

Harmful Algal Bloom Observing System Plan for the Gulf of Mexico Workshop

November 14-16, 2007

The Iberville Suites, 901 Iberville Street
New Orleans, LA

REPORT OF PROCEEDINGS

Workshop Objectives

- Agreement on a HABOS Plan for the Gulf of Mexico;
- Complete inventories of pertinent observations/products currently being made in U.S. Gulf states;
- Gain participants ideas regarding the order in which the various observing system elements should be implemented (based on need, likelihood of obtaining required support and feasibility); and
- Volunteers to provide cost estimates for the various system components within a given time frame.

List of Attendees is attached as Appendix A.

DAY ONE: November 14, 2007

WELCOME AND OPENING REMARKS, INTRODUCTIONS

Bart Bibler, Florida Department of Health, and Chair of the GCOOS Task Team on Public Health, opened the meeting and welcomed everyone. . He pointed out that the attendees were a diverse assemblage, coming from all five Gulf States, federal and state agencies, academic institutions, with a wide variety of expertise. He expressed his gratitude and appreciation for their attendance and participation. He noted that much talent was involved in this planning effort. The size of the workshop had been limited to ensure manageable meeting, but many others were invited to review the draft plans. The Plan is still a work in progress, but it is hoped that it will be finalized in the first quarter of 2008. He noted that there will be yet another full iteration for comments following this workshop.

Following Mr. Bibler's comments, Worth Nowlin, Chair, Board of Directors, Gulf of Mexico Coastal Ocean Observing System (GCOOS) Regional Association, welcomed everyone and asked participants to introduce themselves. Mr. Nowlin explained that the Workshop was sponsored by the Gulf of Mexico Alliance (GOMA), GCOOS, and the Alliance for Coastal Technology (ACT). He noted that there are plans for an operational system as a part of the U.S. Integrated Ocean Observing System (IOOS) and not a research program. In view of this, he also noted that the IOOS Data Management and Communication (DMAC) standards and protocols should ultimately be used.

The workshop steering committee consisted of Mr. Nowlin; Mr. Bibler; and Steve Wolfe-FL Dept. of Environmental Protection. Steve is also the Lead for the Gulf of Mexico Alliance Team

addressing HABS and cosponsor of the workshop. Other commitments prevented Mr. Wolfe from attending the workshop

The meeting was turned over to the Facilitator, Janice M. Fleischer, J.D., FLASH Resolutions.

AGENDA REVIEW/MEETING GUIDELINES/ANNOUNCEMENTS

Ms. Fleischer reviewed the Workshop Agenda (**Exhibit A**), Discussion Guidelines (**Exhibit B**), Consensus Rules (**Exhibit C**), and Roles of the Facilitator (**Exhibit D**).

A copy of this meeting Report and exhibits can be found at www.gcoos.org.

OVERVIEW OF IOOS AND GCOOS

Worth Nowlin delivered a presentation on the Integrated Ocean Observing System (IOOS) and the Gulf of Mexico Coastal Ocean Observing System (GCOOS) (**Exhibit E**). Dr. Nowlin explained that this presentation was just a broad brush background. The presentation was in three parts, dealing with:

- (1) The Global Ocean Observing System (GOOS) and development of the U.S. Integrated Ocean Observing System (IOOS) as part of GOOS;
- (2) The newly established NOAA IOOS Program Office and its planned activities; and
- (3) the status and plans of the Gulf of Mexico Coastal Ocean Observing System and its governing Regional Association. Further information can be found at the GCOOS website located at www.gcoos.org.

Comments from participants on Ocean Observing:

1. NOAA trying to move away from the use of the term "national backbone"; it implies something well defined and it is not – it will be more of a distributed system
2. We should use the term "federal contribution" instead of "national backbone"
3. The term "national backbone" refers not just to federal assets, it is also regional assets that contribute to the national backbone. This helps fill in the regional areas where gaps exist.
4. However, mostly the federal government is paying for all this. The government specifies where data are collected and how collected

Comments from participants on part two of the talk:

1. Regarding the seven (7) societal goals of the IOOS Plan: is there any activity at the departmental level to get funds to do these?
 - a. There is some activity; there are some partnerships in place
2. What opportunities do you see for Health and Human Services to get more involved?
3. There is a line item in the President's budget for IOOS this year; this is a first.

Comments from participants on the status and plans for GCOOS:

1. GCOOS is not only for the American government; Mexico and other countries are welcome to join.
 - Worth et. al., will follow up with workshop participants regarding who to contact in Mexico to bring them in formally.
2. Each federal agency has its own nuances regarding wording in the GCOOS Memorandum of Understanding (MOA).
3. Is there a timetable for the fisheries workshop?
 - It was recommended that we not hold a workshop, but rather get a list of priorities from them.

- Fisheries is a very important stakeholder group.
- 4. It is very important to work together with Mexico; GCOOS has offered various Mexican entities the opportunity to join GCOOS and we are hoping some will soon sign the MOA. Mexico has some observing systems in place now.
- 5. NOAA **{Is this NOAA?}** Health initiative is developing a portal, will you **[who?]** be working with them?

The group took a short break at this time.

OVERVIEW AND FOUNDATION HABIOS PLAN

Bart Bibler spoke to the participants on the events leading to this Workshop and the development of the HABIOS (Harmful Algal Blooms Integrated Observing System) Plan. Mr. Bibler covered the following items:

- Reviewed the 2004 HABs Workshop held in St. Petersburg (could refer to GCOOS Web site for information thereon)
- An ad hoc group under auspices of the U.S. GOOS Steering Committee met in California to examine needs for public health and beach quality in southern California and to estimate costs for an observing system there. That resulted in decision to prepare a HABs observing system plan for the Gulf of Mexico.
- HABs in the Gulf is one of the NOAA IOOS priorities.
- GoMA partnership has taken up water quality as one of their five foci – HABs is one of three priority sub-areas.
- In 2006 there was an IOOS Public Health Workshop in Florida.
- GoMA had a follow-up workshop in Rookery Bay.
- The ACT has held workshops on sensor technology related to water quality and HABs.
- Federal acts and reports should be referenced in the report.

Mr. Bibler explained that there had been an HAB symposium. He asked several of the participants who attended that event to give a few comments on it. He explained that there has been a significant amount of testing to see the effect on humans by red tide. Florida, in particular, has a very high incidence of red tide. The southwest of Florida has expended much effort to enhance ocean observing for HABs. In addition, the Alliance for Coastal Technologies is working on HABs. http://ocean.tamu.edu/GCOOS/Office/documents/HABs/ACT_WR02-01_HAB.pdf

In the future, freshwater, marine and research and development reports will be forthcoming sometime in late 2008. The Florida Department of Health is currently developing response plans to red tide predictions and events.

Comments from participants:

1. NOAA and the National Science Foundation (NSF) have centers in oceans and human health; however, they do only some outreach.
2. Do you want to maintain the HAB related website into the future? Is it of value and if so, then a small group needs to be formed to keep the website up to date.
3. There is a clearinghouse type of website in Woods Hole, maybe we should use that, put a small group together to look into our regional website and theirs to see if there is a possibility for combination.
4. Check out the Woods Hole website; it is primarily for distribution of blooms and species, may not have the additional information that we need.
5. We should also get the Mexico information if we keep our website.

6. Regional website very important to keep; the national website will not have the information we need on it.
7. If you tell Mexico how to do, they will provide their data for inclusion.

VOLUNTEER PLANKTON OBSERVING NETWORK

Allison Sill, Program Coordinator of the Volunteer Phytoplankton Monitoring Network (PMN) delivered this presentation (**Exhibit F**). Although it is volunteer, it is incentive based. Participants who regularly assist are provided a microscope worth \$800.00 for their use as long as they remain in the program. The volunteers are trained by the PMN staff; this allows groups to be more comfortable with sampling, identification and data submission procedures.

Ms. Sill explained there were currently 103 sample sites in SC, NC, GA, FL, TX, AL, HI, MA, CA and the Virgin Islands. The network would like to expand to MS, LA and more regions of FL. The PMN is also interested in expanding into Mexico and other territories. She explained that they recently split their data sheets into two groups: Gulf and Atlantic. This was done because they were finding very different things so it was thought best to separate the two coasts.

Participants Comments:

1. What kind of quality assurance plan do you have?
 - Volunteer groups must send water samples in with data sheet so they can be verified (this is not done with all groups). Volunteers also send in pictures so that species can be confirmed by NOAA scientists.
2. Does Florida have a volunteer group as well?
 - Only sampling not identification
 - Florida uses different subsets of volunteers; difficulty with off shore sites
 - The PMN is interested in having more groups involved in FL.
3. Do you use plankton nets?
 - Yes, and we provide them at no cost to each volunteer group (nets cost \$120.00 each).
4. This is a tremendous program in terms of outreach; it is somewhat limited in scope but really a good program.
5. Are the samples live or fixed?
 - Both, Lugol's is used to preserve specimens and they are overnighted to our labs via FedEx.
6. They are planning to expand to freshwater in the Great Lakes area.

HABSOS (HARMFUL ALGAL BLOOMS OBSERVING SYSTEM)

Rost Parsons spoke regarding the Harmful Algal Blooms Observing System (HABSOS) (**Exhibit G**). Dr. Parsons noted that the information on the system is now available in Spanish as well as English. It is not an analysis or forecasting tool; it is mainly a data information tool. Their new website is <http://habsos.noaa.gov>.

Currently the information on the system only goes back 30 days, some folks have indicated a desire to have it go backer further (120 days, years, etc.). The data will be archived; this is very important.

Participant Comments:

1. How is the EPA involved?

- a. They have been directly involved since the very beginning in doing a case study; as it has evolved they are there to help it along.
- b. EPA has played a role for many years and we do not take it lightly.
- c. They don't DO the work, they provide the money.
2. ECOHAB (Ecology and Oceanography of harmful Algal Blooms) , is a joint program with NOAA and EPA.
3. Are you involved at all in the census of marine life (OBIS) Ocean Biological Information Systems.
 - a. Archiving data and metadata
4. Is the primary audience the research community? Or is it open to the general public and how would they know how to use it?
 - a. Data entry is not open to the public; parts of the data description is open.
 - b. Because it is very complex it is really aimed at the research community.
5. Is there any plan to synthesize the data for other users?
 - a. We have started discussing how to get some of the synthesis information into HABSOS. For example, we are going to a shapefile (GIS) based HAB field, that could be added to HABSOS, as well as the manipulated output.
6. The HABSOS data entry tool; is it a "push" or "pull" entry tool?
 - a. At this point more "push" (take data offered), but we have been asked to make it more of a "pull" (actively go out and ask for data).
7. The website is a public website with aggregate values since the public would not know how to interpret the distinct values.
8. As you develop push/pull techniques, you should talk to University Corporation for Atmospheric Research

STATE REPORTS

Florida

Cindy Heil, FWC

Florida Fish and Wildlife Conservation Commission (FWC) is the state agency that monitors red tide in collaboration with other state entities; Fish and Wildlife Research Institute (FWRI) has the HAB group; FWRI is the research arm of FWC.

Sampling in-shore is not a problem; sampling off-shore is more of a problem. Volunteers are used quite a lot. The primary samplers in some counties are the local Departments of Health. FWRI works closely with FDACS, (Florida Department of Agriculture and Consumer Services). There is an issue of response sampling rather than regular sampling.

Bottom Sampling Ocean Profilers =BSOPs

David Heil, FDACS:

FDACS is a public health regulatory agency whereas other agencies are not. FDACS does not issue warnings, they issue closings. FDACS monitors shellfish areas for marine biotoxins, only in estuaries and there can be as many as 10 stations in an area to as little as 3 stations in an area. FDACS monitors a total of 38 shellfish harvesting areas. The monitoring is of the water not the shellfish because public health agencies don't wait for the shellfish to become toxic.

It can take 2-4 weeks until the shellfish are clear of the toxin after the event is over (cessl no longer present in the water). The objective is to know about the event before it is inshore and affecting people and shellfish. Florida is not making the rules on shellfish control; that comes from National Shellfish Sanitation Program. Therefore, all US Gulf of Mexico States conduct the same type of public health monitoring. There are clear cut standards on when an area is safe and when it is not safe; we address molluscan shellfish (oysters, clams, and mussels) public health.

Participant Comments:

1. Aside from red tide, what other species do you monitor for?
 - i. Paralytic Shellfish Poisoning (PSP) organism *Pyrodinium bahamense*.
2. Do you see many *Pseudo-nitzschia* blooms?
 - i. We have a lot of *Pseudo-nitzschia* blooms but we have not seen it be toxic; it does not manifest itself here like it does in California and other locations.
 - ii. Toxicity of *Pseudo-nitzschia* is increasing in Louisiana.

Barbara Kirkpatrick, Senior “Scientist, Mote Marine Laboratory delivered a presentation on Beach Condition Reporting Systems (Exhibit H).

Dr. Kirkpatrick pointed out that people with asthma are very sensitive to the toxins of *Karenia* so it is very important that the public be notified when it is in an area. Additionally, the general public wants to know what beaches to visit that won’t have dead fish, airborne toxins, etc.

Manatee and Sarasota Counties have public beaches staffed by professional lifeguards; the lifeguards file real time beach conditions reports using a Blackberry. The data is seamlessly transferred to a website; these are subjective reports but still are valuable for public health purposes. Currently, Mote Marine monitors (15) fifteen beaches. Red tide (*Karenia brevis*) respiratory irritation is very noticeable and causes a temporary irritation to asthmatics and non asthmatics alike. Recent research has shown that asthmatics are impacted for days after a 1 hour beach exposure.

BreveBuster-based *Karenia* detection and tracking network in southwest Florida presentation (Exhibit I) given by Gary Kirkpatrick:

Gary Kirkpatrick presented a brief review of the *Karenia* detection and tracking network that he has been involved with along the southwest coast of Florida for the past four years. The detection technology, known as the BreveBuster™, is based upon determination of the correlation between a ‘standard’ *Karenia* light absorption spectrum and the light absorption spectrum of the particles in the sample. It is an automated instrument capable of sampling on a preset interval ranging in length from approximately three minutes to weeks. The BreveBuster has been configured for installation on fixed platforms (pilings, piers, channel markers and buoys) as well as on autonomous underwater vehicles (Slocum glider, REMUS and BSOP). Results are transmitted through a variety of means from cell phone to VHF radio to satellite phone. Endurance is determined primarily by the bio-fouling rate and typically range from one month in an estuary to three months on an offshore buoy.

Sponsors of the twenty-two instruments either assembled or in assembly include NSF, NOAA, FWCC and EPA. The majority of units in this inventory are deployed in or destined for the coastal region from Tampa to Marco Island, Florida. A notable exception includes three units destined for deployment in the waters of the Mexican State of Veracruz.

In conclusion four observations about this work were listed: 1) Daily operations require continuous attention to details such as quality of data, personnel, weather conditions and

forecasts, and maintenance needs; 2) To achieve long-term operation there must be a continuous engineering effort focused on improvements; 3) For safe operation there must be continuous emphasis on safety consciousness and provision of safety equipment and supplies; 4) For all of this effort to be worthwhile it is critical that it be continuously evaluated in regards to the utility of the products.

Participant Comments:

1. What are the safety concerns on a buoy?
 - a. Deploying the equipment off boats
 - b. Devices that are hazards to boats
 - c. Just need to pay attention whenever you put something in the water that could be an obstacle

LUNCH

Alabama

Hugh MacIntyre, Senior Marine Scientist, Dauphin Island Sea Lab:

Alabama has about 100 miles of coast line along the Gulf of Mexico and in Mobile Bay and Mississippi Sound. In past years there have been blooms of numerous HAB species (see appendix) including *Karenia brevis*, that have been responsible for fish-kills and hypoxia. There are sharp gradients from very turbid, nutrient-rich, to very clear, nutrient-poor waters. Consequently, optically based monitoring is very difficult. The high diversity within the microalgae makes chlorophyll an unreliable proxy for HAB abundance.

There are 4 tiers of monitoring:

1st tier:

State and federal agencies, coordinated through Alabama Department of Public Health (ADPH).

These monitor of Gulf beaches and oyster-growing areas in Mobile Bay, with further adaptive sampling during blooms. ADPH has regulatory authority over oyster harvesting. Routine monitoring is weekly, bi-weekly or quarterly, depending on site and season. Data include cell counts and (usually) temperature and salinity.

2nd tier:

Dauphin Island Sea Lab (DISL), in collaboration with ADPH. Grant-based (i.e. finite duration) research efforts in bays and offshore. (Prior funding has come from NOAA, EPA directly or in state- or university-administered funding.) DISL is developing Alabama-centric website on HABs, eutrophication and hypoxia. Sampling is typically monthly. Data include cell counts, physical hydrography, bio-optical descriptors, HPLC pigments, nutrients etc.

3rd tier

Volunteer network (initiated by NOAA PMN with reporting to PMN database), in collaboration with DISL in inshore waters not routinely sampled by ADPH. Methodology and level of training reduce reliability as monitoring tool but excellent outreach and outreach opportunity. Sampling is biweekly. Data include relative abundance of net plankton, physical hydrography, chlorophyll a, nutrients etc.

4th tier

Instrument arrays are maintained by NDBC (1 site on Dauphin Island), DISL/Mobile Bay NEP (3 sites in Mobile Bay, 1 in Perdido Bay is pending), USGS/ADCNR (1 site in Wolf Creek) and the Weeks Bay National Estuarine Research Reserve (4 sites in Weeks Bay). Data vary by site but include hourly meteorology and hydrography (temperature, salinity, dissolved oxygen). High fouling rate in Mobile Bay and Weeks Bay limits potential application of optical sensors because of the need for daily or near-daily cleaning.

Comments:

1. What agencies are providing funding?
 - i. NOAA, EPA, Congressional set aside money for the state or University of Alabama.
2. Upkeep on moorings is done but sensors really need to be cleaned daily and that is not realistic.
3. They collect grab samples on monthly basis

Mississippi

Henry Folmar, Mississippi Department of Environmental Quality (MDEQ)

Mississippi has officially had only one documented HABs incident, a *Karenia brevis* bloom which occurred in 1996. Undoubtedly there have been other cases, and there is ample anecdotal evidence of other occurrences. However, this low incidence is largely a function of limited HABs monitoring and reporting systems.

In March 2007, the Mississippi Department of Marine Resources (MDMR) initiated a Marine Biotoxin Contingency Plan for all marine and estuarine shellfish growing areas. Under this plan, discrete samples are collected and sent to the Alabama Department of Public Health for identification of potentially harmful phytoplankton species. Additionally MDMR conducts routine monitoring of water and shellfish meats according to National Shellfish Sanitation Program Guidelines.

MDEQ, in collaboration with Dr. Cyndi Moncrief, participated in an EPA funded *Pfiesteria*/HABs monitoring project in 2003 which included phytoplankton sampling at 20 nearshore estuarine sites, MDEQ also conducts ambient water quality monitoring of its coastal waters and routine bacteria and nutrient monitoring of its swimming beaches. These programs provide useful water quality data and accomplish federal mandates, and the data can be used to supplement a HABs monitoring program.

In addition to these routine monitoring programs, a number of Mississippi researchers are involved in HABs related work.

A description of the Mississippi research efforts is provided on the GCOSS website at http://ocean.tamu.edu/GCOOS/Office/documents/HABs/MS_HAB_efforts.pdf.

Louisiana

Thomas M. Soniat, Department of Biological Sciences, Nicholls State University:

Karenia brevis blooms in Louisiana are rare. In 1996 a red tide developed east of the Mississippi River; no such events have re-occurred. In Louisiana other HABs are of greater concern. *Pseudo-nitzschia* is an emerging threat, and blooms of the cyanobacteria *Anabaena*, *Microcystis* and *Cylindrospermopsis* are relatively common in the low-salinity waters of Lake Pontchartrain and the upper Barataria Basin. Louisiana's HAB challenges are thus more similar to those of Alabama and Mississippi than to those of Florida and Texas.

HAB capabilities in Louisiana are found in state agencies and universities. They include the Louisiana Department of Health and Hospitals (LDHH), the Louisiana Department of Wildlife and Fisheries (LDWF), Louisiana State University (LSU), Nicholls State University (NSU), and the Louisiana Universities Marine Consortium (LUMCON).

The LDHH is the lead State agency for monitoring HABs and assuring the microbiological safety of shellfish-growing waters. Anthony Roussel directs the Molluscan Shellfish Program which monitors *K. brevis* according to Interstate Shellfish Sanitation Conference guidelines. Sampling occurs in all major estuaries, with a particular emphasis on sampling in areas east of the Mississippi River. The agency has a laboratory for the identification and enumeration of *K. brevis* only. The LDHH also conducts a beach monitoring program.

The LDWF manages the oyster fishery. It conducts extensive fisheries-independent sampling and alerts the LDHH to HAB events.

Sibel Bargu, a phytoplankton ecologist at LSU, monitors *Pseudo-nitzschia* and other HAB species in coastal waters, and conducts experimental studies on nutrient variation and its impact on *Pseudo-nitzschia* and cyanobacterial toxicity. The LSU Coastal Studies Institute maintains five coastal monitoring stations.

Tom Soniat at NSU and Sammy Ray of Texas A&M University at Galveston direct Oyster Sentinel (www.oystersentinel.org). Oyster Sentinel is a gulf-wide program which uses the eastern oyster as a monitor of estuarine health.

Phytoplankton studies have been conducted by Quay Dortch and Nancy Rabalais since 1989. LUMCON scientists sample phytoplankton from the Mississippi River to Texas, from near shore up to 100 km offshore. Monthly samples are taken off Terrebonne Bay, within the Barataria Basin, and within Lake Pontchartrain. Bimonthly samples are collected off Atchafalaya Bay, summer sampling occurs across the shelf, and selected samples are taken from the Mississippi River at Baton Rouge. The Phytoplankton Group has a taxonomic expertise in all HAB species and provides taxonomic assistance to the LDHH. LUMCON scientists are completing a taxonomic compendium of phytoplankton with Gulf of Mexico Program funding. LUMCON has capabilities in pigment analysis using HPLC, including pigments specific to toxic cyanobacteria. LUMCON deploys two to three sondes in the upper Barataria Basin and, in conjunction with LSU, maintains two instrumented real-time stations offshore from Terrebonne Bay and Caminada Pass. The Louisiana Universities Marine Consortium serves as a focal point for inter-agency and inter-university cooperation concerning HABs in Louisiana.

Participant Comments:

1. Funding is from research grants; there is no long term commitment for funding

2. What do you measure with your sentinel site? (Note: measurements would be environmental and the sites are oyster sites)
 - i. Salinity
 - ii. Water temperature

Texas

Meridith Byrd, Texas Parks and Wildlife Department:

Karenia brevis is the major concern in Texas; there are other blooms but none cause as much problem as *K brevis*. Monitoring is done for fishery impacts, health concerns, such as the opening/closing of shellfish beds, as well as to give the public an idea of which areas of the coast are being affected and which are free of red tide. During blooms TPWD conducts daily conference calls with other agencies and universities to coordinate monitoring in order to avoid duplication of efforts, i.e.- if another agency is collecting water samples in one area, TPWD will collect samples elsewhere. Texas Parks and Wildlife Department (TPWD) works closely with the Texas Department of State Health Services as well as Texas Cooperative Extension, the University of Texas and Texas A & M University. There is an interagency HAB working group that is very active and effective; their goals include facilitating research, response, early detection, and outreach.

Participant Comments:

1. Aerial overflight, the aircraft is owned by the Law Enforcement division of Texas Parks and Wildlife Department, we also work with Coast Guard Auxiliary when our Law Enforcement planes are not available.
2. Overflights allow us to get visuals of the bloom along the shore; very limited
3. Where are your blooms coming from?
 - i. AL, LA, MI all said their's are coming from the east. It is likely that Texas blooms come from the east as well.

Lisa Campbell, Professor, Department of Oceanography, Texas, A&M University delivered a presentation ([Exhibit K](#)).

Dr. Campbell is testing an imaging and automated classification system to provide continuous monitoring for HAB detection and enumeration. This instrument, the Imaging FlowCytobot, is designed to look at individual cells, mainly phytoplankton, in the size range 10 to 100 um. A red diode laser is used to measure the light scattering and chlorophyll fluorescence of each particle that passes through a flow cell, and to trigger a flashlamp and a CCD camera to record the image of each particle. Currently, the instrument is deployed on the pier at the University of Texas-Marine Science Institute in Port Aransas, TX. This work is funded by a research grant from the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET).

Participants Comments:

1. The system is triggered by chlorophyll signals, so that only live phyoplankon are counted.
2. Currently it requires cabled power; we are working to reduce the amount of power needed so it can be operated autonomously on a buoy.

Dr. Norman Guinasso talked about a Texas Automated Buoy System ([Exhibit L](#)). The work is done for the State of Texas General Land Office. Their principal mandate is to obtain surface currents for use in oil spill mitigation.

Participant Comments:

1. The ability to forecast trajectories of the blooms is being done in some states; this should be commonly done.
2. Are you still making photos of *K* or other HABs? (Question from Mexico)
 - a. Yes, this is being done by the new equipment that Lisa Campbell talked about in her presentation

Public Health Perspectives

Lora Fleming, Ph.D., University of Miami, delivered a presentation on the public health community's perspectives on this HAB effort and what the public health community felt was important to include in the Plan. (Exhibit M)

Participant Comments:

1. There is no "traditional" approach to IOOS
2. This is within the 7 societal goals we have
3. We just need initially to use the physical data available
4. We need the public health folks to write this part of the Plan
5. Ultimate goal of IOOS is to produce something that is useful to non-science users
6. Red tide may have more permanent type damage than just temporary discomfort
7. Asthmatics are significantly impacted
8. Let's not use track of environmental health

BREAK

At this point in the meeting, the group took a short break.

NOAA HABs FORECASTING SYSTEM

Rick Stumpf, NOAA, delivered a presentation on NOAA's HABs Forecasting System (Exhibit N).

Dr. Stumpf explained that the key goal of the system is forecasting. It is institutionally supported, produced regularly, very highly organized, reliable and held to strict standards of accountability.

Participant Comments:

1. From a manager's standpoint the analysis part is really important. The graphics and visual portion of the system serve to inform the next level up (the manager's bosses).
2. Can you try something like FLH (Fluorescent Line Height) rather than using chlorophyll indicators?
 - i. It doesn't help much to do that, as it does not provide discrimination of blooms, although it does locate patches of higher chlorophyll. We use FLH as a supplement. Currently we are evaluating several algorithms for satellite to discriminate.
3. Do you have a sense of where you have confidence?
 - i. The Forecasts are evaluated for skill (accuracy), however the skill is dependent on the resolution of the forecasts/models and the validation data. Currently the low resolution (county level) leads to high accuracy. HABs other than *Karenia* will require a variety of data to identify, which depends on which state.

1. the entire Florida coast
4. It's good to have a clustering of models for prediction. (like what is used for hurricanes).). Ensemble of HAB field uncertainties and different models and model uncertainties.
5. Are there available opportunities to catch airborne capabilities?
 - i. We need airborne for the resolution. Satellite cannot currently resolve within 1 mile of the shore, we have to infer conditions. Bays are problematic because of the optical complexity and size. "Optical complexity" means many components influence water color, so that more bands must be measured.

INTRODUCTION TO THE DRAFT OBSERVING SYSTEM PLAN

Worth Nowlin reported on the events that led up to this Workshop. He explained the process used to develop the current iteration of the Plan. Versions one and two focused only on mission statement, terms of reference for the plan and goals and objectives because it was thought very important to get those correct before proceeding. Version three then added a tentative outline of the document to solicit comments on the overall structure of the plan before filling in that structure. He noted that reviewers comments had been very helpful in improving the draft document and mentioned the special assistance received from Geoff Scott and co-workers, Rost Parsons, Tom Malone, and Rick Stumpf.

Tom Malone noted that the rankings given during the evaluation of the third version indicate that the document actually has a great deal of acceptance. However, each new iteration adds details which may change the acceptance level. He directed participants to their packets which contained a full copy of the 4th iteration.

Participants were asked to read the 4th iteration overnight and be prepared to rank the document the next day.

ADJOURN FOR THE DAY

The meeting was adjourned for the day.

DAY TWO: November 15, 2007

REVIEW AGENDA/ANNOUNCEMENTS

Ms. Fleischer, Facilitator, reviewed the Agenda for the next two days which had been slightly revised overnight. (Exhibit O) The revision was made to adjust the work of the workshop in response to participants' comments during the previous day. It became apparent during the previous days' discussion that it would be premature to attempt to prioritize elements of the Plan at this stage. Thus the prioritization of the original workshop objectives was eliminated from the new Agenda. The conveners felt that additional time spent on gaining comments from the stakeholders on the Plan to add language and concepts from their specific focus was more important at this time.

RANKING OF DOCUMENT, BREAKOUT GROUP DESIGNATIONS/PLENARY DISCUSSION

The Facilitator explained the next exercise. Participants would rank each portion of the 4th Version of the Plan with no discussion. If any participants ranked a portion a "1" or a "2", their names would be recorded and at the conclusion of the ranking exercise, the Facilitator would go back to those sections in which there were "1s" or "2s" and take their comments on what concerns they had.

When the rankings were complete and prior to beginning the discussion on the individual sections of the Plan for which consensus had not been achieved, a member of the group asked for clarification as to the purpose of the Plan. It was asked whether the Plan would be focused on harmful algal blooms in general or specifically to *Karenia brevis* (red tide). The questioner explained that the answer to this question might influence how the participants would revise and improve the current draft.

The following concept was suggested and tested for consensus:

The document is HAB general with specific examples for Karenia brevis (K) as well as other species that might be relevant, acknowledging that K is the most prevalent HAB and there will be an emphasis on K for that reason. Be clear when you are talking about specifics and when we are making a more general case regarding HABs.

5	4	3	2	1
18	11	3	0	0

Consensus achieved

Steve Lohrenz and Rick Stumpf will write the portion of the Plan regarding the specifics vs. the general.

What follows is the result of the ranking of the document and the commentary that followed:

Ranking of Overall document:

5	4	3	2	1
3	17	6	4	0

2s: Lorraine Backer, Lora Fleming, Lisa Campbell, Cindy Heil

1. Lorraine:
 - a. Very environmental centric; needs a human health data needs component
 - b. Say we need human risk assessment and separate category for animal health
2. Lora:
 - a. Agree with Lorraine
 - b. How do you communicate to end user
 - c. How to evaluate if end product is useful
3. Lisa
 - a. Is this HAB general or K specific? DECISION
 - b. Very different from version 3; text not as understandable
4. Cindy:
 - a. HAB in general or K NEED DECISION
 - b. Each state needs to be tapped into to acknowledge state specific problems
 - c. That is another resource
 - d. Concern about technology; acknowledge the variety of technologies
 - i. May have different mgnmt needs
 - e. Setting up volunteer network; two systems
 - i. How it is done; there are two strategies; different sampling areas, different efforts
 - ii. Can we use new techniques; discussion of two sampling strategies

Vision Statement

5	4	3	2	1
18	12	2	2	0

2s: Jeanne Allen, Mark Fisher

1. Jeanne:
 - a. As we develop plan don't forget Mexican colleagues; try to include them as much as possible
 - b. Extend plan into the southern Gulf of Mexico
2. Mark Fisher
 - a. Line 17, page 2, line 37
 - i. Why it stands out mitigation of socio impact; it should be mitigation of all impacts

Terms of Reference

5	4	3	2	1
9	22	2	0	0

Consensus achieved

G and O introductory paragraph

5	4	3	2	1
7	17	8	2	0

2s: Lora Fleming, Lorraine Backer

1. Lora:
 - a. Nothing about communication to end user
2. Lorraine:
 - a. Same concern as Lora

- b. Page 3, line 79, no mention of improving human health data or enhancing human health data
- 3. Cindy:
 - a. How would we address critical gaps?

Objective 1

5	4	3	2	1
10	19	2	2	0

2s: Lisa Campbell, Cindy Heil

- 1. Lisa:
 - a. Terminology “HAB” hotspots; we may not really know that
- 2. Cindy:
 - a. Agree with Lisa on hotspots
 - b. What are the unknown HABs not just the known HABs; unknown HAB issue
- 3. Sibel:
 - a. Initiation locations may not match with the places that are mentioned in the document
 - b. We need to think of “initiation” in hotspots

Objective 2

5	4	3	2	1
13	13	4	3	0

2s: Mark Fisher, Lisa Campbell, Rebecca Love

- 1. Mark:
 - a. concern on term “relevant” could strike it
- 2. Lisa:
 - a. Need to have human health separate not “lumped” in with all others
- 3. Rebecca:
 - a. How do we determine critical gaps; user assessment, relevant data

Objective 3

5	4	3	2	1
14	10	7	2	0

2s: Lorraine Backer, Alan Lewitus

- 1. Alan Lewitus:
 - a. what does data include specifically; specify what that means (“all data” in document)
 - b. b. pathologies, which ones are measured
- 2. Lorraine:
 - a. in truth general access to human health data is not going to happen, but provide for timely exchange with systems collecting human health information

Objective 4

5	4	3	2	1
12	14	4	2	0

2s: Lisa Campbell, Cindy Heil

- 1. Cindy and Lisa

- a. Clarify whether it is toxicity or toxins itself and use correct term consistently in the final document.
- b. Whether Human illness and animal pathologies can be measured in real time; may be as simple as tracking mortalities
- c. Real time may be the real issue in the whole statement

Objective 5

5	4	3	2	1
26	6	1	0	0

Consensus achieved

Objective 6

5	4	3	2	1
17	14	2	0	0

Consensus achieved

Objective 7

5	4	3	2	1
3	14	10	7	1

2s: Lorraine Backer, Barbara Kirkpatrick, Meridith Byrd, Leigh Zimmerman, David Heil, John Paul, Rebecca Love

1. Lorraine, Barb, Meridith, Leigh, Lora (was a "1"), Rebecca
 - a. Break into 3 components
 - i. ID human health risks from HAB events
 - ii. ID animal health risks from HAB events
 - iii. ID environmental condition epistudies would take into account as possible risk factors for exposure/development of disease
2. John Paul
 - a. Linking changes in environment HAB events vs epidemiology, linkage to environmental changes that might be influencing HAB events
3. David
 - a. Lorraine's "iii" above

1s: Lora, captured above

Objective 8

5	4	3	2	1
15	14	3	2	0

2s: Lisa Campbell, Cindy Heil

1. Lisa
 - a. The document reads very much as a *Karenia brevis* specific focus; I believe the intent is it should focus on HABs in general
2. Cindy
 - a. Need phrasing "identify areas of research", identify which areas as well who is running the system

O1 Activities

5	4	3	2	1
9	16	10	0	0

Consensus achieved

O2 Activities

5	4	3	2	1
9	19	7	0	0

Consensus achieved

O3 Activities

5	4	3	2	1
14	14	3	3	0

2s: Lorraine Backer, Rost Parsons, Gary Kirkpatrick

1. Lorraine:
 - a. Human health data limited access but there wont be storage; need communication across the system we need to acknowledge
 - b. Need to build a system that takes into account the privacy issues (human health)
2. Rost:
 - a. Page 5, line 163, 166, separate "access" and "archive"; plan should not get into archive, focus on access
3. Gary
 - a. Problem with issue of restricted data (public health crowd)
 - b. IOOS is a publicly funded observing system; then is there a conflict with IOOS collecting privileged information?
 - i. Answer:
 1. may depend on level of detail, if you don't identify individual the data can be used
 2. IOOS is a movement; not a system itself; IOOS itself will not create an archive; it will just record what is there
 3. The DMAC system calls for some data that is secure
 4. Are we only dealing with non-restrictive human data
 - a. we may need to tier it

O4 Activities

5	4	3	2	1
6	16	10	0	0

Consensus achieved

O5 Activities

5	4	3	2	1
10	11	5	5	0

2s: Lorraine Backer, Leigh Zimmerman, Mark Fisher , Barbara Kirkpatrick, Lora Fleming

1. Leigh
 - a. #2 bullet, developing outreach material, "use" of the product, what is important that public know how to "use" the products
2. Lorraine
 - a. Develop outreach materials; archive for educational and outreach materials

3. Mark
 - a. On first bullet "IOOS DMAC" look at page 6. line 185 needs to be reconciled with page 17, line 605 (6.1 bring this into this item) what is DMAC that will control the consistency standard
 - b. Provide specificity on the information line 184
4. Lora, Barbara
 - a. Nothing to add

O6 Activities

5	4	3	2	1
10	17	4	3	0

2s: Lisa Campbell, Cindy Heil, Mark Fisher

1. Cindy, Lisa
 - a. #2 what does "monitored by users" mean
 - b. Statements need to be more specific on identifying user groups
2. Mark
 - a. "measure" performance metrics not "implement"

O7 Activities

5	4	3	2	1
2	17	8	6	2

2s: Rebecca Meridith Barb Lisa Cindy Leigh

1. Rebecca Love, Meridith Byrd, Barbara Kirkpatrick, Lisa Campbell, Cindy Heil, Leigh Zimmerman
 - a. Take out #1, confusing add id human and animal health data systems and support HAB related surveillance systems

1s: Lorraine Backer, Lora Fleming

1. Lorraine
 - a. long list of items for small group discussion
2. Lora
 - a. HAB related "disease" surveillance systems

O7 Activities commentary

5	4	3	2	1

No ranking done

O8 Activities

5	4	3	2	1
9	19	7	0	0

Consensus achieved

Section 5 Intro

5	4	3	2	1
6	14	11	1	0

2s: Norman Guinasso

1. Norman

- a. Introduction too terse and you hate sentences that start with “it”

5.1.1.1

5	4	3	2	1
3	12	12	5	0

2s: Mark Fisher, Rick Stumpf, Lisa Campbell, Cindy Heil, Ivonne

1. Mark
 - a. Line 250, re: human health may not be true for Texas, flag this
2. Rick
 - a. Items 1 and 2 say “agree on” we need provisions to say “how” this agreement will happen
3. Lisa
 - a. nothing
4. Cindy
 - a. Agree with Rick
 - b. true monitoring vs. event response; which is really being done; not addressed in this document and needs to be considered
 - c. statistical basis for the monitoring needs to considered
5. Ivonne
 - a. line 248 can be modified from “coastal states of the US and Mexico”
 - b. We have 5 states in part of Mexico, in 4 of those states we have red tide events that are registered

5.1.1.2

5	4	3	2	1
3	7	15	8	0

2s: Lorraine Backer, Lorraine Campbell, Barbara Kirkpatrick, Lisa Campbell, Cindy Heil, Alan Lewitus., John Paul, Hugh MacIntyre

1. Lora
 - a. Lack of mention of collection of other types of networks for volunteer networks for collection of human and animal data such as beach condition report and marine mammal strandings
2. Lorraine
 - a. each state may not make regular observations of illnesses
 - b. change to an objective now only a list
3. Barb
 - a. combination of background information; need to change to objectives
4. Lisa
 - a. not a statement of implementation; no QAQC
5. Cindy Heil
 - a. Different types of volunteer networks; what are regulatory circumstances; in what do we use them
6. Alan Lewitus, John Paul
 - a. States have different volunteer networks; some more hands on than others; great outreach tool and emphasize that; this will not be a quantitative tool unless there is significant devotion of professionals in hands on to the volunteers
7. Hugh
 - a. Methods don’t give you quantitative counts, volunteers not sufficiently trained
 - b. Keeping this going on a long term basis you need other than volunteer
 - c. Excellent outreach tool but not long term quantitative tool

Table 5.1.1.2-1

5	4	3	2	1

Not complete; Not Ranking (Tom Malone has comment)

Tom Malone

- we are not a phytoplankton monitoring system so take it out of that table
- Maybe what we want is a table of volunteer monitoring systems (take out “plankton” in the title)

5.1.1.3

5	4	3	2	1
1	16	9	8	0

2s: Meredith Byrd, Rebecca Love, Lora Fleming, Barbara Kirkpatrick, Lorraine Backer, Norman Guinasso, Hugh MacIntyre, Alan Lewitus

1. Lora, Barb, Rebecca, Norman, Hugh
 - a. Nice to have standard protocols but could be very confining; maybe remove this section
 - b. Why were private research entities taken out of this
 - c. HAB IOOS could come up with other language
 - d. This section is redundant
2. Meredith
 - a. Collect data that is “useful to state monitoring”
3. Lorraine
 - a. Set up standards and require that folks who get federal grants include that they be required to provide the data
4. Alan
 - a. Agreed with shaded comment that we should have a list
 - b. If most of these are grant cycle driven they are too ephemeral for long term planning

5.1.2 Intro

5	4	3	2	1
10	18	5	0	0

Consensus achieved

5.1.2.1

5	4	3	2	1
6	14	10	3	0

2s: Rick Stumpf, Cindy Heil, Alan Lewitus

1. Rick, Cindy
 - a. Line 343 that paragraph is not about what can be measured it is about what research can happen, need to be moved to a research objective
 - b. Detect concentrations of HAB species
 - c. Line 339, in addition being deployed not just tested
2. Alan
 - a. Under environmental parameters add (get a list from Alan Lewitus)

5.1.2.2

5	4	3	2	1
0	21	8	4	0

2s: Lisa Campbell, Cindy Heil, Mark Fisher, Norman Guinasso

1. Lisa
 - a. K and Florida centric
2. Cindy
 - a. Need validity in site selection
3. Mark, Norman
 - a. why were first two sentences added, why cost prohibited in there
4. Norman
 - a. Identify resources that exist and that can be augmented to identify HAB events
 - i. Instrumentation, example

5.1.2.3

5	4	3	2	1
2	14	9	9	0

2s: Norman Guinasso, Ivonne, Jeanne Allen, Hugh MacIntyre, Gary Kirkpatrick, Cindy Heil, Lisa Campbell, Lesley, Rick Stumpf

1. Gary
 - a. This section was very Mote centric; we need to expand this
2. Norman
 - a. Agree with Gary, too specific to FL, get other states to add
 - b. Add sensors to platforms in estuaries and off shore
3. Rick
 - a. Some statement of how plan will be done
 - b. Line 380 "answer" to question needs to be done by those who use the data
4. Jeanne, Ivonne
 - a. Agree with Norman about different states including the Mexican states, they are just beginning to expand
5. Lisa and Cindy, nothing further
 - a. There is more to the Gulf of Mexico than the coast of Florida
6. Leslie:
 - a. From a manager's point of view, add a table to say state name, what equipment on a wish list, with estimated cost of equipment
7. Gary
 - a. Should be based on who is using the data and done in concert

5.1.2.4

5	4	3	2	1
2	13	13	5	1

2s: Norman Guinasso, Lisa Campbell, Cindy Heil, Steve Lohrenz, Alan Lewitus

1. Norman
 - a. Needs to be beyond Florida; other states and add other equipment and how used
2. Lisa, Cindy
 - a. What about the rest of the Gulf areas?
 - b. Equipment in various stages of platform readiness, need to mention them and the stage they are in, when might be ready

3. Steve, Alan
 - a. Agree with others comments
 - b. Stations will not all be measuring the same thing; this needs to be specified

1s: Gary Kirkpatrick

1. Gary
 - a. I wrote this and was very Mote centric, change it to be more inclusive; avoid picking a specific technology or a specific name; state what you want done not which item does it

5.1.2.5

5	4	3	2	1
2	19	8	4	0

2s: Gary Kirkpatrick, Lorraine Backer, Steve Lohrenz, Norman Guinasso

1. Gary, Norman
 - a. Not complete, need expansion
2. Steve
 - a. Too vague and cryptic
3. Lorraine
 - a. Need to recognize the customer needs to be involved at the beginning of the process

5.1.2.6

5	4	3	2	1
3	10	12	6	0

2s: Lora Fleming, Lisa Campbell, Cindy Heil, Gary Kirkpatrick, Steve Lohrenz, Norman Guinasso

1. Lora, Cindy, Gary, Steve, Norman
 - a. Put this section as a good example, i.e. don't lose the specifics in this section, but don't have the specifics to appear in the section
 - b. Use as a case study
 - c. Keep the item in the Plan
2. Lisa
 - a. nothing further

5.2

5	4	3	2	1
5	16	5	4	0

2s: Rick Stumpf, Steve Lohrenz, Rost Parsons, Mark Fisher

1. Rick
 - a. needs to be re-written
 - b. some points need to be added; standards
 - c. needs discussion of aircraft; format, standards, quality control standards
2. Steve
 - a. agree with Rick
 - b. this only refers to Ocean color, the list is incomplete, more detail in a small group work
3. Rost
 - a. Tom's note on background paper; add in some of those items as requirements
4. Mark

- a. line 22, version 3; why was it omitted, specifically line 28 of that paragraph, it is an archive product; seamlessly combine with other geographic data, going for the GIS component
- b. it was an important tool and should not be eliminated

2 Do Not Know

5.3

5	4	3	2	1
8	18	7	2	0

2s: Lora Fleming, Cindy Heil

- 1. Lora
 - a. Does adaptive observation refer to remote sensing; it should go to human, etc. look at numbering system
- 2. Cindy
 - a. Comments tied in with the table
 - b. #1 is too general, forecast of bloom likely to occur, why does public need that? Maybe managers do need that
 - c. What is realistically possible?

Table 2

5	4	3	2	1
4	19	7	4	0

2s: Lora Fleming, Lorraine Backer, Lisa Campbell, Cindy Heil

- 1. Lora
 - a. A trigger can be human or animal based not only in the environment;
- 2. All: we should work on this in small group

5.4.1

5	4	3	2	1
14	15	3	2	0

2s: Mark Fisher , Eduardo last name

- 1. Mark
 - a. Mexican and other partners need to be integrated
- 2. Eduardo
 - a. All states in Mexico have red tide detection
 - b. If positive test, they have responses in place now that include human health and sanitary and public health; societal impacts
 - c. Mexico has multi layers in their response system

5.4.2

5	4	3	2	1
16	14	4	0	0

Consensus achieved

5.4.2.1

5	4	3	2	1
13	17	1	0	0

Consensus achieved

5.4.2.2

5	4	3	2	1
5	18	2	5	3

2s: Meridith Byrd, Rebecca Love, Lisa Campbell, Cindy Heil, Leigh Zimmerman

1. Rebecca, Meridith, Lisa, Cindy and Leigh, Lora, Barb
 - a. Confused whether “user” requirement or data provider requirement; the two sentences should be separated into sep bullets
2. Lorraine
 - a. Inventory observational requirements for human and animal health; some parallel requirements needed

1: Lora, Barb, Lorraine (see above)

5.4.2.3

5	4	3	2	1
9	18	6	0	0

Consensus achieved

5.4.2.4

5	4	3	2	1
9	15	3	4	1

2s: Rebecca Love, Meridith Byrd, Lora Fleming, Barbara Kirkpatrick

1. All four: needs reworking in small groups
2. I would be surprised if there is a model out there for data assimilation for human health
 - a. But some models not currently used for this can be modified or new types of models

1s: Lorraine Backer

5.4.2.5

5	4	3	2	1
12	17	3	2	0

2s: Gary Kirkpatrick , Lisa Campbell

1. Lisa
 - a. Produce “reliable” predictions? Do we want to produce “unreliable” predictions, what you really saying here?
2. Gary
 - a. Do we want to be system specific in this section?

5.4.2.6

5	4	3	2	1
12	18	4	0	0

Consensus achieved

5.4.2.7

5	4	3	2	1
12	17	1	0	0

Consensus achieved

5.4.2.8

5	4	3	2	1
6	19	6	2	0

2s: Norman Guinasso, Rick Stumpf

1. Norman
 - a. Acronyms need to spelled out like: observing systems simulation experiment (OSSE) and a description of what it is
2. Rick
 - a. I don't think this belongs here should be in 5.1.1.1 and 5.1.2.3 about developing sampling plans

1 Do Not Know

5.5.1

5	4	3	2	1
9	19	5	0	0

Consensus achieved

5.5.2.1

5	4	3	2	1
8	17	4	3	0

2s: Lorraine Backer, Mark Fisher, Lora Fleming

1. Lorraine
 - a. Health data incorporation issue
2. Mark
 - a. Scaling issues, be consistent: Line 569, line 551
3. Steve
 - a. Km/day is a rate not a resolution, this needs to be fixed or explained

5.5.2.2

5	4	3	2	1
7	16	7	3	0

2s: Lora Fleming, Barbara Kirkpatrick, Cindy Heil

1. Cindy
 - a. Shellfish toxin levels, done by tissue samples
 - b. What does this mean? It needs to be more clear.
 - c. I wouldn't want the public knowing about mouse statistics
2. Barb
 - a. Add or expand human health data add ER data, clinic data for a later time, good validation tool

5.5.2.3

5	4	3	2	1
6	12	12	1	1

2s: Mark Fisher

1. Mark
 - a. Line 597, bloom indication models? Don't have requirements for research but rather have priorities

1s: Rick Stumpf

1. Rick
 - b. add public health models into this section
 - c. line 596 should include Mexico

6.1

5	4	3	2	1
4	24	3	1	0

2s: Lorraine Backer

1. Lorraine
 - a. What is the GCOOS DMAC effort?
 - i. Needs to be defined throughout the document
 - ii. DMAC=data management and communications;
 - iii. DMAC doesn't currently work on human health data
 - iv. Could be done in the future

6.2

5	4	3	2	1

Discuss as a whole without ranking; combo of objectives & questions

6.3

5	4	3	2	1
4	21	7	0	0

Consensus achieved 1 Do Not Know

7.0

5	4	3	2	1
3	17	5	5	2

2s: Rebecca, Sibel, Barb, Cindy, Leigh

1s: Lora, Lorraine

All of these individuals will work on re-writing this section

1 Do Not Know

8.1

5	4	3	2	1
7	16	4	1	1

2s: Steve Lohrenz

-address the remote sensing adding additional measurements; currently incomplete

1s: Rick Stumpf

- missing other measurements and platforms

3 Do Not Know

8.2

5	4	3	2	1
16	12	5	1	0

1: Lorraine Backer

-needs inventory of what currently available

-field methods for rapid detection of toxins in biological samples

8.3

5	4	3	2	1
3	18	10	3	0

2s: Rick Stumpf, Cindy Heil, Hugh MacIntyre

1. Rick, Cindy

- a. desperately needs prioritization in this section
- b. things that won't make any difference; others will make a huge difference
- c. we need a strategy for how to prioritize
- d. there are a variety of funded projects that already address these

2. Hugh

- a. concern is this a K model or a general HAB model
- b. if you use species model than you are ok if only HAB; some of the techniques would not work if a general HAB document

9.0

5	4	3	2	1
3	14	9	5	3

2s: Rebecca Love, Rick Stumpf, Gary Kirkpatrick, Leigh Zimmerman, Norman Guinasso

1. Rebecca, Rick, Gary, Leigh, Norman

- a. Different ways needed to reach out to users than just the one example
- b. This example is just a case study
- c. Include general public in user groups
- d. How do numbered items relate to the Roman numeral items? Organization needs clarifying (line 780)

1s: Lora Fleming, Barbara Kirkpatrick, Lorraine Backer

- 1. see above, case study only
- 2. one activity could be "identify users"

Appendices

5	4	3	2	1

No ranking

SMALL GROUP EXERCISE

Following the ranking and discussion, the participants broke into four (4) small groups to discuss the current iteration of the Plan from a specific focus area. The four areas were:

- Modeling
- Information delivery
- Health – public and animal
- Monitoring

Each small group was given a computer with the current Plan and instructed to make changes to the document using “track changes” so the Conveners could follow the changes in order to incorporate them as much as possible into the next iteration of the Plan which will be forthcoming subsequent to this Workshop.

The work of the four groups is attached to this document as:

- Exhibit P- Modeling
- Exhibit Q- Monitoring
- Exhibit R-Information delivery
- Exhibit S- Health – public and animal

Groups worked together until the end of the day and were told to be ready to make a short report on the progress of their work the following morning.

ADJOURN FOR DAY

DAY THREE: November 16, 2007

OVERVIEW OF PROGRESS MADE

Worth Nowlin introduced Dr. Brian Griffith, Director of the EPA Gulf of Mexico Program, who had joined the meeting that morning. Dr. Nowlin went through a description of the last two days' process and progress. The Facilitator explained the ranking process and discussion to Dr. Griffith.

BREAKOUT GROUP REPORTS AND PLENARY DISCUSSION

Each small group reported on their work from the previous day and the members of the workshop who were not in that group were encouraged to make comments.

HEALTH GROUP

Lora Fleming was the Reporter for the group. Dr. Fleming explained that their comments incorporated public health and living marine resources into the document. Some of the items they suggested were terminology, data bases, and other suggestions. Assignments for appendix materials were made within the group and those individuals will be submitting them. For the specifics, see [Exhibit S](#).

Participant Comments:

1. Did you have anything on exchange of information on health?
 - i. Yes, each state may have an infectious disease database, we want to identify those databases to be included as an identified group.
 - ii. Mexico: the reports are more global but will try to get the information to this effort.
2. If we assigned people to do stuff do we wait for the next iteration?
 - i. No, go ahead and start
3. All the reviewers will be sent all this information (not at this workshop); so everyone will see it and may provide information.

MODELING

This group had the following members:

Charles Kovach
Rick Stumpf
Steve Lohrenz
Gary Kirkpatrick
Mark Fisher
Kris Pintado
Lisa Campbell
Sheryl Gilbert

Lisa Campbell reported for the group. Dr. Campbell explained that they revised the text throughout. Section 8.3, in their view, did not present a very thorough approach; they changed it to something more appropriate. In Section 5.1.2.5, modeling in all cases should coordinate with the monitoring scheme. In Section 5.4, they reorganized it to a more logical order. They also added a new section to include validated models. They suggested the re-evaluation and

assessment of models on a regular basis. The group felt that Section 8 was just a laundry list and it needs to be either eliminated or revised; maybe make into an appendix. Details of this group can be found in **Exhibit P**.

Rick Stumpf will be re-writing the document to incorporate this group's suggestions.

Section 8 revision was then discussed and consensus sought on the decision. The questions asked included: How to prioritize if we do have a list? Do we just reference research activities by other entities? Do we just do an appendix and eliminate Section 8?

Participant Discussion:

1. Maybe add a section in the beginning that identifies the data gaps and research reports.
2. Annual identification and validation of research models is being suggested in our version.
3. For health those lists may exist; for modeling it is only a wish list; not until we have done things for a year or so should we be evaluating.
4. In public health you may be ahead of the other sections (modeling, monitoring, etc.).
5. We should not be setting up wish lists in this document.
6. In the sections where appropriate, priorities could be suggested if applicable in specific areas:
 - i. Monitoring
 - ii. Modeling
 - iii. Health
 - iv. Data management (Information delivery)
7. HARRNESS (Harmful Algae Research and Response, National Environmental Science Strategy) does this
8. Annual review of capabilities should feedback to the other groups as well.
9. There may be difficulty in each section in determining the research needs if you don't use a wish list.
10. Use a "case study" that uses a model that has both human health and other items in it.
11. Feedback loop is very important to identify new and refined priorities; we should have a continual refinement of the document.
12. This will be a living document; maybe annual review for priorities.
13. One suggestion is that each section be limited in the number of priorities they can name each year.
14. We need to be specific about time frames; look at least a 5 year list.

Decision regarding overall document next iteration:

Within each section the essential research endeavors that can be done now should be identified, there should be no "wish list" in the document. But in the document there should be a list of ranked priorities from other groups.

	5	4	3	2	1
8	14	5	0	0	

Consensus achieved

INFORMATION DELIVERY

Barbara Kirkpatrick reported for the group. There is a critical gap of identification of stakeholders and users in the document. The key to end users is knowing what they need from the system and in what format. Each community of end users may need to determine how they get the information. Contained in the document they revised, Exhibit R is an information delivery flow diagram. Information data exchange is the first stage of information; we need to find out what each component already has to determine what else we need from each other.

There were no additional comments from the participants.

MONITORING

Nancy Rabalais reported for the group. She indicated there were many notes that were inserted into the document (details in Exhibit Q). There is a need for introductory paragraph. The section on monitoring was revised by the group and divided into tools, in situ observation and monitoring design as a better flow. The revisions they made reflected the idea that the document is HAB generic rather than K specific and they tried to incorporate the Mexican states as well. Furthermore, the group felt that the monitoring design was the least developed portion of the document. Some general ideas they suggest:

- a. Define what is a HAB?
- b. In the appendix include a matrix of HABs throughout Gulf of what has been reported.
- c. Need to include upper estuaries and other waters than just the lower estuaries which seem to be the current focus of the document.
- d. Training workshops would be important.
- e. Put price tags on some of the items in the document.
- f. Remote sensing from remotely access platforms but also satellite.
- g. Include volunteer networks pros and cons.

Participant comments:

1. in human health group we identified training needs too
2. did you make a recommendation on who would provide the matrix in the appendix (put it together)
 - a. Karen Steidinger
 - b. Include Mexican states
 - c. Cindy Heil will provide first cut to Worth
3. In monitoring we talked about the need for specific instrumentation
4. Adaptive observation was not covered by this group; there is a small group that would work on this; already incorporated into the health section.
5. Re: monitoring, we talked about what the instruments detect; HAB specific and identifying the gaps and how to bridge the gap if they are only K specific.
6. Some in the groups are not experts in that group; so when you assign re-writing be careful to get the appropriate folks to do that.
7. Who is the first audience for this document?
 - a. Those who will use and provide the information
 - b. If that is true, then make sure you don't lose the appendices, put case studies in little boxes; design piece can be important

At the conclusion of the small group reports and discussion, Dr. Brian Griffith, EPA, addressed the group. Dr. Griffith is one of the Federal co-chairs of the Gulf States Governor's Alliance. He noted that the Alliance may be this efforts most important audience to move your ideas forward.

The Plan the Alliance initiated for itself was a 36 month plan; this runs out very fast so a new Plan is being developed. The Alliance draft second generation Plan is due in June/July 2008. It currently has the consensus adoption of the 5 Gulf Governors, it has extraordinary support right now. The next Alliance Plan will have a 5 year term. There will be much interest to gain the attention of limited money for this effort.

Dr. Griffith stated: *“Here is the message: Five years out why would it be important to the five Gulf Governor’s to look at HABs, what purpose, why do it, and how does it translate into something that resonates for them. You need to get down to a list of priorities that you would take to a funding institution for federal, state, local levels.”*

Dr. Griffith told participants that they need to pitch to the Alliance; they are this group’s most important audience. Dr. Griffith said he needs a different type of document package and he needs it soon. This endeavor has a level of excitement and draw that is going to help every sector in this room. The level of attention that has been given to the writing of this document will need an annual re-prioritization in order to make an RFP process possible.

Participant Comments:

1. Existing plan has 12 specifics on HABs; what is the timeline to get this second generation Plan information from us.
 - i. The current Plan goes to March 2009
 - ii. Optimum would be an expression of what should go into a 5 year Plan by this Spring, 2008
 - iii. Want to hand this into the new administration that would be coming in in 2009.
2. In terms of creating the business message, should we include specifics of each agency
 - i. You want to get to the end where you want to reach in 5 years; look at the whole, not the specific entities
 - ii. You need to be looking collaboratively
3. There are a ton of research plans and research priorities out there and they are not communicating; there is a commitment on the part of the Alliance to do a list of regional research priorities.

OBTAIN VOLUNTEERS FOR COST ESTIMATES AND FOR ANY ADDITIONAL RE-WRITING

Dr. Nowlin announced that volunteers were needed to help re-write the next iteration of the Plan. Lorraine Backer, Teri Rowles, NOAA, Marine mammal strandings, and Porter Hoagland, Woods Hole were suggested.

Dr. Nowlin then proposed timelines for Next Steps:

November 21, 2007- Notes from Workshop circulated to participants (Fleischer will supply and get corrections/comments from all presenters/reporters).

November 27, 2007 - Comments from workshop participants on Workshop notes are due. [Send to Fleischer at janice@flashresolutions.com]

December 2, 2007 - Assignments and comments on the draft Plan agreed to by participants at the workshop are due. [Send to Susan Martin smartin@tamu.edu]

December 8, 2007 - A final version of Workshop notes will be distributed. [Post to www.gcoos.org and alert GCOOS listserve, send to draft Plan reviewers, to EPA Gulf of Mexico Program, to Gulf of Mexico Alliance, and to Mexican colleagues.]

January 4, 2008 - Version 5 of HABIOS Plan completed; formatted version sent to all plan reviewers.

January 20, 2008 - Reviewers' comments on Version 5 are due. [Send to Susan Martin smartin@tamu.edu.]

February 2008 - Gulf of Mexico HABIOS Plan I released and distributed broadly. [Post to www.gcoos.org and alert GCOOS listserve, send to the Gulf of Mexico Alliance, the EPA Gulf of Mexico Program, and to Mexican colleagues, send to the NFRA for distribution to other RAs, send to Ocean.US, to NOAA's IOOS Office, and to GCOOS list serve.]

March 2008 - Formation of continuing oversight group for the Gulf HABIOS. Possible decisions on membership and governance.

March/April 2008 - Decisions made regarding special versions of the Plan that will be needed. [For outreach, for advocacy, in Spanish, other] Outreach for several audiences

April 2008 - First cost estimates completed.

Dr. Nowlin led a discussion on writing assignments and other follow up responsibilities:

1. Representatives from US states to update what is currently done. Worth made note of all state reps who will update their state reports.
2. Florida: Cindy Heil and David Heil
3. Should we prepare a template? Who would develop a template?
 - i. Alan Lewitus and Lorraine Backer will contribute the human and animal health information to put together a template
4. Steve Lohrenz and Rick Stumpf: will work on writing for monitoring and modeling
5. Lorraine Backer: will be leader to go back to the human health group if more re-writing is necessary
6. Barb Kirkpatrick: will be the lead for Information Delivery (include education and outreach).
7. Nancy Rabalais and Alan Lewitus will work on getting additional input.
8. Gary Kirkpatrick and Lisa Campbell will assist and want to see it before attached to Report of Proceedings.
9. Volunteers to look at the remote sensing part of the plan-Steve Lohrenz and Rick Stumpf.
10. Section 5.3 Adaptive Sampling: Gary Kirkpatrick and Cindy Heil

Participant Comments:

1. Be careful in your cost estimates; avoid sticker shock; break it down into projects that get done and show the breakout of how to spend over the next 5 years.
2. Break it down into component parts and assign the approx funds needed for that
3. Do you cost by specific site or some other method?
 - a. Example: platform/buoy sites- do we price this one at a time?
 - b. Need to think about leveraging costs.

- c. The group should be in consensus about what needs to go first, second, etc. That should get this group funds much quicker.
4. Should we get back together to prioritize after the cost estimates are in?
 - a. You need a marketing plan too to appeal to the funding players.
 - b. Break into digestible pieces.
5. If we look at 5 year timeline we need to look at priorities from a scientific point of view as well as operational priorities.
 - a. I think the users should decide the priorities

EVALUATION FORM/ADJOURN

The Facilitator asked participants to complete their survey form and the meeting was adjourned.
