The Stakes are Rising

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Our Coast Our Future Our Choice
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New Orleans, Louisiana
We provide science about the natural hazards that threaten lives and livelihoods, the water, energy, minerals, and other natural resources we rely on, the health of our ecosystems and environment, and the impacts of climate and land-use change.

Our scientists develop new methods and tools to enable timely, relevant, and useful information about the Earth and its processes.
USGS Coastal Storm Modeling System (CoSMoS)

1. Global forcing using the latest climate models

2. Drives global and regional wind/wave models

3. Scaled down to local hazards projections
About CoSMoS

- SF Bay Area & outer coast: ~413 miles
  - 4 storm scenarios
  - 10 SLR scenarios

- So Cal: ~295 miles
  - 4 storm scenarios
  - 10 SLR scenarios
  - Sandy coast evolution
  - Cliff retreat

- Central Coast: ~200 miles
  - 4 storm scenarios
  - 10 SLR scenarios
  - Sandy coast evolution
  - Cliff retreat
  - Vertical land motion
CoSMoS End-Users

County
• Sonoma County
• Marin County
• Santa Mateo County
• Santa Clara County
• Santa Barbara County
• Los Angeles County
  • Office of Emergency Management
  • Department of Beaches and Harbor
• San Diego County

State
• California Coastal Commission
• California Coastal Conservancy
• California Department of Emergency Services (CalOES)
• California Department of Fish & Wildlife
• California Department of Transportation (CalTrans)
• California Energy Commission
• California Natural Resources Agency
• California Ocean Protection Council

Federal
• National Park Service
• NOAA Gulf of Farallones National Marine Sanctuary
• NOAA Office for Coastal Management
• National Estuarine Research Reserve (NOAA)
CoSMoS End-Users

City
- City of San Francisco
- City of Pacifica
- City of San Jose
- City of Santa Barbara
- City of Los Angeles
- City of Santa Monica
- City of Hermosa Beach
- City of Long Beach
- City of Huntington Beach
- City of Imperial Beach
- City of Oceanside
- City of Encinitas
- City of Carlsbad
- City of San Diego
- City of Imperial Beach

Regional Scale
- AdaptLA: Coastal Impacts Planning for the LA Region
- California Climate Science Alliance
- Coastal Ecosystem Vulnerability Assessment (CEVA, Santa Barbara)
- LA Regional Collaborative on Climate Action and Sustainability (LARC)
- Regional Water Quality Control Board for LA and Ventura Counties
- San Diego Regional Climate Collaborative
- Southern California Coastal Water Research Project (SCCWRP)
- Wetlands Recovery Projects (San Diego - Orange County region & LA - Ventura - Santa Barbara region)
A little help from our friends
The Role of Boundary Organizations in Adaptation Planning

- Link scientific understanding with public policy and management
  - Ensure understanding of scientific principles, research, and applications
- Requires participation from both worlds – science and policy
  - Provide resources to scientific and practitioner communities
USC Sea Grant – The Urban Ocean Program

- Fund research
- Community outreach & education
- Technical assistance to local/regional government

10 Million by the Sea…

- Water Quality
- HABs
- Sea Level Rise & Coastal Impacts
- Coastal Management
- Maritime Affairs
Southern California Coastal Impacts Project

- Stakeholder Engagement/Capacity-Building
  - Initial Process Workshops
  - Webinar Series
  - Technical Outreach Workshops

- Focus on 4 sub-regions
  - Santa Barbara/Ventura
  - Los Angeles
  - Orange County
  - San Diego
Regional AdaptLA: Coastal Impacts Planning in the Los Angeles Region

Los Angeles is known for its wide sandy beaches, coastal boardwalks, and beach commerce and tourism. However, the impacts of climate change not only threaten our treasured beaches but also critical infrastructure, including power plants; sewage treatment plants; and two of the busiest ports in the U.S., along the coast. Planning for the impacts of climate change (adaptation planning) is therefore a priority for the region. To fully understand the impacts of climate change and how they can inform regional planning policies, a link between the best available scientific tools and local governments is needed. Regional AdaptLA: Coastal Impacts Planning in the Los Angeles Region is a multi-year project that strives to provide this link to local coastal jurisdictions and to develop a community of practice for the L.A. region.
Science Translation and Communication

Workshop Topics

- Processes/strategies
- SLR science and models
- Vulnerability assessments
- Policy/Law/SLR guidance
- Social vulnerability
- Citizen science/education

Sea Grant helps “interpret academic findings and helps people digest the information, particularly for those who are not specialized and will benefit.”
Science Translation and Communication

- Determine appropriate level of detail
- Helps show stakeholders how to make science info locally actionable
- “Communicate key talking points … better than giving them everything.”
- Trusted messenger
A Place-Based Advantage

- Continuity and consistency over time
  - Mutually understood geographies
- Established and engaged stakeholder base
  - Common trust and language
- Partner with other boundary organizations
  - Economies of scale
  - “what works”
- Resilient to political change
  - Political cycles & administrations

Analysis of attendee list from 30 USC Sea Grant-supported events from 2010-2016 focused on climate change science and adaptation planning.
Adaptive Management

Science is ever-evolving

- Communities need to be comfortable with changes
- Shape processes and methodologies to accommodate:
  - Use flexible language in adaptation plans and documents
  - Create productive relationships between scientists and decision-makers
  - Conduct iterative assessments of vulnerability and risk
  - Embrace uncertainty by developing range of possible outcomes
  - Plan re-evaluation of policies and robust monitoring
Communities want examples!

- 2011 and 2016 update of the *CA Coastal Adaptation Needs Assessment Survey*
- Many communities actively planning, but still few “implementing”
- With scarce resources, need examples to move forward!
Funding, Investments and Community Success

• 2011: coastal practitioners identified funding and staff as primary challenge

• Survey results spurred investments from the State of California

• A small investment, strategically placed and strategically leveraged, can have significant impacts

• Timing of investments is critical

Impact in Southern California of the initial investment in USC Sea Grant’s Coastal Climate Change Adaptation Program
Lessons

- *Regional Approach* in adaptation planning will be critical for interconnected region

- *Place-based boundary organizations* are effective in establishing trust among stakeholders

- The ever-evolving and complex nature of climate science can overwhelm stakeholders with too much/too complex information

- Important to *emphasize key messages* provided by the scientific information rather than providing all of the technical detail

- *Adaptive Management* useful to help communities move forward without “perfect” information, but few examples of adaptive approaches to emulate

- Communities have expressed the need for *tried and tested examples* to move forward in implementing adaptation strategies
….And Forward….

- Lack of significant and sustained funding continues to limit progress in California; however, even modest investments made at the right time can be very impactful

- Lack of mandate at state or federal level directing local communities to plan and adapt for climate risk, with corresponding funding to support action, stymies progress at the community level

- Need consistent and effective ways to empower communities to utilize available information and start implementing adaptation plans and activities
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http://dornsife.usc.edu/uscsseagrant/climate-change
Extra slides
GIS-Based Exposure to Hazards

**JURISDICTIONS**
- 9 COUNTIES
- 56 INCORPORATED CITIES

**ASSETS**
- RESIDENTS (w/ demographics)
- EMPLOYEES (by sector)
- BUSINESS SECTORS
- PARCEL VALUES
- BUILDING REPLACEMENT VALUE
- ROADS AND RAILWAYS
- LANDCOVER

**HAZARD**
- FLOODING EXTENT based on:
  - STORM FREQUENCY
    - None
    - Annual
    - 20-year
    - 100-year
  - SEA LEVEL RISE SCENARIOS
    - 0 cm
    - 25 cm
    - 50 cm
    - 75 cm
    - 100 cm
    - 125 cm
    - 150 cm
    - 175 cm
    - 200 cm
Santa Monica Owl and beyond

On Santa Monica Pier – next week!
Mobile Owl: http://mobileowl.co/samo/
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

http://dornsife.usc.edu/uscseagrant/urban-tides-initiative/
Urban Tides Community Science Initiative

- Worked w/USGS modelers and GIS team to develop photo guidance
  - 2 steps landward from water line
  - Take photo parallel to shore

http://dornsife.usc.edu/uscsagragrant/urban-tides-initiative/
thank you!

Questions?

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