Assessing perspectives on land subsidence in Yolo County

Esther Conrad
Water in the West Program, Stanford University
and the
Center for Conflict Resolution, Stanford Law School

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WATER IN THE WEST

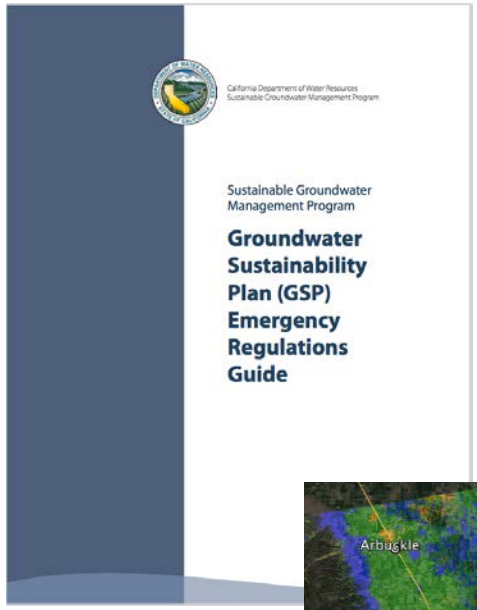
Stanford Law School | Martin Daniel Gould Center for Conflict Resolution Programs

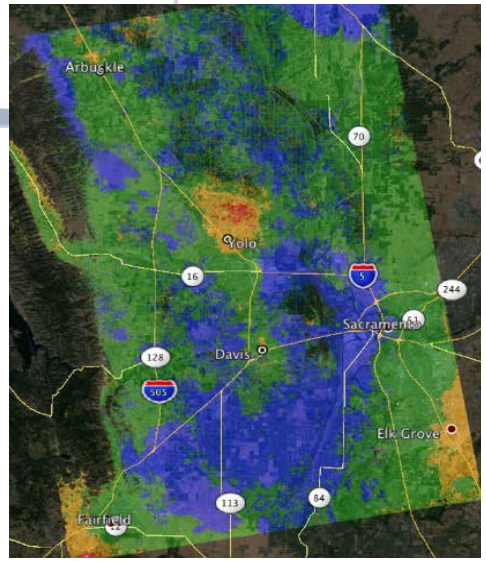
Presentation outline

1. Overview of subsidence research project
2. Perspectives on subsidence in Yolo County: Preliminary findings
3. Next steps

Land subsidence monitoring and groundwater management in California

- Subsidence is one of six “undesirable results” under SGMA
- Groundwater Sustainability Plans must identify thresholds for “significant and unreasonable” subsidence
- Analysis of Interferometric Synthetic Aperture Radar (InSAR) data is a new approach to tracking subsidence
  - May provide higher resolution measurements
  - Potentially less costly
  - DWR may provide statewide InSAR data in the future



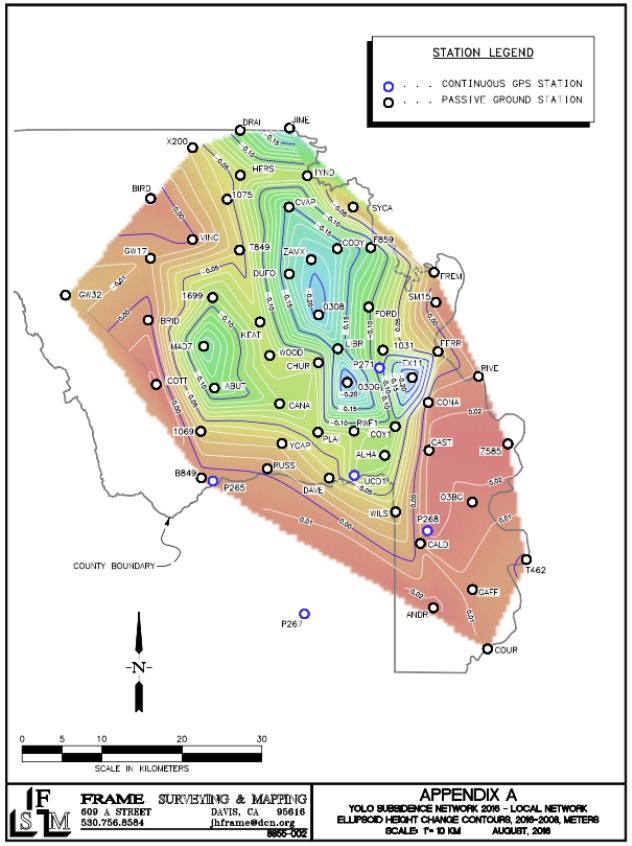


Credit: Farr et al., 2015

Project overview

- ***Can InSAR data be used to improve decision-making to address land subsidence in Yolo County?***
  - Does InSAR improve understanding of magnitude, timing and spatial distribution of subsidence?
  - In what ways can InSAR be used to complement or replace ground-based subsidence monitoring?

- Yolo County's history of subsidence monitoring allows for comparison between GPS survey data and InSAR



Frame Surveying & Mapping, 2016

Two project components

Geophysics

- Estimate subsidence using InSAR data, 2002 - 2012
- Compare with WRA's ground-based surveys

Social science

- Understand attitudes toward subsidence
- Assess potential role of InSAR in decision-making

Preliminary presentation to Technical Committee (TC) on July 7, 2016

Presentation of InSAR analysis results to TC anticipated on March 2, 2017

14 interviews with people involved in water management in Yolo County

Survey of participants in TC mtg after July 7 presentation

Follow-up survey of TC members planned for March 2

Preliminary findings on attitudes toward subsidence

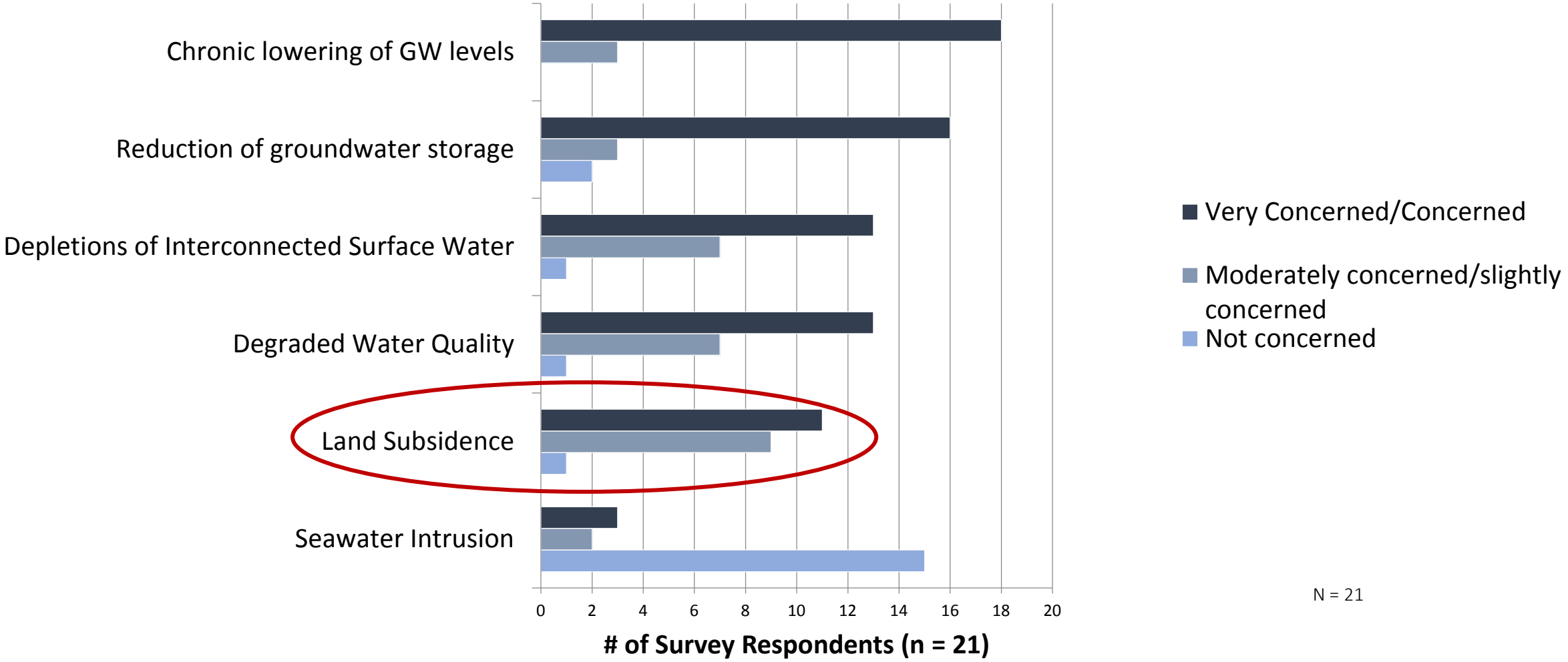
Topics:

- Level of concern about subsidence in Yolo County
- Perspectives on whether action is needed
- Perspectives on current monitoring and whether additional info can help in decision-making

Focus on those involved in water management in Yolo County:

- 14 interviews conducted from March to June, 2016
- Survey of 21 participants in July 7 Technical Committee meeting

Levels of concern about SGMA undesirable results

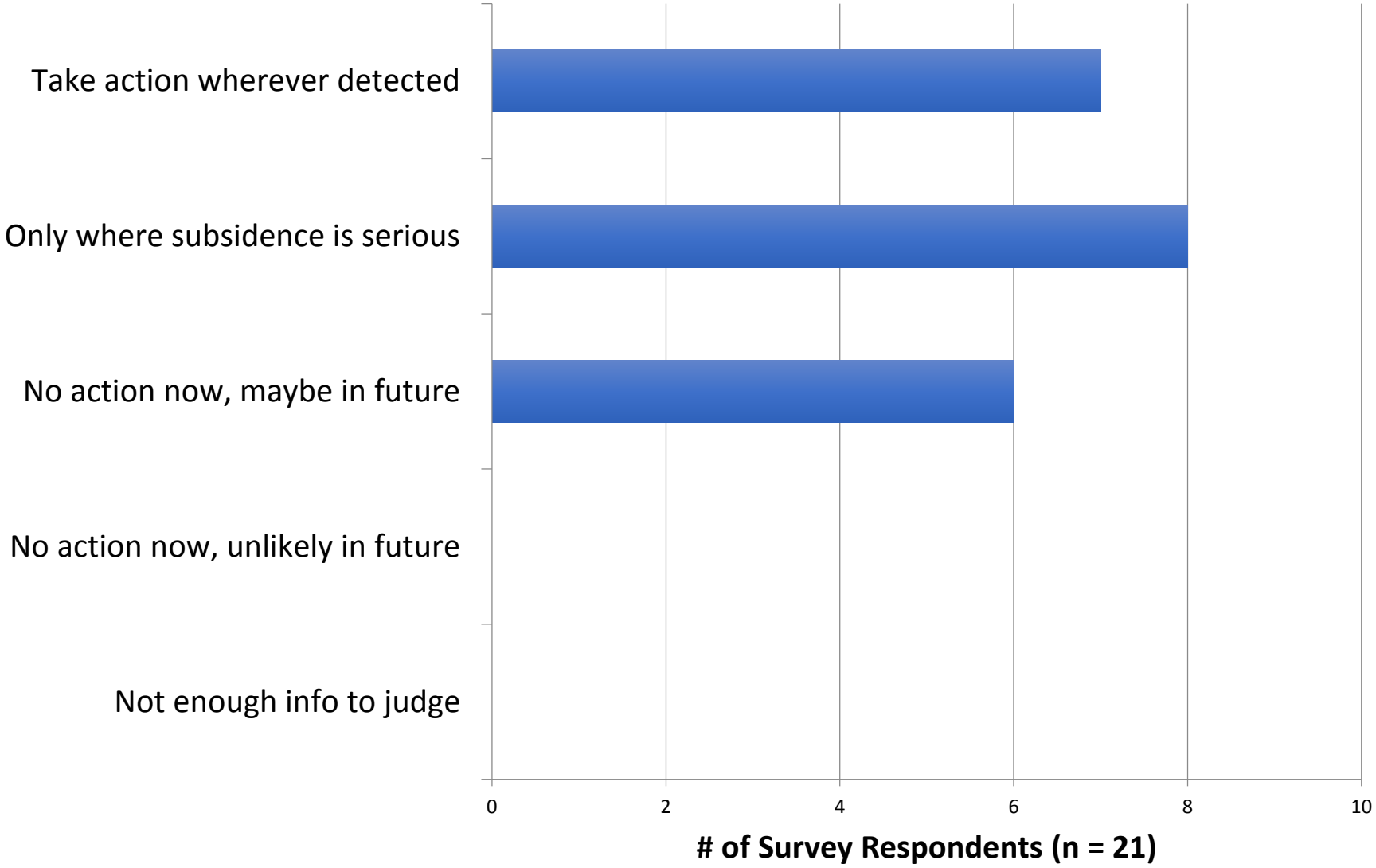


Perspectives on subsidence impacts - Interviews

- 7 out of 12 viewed impacts as minor so far
- 4 were unaware of impacts, 1 believed impacts were significant
- Types of impacts mentioned:
  - Shifting/braking of well pads and casings
  - Cracks in houses
  - Slope change in canal
- 5 noted difficulties in attributing infrastructure damage to subsidence

Photo: USGS

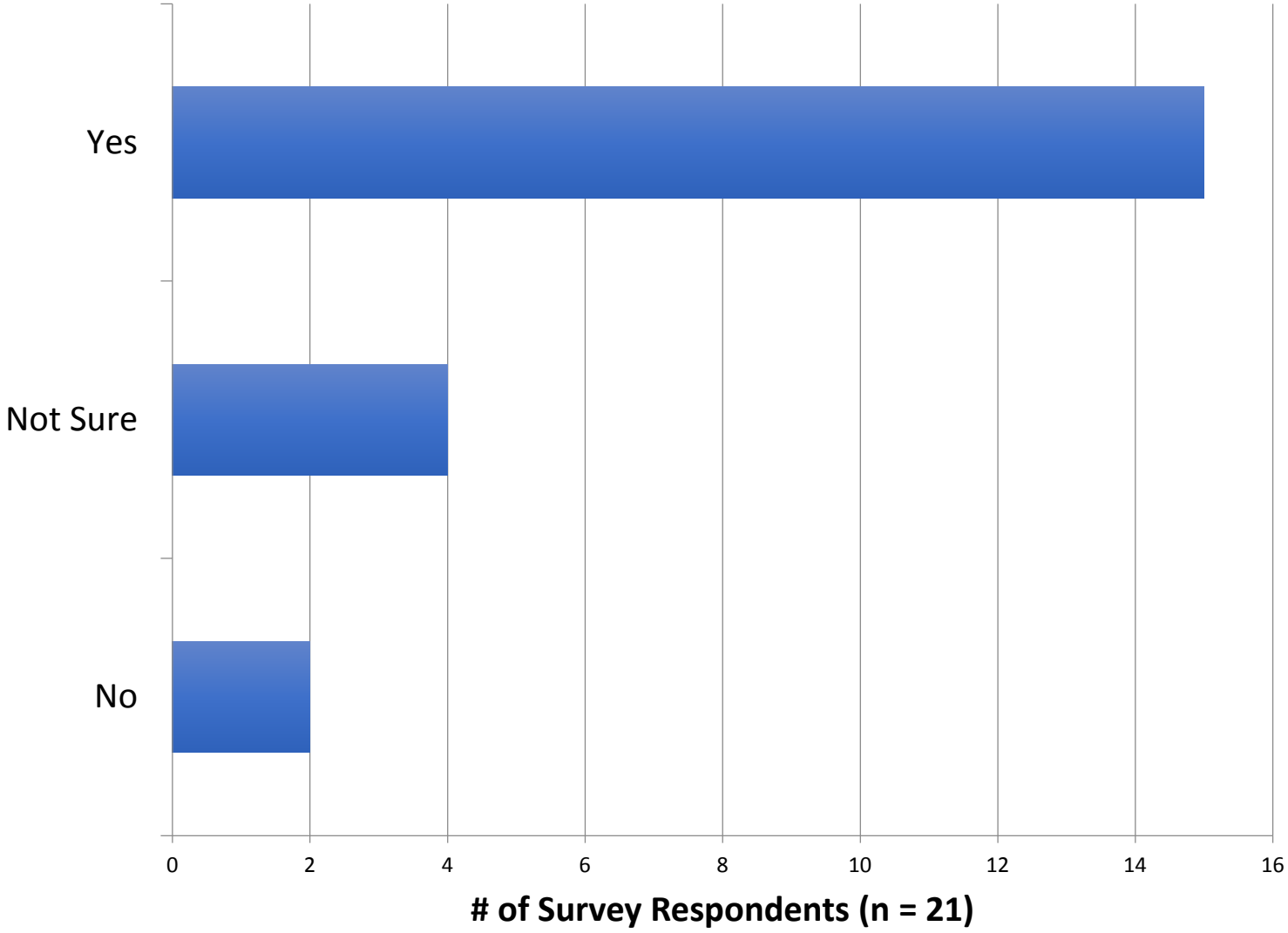
Should action be taken to address subsidence?



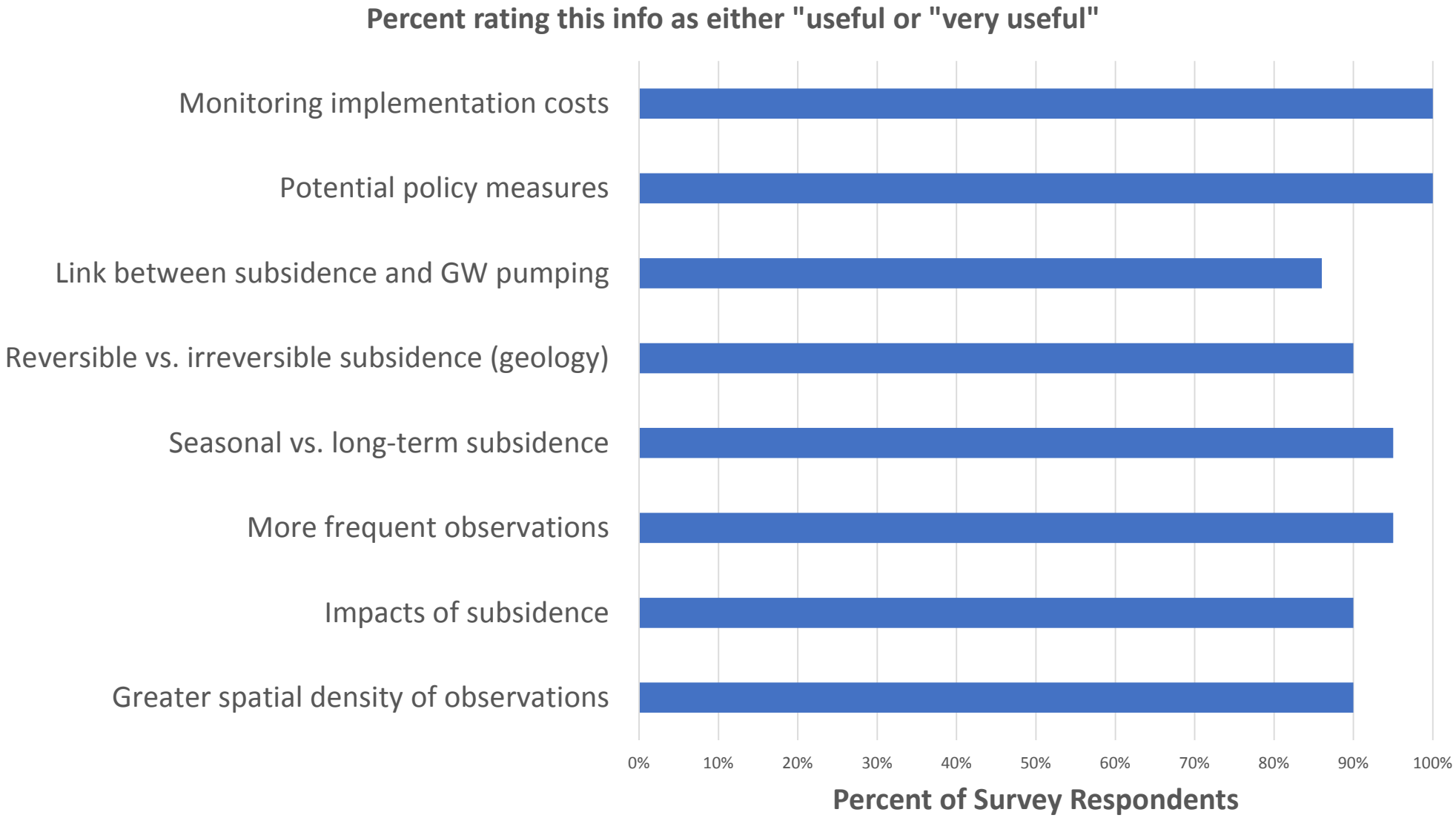
Perspectives on the need to act - Interviews

- 7 out of 10 thought some action was necessary
  - Particular concern about irreversibility
- Some were uncertain over what action would be feasible
  - Lack of alternative water supplies
  - Difficulties in restricting pumping
  - View that action is unlikely unless problem is “urgent”

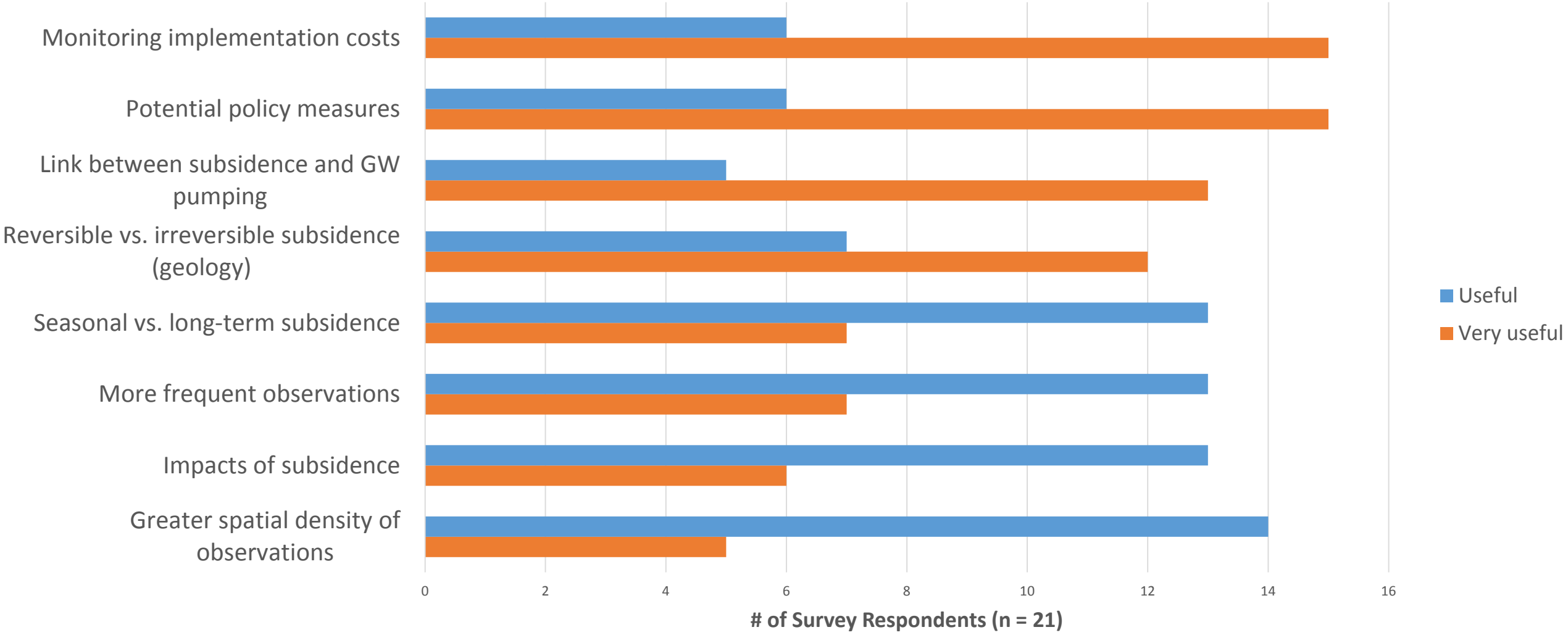
Are WRA's current monitoring efforts adequate for decision-making?



What additional information would be useful for decision-making?



Which info is “useful” vs. “very useful”?



Summary of perspectives among WRA Technical Committee and others involved in water management in Yolo County

1. Concern about subsidence is moderate, ranking below other undesirable results
2. Majority believe action is needed to address subsidence, but are uncertain as to what actions, how to implement
3. Majority believe current WRA monitoring efforts are adequate, but more information would still be useful
4. Information about policy options, costs of monitoring, link between subsidence and pumping likely to be helpful

Next steps

- Presentation of InSAR analysis to Technical Committee on March 2
- Follow-up survey on March 2 to assess reactions to InSAR data
- Additional interviews if needed
- Final report discussing findings and broader lessons anticipated in Fall 2017