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## Gulf Model Analysis for Dec. 6 Hypoxia Task Force

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Katja Fennel &lt;katja.fennel@gmail.com&gt;

Tue, Nov 22, 2016 at 5:50 PM

Reply-To: katja.fennel@gmail.com

To: Rob Magnien - NOAA Federal &lt;rob.magnien@noaa.gov&gt;

Cc: Rob Hetland &lt;hetland@tamu.edu&gt;, Dubravko Justic &lt;djusti1@lsu.edu&gt;, Alan Lewitus &lt;alan.lewitus@noaa.gov&gt;, David Scheurer &lt;david.scheurer@noaa.gov&gt;, Becky Baltes &lt;becky.baltes@noaa.gov&gt;, Derrick Snowden - NOAA Federal &lt;derrick.snowden@noaa.gov&gt;

Hi Rob,

Here is a heads up about our results so far and a preview of what we will be providing.

Two important bits of information before you look at the material below:

1) In the ROMS simulations the 2016 hypoxic area is significantly smaller than the 2015 area. I know this is not what you are expecting. We think this is primarily due to differences in salinity stratification between 2015 and 2016. There was much less freshwater discharge in the summer of 2016 compared to 2015.

2) For ROMS we used an inferior wind product because our preferred product is not available yet for all of 2016. Our best estimate of hypoxic extent for 2016 will change a bit when we can obtain the better wind product (not in time for this presentation).

Please find a slide deck with some figures and explanations here:

[http://memg.ocean.dal.ca/fennelk/wip/COMT\\_2016\\_hindcast/Input\\_2016-11-22.pptx](http://memg.ocean.dal.ca/fennelk/wip/COMT_2016_hindcast/Input_2016-11-22.pptx)

Please also look at these two animations (we hope they are intuitive and useful in illustrating the dynamics of the system):

[http://memg.ocean.dal.ca/fennelk/wip/COMT\\_2016\\_hindcast/CrossSec\\_3d\\_COMT\\_2015.mov](http://memg.ocean.dal.ca/fennelk/wip/COMT_2016_hindcast/CrossSec_3d_COMT_2015.mov)

[http://memg.ocean.dal.ca/fennelk/wip/COMT\\_2016\\_hindcast/CrossSec\\_3d\\_COMT\\_2016.mov](http://memg.ocean.dal.ca/fennelk/wip/COMT_2016_hindcast/CrossSec_3d_COMT_2016.mov)

If this Quicktime movie format doesn't work, we could provide other formats. Just let us know.

All of this is just from ROMS so far, but we have received the FVCOM output from Dubravko and will be plotting this tomorrow.

We are also still polishing images for model-data comparisons with the SEAMAP data (we will not have time to do the same with Nancy's data for this, unfortunately) and we will provide results for a climate change scenario and bottom water acidification. We are planning to send all of this to you tomorrow or Friday.

Please let me know if you would like anything else and have questions or would like to discuss.

More soon.

Cheers, Katja

On Tue, Nov 22, 2016 at 12:03 PM, Rob Magnien - NOAA Federal <rob.magnien@noaa.gov> wrote:

| Katja et al,

Attached is a first draft outline along the lines of what we've been discussing. I kept it open to most of the information we have been discussing, realizing that probably not all will materialize in time and, even if it did, I/we probably wouldn't be able to present it all.

So, now would be the time to start sending me the "meat" of the presentation which are sections 6, 7 and 8 of the outline. I assume that you probably don't have all the things now that you might have by the middle of next week but it would be good to see preliminary graphics, maps, simulations, etc. ASAP. These could be draft or final products or even placeholders, say, with a run from a prior year.

I would like to have a good start on the presentation early next week and I need to submit it on Friday, 12/2. The organizers were unsure about the ability to run movies in the presentation so having a couple examples in the format that we expect to use (can we use just one format, please?) for them to test on Wed would be very helpful.

Of course, any questions, suggestions for modifying the outline, or anything else are more than welcome at this time as well.

-Rob

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**NOTE NEW PHONE NUMBER: 240-533-0299**

<http://coastalscience.noaa.gov/about/centers/cscor>

On Sun, Nov 6, 2016 at 4:58 PM, Katja Fennel <[katja.fennel@gmail.com](mailto:katja.fennel@gmail.com)> wrote:

Dear Rob, Dear All,

Below is a list of items I hope we can deliver, based on some quick e-mail discussions over the weekend. This is the best case scenario (since analyses are ongoing it's difficult to definitively promise), but in any event we will have interesting things you can show.

Related to your items 1 to 3:

- snapshot of 2016 hypoxic area at time of monitoring cruise
- spatially explicit estimate of all the area that was affected by hypoxia
- temporal evolution of 2016 hypoxic area with some analyses of major forcing factors
- comparison against previous years
- assessment of and/or model comparison against 2016 observations (we have in hand only SEAMAP data at this point; Alan is working on getting us access to the other data that were collected)
- slides illustrating insights gained through previous work (could include response to nutrient reductions, bottom water acidification, future projections)

We should be able to deliver well on your items 1 to 3.

Related to your item 4:

We can summarize our thoughts on this -- no problem!

Related to your item 5:

Rob H. has focused on this (in collaboration with Steve DiMarco and others) and will have insights to share.

Everything we deliver for 2016 will come with the disclaimer that analyses are not final.

We got your message regarding the target audience and will try to provide easy-to-understand visuals and animations.

Regarding help with the presentation, I'd love to come (the HTF has been a fascinating entity for me for a number of years now), but whether I can will depend on timing. I have travel until Dec 4 and again Dec 11 to 17. When is your presentation slot?

Cheers, Katja

On Fri, Nov 4, 2016 at 1:06 PM, Rob Magnien - NOAA Federal <[rob.magnien@noaa.gov](mailto:rob.magnien@noaa.gov)> wrote:

Dear Katja, Dubravko and Rob,

As you know, we are hoping that the 3D time variable models for the Gulf that you operate will help us to gain insights on the hypoxic zone in 2016 even though we weren't able to conduct our regular mid-summer cruise this year. These insights could include, but are not limited to:

1. An estimate of the 2016 mid-summer areal extent "snapshot" of hypoxia that is comparable to the annual monitoring of the zone over time.
2. An estimate of all the area that was affected by hypoxia, which is not comparable to #1 but may be very important to know. For example, it could help to better understand the magnitude of impacts on benthic communities that may not be able to recover during the summer even if hypoxia is only transient in a particular area.
3. Increased understanding of the dynamics of hypoxia under conditions that existed in 2016. My understanding is that there was more fresh water at the surface, increasing stratification, and that temperatures were higher. This may be particularly important to know since this is the likely trajectory under climate change scenarios.
4. Insights on some of the most critical needs for monitoring/observations in order to continue to calibrate and verify these models.
5. An understanding of oceanographic conditions that preceded that die-off at Flower Garden Banks that could help to determine the cause of that event.

As Alan and Dave discussed with Katja at the end of Sept, and I previewed with Dubravko and Rob on our site visits earlier in Sept, I will have a half hour slot on the upcoming Hypoxia Task Force (HTF) Public Meeting in New Orleans at the beginning of December to showcase the modeling work. Whereas a complete analysis may not be doable by that time, Katja (along with Dubravko and Rob) thought that you could generate at least a preliminary picture of 2016 hypoxia ("Teaser Hindcast").

In preparing for the meeting, I wanted to check in with all of you to see what you could contribute at this time, along the lines of the 5 items above and perhaps something beyond these that would also be of interest to the HTF (e.g. maybe the response of the zone to extra loading of freshwater and nutrients off of Texas). This is a public audience so we will need to keep the scientific details to a minimum and use a lot of eye candy; the latter should certainly not be a problem with all of the great model output I have seen to date. We also need to have some bottom line messages that speak to the management interests of the HTF and the public.

At this time I need your early input on what you think you can contribute in final form by Nov. 28 since they want the PowerPoint at the end of that week and I'll need to consolidate everyone's input and pass it around among us to finalize. **If you can get to me by COB this Mon, Nov 7 just a preliminary list of the 5 or 10 visuals and information pieces that you have now or think you will have by the 28th, that would be great.** If you need a little more time, let me know. From this information I can generate a consolidated first draft outline and get that back out to all. This will just be the first flush and we can continue to iterate on the presentation for the rest of the month.

I would also like one or more of you to help make the actual presentation. I guess this would be easiest

for Dubravko since he is close by but I wanted to put that out there to all of you. I'm not sure I would be able to come up with travel funds. And, even if I could, I'm not sure it makes sense to travel a long distance for a 20 min presentation. Since they are doing a webinar of the meeting it may even be possible to do something remotely and I can check on that.

Looking forward to your input and further discussion on all of this,  
Rob

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