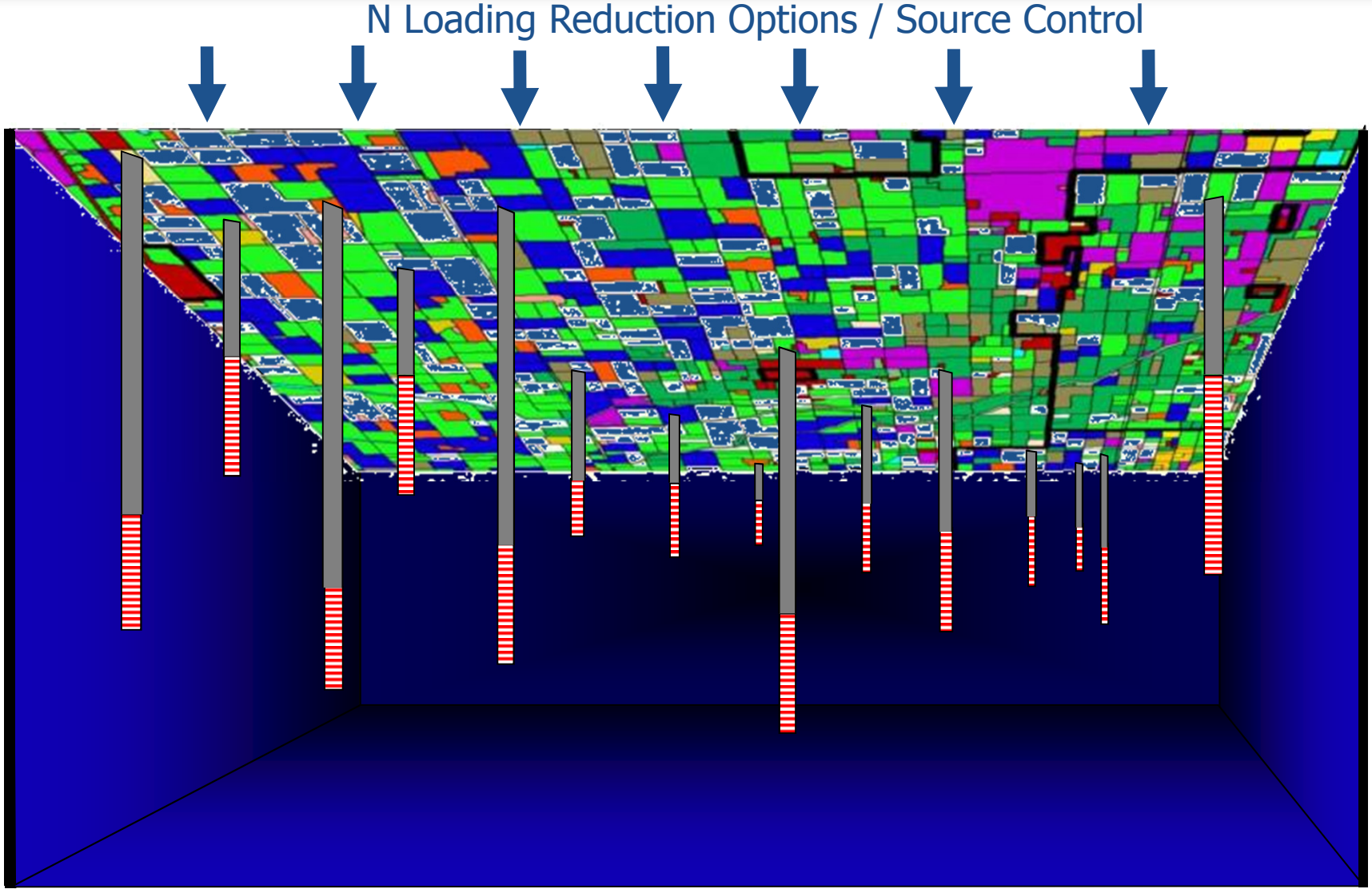
Key Study Outcomes: Issues



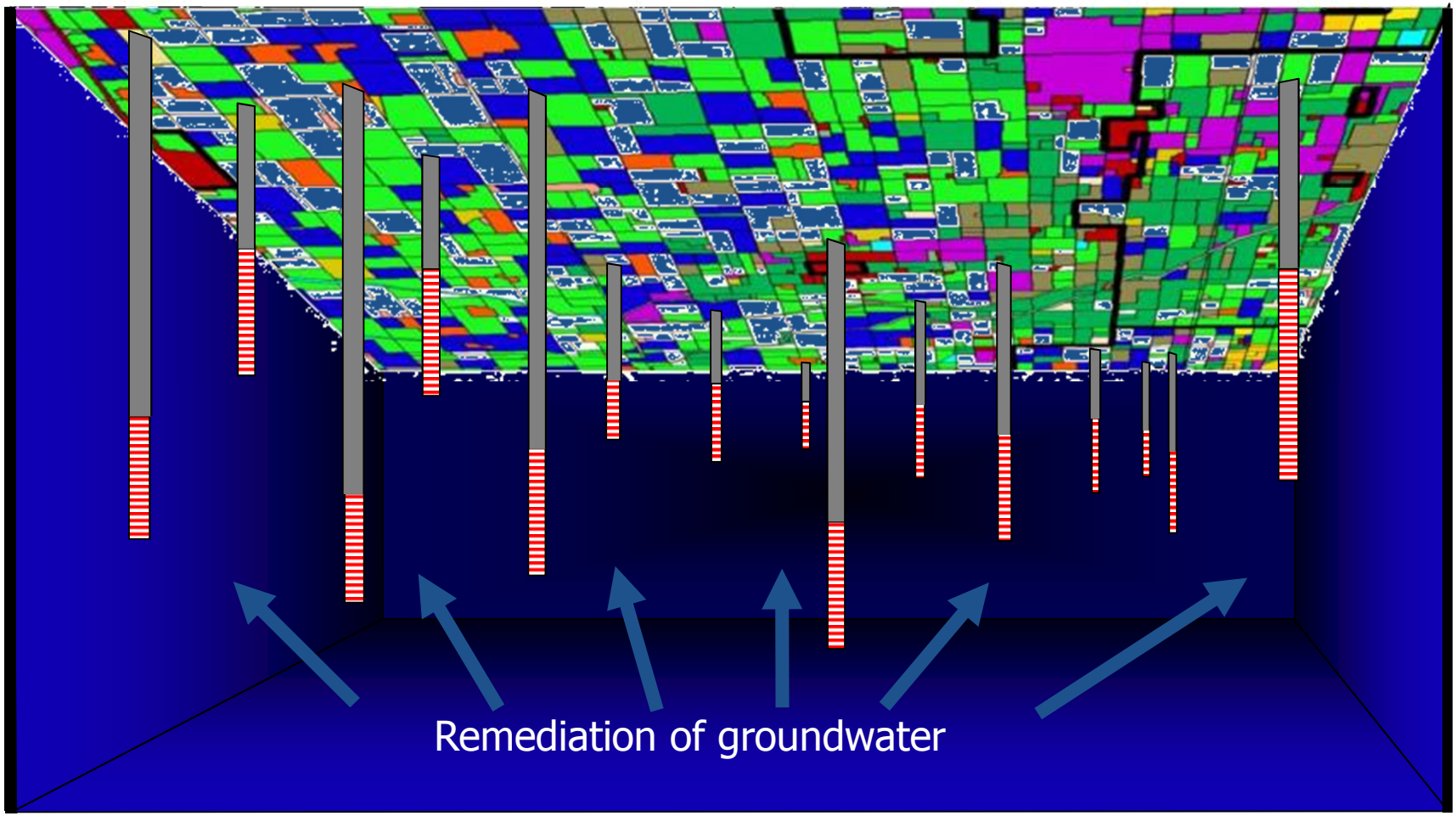
Key Study Outcomes: Issues



Key Study Outcomes: Actions

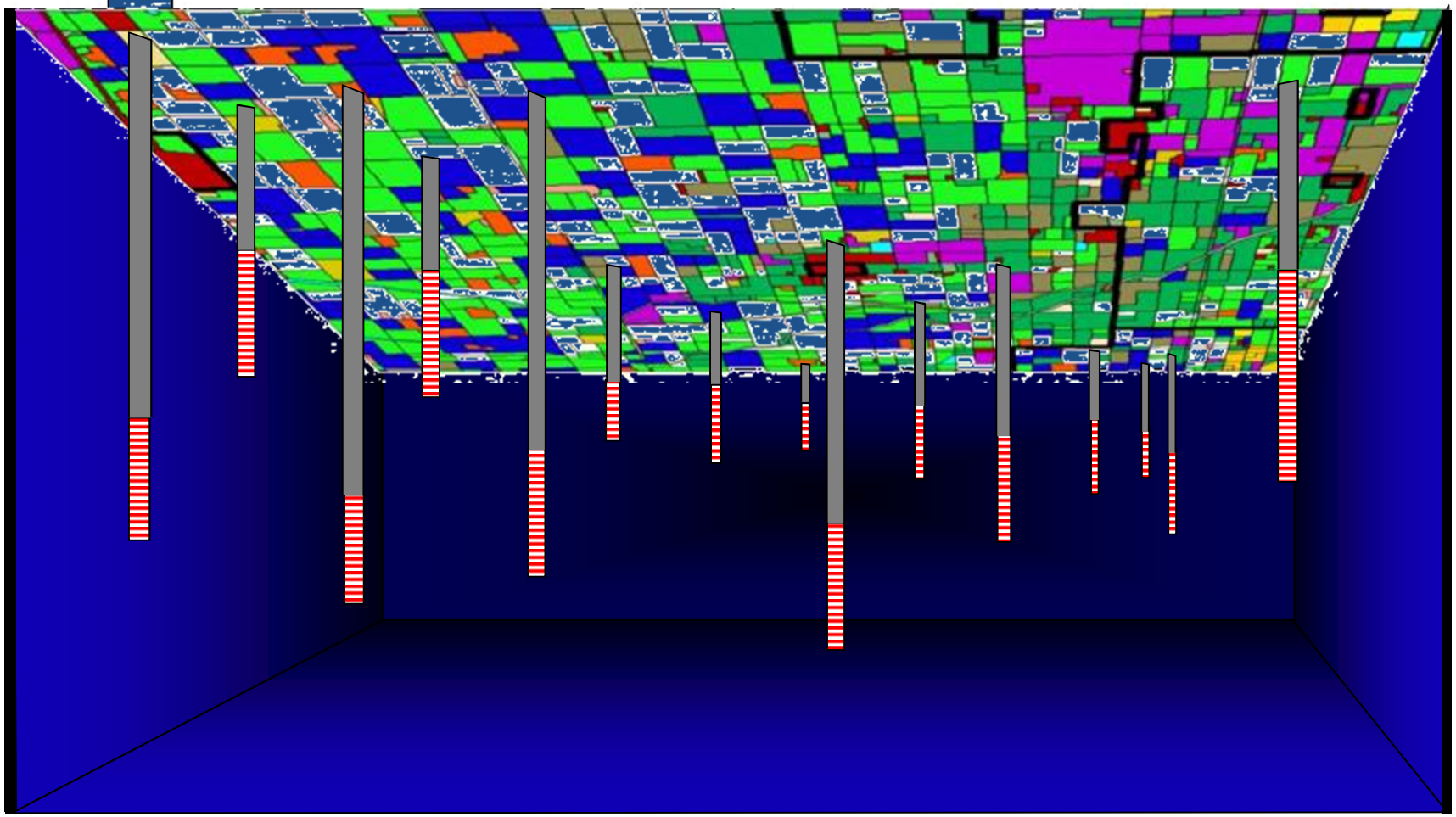


Key Study Outcomes: Actions



Key Study Outcomes: Actions

N treatment options



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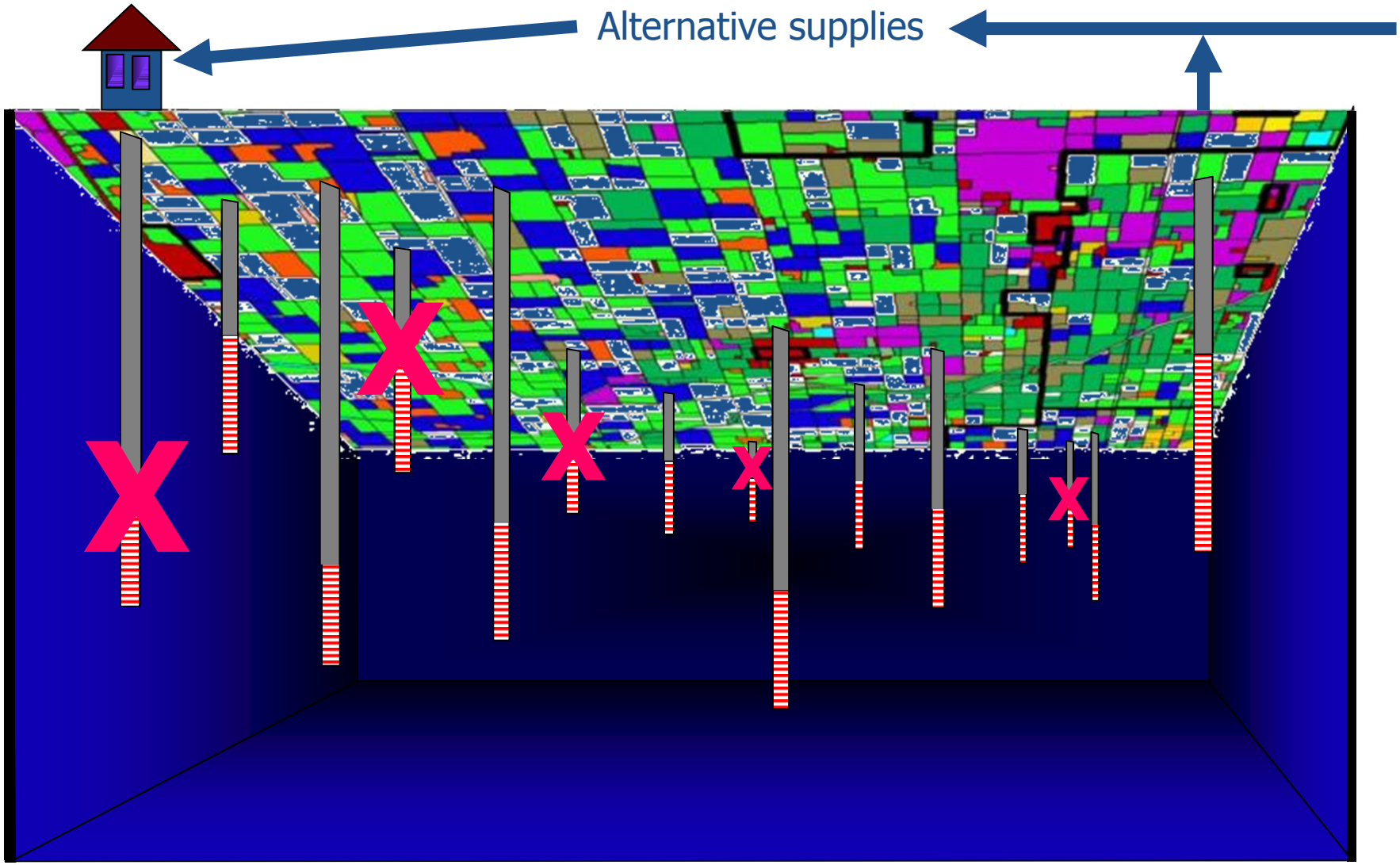
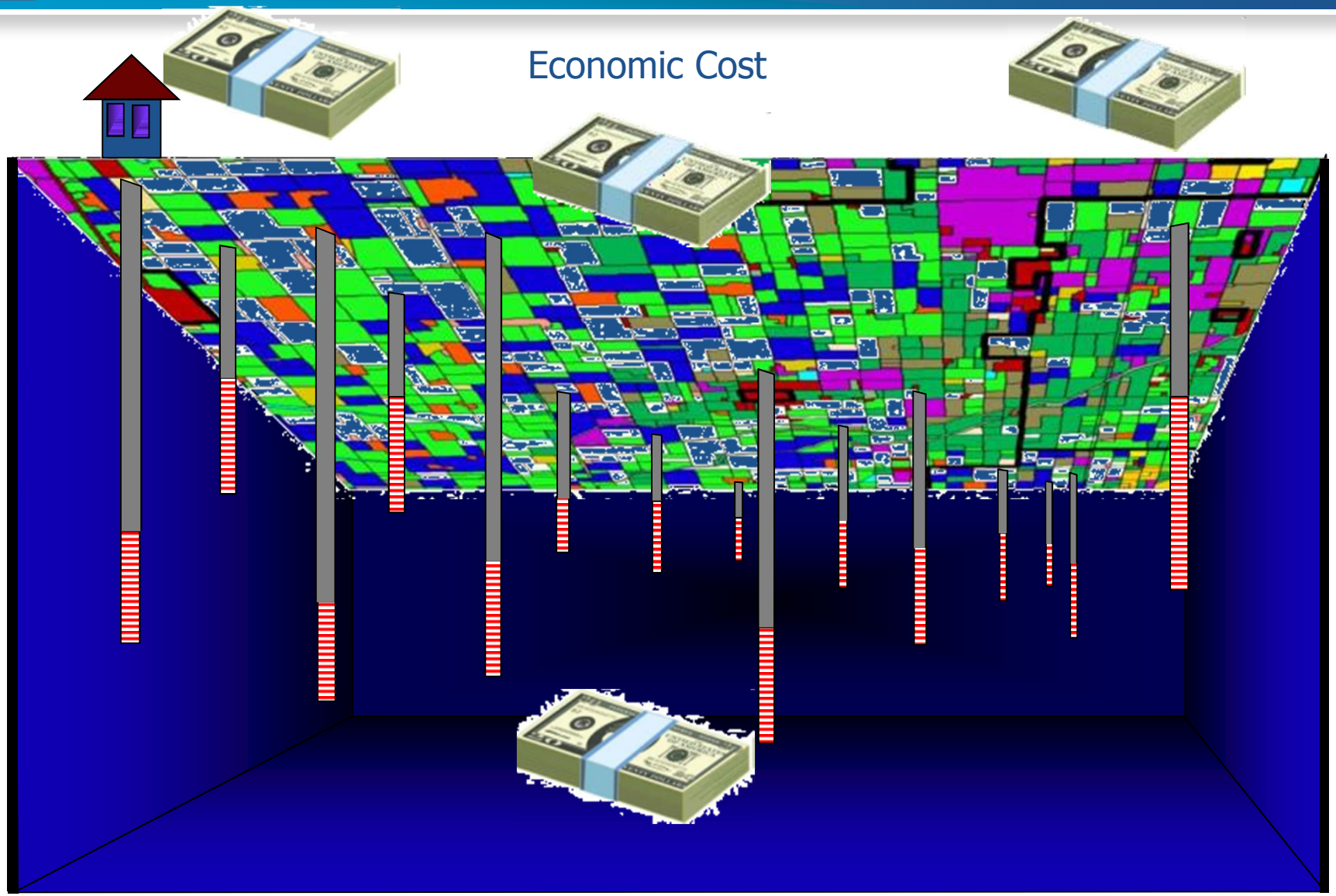
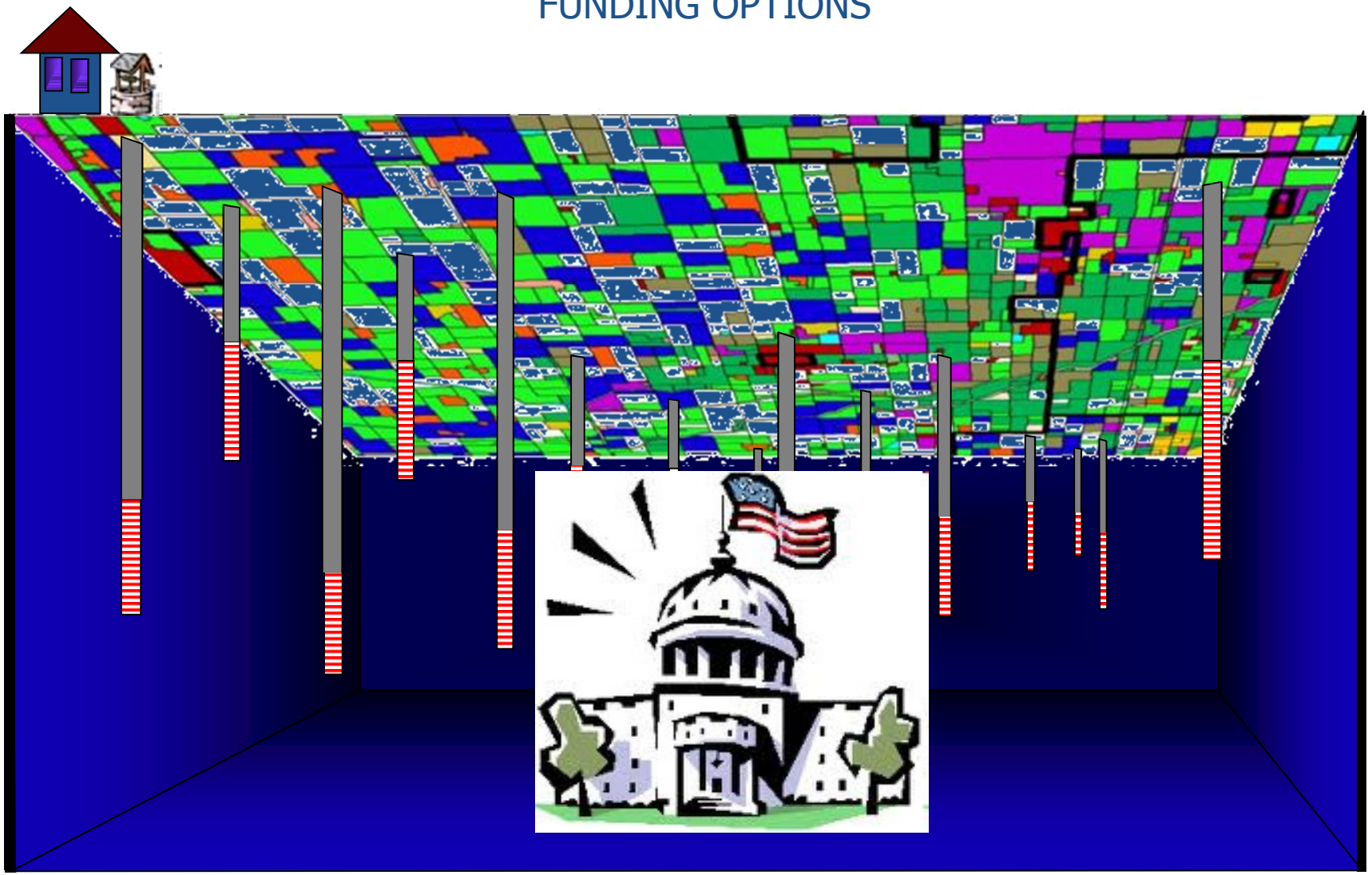


Key Study Outcomes: Costs



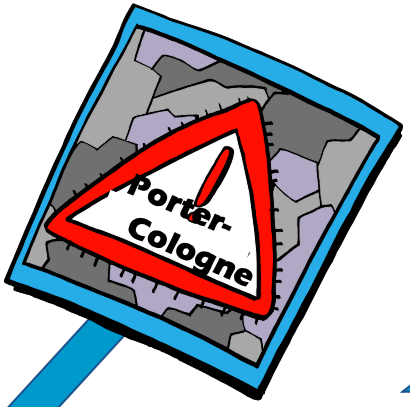
Key Study Outcomes: Funding

FUNDING OPTIONS



Framework for Funding and Regulatory Options

N Loading Reductions

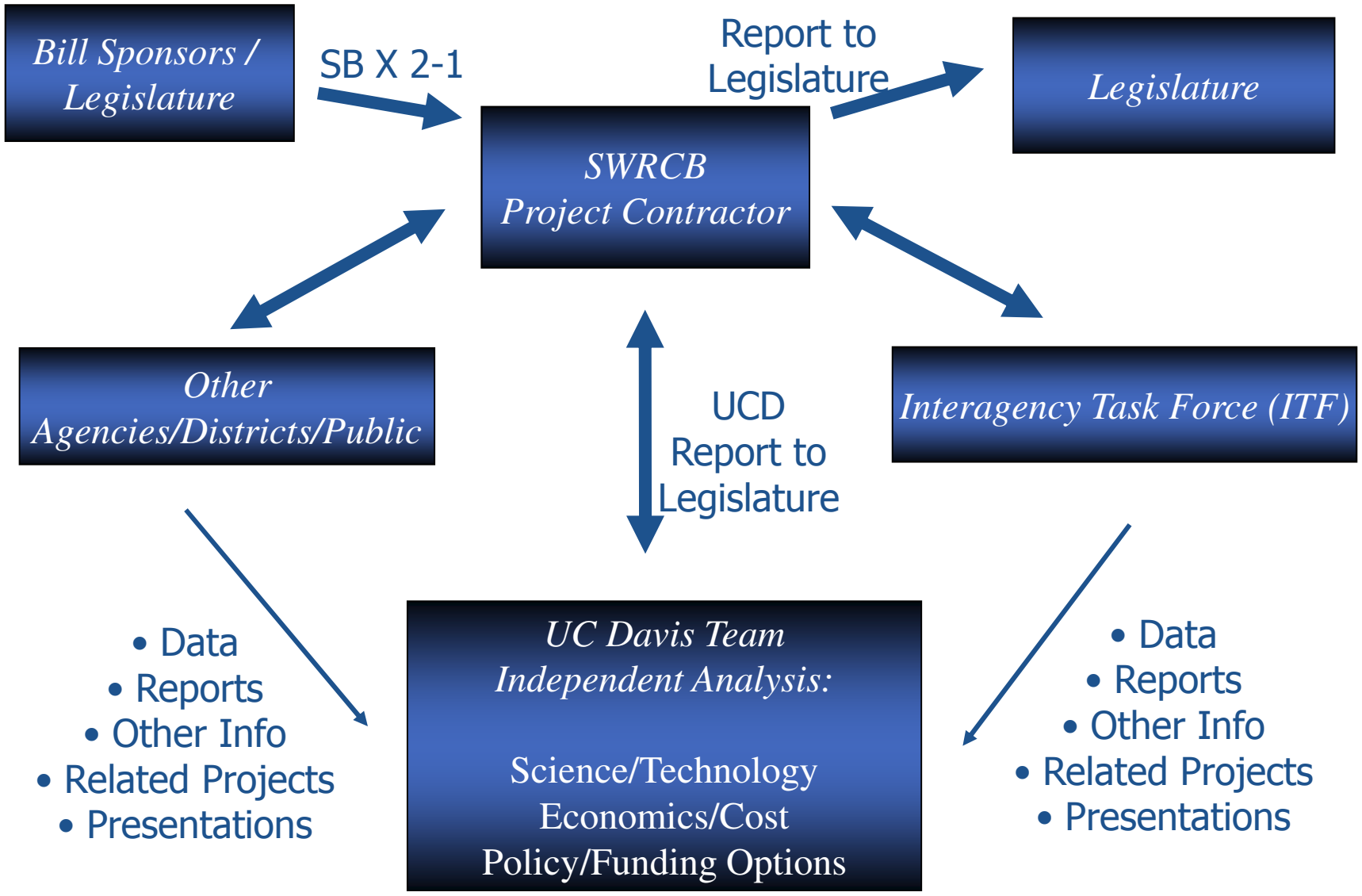


Treatment / Alternative Supply

Decade(s) later

Groundwater Remediation

UC Davis Role



Timeline

- Data collection and analysis – 2nd Quarter 2011
- Economic and policy analysis – 3rd Quarter 2011
  - **2nd ITF Meeting – May 3, 2011**
- Draft report – September 2011
  - **3rd ITF Meeting – October 2011**
- Final report – February 2012
- SWRCB Report to Legislature – March 2012
- Technical completion/data transfer – April 2013

SUMMARY
OF
KEY FINDINGS

Summary of Key Findings

- **Impact to groundwater quality is long-term**
- **Largest regional sources of nitrate in groundwater: Ag fertilizers, animal manure**
- **Nitrogen loading reductions are possible – will improve groundwater**
- **Direct remediation to remove nitrate from large groundwater basins is extremely costly**

Summary of Key Findings (continued)

- **Most cost-effective drinking water supply action: blending, treatment, and alternative water supplies/regionalization**
- **Affordability for clean drinking water is limited in small communities.**
- **Most promising revenue source: fee on nitrogen fertilizer use**
- **Limited or non-existent, inconsistent, often inaccessible monitoring => prevents better and continuous assessment**

SUMMARY
OF
KEY RECOMMENDATIONS

Actions in Four Areas

- **drinking water actions** for affected areas
- **reducing sources** of nitrate contamination to groundwater
- **monitoring and assessment** of sources/groundwater and tap/drinking water
- **revenues** to help fund local and state solutions.

Key Recommendations:

Drinking Water Actions

- CDPH: point-of-use treatment for nitrate
- CDPH and RWQCBs: legal, technical, and funding support for consolidation / regional safe drinking water solutions
- CDPH: stable funding to help support capital and operation and maintenance costs
- CALEPA : Task Force on Small Water Systems
- In areas identified as being at risk for nitrate contamination:
    - nitrate testing for domestic wells and local and state-small systems periodically
    - require disclosure of recent well tests for nitrate contamination on sale of residential property.

Key Recommendations:
Source Reduction

- Significantly raise the cost of commercial fertilizer and for organic fertilizer sources (manure, green waste, wastewater effluent, biosolids, etc.).

- In areas declared to be at risk for nitrate contamination: higher set of excise fees on nitrogen fertilizer applications (including synthetic fertilizer, manures, waste effluent, biosolids, organic amendments).

- CalEPA: Task Force to consider nitrogen mass balance metrics in lieu of groundwater quality standards for regulating N sources

- In areas declared at risk for nitrate contamination:
    - cap and trade system for nitrogen management
    - farm-level nutrient management plans, standards, and penalties
    - nitrogen fertilizer fees.

- CDFA/UC ANR/other organization: comprehensive educational and technical training program

Key Recommendations:
Monitoring and Assessment

- Regional Water Quality Control Boards: designate areas at risk of nitrate contamination for groundwater sources of drinking water.

- CDPH and SWRCB: report 5 yearly: populations at risk, long-term trends in providing clean drinking water => supplement to the California Water Plan Update.

- CalEPA: consider DPR program to include reporting of nitrogen application

- CalEPA with CalNRA, CDPH: State Groundwater Data Task Force - examine the efficacy of current state and local efforts to collect, maintain, report, and use groundwater data for California's groundwater quality and quantity problems.

- CalEPA, CalNRA, and CDPH: State Groundwater Task Force to periodically assess state technical and regulatory groundwater programs in terms of effectiveness at addressing California's groundwater quality and quantity problems => California Water Plan Update.

Key Recommendations:
Revenues

- Increase the mill assessment rate on nitrogen fertilizer
- Introduce a special fee on nitrogen fertilizer sales statewide to fund drinking water solutions
- Comprehensive statewide fee on water use
- CalEPA or the Legislative Analyst Office should examine the formation of “liability district” (landowners efficiently contribute to remedy)