Information Workgroup Report
Governor's Climate Change and Resiliency Update Commission
August 27, 2015

I. Introduction and Background

The Information Workgroup of the Climate Change and Resiliency Update Commission was established to "focus on identifying and pulling together the essential information necessary to support effective and coordinated management and planning across state and local governments." The charge to the Workgroup included examining and recommending "the vehicle or program for the state to establish in order to successfully generate, present, and distribute the information."

The Workgroup met four times (two meetings in April 2015, one meeting in June 2015, and one meeting in July 2015) outside of the three meetings of the full Commission. While the workgroup investigated the types of data that will be needed to effectively adapt to climate change, a comprehensive and detailed list proved to be well beyond our limited time, resources, and technical expertise. Despite these hurdles, we were able to identify several systemic challenges with the collection and aggregation of climate-related data in the Commonwealth. Our discussion highlighted the effective efforts already at play in Virginia and generated a solution that maximizes return on investment and impact.

There are already significant data collection projects being performed throughout the Commonwealth. Vast, useful data sets have already been collected, but there is limited coordination between research partners and no comprehensive list of available data. As a result, parties with shared aims sometimes unknowingly re-collect already gathered information. This is an inefficient and ineffective use of research dollars and resources. It is our belief that the value of information increases exponentially when shared.

II. Summary of Recommendation

The workgroup recommends that Governor McAuliffe establish a Climate Change Resource Center (CCRC). The mission of the CCRC would be to identify the information needed by decision makers to make communities more resilient to climate change. The CCRC would both make the information available and train decision makers and their staff to utilize the information. The CCRC could be created as a new state agency of state government, as a division within an existing agency, or be housed at one or more universities. It is important that an advisory committee of climate change experts and local or regional decision makers be formed to assist the CCRC in the implementation of its mission.

a. Goal

The simple collection and aggregation of data is not enough to mitigate and adapt to the challenges presented by climate change. First and foremost, data must be stored and displayed in a useful and usable manner. Considering this, the information workgroup has come up with four guiding principles for data collection, aggregation, and use. They are as follows:

- Information should be in a consistent format so that it can be shared across jurisdictional lines.
- Information needs to be presented in a way that is understandable and useful to decision makers.
    - Where applicable, data should be summarized for specific management use rather than being presented in its raw form
- While the coastal zone is understandably an area of initial focus given that the impacts of climate change may become more obvious there sooner than in other parts of the state, the workgroup recognizes that climate change will affect the entire Commonwealth. Therefore, when the state invests in data collection, it should as much as possible ensure the data is collected statewide.
- Data collection efforts for the Commonwealth should consider collaboration across federal, state, local government entities, university, and private industry by leveraging the "Whole of Government and Community" approach employed by the Hampton Roads Sea Level Rise Pilot Project.

b. Action Items

Much of the necessary data has already been collected or is already in the process of being collected. Over the course of our discussion, we identified several data sets that provide a strong foundation for future research, including information from federal, state, and local governments, and universities and private entities. The workgroup envisions that the recommendations would be structured as follows.

1. CCRC Responsibilities

Recognizing the limitations of our work group, we have conceptualized a process by which the CCRC, once formed, should go about aggregating, interpreting, and augmenting already gathered data. The CCRC should be tasked with the following responsibilities:

- Make a priority of information needs listed below, as well as determine additional information needs that the workgroup did not have the resources to identify.

- Track and regularly provide updates on when information was collected or is being collected, and when updated information is expected to be available.
- Identify information that is needed but is not currently being collected, and resources that may be available for collection efforts.
- Identify information that requires summarization to be useful for planning and management efforts; emphasis should be placed on data summarization which helps eligibility for State and Federal programs (e.g. National Flood Insurance Program's CRS program).
- Establish quality and format standards. Ideally these standards would conform to those already in use at the federal level or should be designed in consultation with neighboring states so we can share information across state borders.
- Provide technical assistance and training for local elected officials, local staff, Planning District Commission staff and state agency staff.
- Analyze information to create useable products for decision makers.

2. Types of Information Needed

While the workgroup lacked capacity to compile a comprehensive list of information needs, we did begin to compile lists of data that we know will be needed.

Projections and derived/summarized data already exist for localized sea level rise, but will need periodic updating. Indeed, the Commission requested at its December meeting that a protocol be developed by VIMS and the Hampton Roads Planning District Commission. One workgroup member shared a report that had been commissioned by the Sierra Club to analyze and update the most recent VIMS information on this subject and to recommend the levels that local governments should use for planning purposes. Another member recommended that the Commonwealth endorse the use of scenario planning instead of planning only to a single number.

VIMS is proposing to provide information on sea level rise at two time scales, relevant to management. The first is a 30 year projection based on historic tide gauge records. This is most useful for individuals and short term local planning efforts. The second carries projections out to the end of the century and offers high, low and mid-case scenarios for climate change effects. This is most useful for long term local planning and construction of major infrastructure (new roads, bridges, tunnels, storm barriers). The Sierra Club report adds 50-year and 100-year projections and recommends margins of safety that can be added depending on risk tolerance.

Projections would be improved by:

- More detailed subsidence data
  - NASA is trying to get Synthetic Aperture Radar (SAR) flights to measure land elevation; this will take several years to get useful data but will provide highly resolved subsidence data
  - ODU/NOAA/USGS/NASA are equipping tide gauges with the capacity to measure subsidence at the tide gauge; this will take several years to get useful data but will provide subsidence data specific to tide gauges (the primary source of local sea level change information)
- Sea level rise viewer
  - VIMS has a sea level rise viewer for certain localities which has been approved for CRS credit; other coastal localities are under development
  - These would be improved by better sea level rise projections and land elevation data (collected either using SAR or LiDAR)
- Floodplain mapping
  - New floodplain maps have been generated by FEMA HAZUS and systems analysis for flooding in the coastal plain currently and under sea level rise scenarios
  - Data to generate these derived/summarized data currently exist
  - Analyses would be improved by:
    - Elevation of first floors in floodplains.
    - Locations of septic systems and wells vulnerable to saltwater intrusion.
    - Information that identifies the infrastructure that is most vulnerable to rising water levels and more frequent, intense storms. Pollution control, energy and transportation infrastructure were all noted as important types of infrastructure that may need to be managed differently in the future as the climate changes.
    - Comprehensive, integrated, statewide tax parcel data with assessed values is also needed to assess socio-economic vulnerability.
- Changing precipitation patterns that are expected as a result of climate change.
  - Should be summarized to address changes in water supply and crop requirements
- Projected changes in air and water temperatures expected as a result of climate change
  - These would be most usefully summarized as days above a particular temperature (affects aquatic plants that shelter and feed fishery species) and growing degree days (affects agricultural opportunities)
  - Also should be summarized as heating and cooling degree days (affects energy usage and human health)

In addition, baseline information as well as ongoing monitoring to detect changes is needed for:

- High-resolution elevation data seamlessly integrated across the state.
  - Efforts in Hampton Roads and most of the coastal plain are currently underway, but the interior of the state currently has poor coverage
  - Coverages will need to be updated periodically as technology improves
- High-resolution land cover data. There is an effort by the Chesapeake Bay Program to acquire 3-meter resolution data for the Bay Watershed.
- Trends in socioeconomic data that can be used to estimate risks from climate change to facilities and populations. Two sources of this data are the "Surging Seas" project an organization called Climate Central and another is Hazus, a FEMA database.
- Information to assess the economic impact of climate change on critical infrastructure and industries. The economic impact assessment should focus on scenarios and help localities decide when to adopt an adaptation/mitigation measure.
- Sequestration capacity of Virginia's forests, wetlands, seagrass beds, and other natural carbon sinks. The 2008 Climate Action plan included a recommendation that Virginia should establish a no net loss standard for natural carbon sequestration areas.
- The location and extent of coastal natural infrastructure, particularly wetlands and bathymetric resources such as SAV and oyster reefs. VIMS has conducted wetlands inventories for some coastal counties, but these resources are among the most vulnerable to sea-level rise, so more continuously updated information is needed.
- More tide gauges and subsidence monitoring throughout the coastal zone.