National Academy of Sciences • Washington, DC
Exploring California and Other Subnational Climate Assessments
August 14-15, 2018 in Washington, DC

Learning and Applying Lessons from Assessments

On the Fence and Deeply Involved

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A Perspective from the Science-Practice Fence

ACADEMIA

Nina Warminger

PRACTICE

- Dissertation and post-doc on science-policy interaction (assessments)
- DC think tank stint on federally mandated study
- 4 years in NGO
- 5 years doing use-inspired research at NCAR
- Now: independent researcher & consultant, boundary worker
  - State, local, federal government
  - NGOs, foundations, professional societies with international and national focus
  - Academic and consulting collaborators

Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

THE HEINZ CENTER

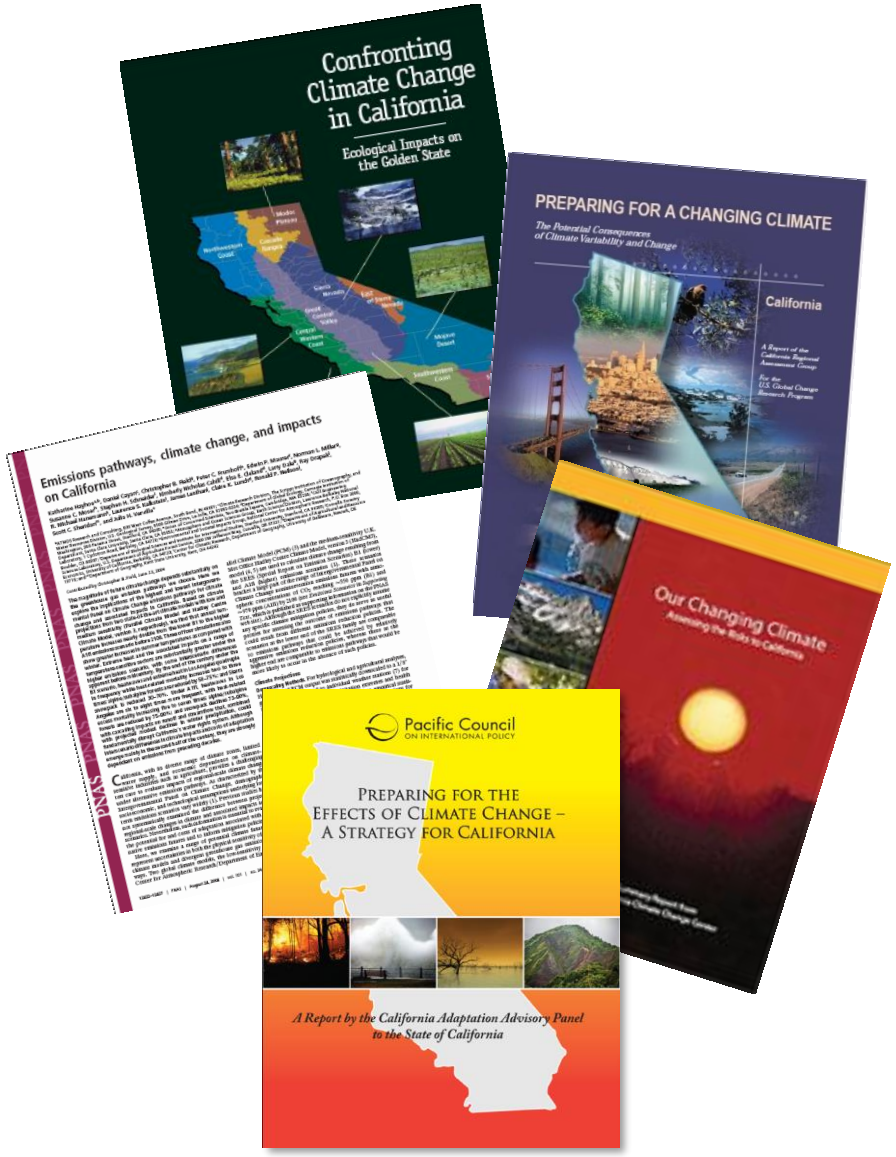
SUSANNE MOSER RESEARCH & CONSULTING

…. And deeply involved

Part I

Lessons from Two Decades of CA Assessments: Improving Science, Enabling Action

History (selected milestones)



Source: adapted from Franco, G. et al. (2008)

1988 — California passes first climate change legislation (AB 4420)

1990 — *First California climate impacts assessment completed by CEC*

First IPCC Assessment Release

1992 — The United Nations Framework Convention on Climate Change adopted

1994

Second IPCC Assessment Release

1996

Greenhouse Gas Emissions Reduction Strategies for California (CEC. 1998b)

1998 — *Confronting Climate Change in CA (Field et al. 1999)*

2000 — *Third IPCC Assessment Release*

California Climate Action Registry (SB 1771, SB 527)

2002 — *National Assessment CA Study (USGCRP, 2002)*

Creation of the California Climate Change Center

Vehicle GHG Standards (AB 1493)

2004 — *Climate Change in CA: Choosing Our Future (Hayhoe et al. 2004)*

Economy-wide GHG Reduction Targets (EO S-3-05)

2006 — *Climate Action Team Report* **(based on First Assessment)**

Statewide Electricity GHG Performance Standard (SB 1368)

Economy-Wide GHG Cap (AB 32), SB 375

2009 — Second CA Climate Change Assessment

2010

ARCCA Alliance of Regional Collaboratives for Climate Adaptation

2012 — Third Climate Change Assessment; launch of the Cap-and-Trade Program, SB 535

2014 — SB 605

Executive Order EO B-30-15

2016 — SB 32

AB 398, Adaptation Clearinghouse, ICARP

2018 — Safeguarding California Update, Fourth Climate Change Assessment, Global Climate Action Summit

New political leadership
New scientific advances
More climate change
Growing pressures to get real about action
More mitigation and adaptation
…

2038 — ?

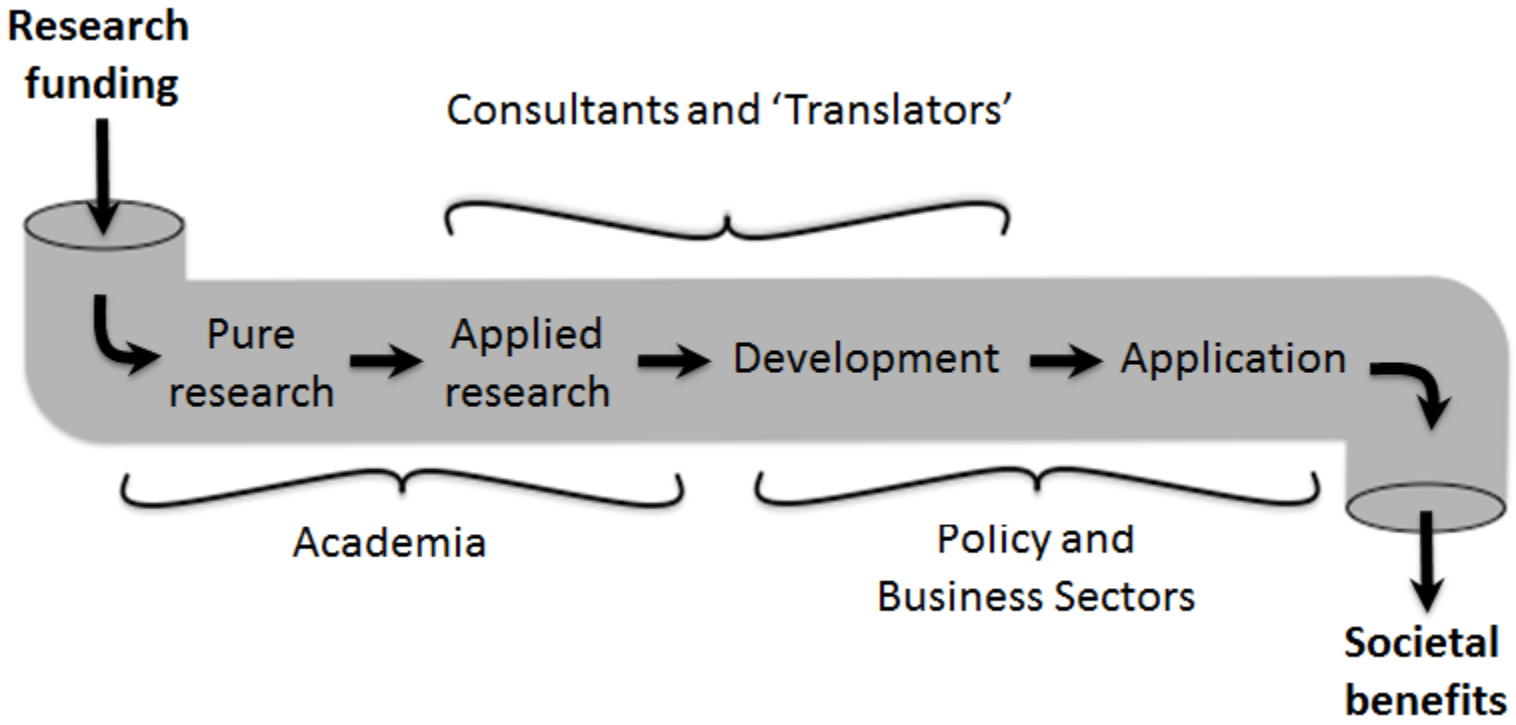
Sources: CA Climate Change Portal and https://leginfo.legislature.ca.gov

Where We've Been and How We Have Evolved

Source: Adaptive Path

- From ***science*** focus to ***impacts*** focus
  - Scenarios & climate projections
  - Biophysical impacts
  - Increasingly economic and societal impacts
  - Increasingly solutions-oriented, mostly problematizing solutions
- From ***statewide*** focus to ***regional*** focus
  - Initially selected regions
  - Now all regions
- From ***single-sector*** to ***complex (interdependent) systems*** focus
- From ***physical/natural-science dominated*** to ***growing presence of social & interdisciplinary science***
- From ***science-driven*** research agenda to ***user-needs cognizant/engaged*** science

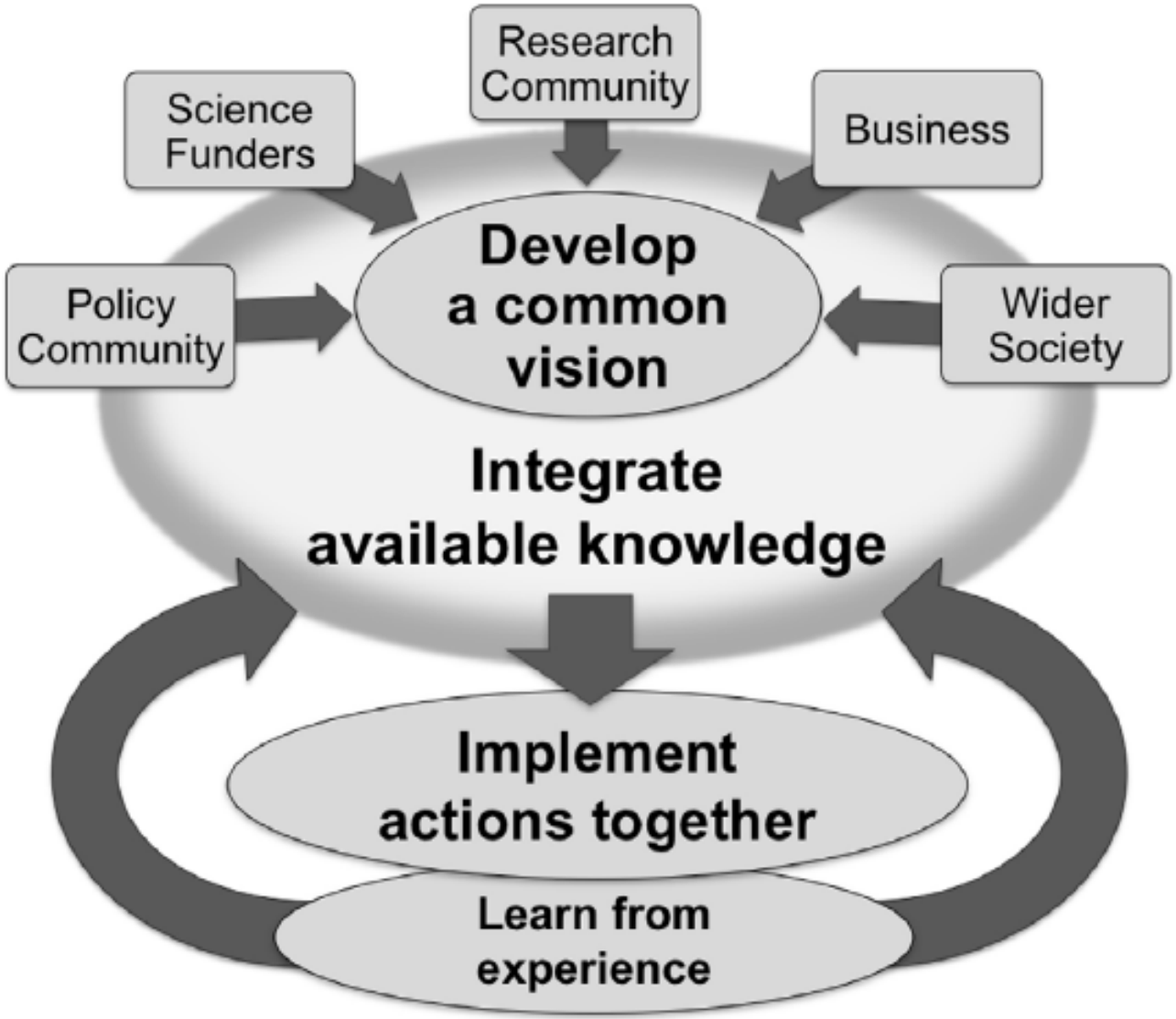
Slowly Changing Mental Models from this…



The 'linear model' of science and society

Source: Stafford-Smith, Moser, et al., forthcoming

Toward Co-Design and Co-Production of Knowledge



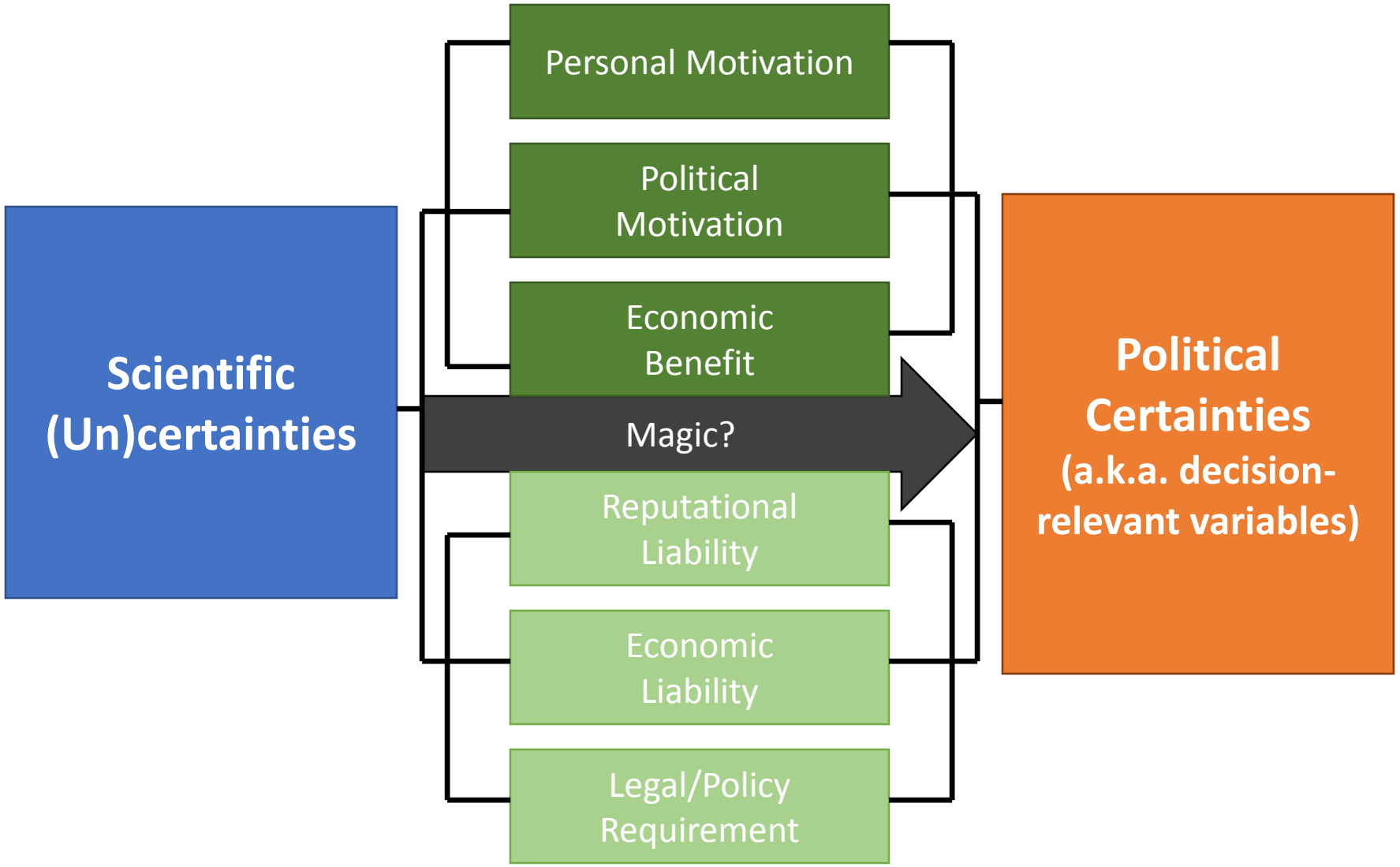
Source: Cowell et al. (2013)

Knowledge in the Political Context is a Strategic Tool

- No knowledge is inherently valuable
- No knowledge is inherently “certain enough”
- No uncertainty is inherently decision-relevant

- But:
- All forms of knowledge can attain value in someone’s eyes, in some contexts
- All knowledge can be “good enough” to act on
- Certainties and uncertainties can be made decision-relevant

How Does Science/Uncertainties Come to Matter?



What Do We Want from Assessments?

- **Greater understanding of and engagement with** science
- **Improved relationships** between knowledge producers and users
- **Increased usefulness and use** of information

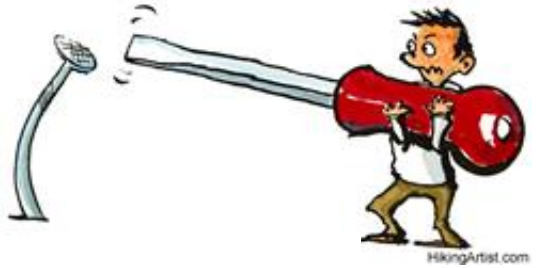
  (while doing interesting science)
- **Better decisions and outcomes**

  (i.e., making a difference in the world)

Source: SoCalMulligan808

What is Needed from Science & Assessments?

- **To be responsive**:



Source: mirabiledictu.org

- **To be supportive**:

- **To be generative**:

Source: photos1.blogger.com

- **To be critical:**

Source: etwritersguild.org

What Makes (Assessment) Information "Useful"?

- **SALIENCE**
  - Regional/local specificity
  - High resolution
  - Issue linkages
  - Timing and format

Source: DWR

- **CREDIBILITY**
  - Whose experts?
  - Interaction among experts
  - Transparency of scientific/assessment process
- **LEGITIMACY**
  - Account of local concerns, values, needs, interests
  - Rules, procedures
  - Involvement in decision support process

Source: Marin County

- **EFFICACY**
  - The right decisions can be made more easily
- **ITERATIVITY**
  - Updates can be made easily, rapidly

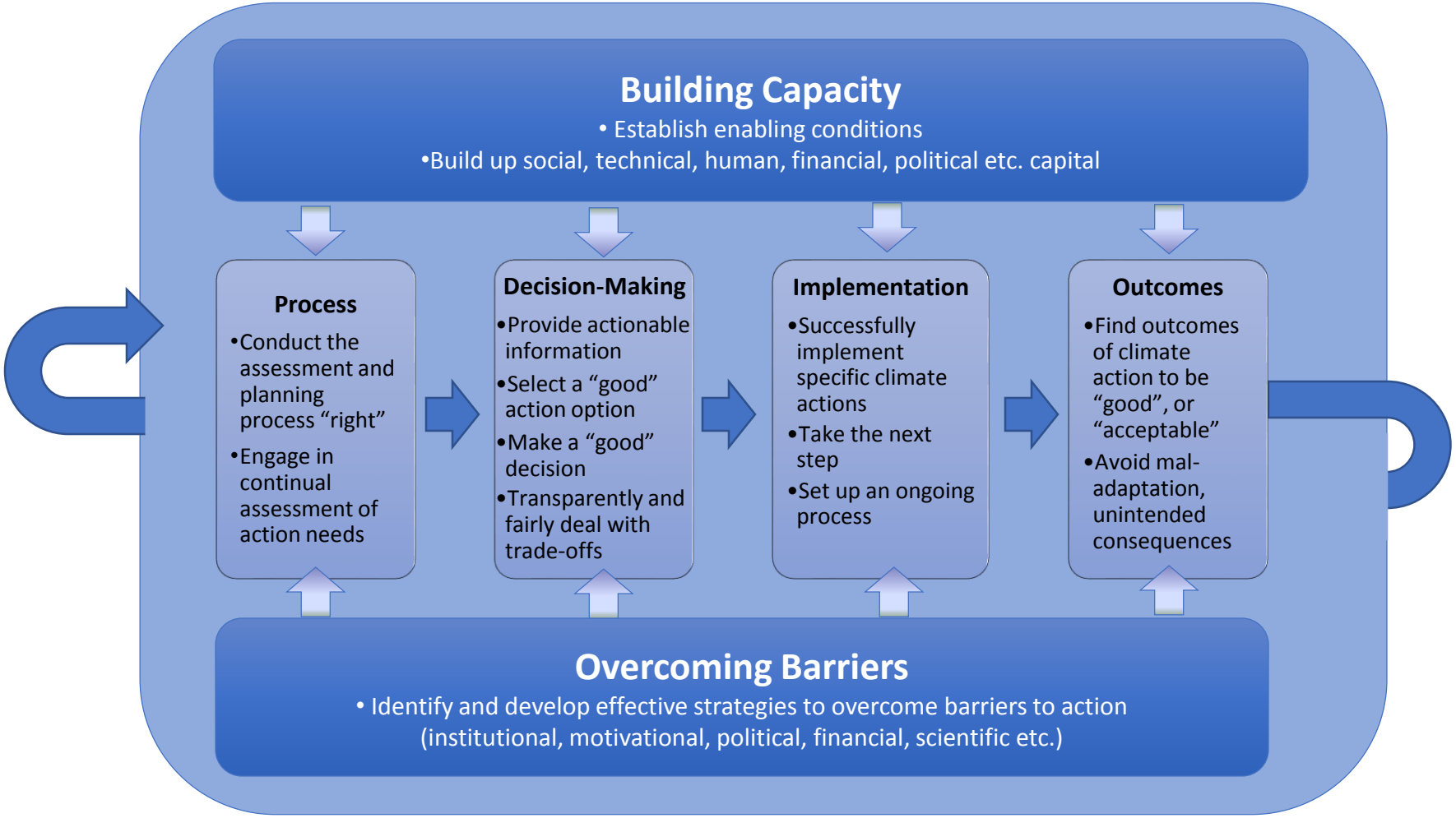
Sources: Cash et al. 2003; Mitchell et al. 2006, Farrell & Jäger 2005; Jones et al. 1999; Sarkki et al. 2015

What Does "Use" Mean Anyway?

- **Practical Uses** (information)
  - Informing planning and decisions (e.g., standards, thresholds, quantities)
  - Help in setting research agendas
  - Use in public or professional presentations, briefings, speeches
- **Symbolic Uses** (authority)
  - Drawing on the authority of science to back/justify legislation/policy initiatives
  - Drawing on scientific uncertainty to resist/ withdraw support for policy/legislation
- **Educational Uses** (resource)
  - Share with colleagues
  - Bring to attention of superiors, elected officials
  - Keep in personal library as reference for later use
  - Keep in office library
  - Way to stay current
  - Insights into the (lack of) scientific consensus or state of the art on a topic

Source: Moser (2014)

Six Dimensions of Success of Assessments?



Source: Adapted from Moser et al., project on adaptation success

Part II

Applying These Lessons in the Context of…

AB 2800 and California's Climate Safe Infrastructure Working Group

The Climate-Safe Infrastructure Working Group

Amir Aghakouchak
UC-Irvine

Bruce Swanger
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Chester Widom
DGS, State Architect

Cis Liban
L.A. Metro

Dan Cayan
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David Groves
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Nancy Ander
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Deb Niemeier
UC-Davis

James Deane
High-Speed Rail Auth.

John Andrew
DWR

Kristin Heinemeier
Realized Energy

Kyle Meng
UC-Santa Barbara

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Robert Lempert
RAND

Project Team

Keali'i Bright
Natural Resources Agency

Elea Becker Lowe
Natural Resources Agency

Joey Wall
Natural Resources Agency

Guido Franco
California Energy Commission

AB 2800 (Quirk): Purpose

Examine how to integrate scientific data concerning projected climate change impacts into state infrastructure engineering, including oversight, investment, design, and construction.

AB 2800 (Quirk): Scope of Assessment and Recommendations

The working group shall consider and investigate, at a minimum, the following issues:

(1) The **current informational and institutional barriers** to integrating projected climate change impacts into state infrastructure design.

(2) The **critical information** that engineers responsible for infrastructure design and construction **need** to address climate change impacts.

(3) How to **select an appropriate engineering design** for a range of future climate scenarios as related to infrastructure planning and investment.

AB 2800 (Quirk): Additional Scope of Recommendations

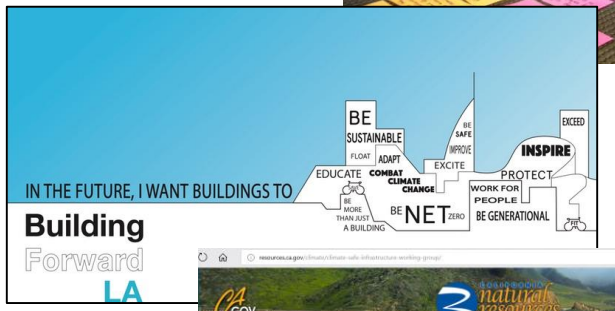
(A) **Integrating** scientific **knowledge** of projected climate change impacts into state infrastructure design.

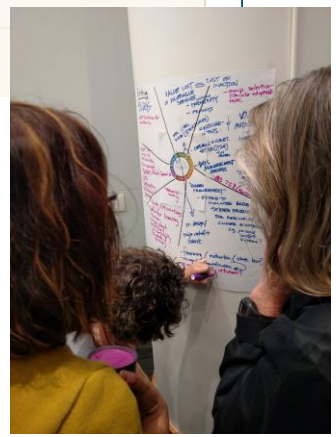
(B) Addressing critical **information gaps** identified by the working group.

(C) A **platform or process** to facilitate communication between climate scientists and infrastructure engineers.

Process Elements

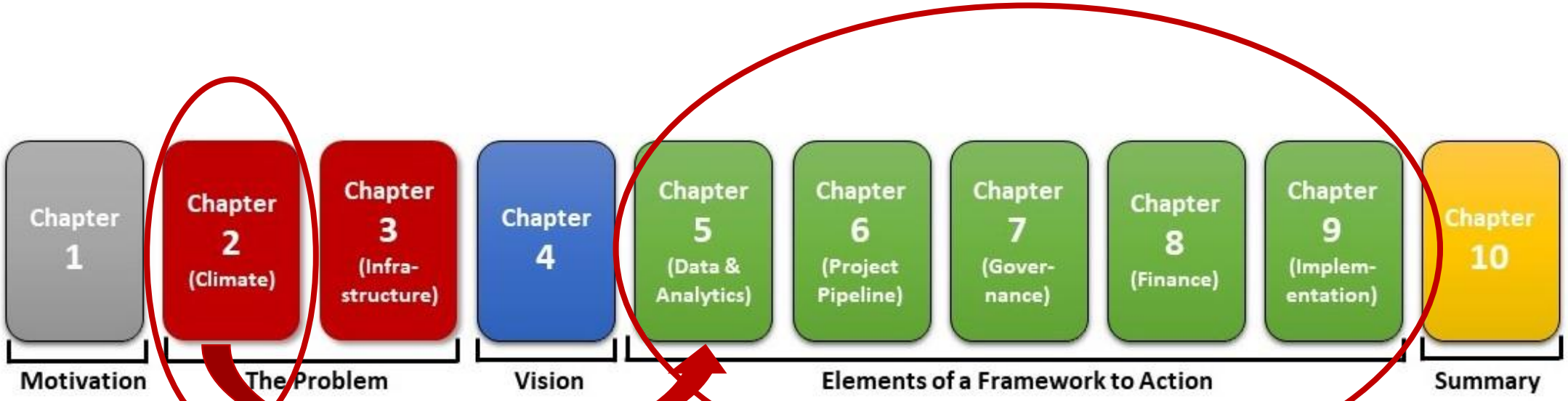
- 6 Working Group meetings (Jan-June 2018)
  - Structured, focused, highly interactive
  - Open to public, public comment periods and active engagement in activities
  - Presentations or panels of local experts/examples
- Homework and writing assignments
- In parallel: Ongoing webinar series to
  - Highlight WG members' expertise and work
  - Bring in outside expertise
  - Educate and engage interested stakeholders
- Literature review
- Outreach (deliberate and opportunistic)





http://resources.ca.gov/climate/climate-safe-infrastructure-working-group/

The Forthcoming Report

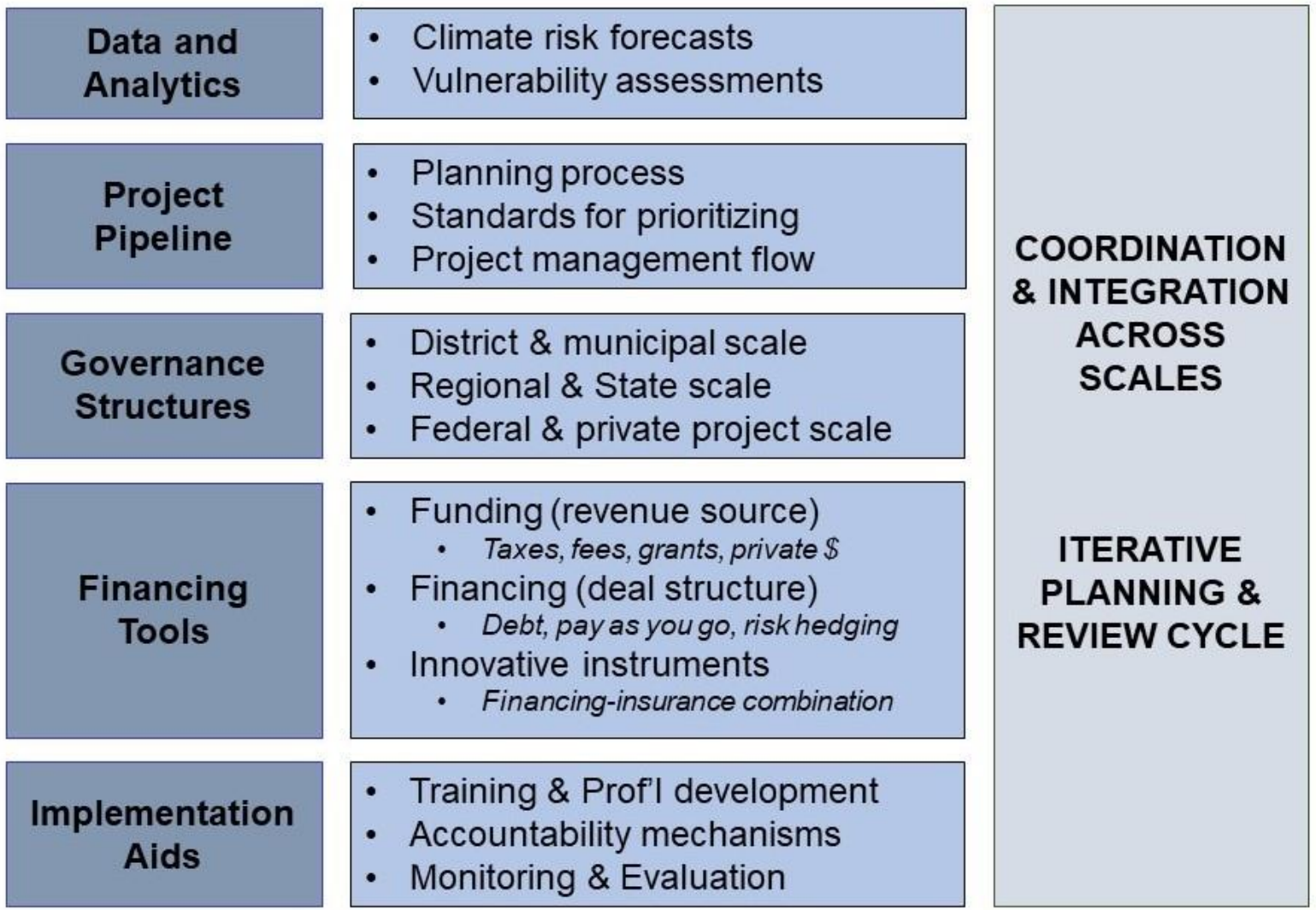


The "science"
Heavy reliance on CCA4

Linking science to action

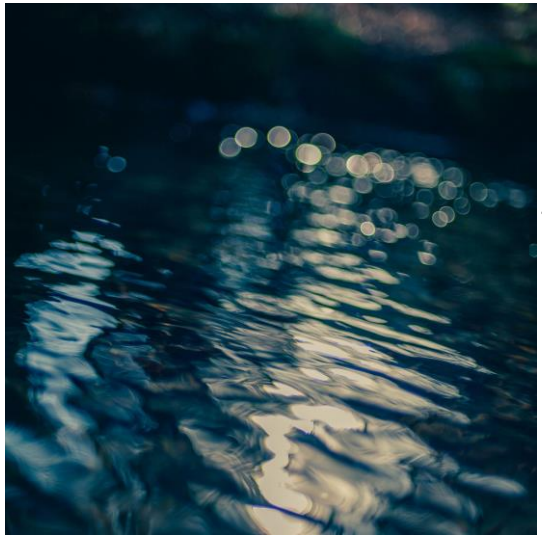
- Changes in planning, governance, funding, implementation

“It Takes a System” Framework for Action



Source: Adapted from Cleveland (2018)

Initial Reflections



Source: Dewtone Recordings

- Process as learning and relationship building opportunity
- Many tensions …reflecting
  - Still a long way to climate literacy
  - Traditional ways of thinking and doing things (professional canon, reputation)
  - Risk aversion to doing something new / different / unfamiliar/ unsanctioned
  - Varying capacities to act/deliver (in science, but particularly in agencies)
- Importance of expansive solicitation of external expertise, practitioners
- Facilitation and internal, one-on-one navigation
  - Big picture vision o f process and experience
  - Many positions to negotiate: # of members x # of areas of involvement

CCA8: California's Climate Change Assessment in 2038 – A Conservative Speculation

- Lead by the Department of Public Health in collaboration with Legislative Analyst's Office (with roles for all agencies, local co-leadership)
- Funded by State Legislature, California Chamber of Commerce and California Infrastructure Bank
- Driven by user needs (public, private)
- Focused on
  - Solutions, accelerating large-scale implementation
  - Complex interactions and impacts of CC and solutions
  - Liability and other legal issues
  - Compensation and other fiscal needs
  - Large-scale adaptations and transformation of entire sectors
  - Assessment of best practices
  - Big data in tracking adaptation actions
  - Climate science focused on Earth system tipping points
- A rather different set of scientific experts engaged with stakeholders in knowledge co-production
- Outputs individuals can tailor, access via apps on hand-held devices

Source: v-a-l-s.org

Source: Hortonworks.com

Source: City Journal

Thank you!

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Photo: worldpress.com

Additional slides on AB 2800 Process, Report