

Attendees

Lee Beach, Cameron Blanford, Elizabeth Canuel, Russell DeYoung, Jay Diedzic, Doug Dwoyer, Chris Edwards, Ben Francisco, Marjorie Friedrichs, Jim Golden, Courtney Harris, Alleyn Harned, Troy Hartley, Mark Huggard, Virginia Jones, Jane Lopez, Dennis Manos, Anne Marshall, Dave Marsell, Doug Meredith, Paul Panetta, Neil Rondorf, Jim Schultz, Al Smith, Gene Tracy, Mike Unger, John van Rosendale, Lyle Varnell, John Wells.

Purpose

The purpose of this meeting was to cover:

- **VIMS Updates** (John Wells)
- **SAIC Wind-Power Projects** (Neil Rondorf/SAIC)
- **Algae Research Report** (Elizabeth Canuel/VIMS)
- **Potential NASA/VIMS Collaborations** (Russell Deyoung, Chris Edwards/NASA)
- **Roundtable Updates** (Jim Golden)

Note: These notes and presentations from Neil Rondorf and Elizabeth Canuel have been posted at:

<https://web.wm.edu/economicdevelopment/VIMSIndustryPartnership.php>

Agenda

John Wells chaired the meeting and Jim Golden facilitated the agenda.

ANNOUNCEMENTS:

- **June 22, 2009. VIMS & WM Export Control Training Seminar.**
Free admission. Online registration and further details:
http://www.vims.edu/about/leadership/sponsored_programs/events/index.php
- The VA Sea Grant RFP has been released and is available for review.

PRESENTATIONS:

John Wells. (VIMS Updates)

NOAA North Atlantic Regional Cooperative Institute Proposal. VIMS has responded to a NOAA RFP proposal that covers ecosystem modeling and monitoring. No decision yet. Five other university partners (Maryland, New Hampshire, Rhode Island, Stony Brook, and Hampton) are collaborating with VIMS. Funding for VIMS would be **\$1 million a year for five years**. Areas would include **modeling, fisheries, ecosystems, and resource management**. John expects the results to be announced within four weeks.

Budget. John announced that the Federal Stimulus Plan is under way and will include hundreds of millions to billions of dollars for scientific agencies, such as NASA and NOAA, including some that have emphasis on coastal marine projects.

Executive Order 13508. This order stating that the Chesapeake Bay has not achieved the EPA water quality standards has been approved. The intent is to promote shared responsibility but no funding is attached to this order. Rob Whitman has proposed a stronger bill seeking clear accountability for the Bay's protection. Together these two actions could eventually provide additional funds for clean-up and monitoring.

Note: As further support, **Dennis Manos** announced that **HR Bill 2454** has passed. This bill supports a stronger clean energy initiative with emphasis on job creation. The bill includes specific targets for carbon capture and sequestration to speed up efforts to combat global warming. **Neil Rondorf** noted that the **Chesapeake Bay Commission** is interested in renewable energy alternatives to assist in cleaning up the Bay.

PRESENTATIONS:

Neil Rondorf. (SAIC Wind-Power Projects)

Neil presented an overview of how **wind power technology** is advancing as an alternative to dependence on fossil fuel. These findings will help Virginia to meet energy needs. Currently, the State is second only to California in importing energy.

Neil reported on his recent study of wind turbine models in Europe. The importance here is that these wind turbine projects have produced actual plant and operating costs needed for more accurate research on costs and profit potential. He noted that using \$90 per short ton as a reference price for coal, the costs per KWT are lower for wind (roughly 10 cents) than for coal (about 14 cents) and are similar to those for gas (about 11 cents).

In addition to demonstrating economic viability, he has been working on issues related to the on-shore transmission grid, identifying suitable off-shore sites in partnership with the Navy, and environmental impacts. The likely site is about 12 miles off-shore which would arguably place it out of sight. The shipping lanes are further out, except for barge traffic along the coast. The 30-meter water depth would permit standard platforms used in Europe, with pilings and jack up rigs.

Other SAIC Coordination

SAIC is working with **VCERC**. **ODU** researchers are working on wind data, tower foundation designs, and electrical connection designs. **JMU** is working on GIS systems to identify potential ocean areas that might be used for wind turbines without conflicts with other uses. SAIC is coordinating with the **US Navy** on the research because of its high energy consumption, its interest in the sea lanes, and the need to coordinate operations in regions with existing wind-power projects. The **Corps of Engineers** has completed a draft environmental impact report. **Homeland Security** is looking at the physical security issues.

Next Steps

To move this technology forward, Neil feels these steps need to happen:

1. The Federal and State governments must be in dialogue and supportive. The government also owns the land needed to locate these turbines.
2. Private capital is available if we can provide credible evidence of profit potential.
3. The Navy wants to control these locations and needs to have a voice.
4. Senators Warner and Webb are working to get guaranteed loans for this new technology.
5. The Virginia legislature needs to come on board as well.

Note: **Dominion Virginia** has started to invest in wind technology and has partnered with BP in a terrestrial wind farm initiative.

Projected Start

Neil expects that it will take two years for permitting and then **three years** to complete. He thinks the first target will be for 300 MW. Full build-out to something like 3,700 MW would take about twenty years.

Elizabeth Canuel. (Algae Research Report)

Under the leadership of VIMS and the William & Mary Research Institute (WMRI), research began nine months ago on the study of algae as an alternative energy source. Liz described the work on algae as an attempt to turn pollution into fuel. The work has concentrated on using wild algae to both filter nutrient pollution from waterways and to then use the biomass to produce fuel. Liz confirmed the encouraging study results of using algae as an alternative energy source – especially to oil. The challenge is that production costs for algae remain high. One solution for cuttings these costs is a technology that called the **Algal Turf Scrubber (ATS®) method**. ATS has proven to be simple, economical, adaptable, safe, and resilient.

This technology removes nutrient pollution from waterways and converts it at low cost into algae usable as feedstock for biofuels. Liz discussed an example system deployed in Florida. A smaller, 4' x 80' system is being tested at VIMS. This is the first application of the system in a saline environment. Researchers are testing the effectiveness of the system in removing contaminants and investigating the biomass characteristics of the algal community.

PRESENTATIONS:

Elizabeth Canuel. (Algae Research Report)

The economic viability of the technology depends on its dual products – cleaner water and fuel. The introduction of nutrient trading systems would increase its economic value.

Potential partners for this technology are industry, other universities, the VA Sea Grant Program, municipalities, and the military - especially Fort Eustis.

Neil Rondorf asked about the connection of this work to VCERC, and Liz explained that the work is complementary to research efforts at ODU and she is also working with colleagues at ODU. **Dennis Manos** noted that James Madison is coordinating a 25x25 state effort to shift energy to 25% renewables by 2025. That framework may provide a good way to coordinate many of our alternative energy initiatives.

Russell Deyoung, Sr. Research Scientist/Atmospheric Science Division/NASA
(Potential NASA/VIMS Collaborations)

Russell sees the potential for greater collaboration between VIMS and NASA concerning the **air-sea interface** and he discussed specific NASA applications.

Example: NASA can capture data and “true color” photos of the Chesapeake’s algae growth patterns and the results from land runoff into the Bay. NASA wants to target **accurate oxygen level readings** from the Bay. The Calipso satellite could be used to generate profiles of oxygen concentrations in the water column, but it does not come often enough. So their goal is to start with Lear jet flights over the Bay to capture the data.

Chris Edwards, System Engineering Directorate/NASA

Chris’ research is focused on **remote sensing** and **coastal mapping** to include high precision measurement of carbon dioxide and ground winds. He presented applications he felt would have interest to VIMS as well. These applications cover support from concept, testing, instrument design, to final product. He noted that if organizations had a measurement problem, NASA could design the best way to solve it.

Examples:

- NASA now has laser remote sensors that can **measure wind, cloud and aerosols in 3-D format**. Dennis Manos felt this technology would be excellent for Neil Rondorf’s work to measure wind speeds.
- **Global Ozone Lidar Demonstrator**. This **hazard and avoidance technology** was designed to detect and avoid moon landing collisions with craters, boulders, or space junk. The laser can produce **profile views in 3-D**.
- **Water Vapor Lidar**. This is a smaller lidar model designed for Mars and Earth to measure CO₂ and could probably measure methane as well.
- **Micro Spectrometer Applications**. Working with GPS, these are the applications that NOAA/NASA uses to collect real-time data on wind speeds.

ROUNDTABLE UPDATES:

Lyle Varnell. The next step following the **March 2009 VIMS Finance Forum** is to improve wins with the Small Business Innovative Research Program (SBIRs) by developing more effective “key word” searches. W&M has had a student working on this.

Lee Beach. Hampton Roads is developing a **Comprehensive Economic Development Strategy (CEDs)** required for U.S. Department of Commerce Economic Development Agency grants. Several groups will be working over the summer on sections of the strategy covering key sectors such as the military, the port, and tourism. He suggested that some of us might want to get involved in the energy and environmental sections of the study.

Agenda, cont.

ROUNDTABLE UPDATES:

Jane Lopez.

- **Department of Defense SBIR** solicitations opened last Monday for submissions. The VIMS OSP web site has the DOD RFP site link:
http://www.vims.edu/about/leadership/sponsored_programs/search/index.php
 - **Export Controls.** The Federal Government has expanded regulations concerning work with foreign researchers as well as limiting access to “controlled” technology by foreign students. VIMS & WM feel that more training on this is needed and an export control training seminar will be held on June 22, 2009. Primary emphasis will on the university community; however other Williamsburg area technology businesses are welcomed to attend.
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CLOSING COMMENTS:

John Wells thanked the participants and adjourned the meeting at noon.

Next Meeting

Friday, July 24, 2009. VIMS Director's Conference Room, Watermen's Hall. 10:00am – Noon.

Note: The agenda will include a VIMS Autonomous Systems Lab Report from **Mark Patterson**.
