



*Team Science*  
**UCI**





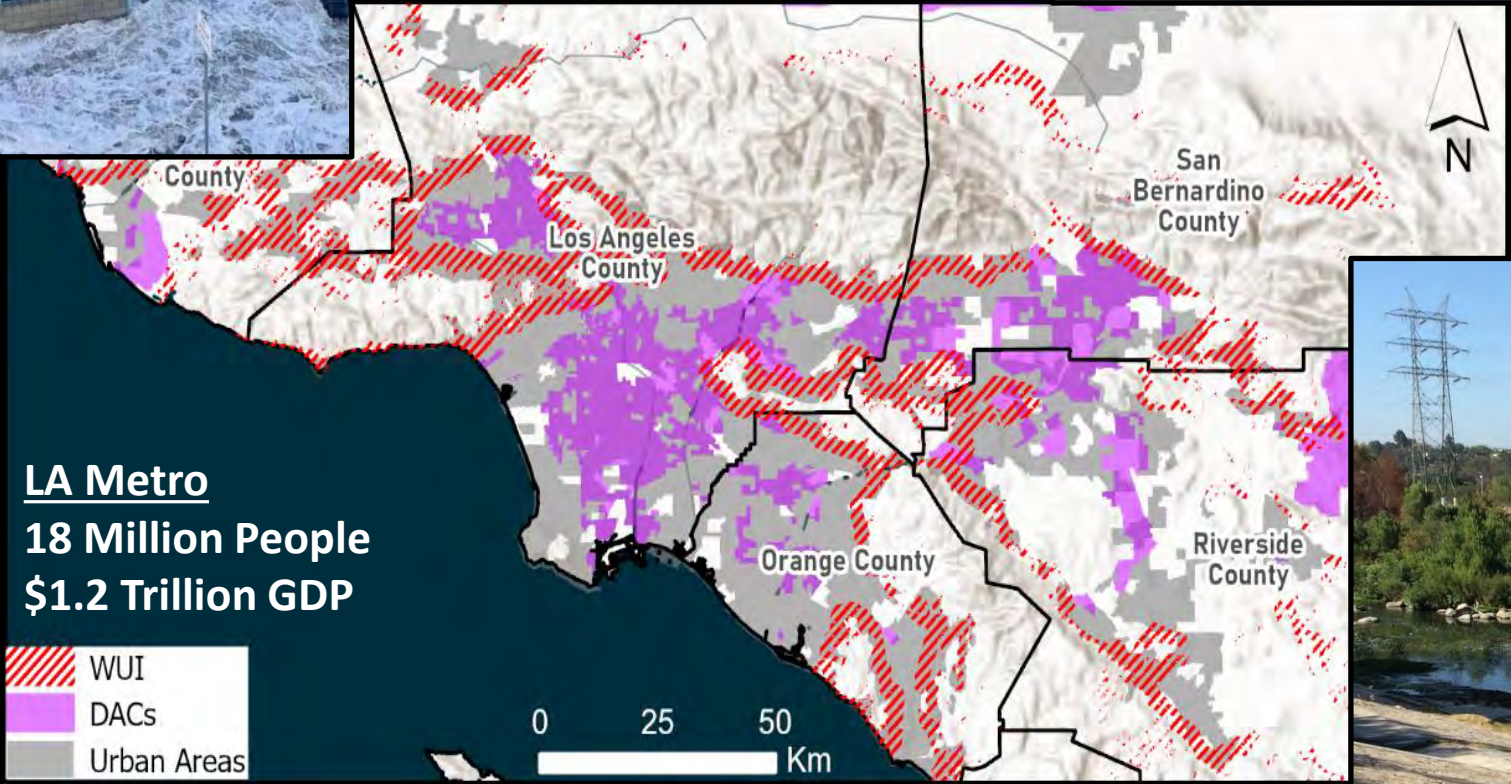
A photograph of a large concrete bridge structure, likely a dam or a large bridge, spanning a body of water at night. The bridge is illuminated by warm, yellow floodlights, creating a strong contrast with the dark sky and water. The structure features multiple concrete piers and a complex steel truss system. In the background, other bridge structures and power lines are visible, also lit up. The water in the foreground shows some ripples and reflections of the lights.

A UC Climate Action Proposal

California FloodRISE: Flood Resilient Infrastructure and Sustainable Environments  
*Brett F. Sanders, UCI Flood Lab*

Photo Credit: Kevin Break

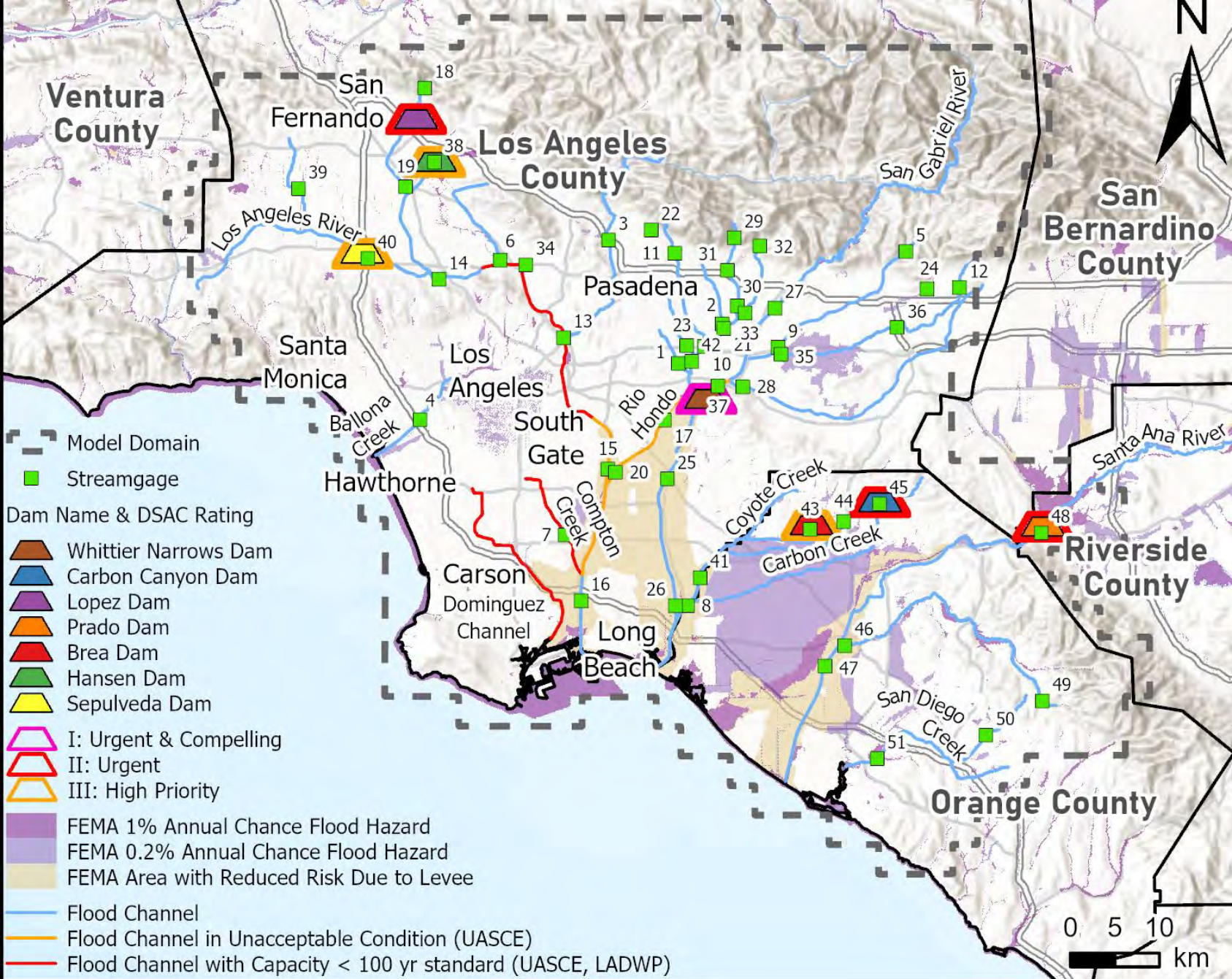




**LA Metro**  
**18 Million People**  
**\$1.2 Trillion GDP**

- WUI
- DACs
- Urban Areas





# Infrastructure Vulnerabilities

- Main stem flood channels unable to contain 100 yr flow (USACE, LAC DPW)
- Main stem flood channels in unacceptable condition (USACE)
- Region protected by aging dams in poor condition (USACE)



# Parallel Raster Inundation Model (PRIMo)



## LA County Exposure (> 1 ft)

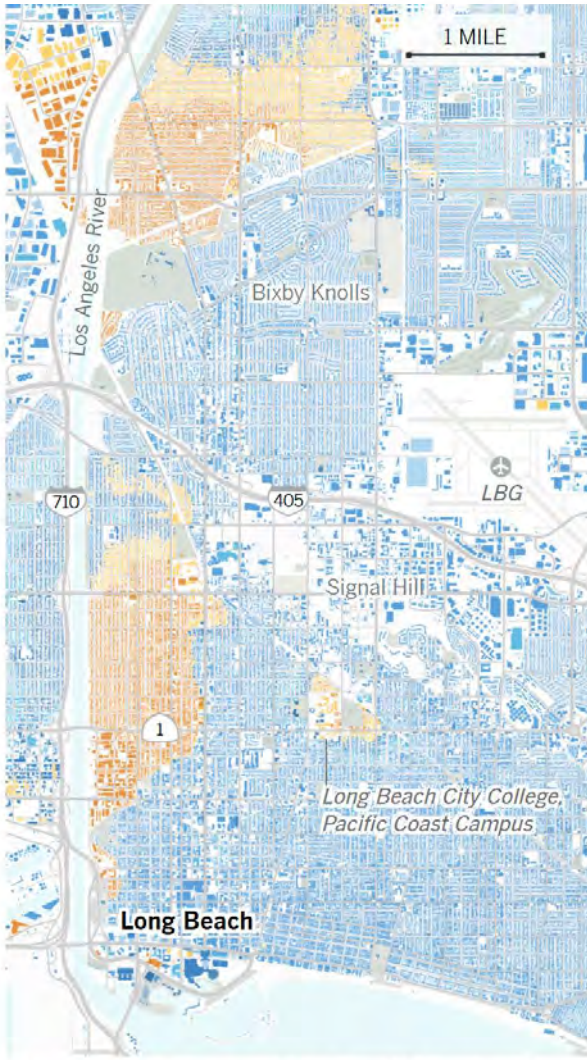
425 thousand people  
\$56 billion in property  
(*median estimates*)

Graphic by Jochen Schubert



CLIMATE &amp; ENVIRONMENT

## Major flood would hit Los Angeles Black communities disproportionately hard, study finds



UCI Flood Lab, LARIAC, © Mapbox, © OpenStreetMap

(October 31, 2022)

## LA County Board of Supervisors' Motion (Dec 5, 2022)

- (1) Make infrastructure enhancements to reduce flood risk, increase water supply through stormwater capture and groundwater recharge, and improve water quality;
- (2) Advance equity and climate resiliency in stormwater infrastructure planning, design, and capital improvements;
- (3) Prepare communities for the impacts of a changing climate and educational efforts to inform residents on how to mitigate their flood risk;
- (4) Advocate for local, state, and federal funding opportunities to reduce flood risk in LAC, particularly in vulnerable and disadvantaged communities.

CLIMATE &amp; ENVIRONMENT

## Los Angeles County seeks flood control improvements in face of climate change



Pigeons circle as the Los Angeles River carries storm run-off under the Washington Boulevard bridge in Los Angeles last month. County officials have ordered a review of the region's flood control infrastructure in the face of climate change. (Raul Roa / Los Angeles Times)

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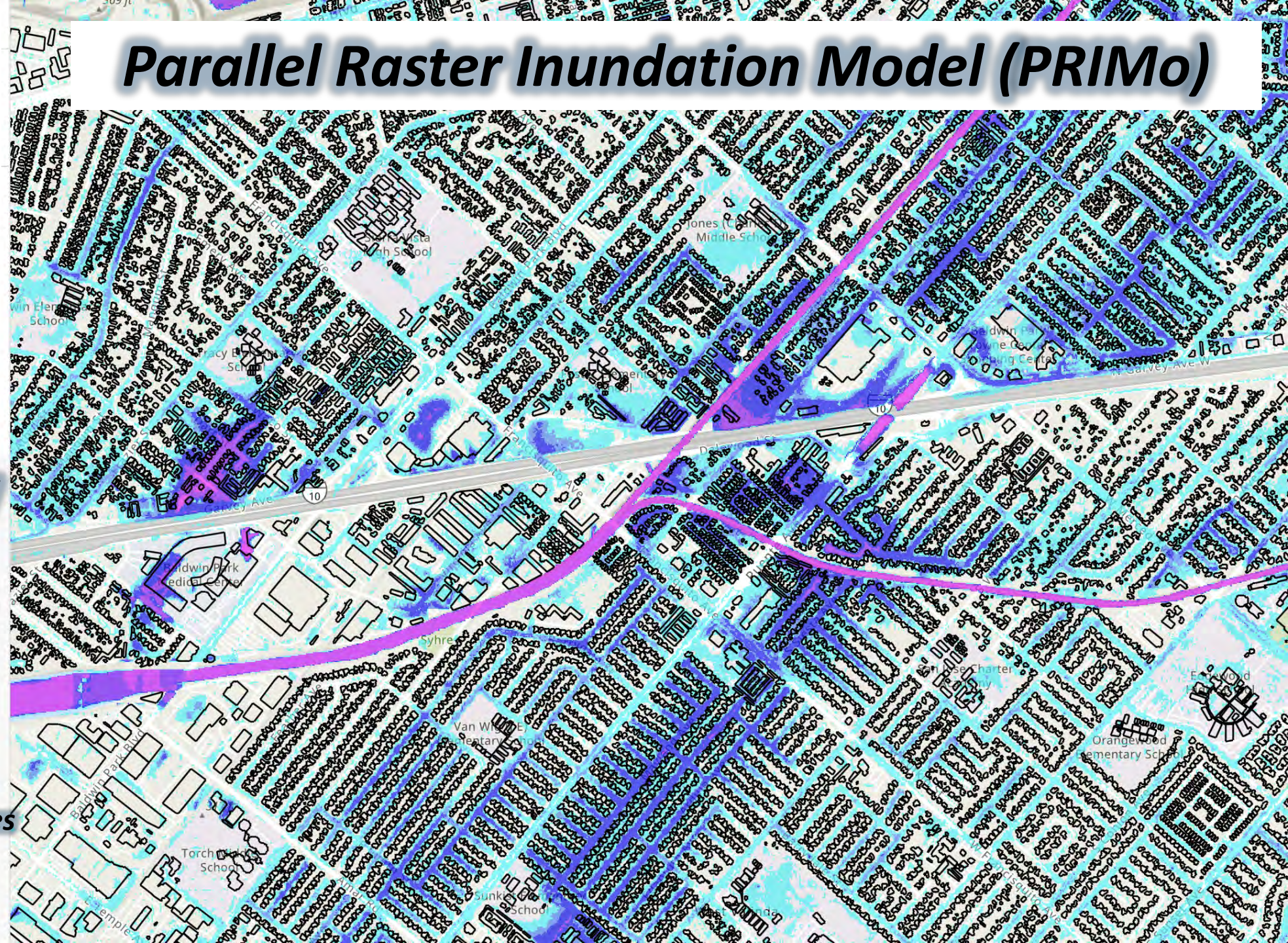
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# Parallel Raster Inundation Model (PRIMo)

Composite Flood Depth 100yr events

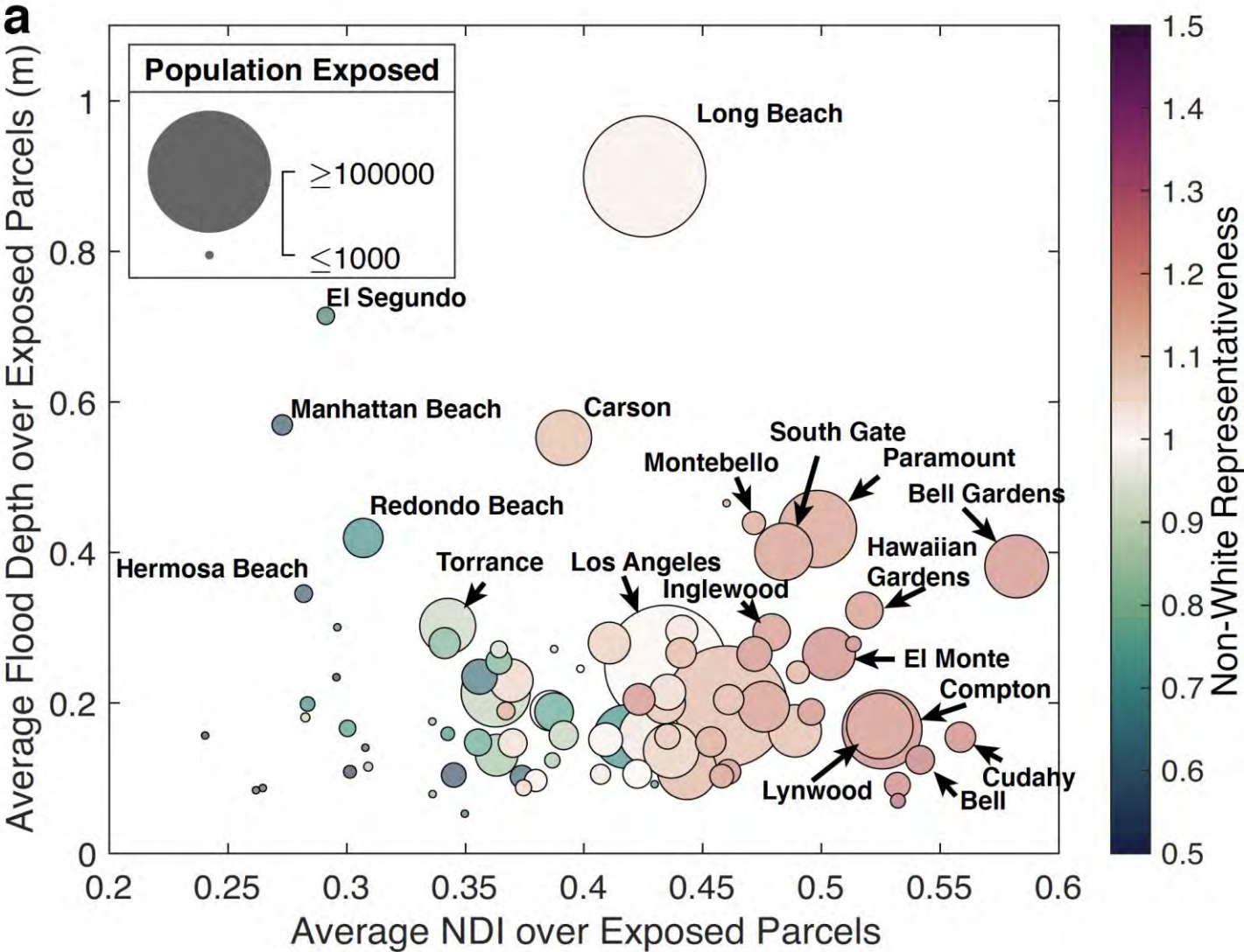
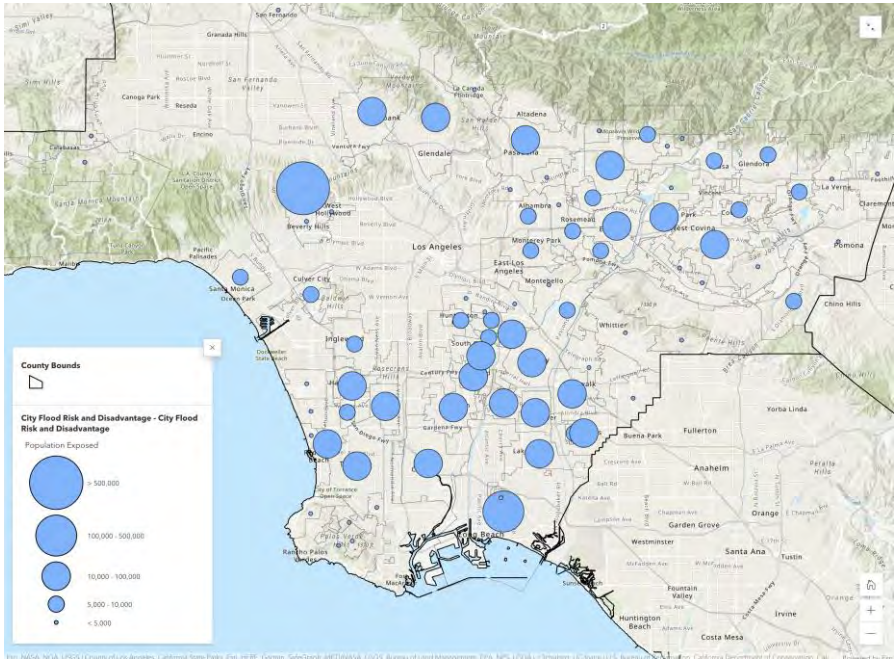


## An Opportunity

- *Increase risk awareness*
- *Help governments adapt infrastructure*
- *Update plans and priorities*
- *Infuse equity into decision-making processes*
- *Empower vulnerable communities*

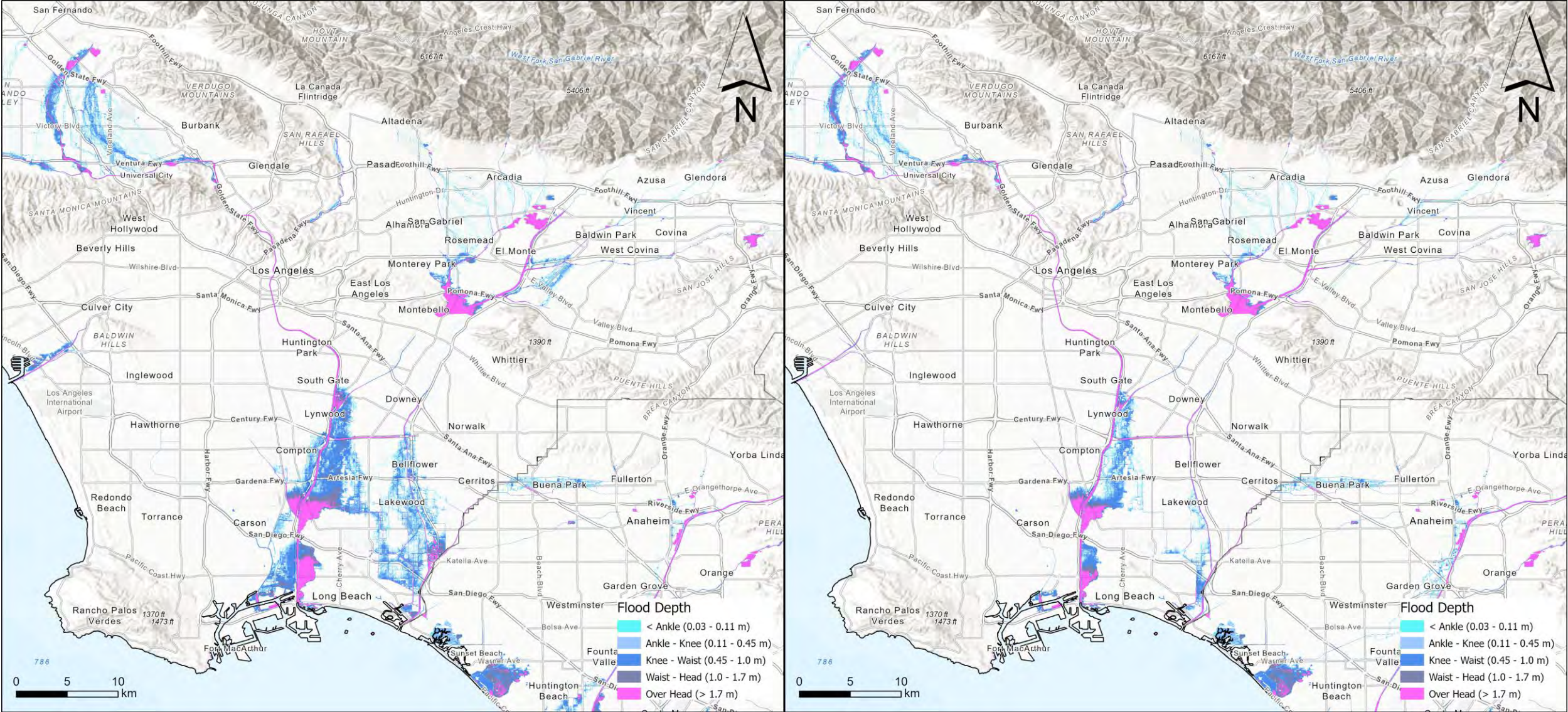


# Using PRIMo to Take Action





# Testing Solutions with PRIMo

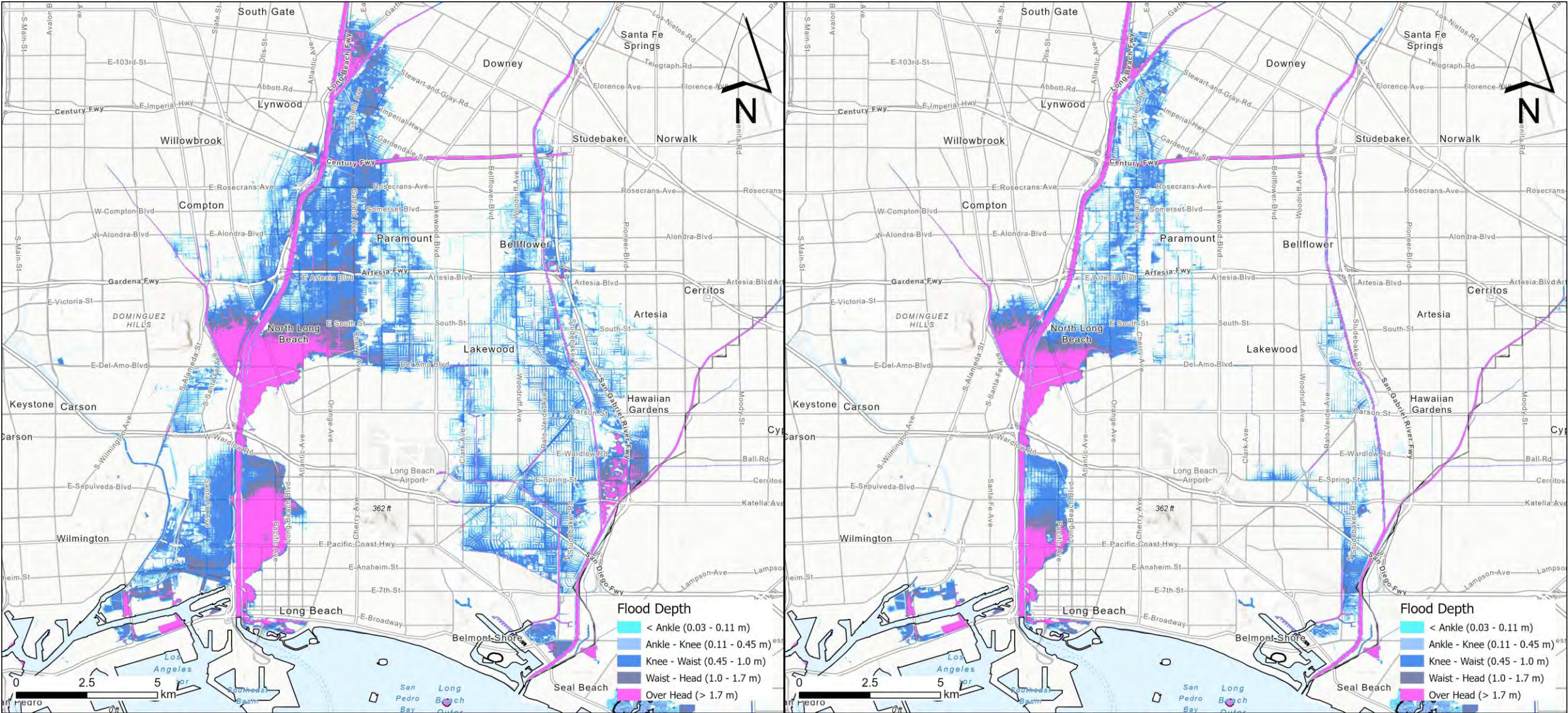


Present Day 1% Annual Chance Fluvial Flood Hazard

With levees raised by 1 m



# Testing Solutions with PRIMo



Present Day 1% Annual Chance Fluvial Flood Hazard

With levees raised by 1 m



# California FloodRISE (UC Climate Action Proposal)

## *Flood Resilient Infrastructure and Sustainable Environments*

- **Scope of Work: Build out PRIMo across Southern California to support climate action needs**
- Academic Institutions: UCI (lead), UCLA, UCR, UCSD
- Project Partners
  - Southern California County Govts/Public Works: Ventura, Los Angeles, San Bernardino, Riverside, Orange, San Diego
  - California DWR Floodplain Management Branch, California Geologic Survey, California Coastal Commission
  - Council for Watershed Health
  - Southern California Association of Governments (SCAG)
  - Blum Centers for Poverty Alleviation (UCI, UCR, UCSD)
  - Los Angeles Regional Collaborative for Climate Action and Sustainability (LARC)
- **Collaboration to Meet Decision-Making Needs**
  - Increase risk awareness from neighborhood to regional scales
  - Identity major vulnerabilities (by hazard and disadvantage)
  - Updating plans and priorities
  - Opportunities for nature-based solutions
  - Processes for equity and inclusion

**Project Duration: 2 years**  
**Project Funding: \$2 million**

***Aspirations for Statewide  
Application in the Future***

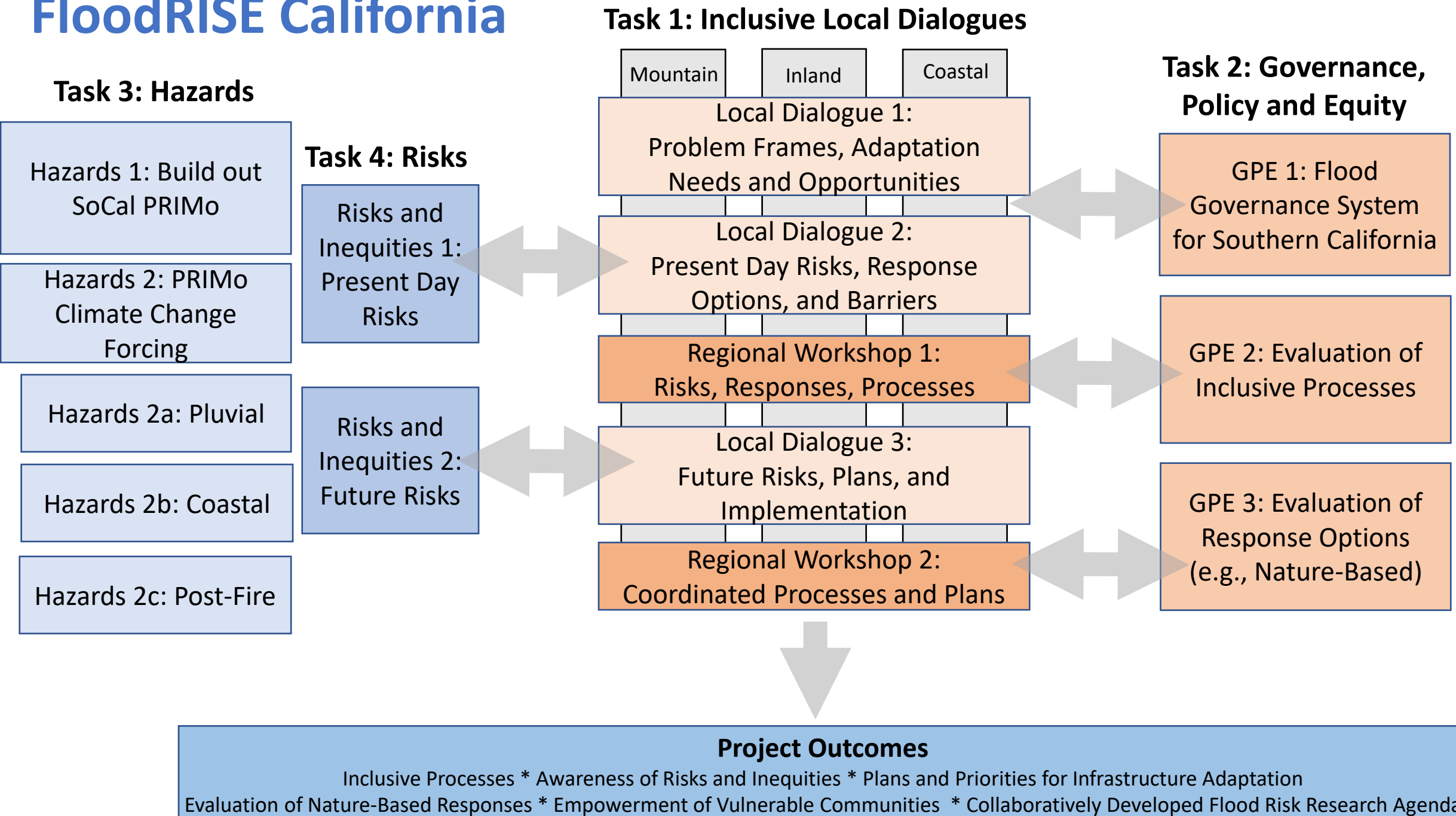


# *What we've heard thus far*

- Los Angeles County DPW
  - We need to address flood risks and inequities (and capture water)
  - We see PRIMo as a tool to help us design flood control systems and storm water systems for equity
- California DWR Floodplain Management Branch
  - PRIMo can be used to identify vulnerability hot spots, identify inequities in risk, and improve awareness
  - PRIMo data can help us with targeted outreach
  - We can match cities to the best state/federal funding opportunities based on PRIMo data
- California Geologic Survey
  - New estimates of runoff and sediment production can be fed into PRIMo to map flood/debris hazard zones below mountains
  - We can help cities and counties identify vulnerable infrastructure (bridges, culverts) where upgrades are needed
- Orange County DPW
  - We can help municipalities update local drainage plans
  - We can use PRIMo to estimate fluvial flood risks based on updated OC Hydrology Manual flow rates
- California Coastal Commission
  - Opportunity to support updates of Local Coastal Plans (LCPs)
  - Opportunity to increase awareness of compound flood risks
- California Insurance Commission
  - Opportunity to explore community-based (parametric) insurance



# FloodRISE California





# Comments and Questions?



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