Coastal Adaptation and Resilience in Tampa Bay

September 22-23, 2015

Location: University of South Florida Saint Petersburg
Room: University Student Center (USC Ballroom)

200 6th Ave South, St. Petersburg, FL 33701

Introduction:

This 2-day workshop, hosted by the Initiative on Coastal Adaptation and Resilience (ICAR), USF St. Petersburg and the Tampa Bay Regional Planning Council ONE BAY Resilient Communities Working Group, will inform participants of the work underway to address vulnerabilities to coastal hazards and build regional resiliency. Through a series of facilitated discussions between experts from South Florida and the Tampa Bay region, participants will explore lessons learned from adaptation strategies currently being applied in these coastal regions of the state and contemplate how to move forward building places that can withstand the effects of a changing climate.

Workshop Objectives:

- Explore the existing and future regional approach for Tampa Bay for climate change adaptation
- Foster a dialog between local elected officials and academia on how to best address the regional impacts of climate change
- Link academic and scientific research to adaptation policy and implementation
- Identify research, data and policy gaps and needs in order to create a focused research plan
- Evaluate the need for regional climate adaptation plan or compact-style agreement in Tampa Bay

Workshop Topics:

- Analyzing Coastal Climate Hazards
- Regional Responses to Climate Change
- Assessing Vulnerabilities and Impacts: Health, Habitat and Transportation
- Implementing Adaptation Strategies: City and Regional Levels
- Communicating Risk to the Public: Strategies and Challenges
- Adaptation Strategies in Tampa Bay: Identifying data, policy and research gaps

Who Should Attend:

- Citizens, Students & Researchers
- Elected Officials & Government Administrators
- Transportation and Urban Planners, Floodplain Managers, Emergency Managers, Public Works Professionals, Natural Resource Managers, Engineers & Scientists, Insurance Companies and Businesses.

Benefits:

- Network and share information with other individuals engaged in coastal resilience planning throughout Florida
- Shape research agendas and future climate adaptation efforts in the Tampa Bay region and beyond

For additional workshop details (program, logistics, registration etc.) – please visit http://www.usfsp.edu/icar/upcoming-events/ or http://onebay.org/.

Schedule

22-Sep	**Day 1**
2:00-2:15	**Welcome** Interim Dean of the College of Arts and Sciences Cornelius **Goals of the workshop and Logistics** Barnali Dixon and Donny Smoak
2:15-3:00	**Analyzing Coastal Climate Hazards** Gary Mitchum, USF, Graham Tobin, USF
3:00 -4:30	**Regional Responses to Climate Change** Panel Chair - Mark Hafen, USF Alison Adams, Tampa Bay Water Maya Burke, TBRPC Carnahan, Elizabeth (Libby) Florida Sea Grant, UF/IFAS Extension, Pinellas County
4:30 -5:00	**Breakout Sessions** ***Regional Efforts: Roles of different groups and gaps*** Organizer: Rebecca Johns Leaders: Maya Burke, Barnali Dixon, Donny Smoak, and Graham Tobin *Desired Outcomes:* *- Inform approaches ideal for the region* *- Identify ways regional organizational gaps can be met*
5:00 – 6:00	**Reception (first round on us and then a cash bar)**
23-Sep	**DAY 2**
8:00- 9:40	**Assessing Vulnerabilities** Panel Chair – Burrell Montz, East Carolina University **Habitat Impacts** Lindsay Cross, TBEP **Transportation Impacts** Alison Yeh, Hillsborough County MPO

9:40-10:00	***Coffee BREAK***
10:00-12:00	**Implementing Adaptation Strategies** Panel Chair – Keren Bolter **Adaptation Action Areas** Jason Liechty, Broward County **Integrated Water Resources Planning** Kelli Hammer-Levy, Pinellas County
12:00- 1:00	***LUNCH BREAK (Lunch served)***
1:00 -1:30	**Communicating Risk** Heidi Stiller, NOAA Office of Coastal Management
1:30- 2:30	**Governing for Resilience – Moderated Panel** Moderator - Avera Wynne, TBRPC
	Janet Long, Pinellas County Darden Rice, City of St. Petersburg Robin DiSabatino, Manatee County Patrick Roff, City of Bradenton
2:30 -3:00	***Coffee BREAK***
3:00-3:45	**Adaptation Strategies in Tampa Bay**: **Identifying Gaps** **Data Gap** Al Karlin, SWFWMD, **Policy Gap** Mark Hafen, USF **Research Gaps** Gary Mitchum, USF
3:45- 4:30	**Breakout sessions** ***Adaptation Strategies in Tampa Bay: Identifying data, policy and research gaps*** Organizer: Rebecca Johns Leaders: Al Karlin & Barnali Dixon **for Data** , Graham Tobin and Maya Burke **for Policy** , Gary Mitchum, and Donny Smoak **for Science** *Desired Outcomes:* *- Guidance on regional climate governance structure* *- Gauge interest in a climate compact-style agreement for TB region*

	- Identify an entity to facilitate existing Climate Science Advisory Panel (CSAP) and evaluate its membership *- Evaluate the need for regional climate adaptation plan*
4:30 -5:00	Summary from Break out sessions and where Next Leaders: Graham Tobin, Mark Hafen and Donny Smoak Closing remarks – Barnali Dixon

This event is sponsored by GTU, USFSP and USF.

Gamma Theta Upsilon (GTU) is an international honor society in geography.

Speaker Biography and Contact

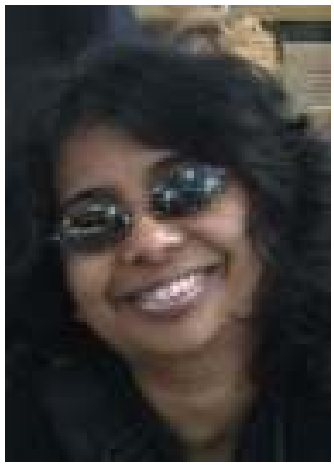
Alison Adams, (AADAMS@tampabaywater.org) Ph.D., P.E. is the Chief Technical Officer Tampa Bay Water. Dr. Adams, a water resources engineer, has work in Florida on large-scale water supply and management problems for nearly 30 years. As the agency's Chief Technical officer she is responsible for long term water supply planning, demand forecasting at multiple time scales, and decision support for risk, reliability and source allocation. She also directs research into climate variability and climate change and the effects on supply reliability for the Tampa Bay region and management strategies to mitigation these effects. Dr. Adams represents Tampa Bay Water as the chair of the Water Utility Climate Alliance and co-manages a project with the University of Florida and the Southeast Climate Consortium on downscaling global climate model output for use in the agency's integrated hydrologic model. She also represents Tampa Bay Water (a founding member) on the Florida Water and Climate Alliance. She earned a doctorate degree in Water Resources Planning and Management from Colorado State University. She also earned an undergraduate degree from the University of Florida in Environmental Engineering and a Masters' degree from University of South Florida in Engineering Management.

Keren Bolter (kbolter@fau.edu) is the Science Director for Coastal Risk Consulting, LLC and does research at FAU Center for Environmental Studies and the Southeast Florida Regional Council. Keren uses GIS to assess sea-level rise risk, modelling LiDAR, storm surge, and water table data to address physical, socioeconomic, and health impacts. Dr. Bolter has a Bachelor's Degree in Environmental Engineering from Tufts University, a Master's Degree in Environmental Studies from Florida Atlantic University (FAU), and a PhD in Geosciences from FAU.

Maya Burke (maya@tbrpc.org) serves as the director of the Agency on Bay Management and also coordinates the ONE BAY Resilient Communities Working Group on sea level rise adaptation planning in her capacity as the Senior Environmental Planner with the Tampa Bay Regional Planning Council. She has spent the past 10 years working in water resource management, regulatory compliance, land acquisition, and environmental land use planning. Prior to working at the TBRPC, Maya worked for the Southwest Florida Water Management District. She is a graduate of New College of Florida (Political Science and Environmental Studies, 2005) and a native Floridian.

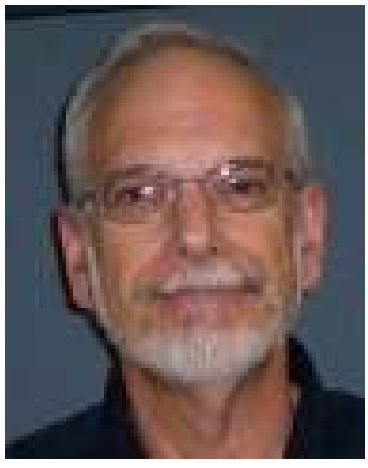
Libby Carnahan (lcarnahan@co.pinellas.fl.us>) is the UF/IFAS Extension Florida Sea Grant Agent in Pinellas County. She works to deliver the complex, cutting-edge science of climate change and sea-level rise to her community. This includes public workshops, facilitating scientific advisory groups, and liaising with local governments to increase awareness and aid planning efforts. Libby holds a Bachelors of Science in Biology from Truman State University, Kirksville, MO (1998) and a Masters in Marine Science from University of South Florida, St. Petersburg, FL (2005).

Lindsay Cross (lcross@tbep.org) received a B.S. degree in Environmental Health from Colorado State University and a M.S. degree in Environmental Science and Policy from the University of South Florida. As the Environmental Science and Policy Manager at the Tampa Bay Estuary Program, she manages multi-entity habitat restoration, water quality improvement, ecosystem protection, and environmental policy projects. She also facilitates working groups, develops grant proposals, creates public documents summarizing Tampa Bay research projects, and serves on policy and advisory boards. She has been with the Estuary Program for 13 years.



Barnali Dixon (bdixon@mail.usf.edu) is a professor and chair of Environmental Science, Policy and Geography Dept., USFSP. She is also the Director of the Geospatial Analytics lab. She has extensive experience in the application of Geographic Information Systems (GIS), remote sensing, Global positioning Systems (GPS), geostatistics, fuzzy logic and neural networks for environmental modeling. Specific research interests and projects are: Risk assessment and environmental modeling for soil, water and landuse interaction and surface and ground water quality and quantity. She earned her PhD in Environmental Dynamics from University of Arkansas in 2001. Dr. Dixon's study areas include Florida, Malaysia, India, Iran, Greece and Turkey. She recently completed a text book called '*GIS and Geocomputation for Water Resource and Science Engineering*'. http://www.usfsp.edu/espg/dixon/

Mark R. Hafen (mhafen@usf.edu) is Assistant Director and Senior Instructor in the School of Public Affairs at the University of South Florida in Tampa, where he teaches and advises in the Master of Urban & Regional Planning (MURP) program, with an emphasis on urban environmental policy and planning. He holds a B.S. in Business Logistics from Penn State University, and an M.A. in Geography and a Ph.D. in Marine Science, both from USF. He has professional experience in land use planning/consulting, primarily with power plant and transmission line sitings, highway construction projects, and landscape architecture plans. He has co-authored a forthcoming book (with A.C. Hine, D. Chambers, G. Mitchum, and T. Clayton), *Sea Level Rise and Florida: Planning for Change*, with responsibility for a chapter on urban planning and policy responses to rising seas. He currently serves as a member of the Tampa Bay Climate Science Advisory Panel (CSAP).



Alvan Karlin, Ph.D., GISP (Al.Karlin@swfwmd.state.fl.us) went to school at Rutger's University in New Jersey and Miami University of Ohio where he graduated in 1978 with a Ph.D. in Theoretical Biology. He did a post-Doctoral Fellowship at Florida State University before taking a position in the Department of Zoology at the University of Arkansas – Little Rock. While on the faculty at the UALR, Al held positions in the Departments of Zoology, Computer and Information Science, and Engineering Technology. Dr. Karlin left the University after 20 years and moved to Florida in 2000. After a short time as a consultant in the private sector, he took his current position with the Southwest Florida Water Management District where as the Senior GIS Scientist, he directs the District's LiDAR data collection missions.

Kelli Hammer Levy (klevy@co.pinellas.fl.us) has her B.S. from Eckerd College and M.S. from the University of South Florida in Marine Science. As the Manager of Pinellas County's Natural Resources Division Kelli oversees the County's stormwater and floodplain management programs, environmental monitoring, NPDES and TMDL programs, watershed planning, dock and dredge and fill permitting, mangrove protection and preservation, coastal management, ecological services, environmental education and compliance programs, urban forestry, vegetation and lake management, and mosquito control. She has been with Pinellas County for 15 years.

Jason Liechty (jliechty@broward.org) is Environmental Projects Coordinator with the Broward County Environmental Planning and Community Resilience Division, where he manages state and federal environmental policy and legislative issues and contributes to many of the County's climate change and energy initiatives. He is one of two Broward County representatives on the Staff Steering Committee of the Southeast Florida Regional Climate Change Compact and also serves as the Compact's de facto policy and legislative coordinator.

Gary Mitchum (mitchum@usf.edu) is a Professor of Physical Oceanography and the Associate Dean in the College of Marine Science at the University of South Florida. He received his PhD from the Department of Oceanography at the Florida State University in 1985, spent 11 years in the Department of Oceanography at the University of Hawaii, and came to the University of South Florida in 1996. His research interests emphasize short-term climate changes, ranging from interannual variations such as ENSO, to decadal processes, to the long-term sea level rise problem.

Burrell E. Montz (montzb@ecu.edu) is Professor and Chair of the Department of Geography, Planning and Environment at East Carolina University. She has more than 35 years of experience in various aspects of hazards research including vulnerability analyses, addressing socio-economic, demographic, locational, and environmental factors, as well as evaluation of mitigation planning and policy. She also serves as the President of GTU at the national level. http://www.ecu.edu/cs-cas/geog/Faculty/upload/Dr_Montz_CV.pdf

Joseph M. Smoak (smoak@mail.usf.edu) is a professor of biogeochemistry at the University of South Florida in St. Petersburg. Dr. Smoak has conducted research at sites ranging from Florida to locations around the world including Antarctica, Australia, Brazil, China, Iran, Mexico and Venezuela. He has examined lakes, freshwater wetlands, coastal ecosystems, continental margins and deep-sea sediments. Dr. Smoak's current research focuses is on how coastal wetlands respond to climate change and sea-level rise. Specifically, his work examines carbon burial (i.e., sequestration) in coastal wetlands, and how that burial might change and influence the global climate. http://www.usfsp.edu/espg/smoak/

Heidi Stiller (Heidi.Stiller@noaa.gov) with a background in public policy, coastal management, and sociology, Ms. Stiller has been with NOAA since 2001. She is part of the Office for Coastal Management's Engagement and Training Program, and since 2006 has been focused on the Gulf of Mexico region. Ms. Stiller helps NOAA's customers and partners identify, promote, and implement activities that enhance the resilience of the built, natural, and social environments of coastal communities.

Graham Tobin (gtobin@usf.edu) is a Professor in the School of Geosciences at the University of South Florida. He received his B.A. degree from the Durham University, England and Ph.D. from the University of Strathclyde in Scotland. His research interests in natural hazards, water resources policy, and environmental contamination examine human vulnerability,

community sustainability and resilience, social networks, and health conditions in hazardous environments. His current research focuses on the volcano hazards in Ecuador and Mexico, earthquakes in New Zealand, and hurricanes in Florida,
USA. (http://hennarot.forest.usf.edu/main/depts/geosci/faculty/gtobin/).

Allison G. Yeh, (YehA@plancom.org) AICP and LEED Green Associate is an Executive Planner and the Sustainability Coordinator with the Hillsborough County Metropolitan Planning Organization/Planning Commission. Ms. Yeh has over 15 years of experience in transportation and land use planning. She holds a B.A. and Master of Urban and Regional Planning Degree from the University of Michigan (Ann Arbor). As Sustainability Coordinator and planner, she facilitates the development of transportation and land use initiatives and works with stakeholders from local governments, organizations, and regional and federal partners on implementation. Allison's areas of interest include climate adaptation & resiliency, sustainable transport systems, social & economic sustainability, and healthy livable communities. Her experience includes work with the FHWA Climate Change Resilience Pilot Program, the Atlanta Regional Commission, the Metropolitan Atlanta Rapid Transit Authority (MARTA), and the Atlanta Committee for the Olympic Games.

Avera Wynne (avera@tbrpc.org) has 29 years of professional urban and regional planning experience and currently serves as the Planning Director of the Tampa Bay Regional Planning Council. He was the technical team leader for the regional visioning project ONE BAY (www.onebay.org) and is currently a lead collaborator for the ONE BAY Working Group. Mr. Wynne holds an undergraduate degree in urban planning from East Carolina University and a Master's of Regional Planning from the University of North Carolina. Avera has been a member of American Institute of Certified Planners since 1988.

Panelists for Moderated Session: Governing for Resilience

Moderator: Avera Wynne, TBRPC

Panelists: Commissioner Long (Pinellas County), Councilmember Rice (City of St. Petersburg), Councilmember Rolf (City of Bradenton), Commissioner DiSabatino (Manatee County)

Summary of Breakout Sessions and Recommendations

DAY 1

Theme: Science

Group 1

- **What organizations are represented at your table?**
  - USF, SWFWMD, Environmental/Engineering Consultant, Education entities
- **Where are our strengths in terms of current scientific knowledge of effects of climate change on our coastal area?**
  - Enough to know how to move forward – natural science data, SLR projections/models, social and economic census data
- **Where are we missing critical pieces of information that might help inform our policy responses with strong data?**
  - Infrastructure data/management inventories
  - Communication: social science to policy makers, factor in economics and social consequences
  - Non-profits filling gaps of government
  - Disconnect between public and planners along with disinterest of developers and policy makers, lack of accountability of developers
  - Getting the good science "out there"
  - Are we learning lessons? →post disaster recovery planning
- **What agencies and disciplines should be involved in filling the gaps of knowledge?**
  - University research teams, insurance companies/re-insurance, public/private partnerships, integrated project teams – seamless web of communication

Group 2

- **What organizations are represented at your table?**
  - USFSP faculty and students, Florida Democratic Environmental Caucus, Tampa International Airport
- **Where are we missing critical pieces of information that might help inform our policy responses with strong data?**
  - Missing specifics on SLR scenarios – over-reliance on bath tub model
  - Synergistic effects of population growth and economic growth on water demands
- **Why do these gaps exist? Is this a problem of research funding or are there other obstacles?**
  - More funding needed; not just reallocation, but greater overall to tackle the issues, like WWII funding or a "Green New Deal"
  - Improved means/methods to communicate the message of climate change
    - How to impact powerful interests?
    - How to reach disenfranchised communities?

        - How to educate the general public?
- **What are the critical organizational needs for better scientific information dissemination? How does your organization fit in?**
    - Tampa International: developed Sustainable Management Plan
        - People, Planet, & Prosperity incorporated into all operations – holistic approach

Group 3

- **What organizations are represented at your table?**
    - USGS, USFSP, USF CMS, FWC
- **Where are we missing critical pieces of information that might help inform our policy responses with strong data?**
    - Local cost/avoided costs to implement resiliency/adaptation structural and non-structural improvements (more data/info on this will shift the discussions)
- **What agencies and disciplines should be involved in filling the gaps of knowledge? How does your organization fit in?**
    - Broaden science to other disciplines – law, economics, green technology, habitat
- **Why do these gaps exist? Is this a problem of research funding or are there other obstacles?**
    - Knowledge "gaps" in certain levels of administrations exist due to priorities and lack of desire (fear of falling property values)
- **What are the critical organizational needs for better scientific information dissemination?**
    - Better coordination among agencies, universities, and organizations to conduct citizen/stakeholder engagement to influence decision makers and elected officials

Theme: Data

Group 1

- **What organizations are represented at your table?**
    - NOAA, USFSP, HCC Tampa Bay Water, Hernando County, Manatee County
- **What kinds of data sets are currently available? How strong are these data sets?**
    - Some "ready-made" data/tools out there, but some do not work for Florida, and metadata is not always available
- **What are some of the important issues moving forward in the data area?**
    - Make sure everyone knows about available data in the Tampa Bay area
    - Understanding where future job and skill needs will be
    - Data quality, consistency, and compatibility issues
    - Misapplication of data is a problem
- **What types of data are missing that would be helpful to this process?**

    - Improved downscaling modeling of rainfall
    - Cost information – for society, incorporating all ecosystem services
- **What will be the best way to make data available?**
    - Funding to get data into GIS
    - Clearinghouse – central location for data for Tampa Bay area

Theme: Policy

Group 1

- **What organizations are represented at your table?**
    - Pinellas County, TBW, USF, TBRPC, citizens
- **What policy measures do we have in place currently that impact our area – from federal to local scale? What kinds of policies are we missing that are needed to better develop resilience in the fact of climate change?**
    - FL Statute – comp plans and SLR, Adaptation Action Areas, storm water utility fees, bonding/rating
    - Political cover/constituent response questions, timescales, service/duty to health/safety/welfare
- **What are the obstacles to better policy making, and how can we overcome them?**
    - Credibility, incrementalism, ROI, risky business, systems thinking (relation between built and natural systems)
- **Who should be involved in developing these policies?**
    - Business community

Group 2

- **What organizations are represented at your table?**
    - Academia, local government, community, consultants
- **What is the mission of your organization?**
    - Education and outreach
- **What policy measures do we have in place currently that impact our area – from federal to local scale?**
    - AAAs, EIS
- **What are the obstacles to better policy making, and how can we overcome them?**
    - Need political buy-in: regional, elected officials, stakeholders, businesses
    - Have a plan → implement (→budget) → enforce (→priorities) → infiltrate planning process

Group 3

- **What organizations are represented at your table?**
    - Universities: USFSP, Patel College of Sustainability, Leeds University UK, UF Extension
- **What are the obstacles to better policy making, and how can we overcome them? What are the critical organizational needs for better policy making and implementation?**

- Bring more social science into the process; understanding diversity and social stratification – impact on vulnerability and involvement in process
- Consider political economy/culture of our region, how it may limit or shape process, possibilities
- Bring sustainability into conversation in terms of systems level changes (St. Pete's Executive Order, for example)
- Ask questions about HOW we get things done, what we are asking people to do

DAY 2

Each group had experts from thematic areas of science, policy and data - this was by design to create an environment for interdisciplinary discussions.

Group 1

- **What needs to be done to bring diverse players together to move forward?**
  - Look at structure of CATALYST – Miami and CLEO Institute
    - Climate 101 Training for all government workers
  - Engage social scientists to complete stakeholder analysis of our communities
    - Adapt ONE message for different groups/neighborhoods
    - Reach out and engage grassroots groups (TRUST)
  - Reach out to business community – through COB/USFSP – Climate Change Business Group
  - Create a clearinghouse organization through USFSP to bring all data and models of action to one place
    - To coordinate info exchange and collaboration
      - Utilize resources at USFSP (COB, students, scholars across disciplines)
    - Apply for funding

Group 2

- **How can we build on the existing knowledge to move forward with an adaptation and resilience agenda for our area?**
  - Structurally, we have CSAP, TBRPC, OneBay, Tampa Bay Partnership
    - Committee of TBRPC (as minimum – could involve business, other stakeholders) focused on adaptation and sustainability
      - Elected level – for buy-in, public face
      - Staff level to do the work
  - Thematically, we have focus on science, specific risks (e.g. transportation analysis)
    - Expanding to include sustainability along with adaptation
    - Building/expanding to include integrated vulnerability and opportunity analyses

        - Physical infrastructure
        - Natural infrastructure
        - Social
        - Economic
    - Planning – regional plan(s)

Group 3

- **How can we build on the existing knowledge to move forward with an adaptation and resilience agenda for our area?**
    - More "cost of inaction" info
    - Where to find data?
        - Clearinghouse
        - Better "translated" – easier to understand
        - Well-referenced sources
    - Address "financial gap"
- **What are some strategies for dissemination of the existing, robust data and scientific knowledge to diverse sectors of the community?**
    - Public outreach of data sources
        - Not reinventing wheel
        - Expedite selection of data

Group 4

- **How can we build on the existing knowledge to move forward with an adaptation and resilience agenda for our area?**
    - Need to compress timeline of science → action, on all levels, but especially federal
    - Department of Defense doing climate change planning
- **What are some strategies for identifying specific obstacles to building resilience that stem from our political economy and political culture here in Florida? What are specific ways we might work together to overcome these obstacles?**
    - Need to overcome ideological resistance to new regulations and strategies
    - Local government/industries taking the initiative

Group 5

- **How can we build on the existing knowledge to move forward with an adaptation and resilience agenda for our area?**
    - Define goals (e.g. community resilience, mitigation – risk reduction)
- **How might we best pull together the diverse expertise, resources, knowledge, tools and skills, of our groups to develop a comprehensive plan to prepare for, and adapt to, the coming and ongoing changes in climate, weather, water resources, etc.?**
    - Science (all) inform decision-making
        - Evidence (data) tipping points
- **What are some strategies for dissemination of the existing, robust data and scientific knowledge to diverse sectors of the community?**

    - Communication (tools) to decision makers and public
- **How might we address the notion of "community" in seeking to spread scientifically based consensus on climate change?**
    - Local context – knowledge
- **What are some strategies for focusing research in new areas to address gaps in the data and scientific knowledge (including social science issues, such as identifying specific vulnerable populations in our area and involving them in the resilience-building process)?**
    - Unintended consequences (of action and inaction)
    - Action "Entity"/"Group"
        - Place to articulate goals
        - Mobilize action/decision-making
        - Co-producing data
    - Keep communication going

Group 6

- **How can we build on the existing knowledge to move forward with an adaptation and resilience agenda for our area?**
    - Entity to evaluate CSAP: TBRPC
- **What are some strategies for focusing research in new areas to address gaps in the data and scientific knowledge (including social science issues, such as identifying specific vulnerable populations in our area and involving them in the resilience-building process)?**
    - Science gap
        - Need to synthesize the science we do have
        - Strengths: data, university support, scientific infrastructure, we have experts and local citizen/community engagement (e.g. OneBay)
        - Future research: need regional critical infrastructure vulnerability assessment
        - Data needed: LiDAR bathymetry for state-of-the-art surge models; atmospheric data for areas in the region outside Tampa Bay and Pinellas County