

Attendees

Randy Akers, Buzz Ashmore, Jennifer Barker, Lee Beach, Bill Bean, John Brubaker, Tina Bunai, Bill Cooke, Jay Diedzic, David Forrest, Jim Golden, Virginia Jones, Steve Kaatari, Hank Majdeski, Dennis Manos, Doug Meredith, Mark Patterson, Jim Schultz, Gregory Stringfield, Jay Titlow, Mitch Thompson, Mike Unger, Lyle Varnell, Harry Wang, John Wells.

Purpose

The purpose of this meeting was to cover:

- **VIMS Update** (John Wells)
- **Algal Fuel Research Update** (Dennis Manos, Bill Cooke)
- **A Real-time Forecasting System for Chesapeake Bay Tributaries Update** (Harry Wang, Jay Titlow, David Forrest)
- **Measurement Specialties, Inc.** (Mitch Thompson)
- **Roundtable Updates** (Jim Golden)

Note: These notes and presentations from **Dennis Manos, Mitch Thompson, Harry Wang, and David Forrest** are posted at:

<http://www.wm.edu/offices/economicdevelopment/regionalprojects/chesapeakebay/vimsinduspartner/index.php>

Agenda

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

PRESENTATIONS:

John Wells. (VIMS Update)

Budget. John reported that, as expected, budget cuts for VIMS were severe – **15%**. Immediate strategy meetings have been scheduled to identify the best approach for handling these cuts for the next two-to-three year period. Some of the cuts will be offset by federal stimulus money this year, but that will probably not be the case next year.

Dennis Manos. (Algal Fuel Research Update)

Program. Dennis gave an update on this new collaborative algal fuel research program. There seems to be general agreement that the future for energy and fuel production must be based on renewable sources. And those renewable sources must be environmentally friendly. A system based on algae is uniquely suited to solving these problems.

Goal. This program's goal is to find a solution for reducing US current consumption of 1,000 barrels of oil per second by producing algal biofuels on an industrial scale.

Partners. Includes W&M-VIMS, Blackrock, Statoil, and numerous other corporate organizations and academic institutions.

PRESENTATIONS:

Advantages of Using Algae.

- High oil content and capacity to turn pollution into fuel.
- Simplicity. Low labor costs due to automated production methods available. Requires little filtration.
- Adaptable and resilient. Algae grow in vast quantities in nature and the diverse populations provide stability.
- Contains multiple biochemical components that can be extracted to produce numerous biofuels products – lipids into biodiesel; other organic material into methane, ethanol, butanol; and inorganic minerals into fertilizer.
- Fast growing and located worldwide. This can help to attract more global partners who will benefit as well.

Advantages of Algal Turf Scrubber (ATS) Method. It is already in commercial operation – simple design, low cost, uses natural algae, low risk of infection. Dennis introduced **Bill Cooke**, W&M Physics participant, who is working with VIMS and fellow physics professor **Gene Tracy** to develop a water-based system to deploy in the York River. Other partners are working on processing the material into fuels.

Discussion. Participants asked about potential conflicts over use of water for future farms and the impacts of withdrawing large volumes of algae from the water system. **Mike Unger** noted that we are a long way from any problem with having too little algae, and in fact we are investing heavily to reduce nutrients from non-point sources.

Next Steps. The group is seeking funding from other partners to sustain the effort into future phases.

Harry Wang, Jay Titlow, David Forrest.

(A Real-time Forecasting System for the Chesapeake Bay Tributaries)

Introduction. Harry introduced Jay and David as part of this collaborative research effort to create a real-time forecasting system for the Chesapeake Bay tributaries. The wind data forecasts provided by Weather Flow now allow Harry's team to move into real-time surge forecasting.

Jay Titlow, Weather Flow

Background. Weather Flow, <http://www.weatherflow.com>, provides wind data for a variety of uses.

Jay explained that WeatherFlow provides wind forecasting models that have had multiple applications such as the recreational industry, terrorism preparedness, and hurricane modeling. Their models are also used by the Coast Guard, naval bases and local weather services. Their Regional Atmospheric Modeling System (RAMS) supplements data available from the weather service. The most difficult modeling challenge is at the air-sea interaction in coastal areas. They currently provide 30-hour wind forecasts. The company has locations in Massachusetts, Poquoson, and Orlando. Weather Flow has accumulated **20 years of Chesapeake Bay wind data**.

David Forrest, VIMS

David discussed the Eulerian Lagrangian Circulation (ELCIRC) grid for the East Coast. The hydraulic models are driven by wind data. National wind scale models have to be linked to the hydraulic models using interpolation tools. Metadata from local models are used to develop the interpolation tools. Hindcast runs using prior wind data are supplemented with wind forecast data to develop surge forecasts. There are challenges with the size of the data set required and with the standardization of output data.

Discussion. **Jay Diedzic** suggested contacting **insurance companies** as potential partners. He asked if wave height forecasting is possible. The answer is that is a next step.

PRESENTATIONS:

Harry Wang, VIMS

Working in collaboration with Wakefield, Harry has presented three papers discussing the surge data using Hampton Roads as a sample of a vulnerable area for surge activity. The goal is to get street level resolution in surge forecasts. A large domain storm surge model covering Nova Scotia to the Florida Keys is now in place. The grid resolution increases closer to shore, permitting a high resolution nested inundation model. Harry showed several example of the accuracy of the model using hindcasts. The accuracy is limited by wind data, so the partnership with Weather Flow is very promising.

Next Steps. Continued integration of Weather Flow wind data to provide real-time surge forecasting capabilities.

Mitch Thompson, Measurement Specialties, Inc., Global Headquarters, Hampton, VA.

Bill Bean introduced Mitch and Measurement Specialties, Inc. as a potential partnership opportunity.

Background. MSI is headquartered in Hampton and specializes in producing a wide range of sensors. The company, founded in 1983, has 2,210 employees worldwide, with a significant presence in China. Mitch said the company has an emerging interest in government and academic partnerships. He wants to learn more about sensor applications of greatest interest to VIMS. He noted that MSI has a wide range of sensors used on buoys and they have been developing sensors for use in algal farms.

Next Steps. Participants noted that there were many potential links to VIMS researchers and others on the main campus (for example **Dennis Manos**, W&M VP for Research, Physics and Applied Science, in several areas; **Henry Krakauer**, Physics, in piezoelectronics; and **Mark Hinders**, Applied Science, in non-invasive sensing).

ROUNDTABLE UPDATES:

Bill Bean. Upcoming Sensors Forum

December 3, 2009. 8:00am – 12:30pm at
Measurement Specialties corporate headquarters, 1000 Lucas Way, in Hampton.

Topics:

- Ultrasound – Medical and NDT/NDE
- Nano/BioScience Sensing Technologies
- Laser/Optical Sensing and Technologies
- Medical Sensors

Sponsored by:

- Hampton Roads Research Partnership's Sensors Cluster Program
- Hampton Roads Technology Council's Sensor Science and Technology Forum

Jim Golden. Jim summarized a message from **Paul Panetta**, ARA, about recent work. Paul and **Carl Friedrichs**, VIMS, presented an *Acoustic Interactions with Surficial Sediment for ASW Sensor Applications* white paper to Navair. The SBIR Phase I proposal to the DOE submitted by Paul, when he was at Luna, and Carl **has been funded**. The proposal title is *Ultrasonic In-situ Characterization of Tank Waste*. Carl will work with Luna on that project.

CLOSING COMMENTS:

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

Next Meeting

Friday, February 12, 2010. VIMS Director's Conference Room, Watermen's Hall. 10:00am – Noon.
