

AdaptLA: Sea Level Rise and Coastal Impacts Planning for the L.A. Region.



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Regional Water Quality Control Board
February 11, 2016

USC Sea Grant - The Urban Ocean Program



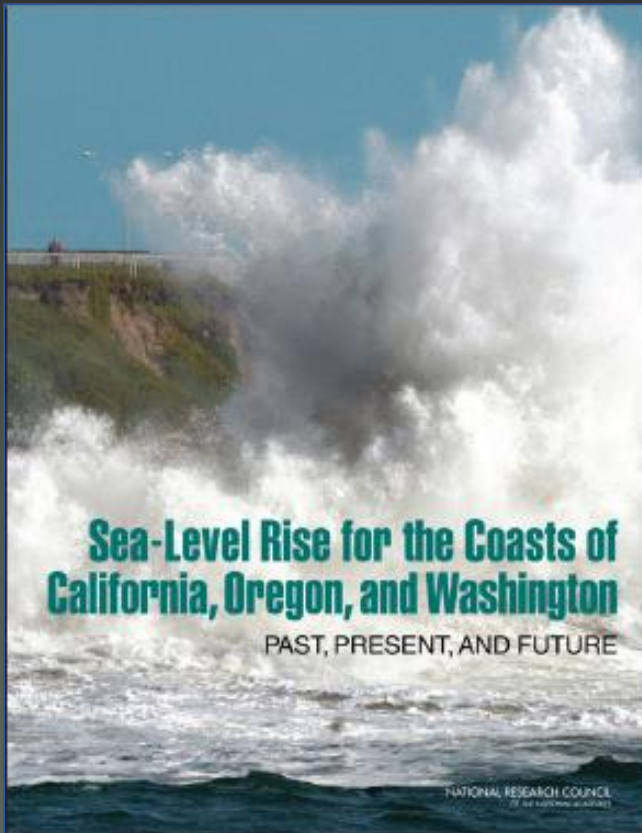
Role of SG Programs

- Fund relevant research
- Outreach & Education
- Boundary Organization

Urban impacts on coastline

- Human Impacts
- Harmful Algal Blooms
- Water Quality
- Invasive Species
- Climate Change

SLR Projections for U.S. West Coast



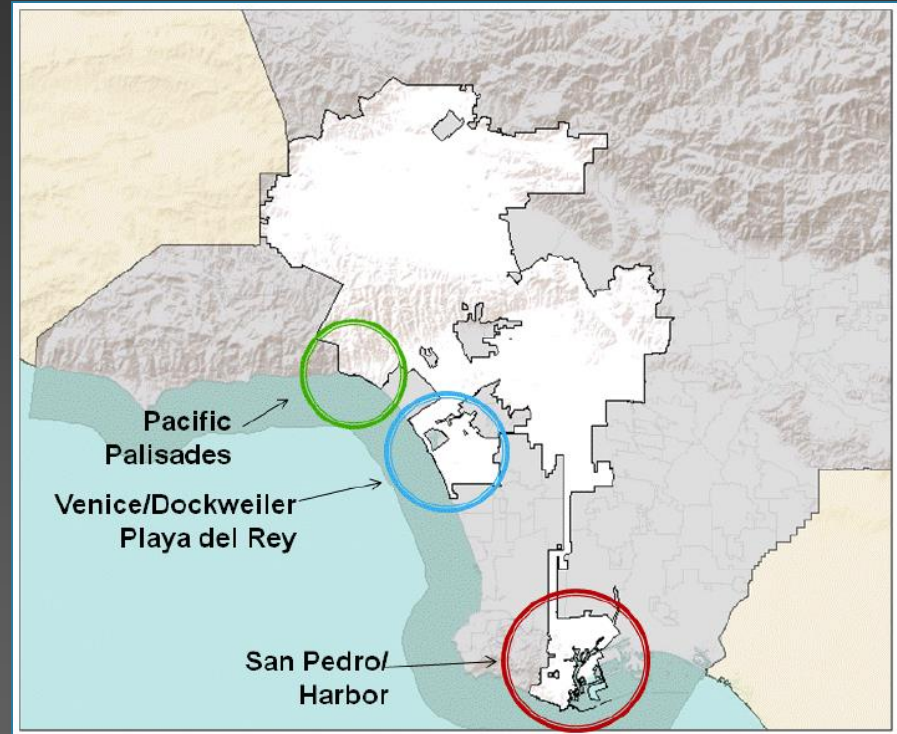
Time Period	Southern California
2000 – 2030	2 – 12 inches
2000 – 2050	5 – 24 inches
2000 – 2100	17 – 66 inches

http://www.nap.edu/catalog.php?record_id=13389

AdaptLA: SLR Vulnerability Assessment for City of L.A.

Sea Level Rise Vulnerability Study for the City of Los Angeles

Prepared by the
University of Southern California Sea Grant Program



Sea Level Rise Impacts in L.A.

- Vulnerable communities
 - LA City population of 4 million
- Vulnerable infrastructure
 - 2 Water Treatment Plants
 - 2 Energy Generation Plants
 - Port of Los Angeles
 - Pacific Coast Highway
 - 780,000 feet of pipes
 - 10,500 water services



Participatory Process

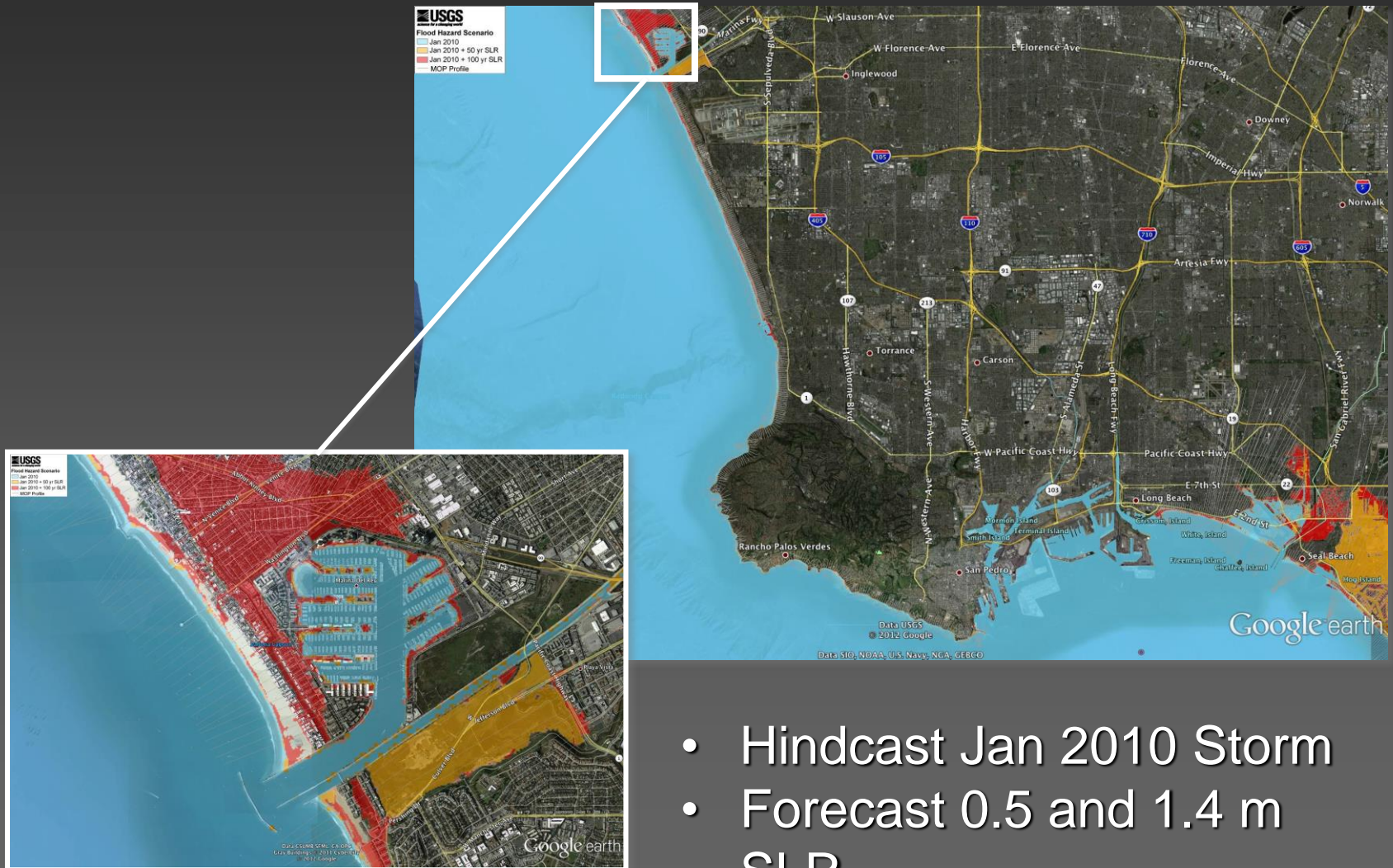
- City Adaptation Leadership
 - Department of Water & Power
 - Port of Los Angeles
 - Bureau of Sanitation
 - Emergency Management Services
 - Planning
 - Parks and Recreation



- Regional Stakeholder Working Group
 - Local business, industry experts, LA County representatives, public utilities, NGOs, COGs, SCAG

Coastal Storms Modeling System 1.0

Led by Dr. Patrick Barnard - USGS



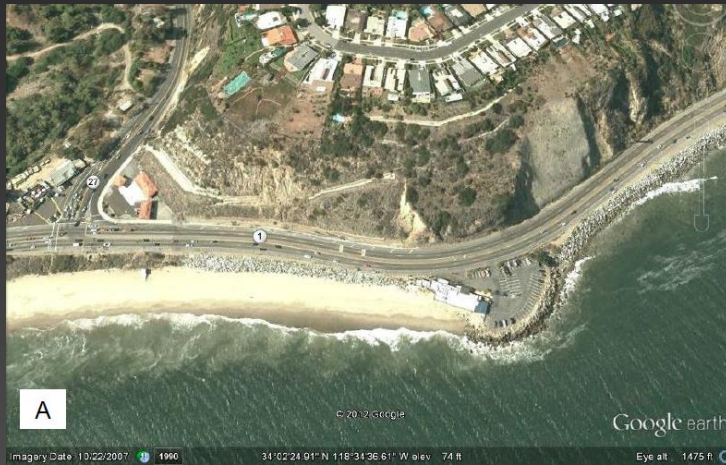
- Hindcast Jan 2010 Storm
- Forecast 0.5 and 1.4 m SLR

Existing Conditions and Current Vulnerabilities

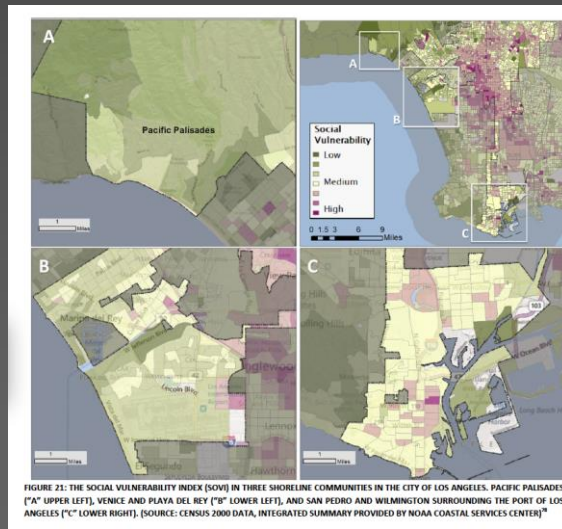
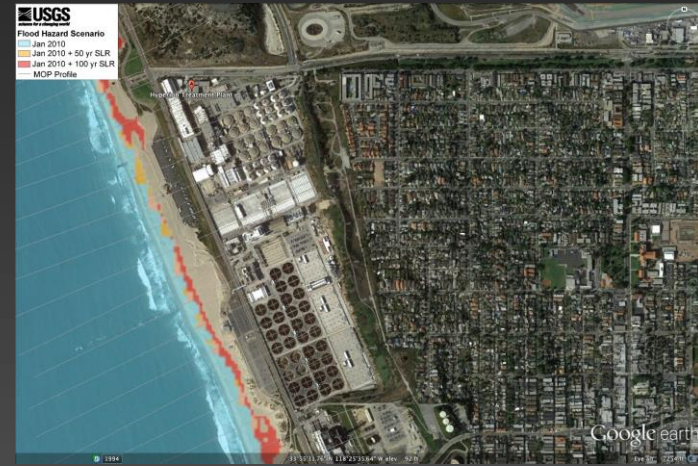
- Start with what we know
- Existing Conditions
 - Identified all assets coastward of 6 m elevation contour
 - Known vulnerabilities from high tide and storms
- Review of city existing policies
 - General Plan, GreenLA, ClimateLA



Coastal and Shoreline Asset Overview (Dr. Ron Flick)



Physical Assets (ICLEI)



Social Vulnerability (Drs. Moser & Ekstrom)

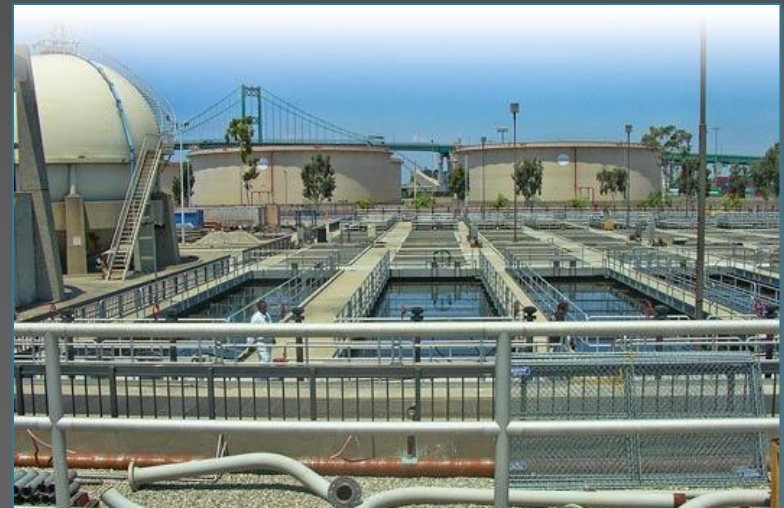


Economic Vulnerability (Drs. Wei & Chatterjee)

Physical Vulnerability Assessment

Conducted by ICLEI

- Potable, stormwater, and wastewater systems
 - Higher vulnerability
- Port facilities & assets
 - Lower Vulnerability
- Roads
 - Higher vulnerability



Social Vulnerability Assessment

- Examined suite of census data
 - Income
 - Poverty
 - Education
 - Physical/mental illnesses & disabilities
 - Race
 - Age
 - Housing Type / Age
 - Linguistic isolation

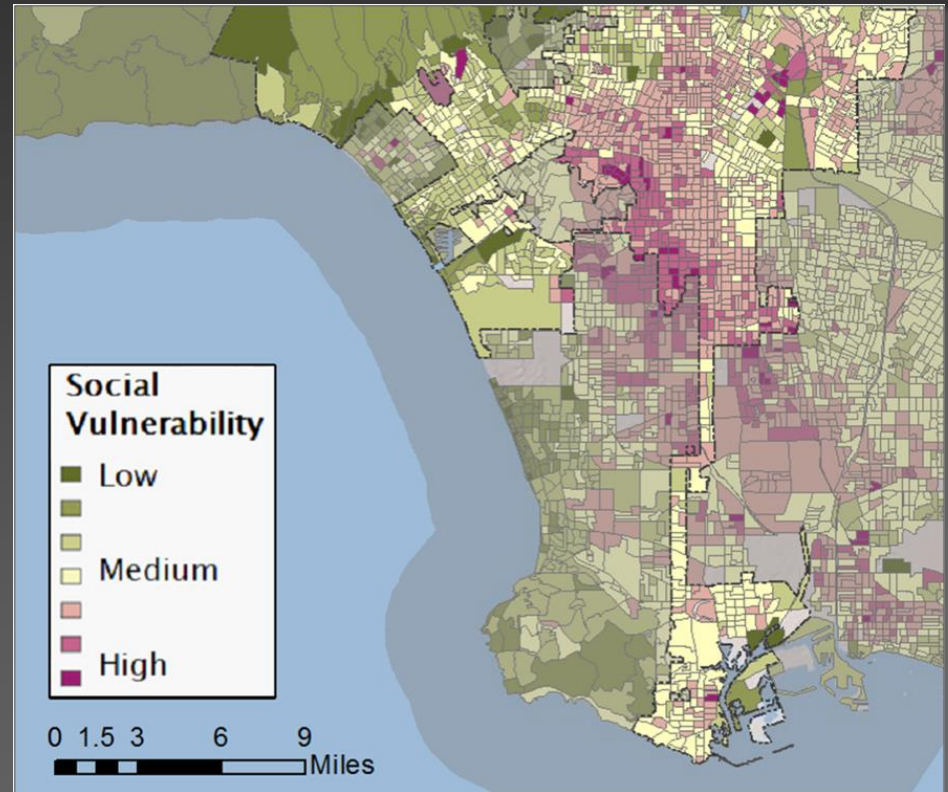


Led by Dr. Julie Ekstrom & Dr. Susanne Moser

Social Vulnerability Assessment – Major Findings

Census data analysis

- Low-lying San Pedro and Wilmington highest vulnerability
- Lower per capita income, lower education, linguistic isolation, larger proportion of renters



Beginning Strategies for Adaptation

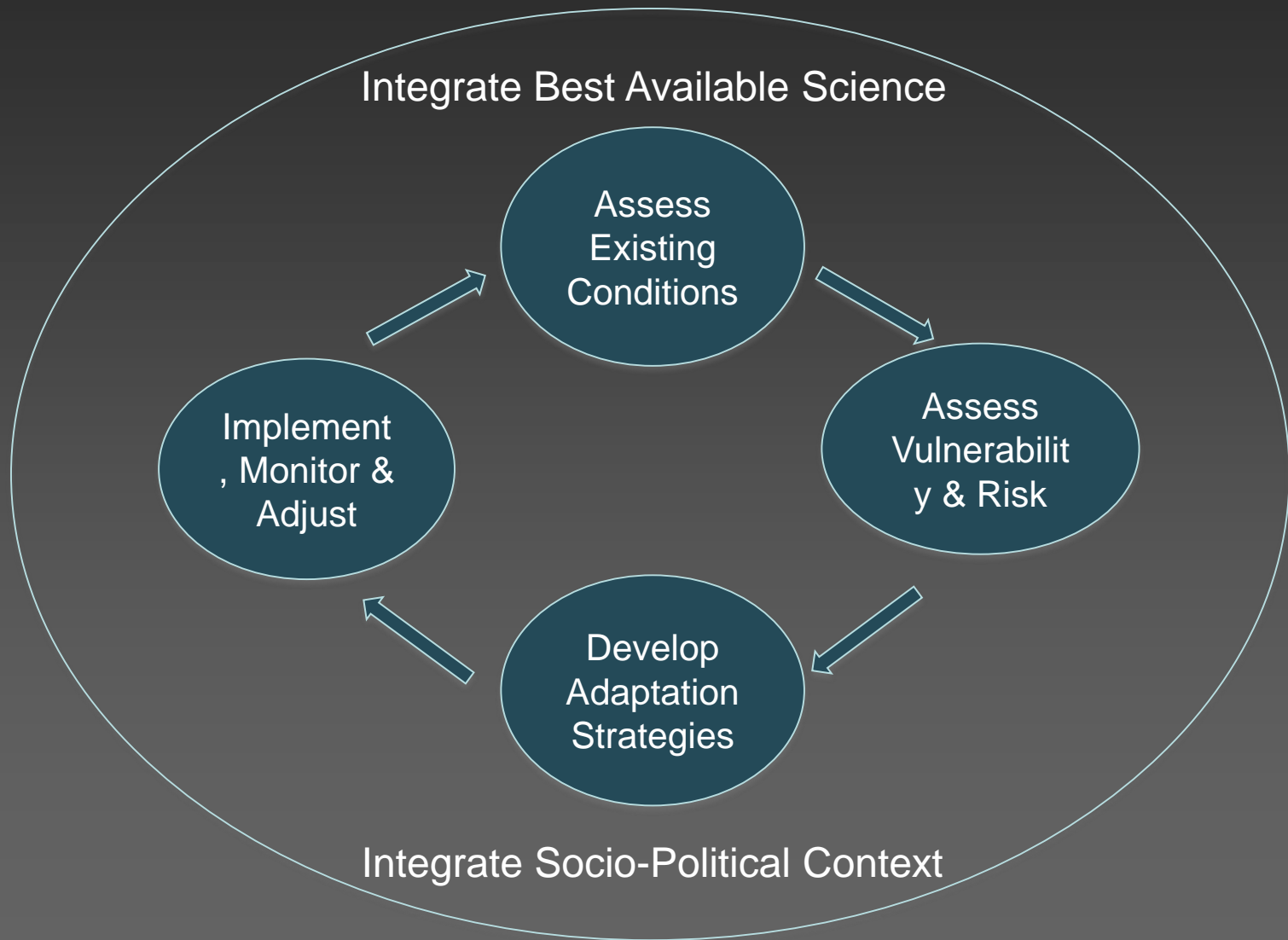
- Document vulnerable populations – helps first responders
- Alternative forms of communications
 - In other languages
 - Don't require computer access
- Empower neighborhood councils, churches and community-based organizations



Major Findings

- The beaches are the best line of defense
 - Big need for shoreline change information
- Effective SLR planning through regional collaboration
 - Need regional perspective
 - PCH in L.A. City boundaries, but managed by Cal Trans
 - Hyperion Treatment Plant city-owned asset in middle of other city (El Segundo)
 - Shared knowledge, economies of scale

“Adaptive” Adaptation Planning



Regional AdaptLA

- Grant led by City of Santa Monica, but includes 11 coastal jurisdictions and L.A. County
- Project partners - LARC, Heal the Bay, Santa Monica Bay National Estuary Program



Regional AdaptLA: Project Scope

- “Best of the best” coastal impact models for L.A. region
 - CoSMoS 3.0
 - TerraCosta Consulting Group
 - ESA/Revell Coastal
- Capacity-Building and Outreach
 - Trainings/Workshops
 - Webinar series
 - Public outreach



Southern California Coastal Impacts Project



- USGS CoSMoS Model Outreach for Santa Barbara – San Diego
- Stakeholder Engagement and Capacity Building
 - Initial Process Workshop
 - Webinar series through
 - Technical Outreach Workshops



Photo: Marika Schulhof



Photo: Monica Ly

Municipal Capacity-Building

- Training Opportunities
 - Existing Conditions & Vulnerability Assessments
 - Social Vulnerability Assessments
 - Technical Outreach of Modeling Results
- Webinar Education Series
 - El Niño
 - Legal Opportunities and Challenges with SLR
 - Sub-regional CoSMoS results
 - Cost-Benefit Analysis of Adaptation Strategies



Stakeholder Engagement



Political Leaders
City Councils
Sustainability Depts
Wastewater Treatment
Emergency Managers
Private Industry
Consultants
Public Utilities
Public Works
Harbor Depts
Planning Depts
Park Managers

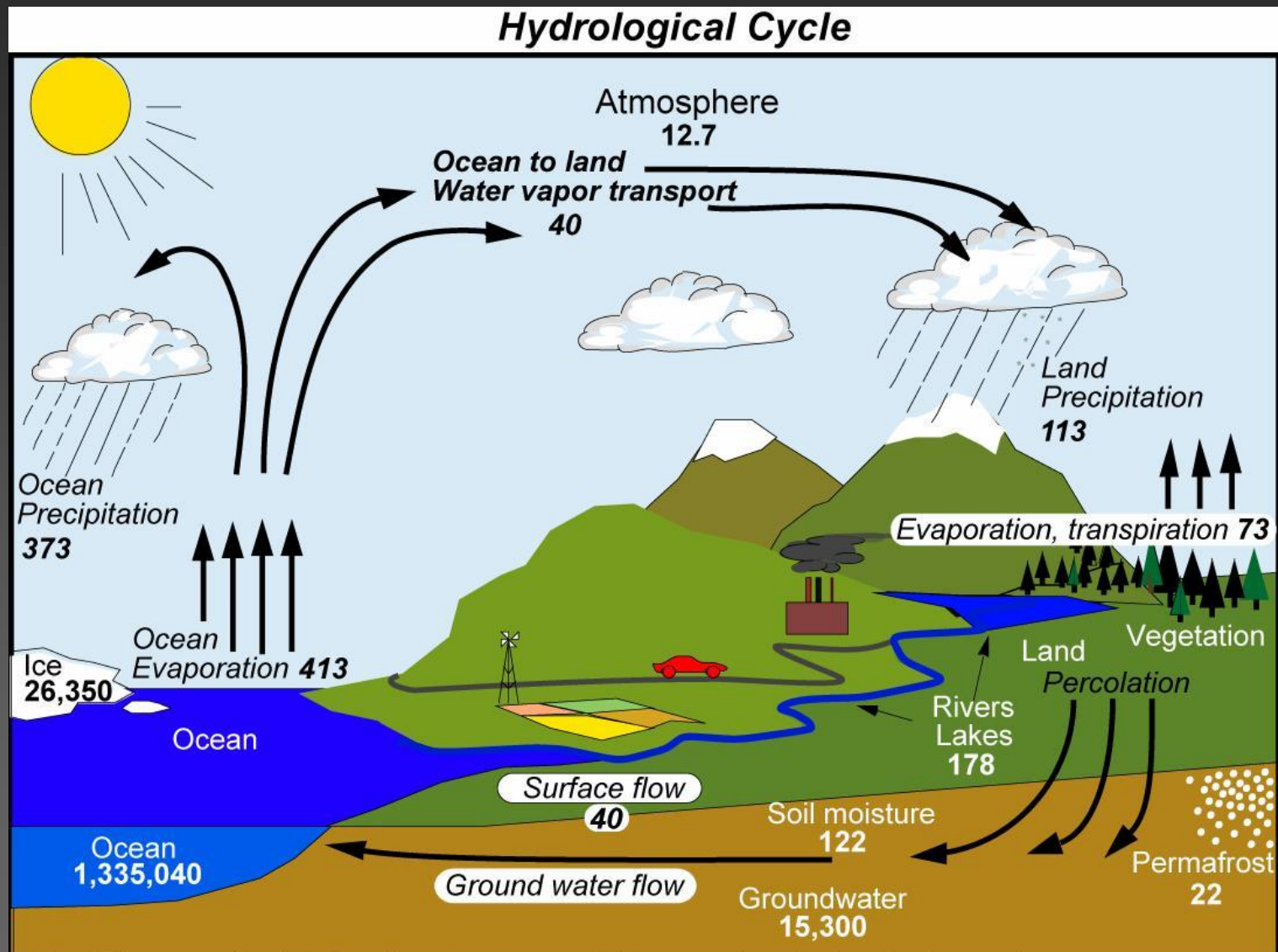
NGOs
Academia
Educators
State Agencies
Federal Agencies
MPOs, JPAs, COGs
Museums, Aquariums
Community Organizations
Professional Associations
Regional Organizations
Neighborhood Councils
Social Justice Organizations

Stakeholder Engagement

- Policy change often requires making difficult choices
- Continuity rests with well-informed stakeholders
- Grassroots/community-based action can foster dialogue and inspire novel approaches



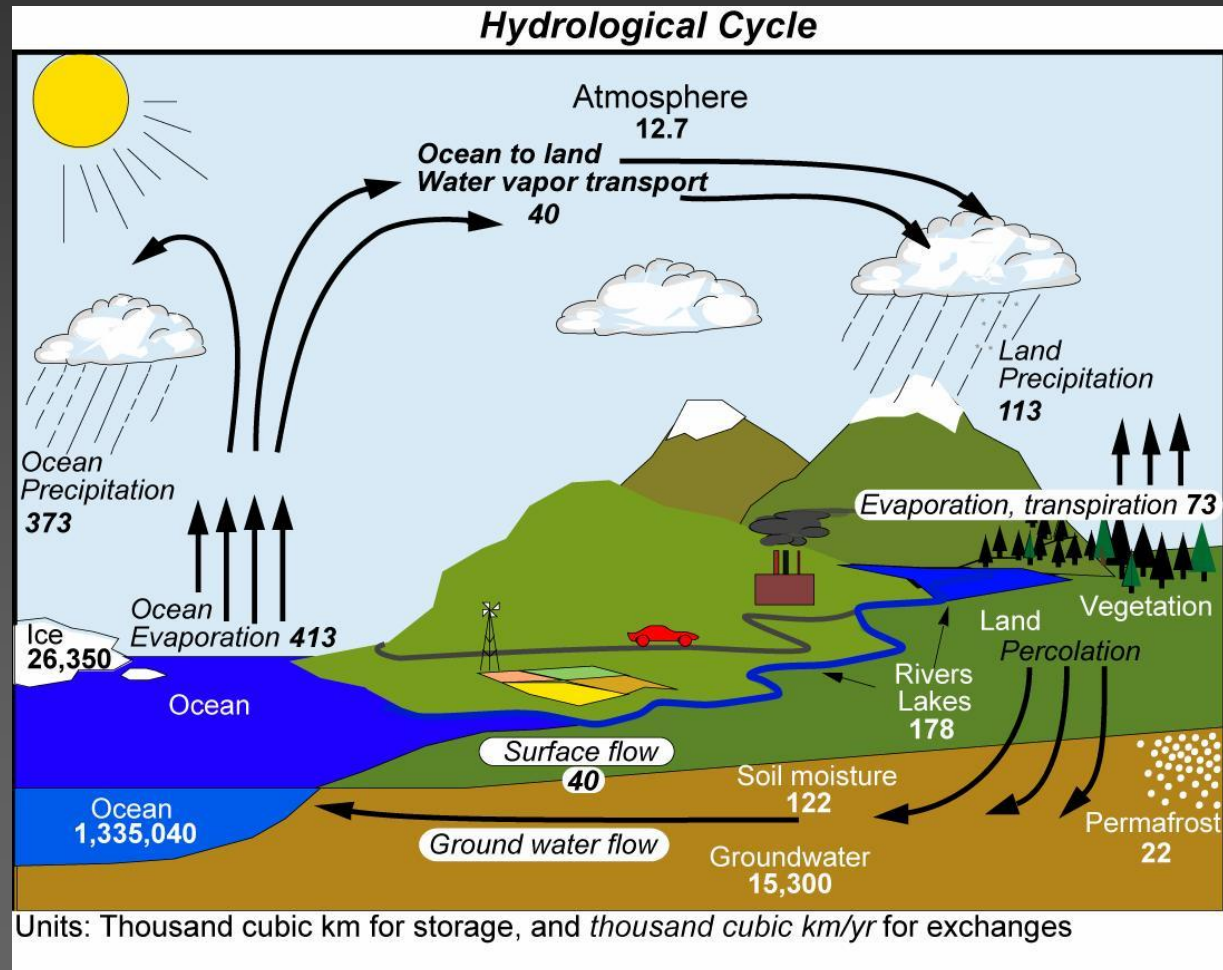
Crest to Crest



Units: Thousand cubic km for storage, and *thousand cubic km/yr* for exchanges

Crest to Crest

- What are the impacts from climate change at the various stages?
- How do impacts interact – do they amplify/attenuate each other?



Future Projects (fingers crossed...)

Los Angeles Region Framework for Climate Change Adaptation and Mitigation

*Current State of Knowledge &
Water Quality Regulatory
Program Considerations*

Los Angeles Regional Water Quality Control Board

- Crest to Crest Community of Practice
- NSF Coastal SEES Grant:
 - Led by UCLA
 - Examine nexus of sea level rise and groundwater modeling
 - Impacts of current and future management strategies
- NOAA Grants
 - Sea level rise impacts to beaches and wetlands
 - Economics of adaptation strategies and ecosystem services
- NSF Long Term Ecological Research Station

Thank you!

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USC SG Climate Change Projects:

<http://dornsife.usc.edu/uscseagrant/climate-change>

CoSMoS Data Site:

<https://www.sciencebase.gov/catalog/item/5633fea2e4b048076347f1cf>

extra slides



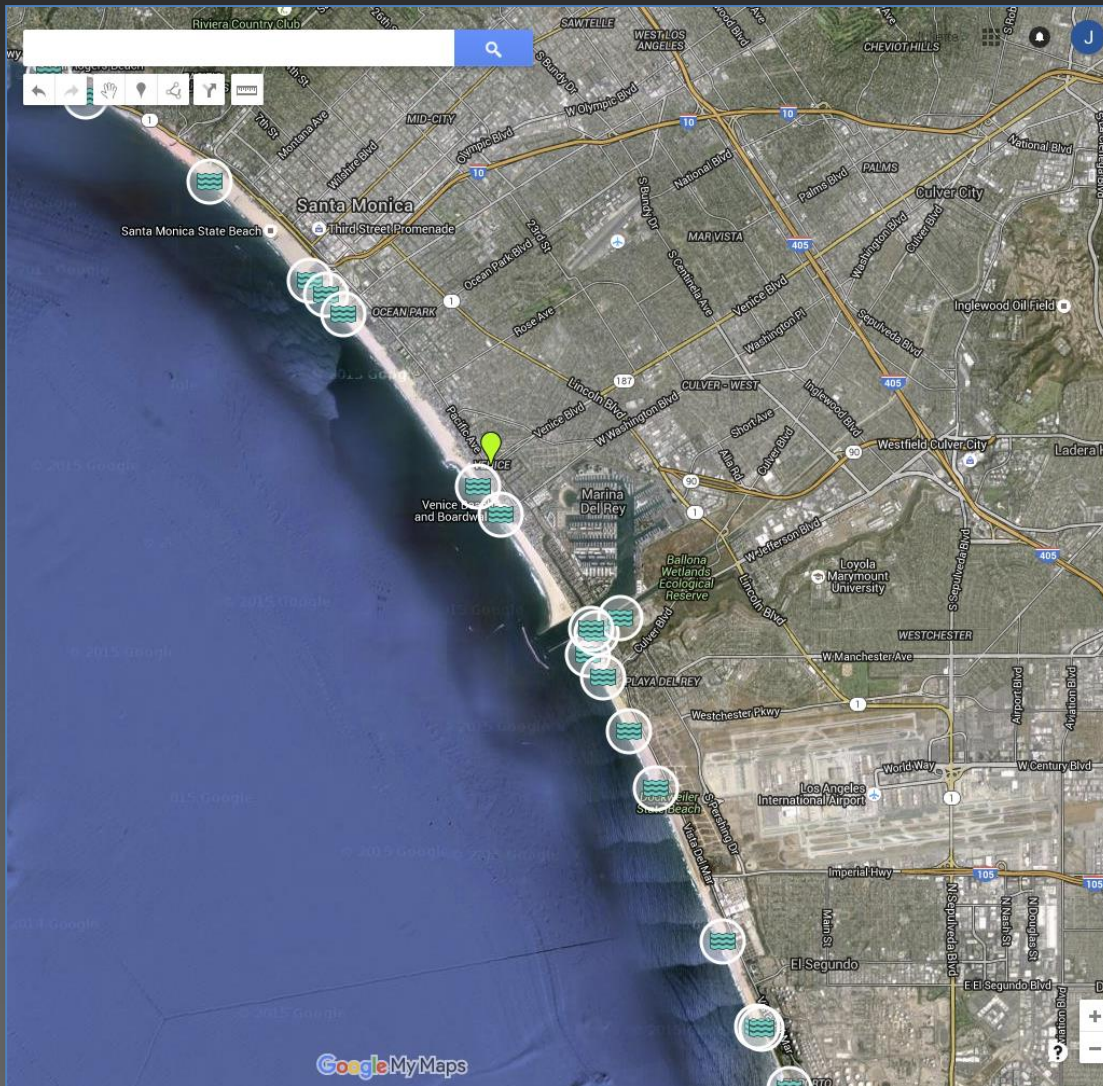
Urban Tides Community Science Initiative



- Collect images to visualize current flooding risks in So Cal
- Images to ground truth and calibrate scientific models
- Engage communities in meaningful science and invite into discussion of how we can adapt to rising seas
- Increase ocean and climate literacy within our communities



Urban Tides Community Science Initiative



- Worked w/USGS scientists, local NGOs, flood maps to ID photo sites
- Developed Google map that directs you to the sites

<http://dornsife.usc.edu/usceseagrnt/urban-tides-initiative/>



Urban Tides Community Science Initiative

LIQUID Search Datasets

Urban Tides Community

- Overview
- Form
- Charts
- Records
- Discussion
- Team
- Settings

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Verizon 2:4

liquid mobile data

LIQUID

email / username

password

Login

Connected to Liquid Server



Urban Tides Photo Database: Entry Form
 Use this form when uploading a photo from your computer.
 Upload photos and data here: <https://getliquid.io>

Record 1

Photo Location:
 Please use your phone's compass to take a GPS location in latitude and longitude.

Latitude

Longitude

Orientation:
 Use your phone's compass to determine (i.e. W, NE, etc.) _____

Date: _____

Time: _____

General Comments: This is the field to provide anything that you find interesting about your photo or information you feel is important to convey. This *is not* a required field.

Record 2

Photo Location:
 Please use your phone's compass to take a GPS location in latitude and longitude.

Latitude

Longitude

Orientation:
 Use your phone's compass to determine (i.e. W, NE, etc.) _____

Date: _____

Time: _____

General Comments: This is the field to provide anything that you find interesting about your photo or information you feel is important to convey. This *is not* a required field.
