VIMS Industry Partnership - *Meeting Minutes*

22 May 2009
Director's Conference Room. Watermen's Hall. 10:00am - Noon

Attendees Buzz Ashmore, Jim Barton, Bill Bean, Ben Francisco, Jim Golden, Ed Goodzait, Alleyn Harned, Troy Hartley, Carl Hershner, Steve Kaatari, Jane Lopez, Dennis Manos, Anne Marshall, Doug Meredith, Paul Panetta. Mark Patterson, Jim Schultz, Al Smith, Gene Tracy, Mike Unger, Lyle Varnell, John Wells.

Purpose The purpose of this meeting was to cover:

- **VIMS Update** (John Wells)
- **Autonomous Systems Laboratory Report** (Mark Patterson)
- **Underwater Ordnance Recovery, Inc.** (Jim Barton)
- **Biosensor Field Testing** (Mike Unger)
- **Roundtable Updates** (Jim Golden)

Note: These notes and presentations from **Mark Patterson** and **Mike Unger** will be 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 Updates)

Budget. John reported that all state agencies were required to submit budget cuts of 5, 10, and 15% on July 22, covering fiscal years 2010, 2011, and 2012. The state will have refined economic forecasts in mid-August. These cuts could have very serious impacts. **Dennis Manos** reported a similar situation for William & Mary, and noted that curtailments in student loans could compound the problems. He noted that W&M has submitted some $21 million in requests for stimulus funds. **Jane Lopez** announced that the Federal Stimulus Plan is having some positive results. VIMS recently received an additional $2 million from NSF and NOAA, including surprise reversals in funding of grant requests that had earlier been denied.

Visit. W&M President **Taylor Reveley** spent a day at VIMS, including a visit to the NOMAD Buoy that was donated to VIMS as a result of VIMS Industry partner SAIC.

Strategic Plan. The plan calls for increased emphasis on business partnerships. The VIMS Foundation is exploring creation of a C Corporation that would be used to promote business collaborations and contracts.

Mark Patterson. (Autonomous Systems Laboratory)

Bonaire Expedition. NOAA funded the project in 2008. Mark used three autonomous underwater vehicles (AUVs) to map the waters around the island in a month. An earlier project completed by another researcher using normal scuba techniques took three years to complete. The project is described at http://oceanexplorer.noaa.gov/explorations/08bonaire/welcome.html . Mark hopes to convert the project into a book – 50,000 divers visit Bonaire each year.

Iceland. Mark used the Fetch AUV to map the location of hydrothermal vents at Iceland's first underwater park. The park, on the Mid-Atlantic ridge sits on a hot spot in the earth's crust. One vent releases fresh water at 160 degrees Fahrenheit into seawater in the upper thirties Fahrenheit, producing clay mounds with unusual organism colonies. Most of the other hydrothermal vents release hot seawater, many with extremely high PH levels.

Agenda, cont.

PRESENTATIONS:

Mark Patterson. (Autonomous Systems Laboratory), cont.

Gifts. Dave Clifford and **Prizm Age, Inc**. gave the original Fetch AUV to VIMS in 2006, and they have now given four additional Fetch AUVs, the underlying patent, a machine shop, tools, an electronics shop, a trailerable AUV command post, and a vessel hull pressure tester. The value of the four Fetch AUVs is over $1 million. W&M/VIMS are actively working to license the technology. That technology, as well as the neural network technology, are described at http://www.wm.edu/offices/techtransfer/featuredtechnology/marinescience/index.php .

Tunnel Inspection. The ASL is exploring the possibilities of a contract to use an AUV to inspect the interior of an underwater tunnel for an international company. This has raised some export control issues that VIMS is exploring. If successful the contract would involve some local AUV subcontractors.

Robotics. Governor Kaine signed HB 2415, which makes robotics and unmanned vehicles technologies eligible for state funding.

Competition. The Office of Naval Research (**ONR**) is interested in autonomous surface vehicles for use in security and environmental monitoring. They provided prize money for a competition at Regent University that drew six college teams. ONR now plans to fund a similar competition in Hampton Roads every year. **Dennis Manos** expressed interest in fielding a W&M team in the next competition.

Governor's School. A student worked with Mark for four weeks and added a new "find home" computer routine to Fetch, to have it return to the launch point and shut down.

Project Sea Camel. Mark showed a short video clip from the underwater lab Aquarius project featuring VIMS graduate students. *Living Oceans* produced a 13 minute video that has gotten worldwide exposure.

Jim Barton. (Underwater Ordnance Recovery, Inc.)

Recovery Technology. Jim has a patented technology for using underwater robots to pick up underwater munitions. A controller on the surface manipulates the arms of the crane to pick up the rounds and place them in a container. A mobility chassis can be designed to meet the requirements of the site. The device is connected to the surface by a tether to control the crane. The operator can use wireless controls from outside any potential explosion area. A government study confirmed the validity of this non-destructive remediation technology. The device used a closed loop hydrolic system.

Scope of the Problem. Jim explained that there are millions of munition rounds underwater, primarily from fixed firing point facilities or dumping. He believes the major problem is in our inland waters. For example, he estimates there are 500,000 tons of abandoned munitions in the Great Lakes and there are almost 40 live-fire impact sites in the Chesapeake Bay. He believes there are 20 million chemical rounds in the Chesapeake Bay, which leak arsenic. The explosives are primarily nitrogen and phosphates and he believes those chemicals are a food source for algae and produce algal blooms. He is interested in scientific evidence that would demonstrate that link. He is also interested in markers that can identify trace concentrations that would pinpoint munition locations.

Solutions. Jim believes we need a clear understanding of the scope of the problem and a plan to begin dealing with the most pressing issues. A first step would be to give the military a release from liability, so they would be free to explore solutions. At the moment he believes the only effective way to address the issue will be through Congressional action.

Agenda, cont.

PRESENTATIONS:

Mike Unger. (Sensor Field Tests)

NOAA CICEET Project. This research funded for 2007-2009 required field testing of the sensors, using antibodies for specific chemicals, to demonstrate impact. The sensors were developed for 3-5 ring Polycyclic Aromatic Hydrocarbons (PAHs). The field tests were conducted in the Elizabeth River at hot spots developed from creosote and oil spills.

Research Question. The river was being dredged. Did the dredging release PAHs? Can we define the PAH plume? Tests in June communicated data from the sensors to the shore by cell phone. The sensors recorded the presence and intensity of PAHs at various spots in the river, defining the plume. Subsequent lab analysis of samples from each site confirmed the accuracy of the real-time sensor readings. The sensors are capable of picking up concentrations as small as 0-2 parts/billion.

Next steps. Mike Unger, **Steve Kaatari** and other researchers will work on new antibodies to distinguish among PAH sources, they will target new compounds, and they may work on multiple compounds.

ROUNDTABLE UPDATES:

Lyle Varnell. **Stan Allen** is following up on a potential SBIR lead that came from the new keyword search effort. **Bill Bean** reported that a student intern will be working on this project in the coming semester.

Jane Lopez.

- VIMS and W&M conducted an export control training seminar on June 22, 2009. Sixty people attended. Information has been posted on the VIMS website. **Jason McDevitt** has lead responsibility in this area for W&M. Primary emphasis will on the university community; however other Williamsburg area technology businesses are welcomed to attend.
- The algae research project continues in the boat basin. Funding for expanded research may be in sight.

Jim Golden. Dennis Manos and Jim will be meeting later this summer with the CEO of the new AREVA joint venture with NG/NNS. The JV will produce components of nuclear power plants for assembly on other sites. Anyone who sees potential research connections should contact Jim or Dennis.

CLOSING COMMENTS:

John Wells thanked the participants and adjourned the meeting at 11:45.

Next Meeting

Friday, October 30, 2009. VIMS Director's Conference Room, Watermen's Hall. 10:00am – Noon.

Note: The agenda will include a presentation by **Harry Wang** about "A Real-time Chesapeake Bay Forecasting System: Starting with the York River."
