STATE OF RHODE ISLAND
EXECUTIVE CLIMATE CHANGE COUNCIL

Meeting Minutes

RIDEM
235 Promenade Street – Room 300

Note: italics indicate action items, follow-up at next meeting. Shading indicates issues and/or policy recommendations that probably warrant follow-up, consideration for report.

In attendance: Janet Coit, DEM, Council Chair
Grover Fugate, CRMC
Jamia McDonald, EMA
Dr. Michael Fine DOH
Kevin Flynn, DOA/Planning
Marion Gold, OER
Melissa Long (for Michael Lewis DOT)
Allison Rogers (for Richard Licht DOA)
Hannah Morini (for Marcel Valois Commerce RI)

Others: See attached sign-in sheet

Director Coit called the meeting to order at 11:11 a.m.

Approval of minutes for March 20, 2014 meeting. Kevin Flynn moved to approve, Grover Fugate seconded. All in favor.

Housekeeping. Director Coit thanked Statewide Planning for getting a web site up and functioning for the Council at www.planning.ri.gov/statewideplanning/climate. The site will serve as a repository for basic materials generated by council, and other key information resources, if only by cross-linking to other web sites. *Council members are asked to forward links to specific programs and resource materials they think should be posted* to Jan Reitsma (jan.reitsma@governor.ri.gov)..

Director Coit thanked council members and staff for their willingness to participate in an ambitious meeting schedule so as to get the initial report out on time. The meetings are intended to help the Council build a shared foundation of knowledge needed for producing a good report. We should make sure to make the time to discuss policy recommendations that will go into report. Several meeting dates have been confirmed (and will be posted on the web site). Topics include State Energy Plan (April 9), Vulnerability Assessment (April 4 and 14), what other states are doing (April 18) and the private sector/business perspective (April 21). Please forward suggestions for any additional topics for future meetings.

The Council's first meeting reviewed how each department is currently engaged in programs or activities related to with climate change. Council members have been provided with a spreadsheet with a preliminary summary and are asked to *review, edit, further populate the spreadsheet, and provide feedback* to Jan Reitsma (jan.reitsma@governor.ri.gov, 222-8291). The spreadsheet will probably become part of the May 1 report

Presentations and Discussions. Director Coit explained that this meeting will feature short presentations on sea level rise projections and associated impact scenarios, and that the focus of the discussion following the presentations will be on what the policy implications are, and what recommendations should be developed for the report.

CRMC. Grover Fugate began by noting that RI already has world class coastal hazard planning and policies, but lacks sufficient enforcement and other necessary resources to implement them to the fullest extent.

Next, he made the point that sea level rise ("SLR") is going to be with us for a very long time, showing a graph illustrating how atmospheric temperature lags behind increases in CO2 emissions, resulting in inertia that ensures ongoing warming (of atmosphere and oceans) even if/when we manage to reduce emissions. He then emphasized that SLR in New England should not be looked at on (just) a global scale, given that the North Atlantic ocean basin is relatively small and dominated by an unstable Greenland Ice Sheet (recent science that was not incorporated into the last reports of the Intergovernmental Panel on Climate Change, which looks at global trends). Recent internal projections by NOAA of "mid-range" for SLR along New England shores show 2-3 ft by 2050. More precise projections are difficult because of the many factors that drive SLR and uncertainties regarding how exactly the Greenland Ice Sheet will respond to global warming. In response to a question, Grover Fugate said that CRMC's current, conservative estimate is there will be will be 2 ft. of SLR by 2050 and 5-6 ft by 2100. He noted that Newport tide gauge data from the last 10 years indicates a doubling of the rate of SLR over historic rates.

Rhode Island's wetlands are no longer keeping up with SLR as their sediment accumulation rates are less than current SLR rates. Many salt marshes are starting to "drown in place." Other impacts of SLR can be witnessed daily, such as at the Watch Hill village parking lot which now floods often with the high tide.

When combined with SLR, storm surges are leading to accelerating inland migration of the RI shoreline. Since 1939, the Napatree Point barrier spit has moved a full barrier width inland. The Browning Cottages site essentially eroded away from 1972 to Sandy in 2012. At South Kingstown Town Beach, erosion that was projected to occur over a period of 100 years actually occurred in less than twenty years. We are also starting to witness flooding occurring from the backside of coastal barriers, such as tidal flooding of Atlantic Avenue in Westerly.

As part of the CRMC Shoreline Change (Beach) Special Area Management Plan ("SAMP") project, CRMC is developing projections of shoreline erosion and landward migration. Fugate showed examples at the Matunuck headland, Warwick Neck, and Newport Harbor. With 5 ft. of

SLR, Warwick Neck may be cut off from emergency response services during a major storm event. The same may happen in the Ocean Drive to Newport Harbor area of Newport.

In the aftermath of major storms, CRMC's regulations for minimum setbacks for development from the shoreline have become useless in some cases because the loss of property along the shoreline makes it impossible to comply with minimum setbacks.

Fugate showed slides simulating 3-5 ft SLR in Waterplace Park, Providence and Newport Harbor, as well as slides of actual flooding at such levels in recent storms, showing impacts on businesses and public infrastructure. He also pointed out that SLR increases the number and size of areas that will be vulnerable to storm surge damage, and that we really need to consider both SLR and storm surge. He noted that CRMC is evaluating projections of SLR and surges, and concerned about the vulnerability of, for example, the Newport water supply (including the levee protecting North Easton Pond and a critical water supply pump station)..

With respect to policy issues, Fugate first emphasized that much of adaptation involves local land use decisions, which are in the domain of local governments. They, however, generally lack the capacity and tools to engage in proactive adaptation. CRMC and others are providing assistance where and when possible, for example, through the Shoreline Change SAMP process and two pilot projects with North Kingstown and Newport. The SAMP team is also working with URI's ocean engineering program to explore engineering solutions, and with its landscape architecture department to develop strategies for protecting and adapting historic landscapes. CRMC is also working to combine recent SLR and storm surge modeling by the Army Corps with the StormTools initiative by Dr. Spaulding, which would allow the integration of shoreline dynamics for the first time.

CRMC has major concerns with the accuracy of recently updated floodplain maps issued for RI by FEMA Region I. It has denied a federal consistency certification but not heard back from FEMA, although it expects to be overruled. (Jamia MacDonald noted that this may be the case, but also that RI is not alone in raising questions, and that other FEMA regions have responded differently in the past to similar denials.) Fugate noted that the Army Corps modeling is likely to conflict with FEMA's results which he believes may lead to underestimating of flood risks along the southern RI coast and possibly an overestimating of risk in upper Narragansett Bay and inland areas.

Fugate ended his remarks (for the time being) by predicting that, because the adaptation tools we need do not yet exist, and because municipalities need more assistance than we can provide, climate change adaptation will take decades and will be a process of incremental change.

Hannah Morini asked that the presentation be made publicly available. Dr. Fine raised the issue of how SLR and storm surge may affect health care facilities. Director Coit assured him this will be part of the Vulnerability Assessment agenda on April 4 and 14.

RIEMA. Jamia McDonald shared a listing of five grant programs administered by her agency that could be used to implement any adaptation strategies the state wishes to pursue. This includes significant post-disaster funding the agency receives, over $152 million since 2007 (not

including payouts from the National Flood Insurance Program). The vast majority of these funds go to public assistance such as rebuilding roads and other public facilities. With proper planning and policies, these programs can help to intelligently guide redevelopment after a major storm or flood.

RIEMA's work can be divided into 4 phases: planning, preparedness, response and recovery. Recovery activities unfold under a much long time scale than response. With greater planning and preparedness, response and recovery phases can proceed more quickly and intelligently. McDonald also noted that the enhancement of storm surges by SLR will greatly increase the size of the population that RIEMA must serve during storm response.

Next, Michelle Burnett explained that RI experiences all major types of flooding: riverine, flash, coastal, and shallow. Sandy was of course an example of coastal flooding. As bad as it was, we were lucky compared to other states and for us it was fortunately a "manageable" disaster that taught us we can in fact respond and recover, and how to go about it. An example of shallow flooding was the flooding of the Warwick wastewater treatment plant in March 2010.

RIEMA works with municipalities on preparation and approval of local mitigation plans, and with state agencies on planning for state facilities. Currently, there are 19 approved municipal mitigation plans, 16 expired plans, and 6 municipalities with no plans. Local planning efforts of course tend to focus on the most vulnerable areas. Importantly, these plans are a condition to be eligible for FEMA mitigation funds as well as disaster assistance funds. Currently, 22 RI municipalities would not be eligible for FEMA post-event funding if a natural disaster occurred tomorrow.

Director Coit asked why are so many municipalities lacking up to date mitigation plans; is it just a matter of capacity? Jamia McDonald replied that while the municipalities possess the requisite competency in their planning departments, town planners are often stretched too thin dealing with immediate concerns to work on longer term plans or to maintain and update them. RIEMA staff have worked hard to help the towns do the plans and RIEMA mitigation grants may be used to hire consultants to do the plans. RIEMA tracks closely those municipalities lacking an approved mitigation plan and has encouraged each such municipality to apply for grant support to help complete the planning requirements.

RIEMA also maintains the State Mitigation Plan. A final version of the updated plan was submitted to FEMA on March 26 and approval is expected next week.

Coastal Floodplain Maps have gone into effect for 4 of RI's 5 counties. Bristol County's maps are expected to go into effect this July.
RI was able to update riverine flood mapping in response to the March 2010 rains with a series of new high water marks measured with ACOE assistance. This has led to a new riverine flood risk study for watersheds that haven't been so assessed for forty years.

RIEMA has launched a RI floodplain mapping tool to be used for reference purposes only (i.e. cannot be relied on in legal proceedings). It is designed to inform decisions about flood risks for

a specific area, and properties within that area. It can be found on the RIEMA website and has been very popular with the public and local realtors.

State and municipal agencies, as well as the Narragansett tribal government, private and non-profit organizations, can apply for RIEMA mitigation grants. Individuals and businesses can apply for mitigation grants through their municipalities.

In closing Jamia McDonald suggested the following policy recommendations for consideration:

Incorporate adaptation standards into state capital improvement projects.

Amend State Building Code to increase required freeboard from 1 ft. to 2-3 ft for coastal construction.

Create a State-administered buyout program of flood-prone residential structures. This is done already to a limited extent through a federal program.

Jan Reitsma encouraged members to try RIEMA's mapping tool as it, too, visualizes the extent of areas in RI communities that are vulnerable to flooding associated with SLR and storm surge scenarios that are being projected. (www.riema.ri.gov/prevention/floods/flood_mapping.php). Jamia McDonald added that the new mapping has already had a significant impact in the real estate market, although Congress has temporarily rolled back the insurance premium increases.

Division of Planning/Office of Statewide Planning

Kevin Flynn noted that the Division of Planning has a number of programs underway that relate to climate change and resilience. He drew the Council's attention in particular to the Division's review of local comprehensive plans, administration of Community Development Block Grant disaster recovery funding, and its getting underway with a new, EPA-funded study of the economic impact of climate change. Today's presentation will focus on the Division's work to assess the vulnerability of the state's transportation infrastructure in coastal areas to SLR (not storm surges). The Division is the state's Metropolitan Planning Organization ("MPO") for federal transportation funding.). Flynn introduced several of his staff who work on this and related matters, including Vin Flood, who took over the presentation..

Vin Flood explained that Statewide Planning has been working on climate change associated risks to transportation since its work on the transportation element of the State Guide Plan, which it completed in 2009. The US DOT requires MPO's to address such risks. The current project has two phases: (1) exposure, i.e. the mapping of SLR and impact areas, and (2) vulnerability assessment. He presented several powerpoint slides including maps showing SLR scenarios of 1, 3 and 5 ft in coastal areas. This is using the recent statewide LIDAR (high resolution) dataset which has enabled bathtub modeling using NOAA's SLR projections. He noted that the format, including colors, has been coordinated with other mapping programs, so as to optimize compatibility and comparability.

A technical paper will identify transportation infrastructure vulnerabilities for incorporation into local comprehensive plans and State Guide Plan elements, and will provide an inventory of roads that are vulnerable statewide. The assessment looks at both the magnitude of future impacts and their urgency, i.e. is a projected impact a short-term or a long-term risk? Assets that are being considered include roads, bridges, bus routes, bike infrastructure, ports and harbors, and airports.

In response to a question, Flood confirmed that this assessment focuses on tidal flooding and does not include storm surges. He also pointed out that, in the 3-5 ft SLR scenarios, many "local" roads are impacted that are currently not eligible to be included in the statewide Transportation Implementation Plan (that governs how federal funding is distributed). The municipalities will need to address this in their comprehensive and capital improvement plans. Some examples of particularly vulnerable roadways include Basin road in Narragansett and Mackerel Cove Road on Jamestown, both of which will flood daily with 1 ft. SLR. Significant local pushback should be expected as the inventory on flood-prone roads becomes public.

The assessment is looking at the freeboard and accessibility of bridges statewide:

66 bridges are vulnerable with 5 ft and less of SLR
49 have low freeboard heights
46 have accessibility issues

Some storm evacuation routes rely on these vulnerable bridges. Some trouble spots are on key highway and/or bus routes (e.g., Rt.114), are already flooding on a regular basis and/or have recently undergone expensive (re)construction).

Statewide Planning is also assessing vulnerabilities to rail, bikepaths, and port and harbor parcels with important transportation functions such as the fast ferry terminal at Quonset

The report will provide guidance on which are the most important transportation assets to consider and which of those will be the first to flood regularly. It will provide guidance on how we prioritize other efforts statewide to address the impacts of SLR.

Kevin Flynn emphasized that Statewide Planning is also concerned about infrastructure for wastewater, stormwater, water supplies, and reminded that significant infrastructure such as natural gas lines is often present below the roads..

Discussion

Grover Fugate remarked that SLR is a chronic problem, but that we also need to consider relatively more rapid responses to storm damages, especially in relation to the potential intensification of storms. Wind issues are going to become a bigger hazard as wind-generated damage increases exponentially with increased wind speed. We potentially face major debris removal issues, especially because of tree growth since the 1938 hurricane. He noted that it will be critical to conduct SLR analysis in combination with improved storm surge analyses. He expressed concern for example about the overtopping of the Providence hurricane barrier.

In the process of recovery after Sandy, CRMC noted the significant alteration of many coastal features, many rendered into flat sand sheets. This loss of coastal features will further increase storm surge damage. CRMC Staff are currently mapping existing coastal features to establish a baseline for recovery from the next storm.

In the course of emergency permitting after Sandy with towns and DEM, it became clear that many municipalities were unprepared to handle the many required local permitting decisions in a short period of time. A major storm event could cause local permitting processes to become overwhelmed, delaying recovery even further. Westerly encountered these difficulties after Sandy and CRMC is doing a study of what happened there. Fugate recommended that the state and municipalities look at planning to have additional administrative resources that will enable local permitting processes to handle many more decisions.

Jamia McDonald asked whether we should we consider creating a body that can make emergency recovery decisions? Grover Fugate responded that CRMC can set aside its normal permitting process and make adaptive permitting decisions, but that such flexibility is generally not available at the municipal level.

Grover Fugate also recommended a policy or program to encourage residential property owners to fortify their structures against storms and allow homes to be retrofitted proactively. Major population dislocations due to a storm that causes significant housing damage often lead to permanent population loss for a community. It makes sense now to invest in resilience in order to reduce this risk of major population losses later. Florida and South Carolina have created Safe Home programs to encourage retrofits pre-storm.

Director Coit stated that we need to develop recommendations for what the state can do to help municipalities with planning, mapping, and vulnerability assessments. The Council should bring in cities and towns to discuss this. We also need recommendations how the state can help homeowners and businesses recover from major storms. There is an upcoming conference of the 6 New England states to work together with EPA to find ways to provide vulnerability assessments and other types of support for municipalities.

Hannah Morini recommended that the Council develop a database of case studies and examples from other states. Director Coit noted this will also be the topic on April 18 Fugate noted that CRMC is developing an adaptation database via the Shoreline Change SAMP; the next stakeholder meeting on Apr 3 will focus on coastal adaptation issues.

Public input:

Eugenia Marks (Audubon Society of RI), following up on CRMC's concerns with the new FEMA floodplain maps, recommended that Council establish a statewide floodplain map that does have legal effect, so that municipalities can rely on it. *Jamia McDonald, Grover Fugate and Jan Reitsma volunteered to follow up on this recommendation.*

Jim Boyd (CRMC) mentioned that a new SLR projection tool is available via the RI Enterprise GIS web site that combines information from several models. A central data archive could be

established there. (*The link will be posted on the Council web site.)* Grover Fugate added that the Council should consider Spaulding's Storm Tools project, which will provide a dynamic, high resolution mapping tool for the RI shoreline 20 meters upland. This will make scenario analyses at the community level possible .

Tim Faulkner (EcoRI) asked what is the planned response for a major storm cutoff or breach of a coastal barrier? Grover Fugate responded that the Salt Pond SAMP already allows for emergency responses such as filling a breach. The problem will be finding sufficient sand resources to do the work as local sand resources are 'discrete' and valuable to fishing. Jamia McDonald added that, with regard to road cutoffs, evacuation is clearly a key concern. We need to look at the vulnerability of evacuation routes and make tough decisions about what routes are not going to be rebuilt if they are damaged. Rebuilding such routes may result in many people being trapped in the face of a major storm. Director Coit reiterated we need to take a serious look at key access routes, how to protect them and/or find alternative routes. Amanda Martin (Statewide Planning) pointed out that the transportation infrastructure assessment will make policy recommendations in this regard. Jamia McDonald asked whether anyone is looking at riverine flooding risks. Kevin Flynn answered that the current assessment only looks at SLR, not riverine flooding. *Jamia McDonald stated her agency would share its riverine flooding data with Statewide Planning once it is available.* Michelle Burnett noted that municipalities currently don't take into account SLR when they provide information on vulnerable roadways to RIEMA.

In closing, Director Coit reminded all that the next session on April 4 will look at additional vulnerability assessment issues. She also noted that a couple of reserved dates have not yet been assigned topics and invited suggestions for topics that need to be discussed before May 1.

Motion to adjourn was made by Jamia McDonald, seconded by Marion Gold, approved by acclamation.