



# ***“Envisioning Our Future”***

## **Climate Trends**

Session F on Wednesday, April 10, at 12:45 – 2:00 p.m. in Moody Hall, Activities Room  
**Environment Virginia Symposium 2013**

**Conveners:** Jefferson Reynolds, DEQ Enforcement Director  
Colonel Paul B. Olsen, Norfolk District Commander, U. S. Army Corps of Engineers

### **Sub-issues suggested by stakeholders in previous interviews with DEQ staff:**

- Water quality impacts (loss of tidal and nontidal wetlands; impact on instream flow; impacts of sea level rise on existing infrastructure, like low-lying wastewater treatment plants)
- Greenhouse gas emissions; developing technology that can address CO by utilities, transportation sector, and other contributors
- Future construction in low-lying coastal areas (including insurance in floodplain, & policies re subsidizing building or rebuilding in floodplain)
- Analysis of impacts on agriculture, tourism, construction industry, insurance companies, seafood industry, ports & shipping, military installations (e.g., Wallops Island) and other economic sectors, and planning how to manage impacts to best advantage
- Economic development goals vs. urban planning goals
- Adapting to severe weather events (drought, hurricanes, flooding, tornadoes, earthquakes)
- Impact of floods & other severe weather on historic/cultural resources
- Ground water recharge in face of changing winter weather patterns
- Potential changes in crops that can be grown (e.g., drought-resistant; crops that formerly could only be grown in Florida & other warmer locations; pest & disease issues, such as soybean rust brought by hurricane)

*If you have further ideas to contribute, please email them to [carol.wampler@deq.virginia.gov](mailto:carol.wampler@deq.virginia.gov).  
Thank you for contributing to the dialogue on our FUTURE.*

## **ENVISIONING: CLIMATE TRENDS CONVENERERS**

### **JEFFERSON D. REYNOLDS**

Jefferson “Jeff” Reynolds is the Enforcement Director for the Virginia Department of Environmental Quality (DEQ). In this role, he is responsible for statewide oversight and enforcement of all laws, regulations and permits administered by DEQ through six regional offices. Prior to joining DEQ, Jeff was part of a national-level environmental practice serving mining, oil and gas, and agriculture clients in western states in the areas of remediation, reclamation, natural resource damage, and environmental compliance. He also served as Chief of the Environmental and Real Property Law Division at Kirtland Air Force Base in New Mexico and Deputy Regional Environmental Counsel for 27 eastern states for the Department of the Air Force. He served as Counsel to the New Mexico Senate Conservation Committee and Committee Chair for the New Mexico Association of Commerce and Industry for the development of the state’s renewable energy platform.

Jeff received his LL.M. in Environmental Law in 1995 from George Washington University and his J.D. in 1990 from Hamline University where he was a member of the law review. Jeff is a decorated military veteran from operations Enduring Freedom, Iraqi Freedom and Joint Forge. He achieved the rank of Lt Colonel and was selected for the Department of Defense RAND National Security Fellowship in 2003. He is also the recipient of the Air Combat Command Judge Advocate of the Year award (2004). Jeff has over 32 years of rock and alpine climbing experience.

### **COLONEL PAUL B. OLSEN, P.E.**

Colonel Olsen is Norfolk District Commander, U. S. Army Corps of Engineers. He was commissioned in the U.S. Army upon graduation from the University of Wisconsin where he earned a Bachelor of Science degree in Geography. He has held leadership positions in mechanized and combat heavy engineer units in Europe, the Middle East, and the United States, including command of the 249th Engineer Battalion Prime Power during Operation Iraqi Freedom in Iraq, Bravo Company, 9th Engineer Battalion during Operation Joint Endeavor in Bosnia; Executive Officer of Headquarters Company, 43rd Engineer Battalion during Operation Restore Hope in Somalia; and Platoon Leader, Alpha Company, 317th Engineer Battalion during Operations Desert Shield and Storm in the Middle East. Additionally, he has held a number of key staff assignments including the Speechwriter to the Commanding General, U.S. Army Combined Arms Center and the Executive Officer to the Deputy Assistant Chief of Staff for Installation Management.

Colonel Olsen is a registered Professional Engineer in the Commonwealth of Virginia and holds a Master of Science Degree in Civil and Infrastructure Engineering from George Mason University, a Master of Strategic Studies from the U.S. Army War College, and a Master of Arts Degree in Business Management from Webster University. His military education includes completion of the Engineer Officer Basic and Advanced Courses, the U.S. Army Command and General Staff College, and the U.S. Army War College where he graduated with distinction. He is also a graduate of the French Army Engineer Advanced Course.

**RECORDER:** Ann Regn, Department of Environmental Quality, Director of Office of Public Information and Outreach  
Session Notes:

## *Session Notes*

Carol Wampler welcomed attendees on behalf of DEQ and introduced co-host of the Envisioning track, Tammy Stephenson, as well as the session conveners and reporter. She explained that the “Envisioning Our Future” sessions are part of DEQ’s seeking stakeholder input regarding future environmental and energy priorities. The Virginia General Assembly formed DEQ in 1993 by joining four agencies – State Water Control Board, Department of Air Pollution Control, Department of Waste Management, and Council on the Environment, which was responsible for long-range planning. Now, at Environment Virginia, expert conveners will facilitate discussion among attendees to get information on how DEQ and other parties should plan for the next 30-50 years. The session reporter, Ann Regn of DEQ, will capture comments. Summaries will be posted on DEQ’s and VMI’s websites and will form the basis of white papers to be submitted to DEQ’s Director and the Secretary of Natural Resources.

Convener Jeff Reynolds opened the session: Stakeholders provide input to agencies who are public servants. It appears to him that the issue of climate trends has evolved from “if/why” to “how can we adapt?”

Sea level rise (SLR) has been documented since 1971 by VIMS from 3 millimeters per year to potentially one foot rise per year by 2050. Why? Withdrawal of ground water is contributing to land subsidence. Also, lack of snow pack and thermal expansion of ocean contribute to rise. At the Va. Beach listening sessions: 90% said priority should be given to SLR and 98% said priority should be planning (cf. Sea Level Rise in Hampton Roads: Findings from the Virginia Beach Listening Sessions).

Protection, accommodation (e.g., stilts) and retreat (e.g., restriction of development) are three strategies to respond. How does Virginia compare? Four states along the East Coast have laws, and six states have offices to address. Virginia is behind; General Assembly did pass legislation asking VIMS to study.

We do have agencies--CZM, VIMS -- who are alerted and investing resources into it. Hurricane Sandy is still on top of people’s minds. Just missed Virginia—what would the storm hit have meant to Virginia?

Convener Paul Olsen: told story of Carolina wren in Wisconsin in December...snow is different in Wisconsin and affects ice boating—two indicators that climate may be changing. Has background as engineer and emergency responder; doesn’t question why conditions are changing; thinks the quality of snow, rain, ice, sediment in runoff are signs of change. Since 2009 ACOE has factored SLR into all of the ACOE projects. Planning for 6mm/year SLR. Warm water expands and as it comes up from the Gulf it creates a sort of surge. ACOE responsibility is at four levels: Country, Corps, Commonwealth and Community.

Country: The Norfolk district was ready for Sandy. \$29 million worth of funding for readiness is coming for flood projects since they had a plan ready to fund.

Commonwealth: Tangier Island is example—stabilization project just signed with the Commonwealth as partner.

Community: Beach renourishment project at Va. Beach...studies show that for a few million the sand will buffer the buildings from storm surge; cheaper than repairing or replacing infrastructure. Cheaper to replenish the sand. Since 2003 has saved \$430 million. Helps support the economy.

Corps: spend a lot of time developing a tool to predict and map an inundation plan. Can show if you are in a Flood Zone area. The Silver Jacket team can come to the community and answer questions and facilitate the interaction with FEMA and others.

The Engineering and Development District has team that is developing tools and scenarios that can model SLR to show on a GIS platform.

Jeff Reynolds: Virginia has shared resources for emergency management and boots on the ground responders. How do we best deploy the tools, what policies do we develop?

A conservation group representative Lynnhaven -- Now: two priorities 1) responding to emergency situations (full moon and east winds will also affect surge) 2) planning for the future. Va. Beach is trying to focus resources, but it is a gigantic job; e.g. there's a whole neighborhood that is 5 feet about sea level. One road that connects east and west and if that is flooded will be cut off. Thousands of peoples' homes are threatened. FEMA flood insurance increased rates will affect people's abilities to get insurance. A larger issue than has ever been dealt with before.

Jeff Reynolds -- can you quantify the number of responses by emergency management? Frequency and cost are two factors.

An attorney -- some localities spending time assessing risk; what are the risks, to have a complete picture, you need to understand all the layers of risk, ability to get insurance, water quality, so knowing property-risk-impacts is priority. Show on a GIS map.

A local government representative -- we need specific community information about what areas are most at risk so they can plan for upcoming storm surge, etc. Seems like lots of graduate students and people are studying this, but very general and they don't provide detail enough for the city's needs. So recommend two tracks: statewide info as well as specific information that localities can use.

Col. Olsen -- lives in Poquoson. Levels of government discussion (good studies are costly and need bigger audience to justify the expenditure). Coastal communities are more prepared after Katrina. Mountain communities are not as prepared for response e.g., for ice storms (a likely climate trend).

A college faculty representative — agrees two levels of planning. Thinks the state and federal resources for mapping should be compatible with local planning.

Col. Olsen -- ACOE Silver Jackets program can help bridge the gap between feds and community.

A local government representative -- some work regionally is being done by Hampton Roads. The agencies seem to be collaborating. The political players are missing from the discussions (i.e., BOS). Would like information links to existing programs, and they will post on their page and will help move it to the public. Will help ACOE do outreach.

Jeff Reynolds: suggested more coordination of resources to elevate policy discussion.

A state government leader -- The General Assembly asked VIMS to look at recurrent high tides and they delivered the report this session. We need more. The issue is not why; the issue is how do we mitigate. Thinks this is an emergency management issue (not a natural resources issue alone). Secretary of Natural Resources is planning an "event" to bring together people to show off the tools we have and identify tools we don't have. Hope to engage political leaders at the local level.

A conservation group representative -- designed the SLR forum; has done lots of outreach. PDC, ODU, ACOE, local govt, NGOs; trying to do a Town Hall to local and elected officials. Also talking to business community and they are beginning to incorporate this into their plans. Operate on 5-year plans. This has to be a regional planning effort. Needs an economic analysis or will have flight from Norfolk/Tidewater. Local officials not talking about the issue for fear of driving businesses away. Very little change in the watersheds; no topographic relief so needs to be a coordinated approach/adaptation response for infrastructure planning.

An attorney -- business located along the shoreline, many have little sophistication about the issues; and thinks the insurance companies are driving. Transportation hubs will be affected. New requirements for disclosure of financial reporting. Private sector issues.

Representative of a research group -- VIMS model shows inundation and surge and how precipitation upstream will accelerate downstream. VIMS/Henry Wang's work won an award. Street-by-street flooding. Can pinpoint where to put rescue and effort. More routine use of tools. Need a regional elevation map. Some done and some patchwork. Locals need to dialog with VIMS. Has not been widely used yet. Hindcasts, predicted Isabelle within 6 inches in Alexandria.

FEMA gives inundation, general flooding but this one gives street to street, facility level predictions.

Evolutionary changes vs revolutionary changes—e.g. upgrades to existing programs rather than new programs.

A conservation group representative -- should develop response "tool box" with costs for different options. Need to have all the options and their costs. Some of the questions like buying development rights, zoning, reverting back to wetlands, probably should be regional discussion.

A conservation group representative -- Need a "poster child locality." This would be a good way for other localities to adopt or review. Delaware has a great NOAA and state program. Hazard risk assessment and cost-benefit analysis. Fort Lewes, DE also Florida. Envisioning competitions held by New York that generated professional adaptation plans. Innovative solution, NY Port is an example.

A college representative -- after you see the level of SLR in a building from a map or model, you can present info to homeowners insurance and flood insurance programs; can do a cost-benefit analysis on an individual level.

Jeff Reynolds -- as the problem gets more and more studied, insurance companies will get even more involved.

CRC- Sarasota looked at location of future infrastructure and evacuation routes based on models. Model outputs used to inform zoning, comprehensive plans and budget planning.

A consultant – her company is doing work at Biloxi Air Force Base in Mississippi. Addressed opportunity costs of the profound effect of hurricane and then economic costs of future increased insurance costs.

An attorney -- what happens to property values in those areas is a major economic factor. Changes expectations.

A conservation group representative -- Inland impacts—public utilities, water supplies, when there is variation in rainfall impacts water treatment processes. So not just a coastal issue.

At the close of the discussion, Carol awarded Cabell Brand's book as a door prize.