NYS Ocean Acidification Task Force Meeting Minutes for January 22, 2019 Meeting

Location: Theodore Roosevelt Executive and Legislative Office Building, Mineola, NY

Task Force Member Attendance:

Present:

- James F. Gennaro (chair)
- Marci Bortman
- Chad Cook
- David Gugerty
- Jeff Herter
- John McLaughlin
- Jason Masters
- Carl Safina
- R. Lawrence Swanson
- Jeremy Thornton

Absent:

- Malcolm Bowman

Summary of Chairman Gennaro's Opening Statement

Chairman Gennaro called the meeting to order and read an opening statement. The Chairman introduced himself and stated that he considered it a privilege to work with the dedicated members of the Task Force and the Task Force staff. He recognized the members of the public in attendance and introduced Carl Safina who had been unable to attend the first meeting, as well as Jason Masters and Chad Cook; two new members of the Task Force. The Chairman welcomed the new Task Force members. He also welcomed Long Island Regional Planning Council (LIRPC) Chairman John Cameron and LIRPC Executive Director Richard Guardino, who are key members of the Long Island Nitrogen Action Plan (LINAP) initiative, and who were present in connection with the LINAP presentation to be delivered at the meeting. Chairman Gennaro thanked Dr. Swanson for being the lead investigator of the Task Force and for managing the Task Force staff. He also introduced two prospective members who attended as members of the public, Dr. Joyce Novac (Director of the Peconic Estuary Program and a coastal oceanographic ecologist) and Chris Pickerel (Director of the marine program for Cornell Cooperative Extension of Suffolk County), and thanked them for attending.

Introductions of Task Force Members

The three task force members who were not in attendance at the November 1, 2018 meeting introduced themselves to the rest of the committee.

- Carl Safina stated he is an ecologist who has spent most of his research career studying seabird ecology, which led him to fisheries management. He co-authored the draft of the Sustainable Fishing Act and has since written a series of books looking at how people interact with the natural world.
- Jason Masters was recently appointed to the Task Force to succeed Karen Rivara as the designate of Suffolk County Executive Steven Bellone. He introduced himself as a chemical oceanographer since 1993, and a former officer of the NOAA Corps. He has worked with many different oceanography programs and separated from NOAA in 2009. He now has his own consultancy group that looks at marine problems and aquaculture on Long Island.
- Chad Cook is a newly appointed Task Force member. He is a senior attorney with the New York State Office of General Services, where he works closely with the real estate center, the land management bureau, and land and water management. He stated that he looks forward to working on the task force and with the other task force members.

Review of Minutes from the 11, 1, 2018 OATF Meeting

Chairman Gennaro opened the task force up for discussion of the minutes from the November 1, 2018 OATF meeting. Hearing no concerns, John McLaughlin moved to approve the minutes. This was seconded by Jeff Herter and the minutes were approved unanimously.

First Presentation: Dr. Chris Gobler

Chairman Gennaro introduced Dr. Chris Gobler from the School of Marine and Atmospheric Sciences (SoMAS) to give the first presentation of the meeting. Dr. Gobler emphasized that new studies are showing that fish are sensitive to ocean acidification as well as bivalves. Many former studies discuss pH and hypoxia in isolation, and their experiment design often led to artificially high pH in hypoxic conditions. The methods used to reduce the dissolved oxygen in the water column led to higher pH than is observed in the field during episodes of hypoxia. In our coastal environment, low pH and hypoxia often coincide, and newer studies have only just begun to examine how waters that are both acidified and hypoxic affect organisms. Impacts of the combined effects have varied among species and initial conclusions suggest that there could be benefits to multi-trophic aquaculture. Dr. Gobler concluded, emphasizing that there are no federal or state standards for pH, and that fisheries may be more vulnerable to overfishing than previously assumed due to the consideration of dissolved oxygen as the only risk factor. At the conclusion of Dr. Gobler's presentation the floor was opened for questions from the Task Force.

- Chairman Gennaro started off by requesting access to the peer-reviewed article that Dr. Gobler referred to within the presentation, to be shared with the Task Force. He emphasized the importance of this work in helping to mitigate OA and stated that the Task Force would

welcome further recommendations from Dr. Gobler, stating that the Task Force is also looking to identify areas of OA research to recommend in their final report.

- Marci Bortman asked for further information regarding the combined effects of acidification and hypoxia on eelgrass.
    - Dr. Gobler stated that seagrasses and macroalgae both benefit from high carbon dioxide but that when grown together, the macroalgae *ulva sp.* grew faster and slowed the growth of the seagrass due to light shading, nutrient competition, and compounds secreted by the *ulva sp.* to inhibit seagrass growth. He concluded that high carbon dioxide levels may benefit seagrass in areas where *ulva sp.* is not present.
- David Gugerty asked if funding is needed to do more field work, rather than just laboratory studies.
    - Dr. Gobler responded in the affirmative, emphasizing the benefits of cruises but acknowledging that with time and space changing simultaneously, analysis of such data is limited. Additional monitoring, using stationary equipment to make continuous measurements over time would be highly beneficial. Ideally these would be set up as an array of stations that could advance our understanding on multiple fronts, with the end goal being protecting fisheries.
- John McLaughlin asked if mixing dynamics would affect the results of the combined effects of hypoxia and acidification. Specifically, would raising the bottom help to remediate some of the effects?
    - Dr. Gobler stated that enhanced physical mixing improves oxygen and acidification effects and agreed that raising the bottom might help, but he cautioned the task force to consider carefully due to the law of unintended consequences.
- Jason Masters' question was regarding Dr. Gobler's point about the lack of research looking at dissolved oxygen and carbon dioxide together. He asked how additional research would help fisheries managers make better decisions.
    - Dr. Gobler stated that studies looking at both of these conditions together would show the "true effect" seen in the environment. If this effect is more significant than the effects of hypoxia alone then that would inform researchers and fisheries managers that the DO limits may not be stringent enough, or that they may want to have a pH limit as well.
- Larry Swanson referred to Dr. Gobler's mention of a study involving *ulva sp.* and shellfish. He asked why the shellfish survived better in the presence of the *ulva sp.*
    - Dr. Gobler stated that U*lva sp.* acted to raise both the alkalinity and dissolved oxygen in the water column, which made it easier for the shellfish to calcify. He pointed out that this was a laboratory study, not a field study. The mechanism would be the same but there are more external variables in the field, which are controlled in a laboratory study.
    - Dr. Swanson, followed up, asking if the macroalgae would then have to be harvested.
        - Dr. Gobler agreed that the macroalgae would need to be harvested and that China is already doing this, citing the example of seaweed, which is often one of

their biggest crops. The United States does not commercially harvest macroalgae but could do so in the future.

- Carl Safina asked for clarification regarding the relationship between carbon dioxide and pH. Dr. Safina then asked if measuring pH was the same thing as measuring carbonate and if it is possible to have low pH with acceptable levels of carbonate.
    - Dr. Gobler explained that as carbon dioxide concentrations increase in the water column, carbonate concentrations decrease. Shellfish use the carbonate in the water to form their calcium carbonate shells, so with decreased carbonate saturation, shell formation is impeded.
    - Dr. Gobler clarified that pH and carbonate concentration are not the same measurements. Carbonate is not easily measured independently, so in practice, scientists measure two parts of the carbon cycle (usually pH and one other part of the cycle such as dissolved inorganic carbon or carbon dioxide)to determine the carbonate saturation.
    - Dr. Gobler stated that it is theoretically possible to have low pH and acceptable carbonate concentrations and pointed out that this is why pH cannot be the only measurement collected to assess the oceans. With regard to this, the cruises that SoMAS is conducting with Dr. Janet Nye collect both pCO_2 and pH measurements for this reason.

<u>Second Presentation: Kyle Rabin</u>

Chairman Gennaro introduced Kyle Rabin, Program Manager for the Long Island Nitrogen Action Plan (LINAP), emphasizing that LINAP and the OATF should collaborate and should make efforts to ensure that the two entities are not working at cross-purposes. The Chairman stated that this second presentation should help to inform the Task Force about how the two groups intersect. Mr. Rabin provided an overview of the mission of LINAP and discussed many of the LINAP-related initiatives in Suffolk County and Nassau County that are working to reduce eutrophication. He concluded that there are a number of LINAP activities that fit into the OATF's goals and objectives. At the conclusion of Mr. Rabin's presentation the floor was opened for questions from the Task Force.

- Chairman Gennaro first commented that it is important for the Task Force to further define how its goals align with LINAP's initiatives and stated that the Task Force can be supportive of LINAP and vice versa. The OATF should take a look at the LINAP activities as a staff level project.
- David Gugerty stated that he lives in Bayville, which is located in the middle of the worst areas of coastal eutrophication. He asked if LINAP would be willing to travel to Bayville to communicate with the town with regard the Nassau County Septic Improvement Program. He stated that this could help with ocean acidification.
    - Mr. Rabin replied that he would be happy to do so.
- Marci Bortman stated that if the task force were to look at potential endpoints from the perspective of nitrogen, dissolved oxygen, and pH together, this would be an area of

collaboration. Ecological and chemical endpoints might be a good area to collaborate with LINAP.

- John McLaughlin referred to Mr. Rabin's mention of innovative systems to improve nitrogen beyond traditional hard systems. He stated that this would be an area of interest for the Task Force to learn more and for the Task Force to decide if clean water technology should be a focus for future discussion.
    - Mr. Rabin pointed to the Suffolk County website where this information is available. Suffolk County is also sharing this information with Nassau County.
- Jeremy Thornton referred to the nutrient bioextraction initiative, stating that a lot of the goal areas are already closed waters with regard to aquaculture. He asked if there have been any thoughts about how to work with this?
    - Mr. Rabin stated that this is one of the challenges and one of the areas that the initiative is currently focused on.
    - John McLaughlin stated that LINAP is looking at using ribbed mussels as they may be a better species for this work.
- Jason Masters asked if there is a way to show the cost of inaction as compared to the cost of action regarding the nitrogen action plan: what is the cost to Long Island and New York State if we do nothing?
    - Mr. Rabin stated that, while the original document may not have specific numbers for this, there are a few studies that have tried to estimate this cost. There has been an ongoing discussion, specifically trying to estimate the cost of removal of nitrogen per pound. LINAP is still working to estimate this exact number.

<u>Third Presentation: Frank Roethel</u>

Chairman Gennaro introduced Dr. Frank Roethel SoMAS to give the last presentation of the meeting. Dr Roethel presented multiple possible mitigation measures for ocean acidification. The first method that was presented estimated the viability of adding alkaline reagents (such as sodium hydroxide or lime) to sewage treatment effluent in an analogous treatment method to liming lakes, which has a large precedent. He then began to talk about introducing pulverized glass as an alternative to Portland Cement, which has a large carbon footprint. Chairman Gennaro commented that, while worthwhile, this would be difficult to do and may be outside the focus of this Task Force. Dr. Roethel stated that the aim of this type of measure would not be to stop all carbon dioxide emissions and that this may be something to consider. The Chairman stated that eliminating New York State carbon dioxide emissions completely would not significantly impact global carbon dioxide emissions and Dr. Roethel agreed but stated that the Task Force might consider measures that would enable New York to contribute to a global effort of carbon dioxide emission reduction. The Chairman requested that Dr. Roethel move on to other potential mitigation measures. Dr. Roethel presented information about recycling of shells from restaurants, sediment modification, and enhancing marine vegetation as other potential strategies for mitigation. He concluded that there are several financially-viable, regional mitigation strategies, but that

more research is needed, and public-private partnerships are an important part of these strategies. At the conclusion of Dr. Roethel's presentation the floor was opened for questions from the Task Force.

- John McLaughlin stated that a pH of 13 (for sodium hydroxide) is considered a hazardous material and added that it may not be a viable option to introduce in sewage treatment plants. He said that sewage also has high levels of sodium hypochlorite which could negatively interact with the sodium hydroxide.
    - The Chairman noted his statements.
    - Dr. Roethel stated that sodium hydroxide reacts badly with ammonia, but not with sodium hypochlorite.
- David Gugerty stated that the public is very upset about the cessation of glass recycling and that any beneficial reuse should be considered.
    - Dr. Roethel agreed.
- Marci Bortman stated that she believed it was prudent to consider Dr. Roethel's ideas on alternatives to CO2-producing Portland cement. She stated that the current New York State governor seems to support carbon sequestration in every way possible and that the Portland cement idea should be considered seriously.
- Dr. Roethel mentioned an enhanced bottle bill as a way to fund research projects regarding ocean acidification mitigation measures.
- David Gugerty asked Dr. Roethel if he was familiar "softcrete" as another alternative to Portland Cement.
    - Dr. Roethel had heard of softcrete but not worked with it directly. He pointed out that pulverized glass is just one of many alternatives that could be used to replace Portland cement.
- Jason Masters asked what an acceptable pH level would be for an alkaline reagent to be added to sewage effluent. He stressed that this is necessary to determine the viability of this as a mitigation measure. Dr. Roethel discussed that relatively small amounts of sodium hydroxide could yield significant increases in pH in NY coastal waters.

<u>Discussion of the Preliminary Draft Report</u>

Chairman Gennaro introduced the next topic of discussion: the preliminary draft report. He stated that to the extent that anyone had a concept that did not make it into this report, those ideas are not necessarily going to be excluded from future drafts or the final version. He urged the Task Force to look through the report and let the staff know if any ideas have not been included at this point, so they can be discussed, evaluated, and included in the draft report and further discussed by the Task Force. The Task Force should also look to provide commentary, factoring in the presentations provided at this meeting. The Chairman encouraged the Task Force to communicate their ideas and commentary in between meetings via email so as to increase dialogue and collaboration among the Task Force between meetings, making the best use of the Task Force's time. Chairman Gennaro put forth two questions to the task force:

1. Does the task force think this is a good way to proceed?

2. Does anyone have any comments or issues with the current draft report?

- Dr. Swanson stated that he felt the Task Force is obliged to provide some solutions rather than a simple diagnostic of the ocean acidification problem. This requires innovative ideas for mitigation and was the impetus behind Dr. Roethel's presentation. These are the types of ideas that we can offer up to the state for implementation or investigation.
    - Chairman Gennaro agreed strongly.
- David Gugerty expressed his support of the process that the Chairman proposed for moving forward and pushed for a more in depth discussion of macroalgae, aquaculture, and co-mingling algae and shellfish, in future versions of the report. He suggested that he could work with Jason Masters to put together a cogent plan to include in the report.
    - Chairman Gennaro expressed support for this collaboration.
- Jeremy Thornton commented that the Task Force should initiate a ranking system for mitigation ideas with regard to feasibility (cost and ability) and urged the Task Force to look at what parts of these mitigation measures could be commercialized as well, whether that is aquaculture or grinding glass for cement. He expressed doubt that the government could sustain all of these initiatives alone.
    - Chairman Gennaro agreed with the need for a ranking system.
    - David Gugerty strongly agreed with the need for commercializing some of these mitigation measures, using the potential for commercial kelp harvesting (for the cosmetic industry) in Long Island waters as one example of this type of potential.
- Chairman Gennaro thanked Kaitlin Willig and Damien Beri for taking notes at this meeting and encouraged Task Force members to send them any ideas to include in subsequent drafts of the report.
- Marci Bortman requested clarification about the process, asking if the plan is to include more narrative information in the draft report before sending it back and forth.
    - Chairman Gennaro stated that the outline acts as a facilitator, with some "clay on the wheel" for the staff and Task Force to work on and add depth and detail to for ideas that are already in the report.

<u>Public Comment</u>

- Morris Kramer stated that he has been interested in the ocean for many years and pointed out that the most recent New York Times article regarding climate change shows that past projections are wrong. He urged the Task Force to step up the pace and look at innovative ideas and bring these to the attention of the governor so that he can run with them. He strongly believes that the governor would look into the ideas as soon as he had the information available to him and that New York State needs to act as soon as possible.
    - Chairman Gennaro responded that the NYS DEC has an office of climate change that is in direct contact with the governor's office, so that they can be fully engaged on the climate change issue, in the broad sense, as compared to the more narrow view that

this task force is obliged to maintain. He encouraged Mr. Kramer to pass along any information to him and that he would share that information with both the Task Force and DEC's Office on Climate Change.

- Guy Jacob is the Conservation Chair for the Nassau County Hiking Club. He stated that a mitigation plan would benefit from legislation that could accelerate implementation of these plans. This could codify Governor Cuomo's ideas for the green new deal and it is very aspirational to attempt to make New York State independent of fossil fuels. Mr. Jacob again suggested that the Task Force consider codifying mitigation efforts that they recommend in order to make sure mitigation is pushed forward.
    - Chairman Gennaro responded that the Task Torce is also making legislative recommendations and that he agrees that legislation is necessary.
- Maureen Dunn spoke to reiterate her statement from the first meeting, where she also participated in the public comment portion. She discussed the oyster recycling program started by Seatuck and that the goal of this effort is shoreline stabilization and to promote spat-on-shell efforts. Her research has found that oyster shells in the water column last approximately eight to ten years, which is a much shorter timeframe than oyster middens that are often buried and take longer to dissolve. She stated that the oyster recycling program is good for community involvement and easier for the public to relate to. She urged that the task force not rule out shellfish recycling programs from their list of recommendations.
    - Chairman Gennaro assured Ms. Dunn that shellfish recycling has definitely not been ruled out and requested she share any available information with the task force for further consideration. He thanked her for attending both meetings.
- Tom Gulbransen urged the Task Force to consider how it could help to create markets to engage industry in solving the ocean acidification issue. He indicated that we are missing information about allocations of resources. He urged the Task Force to consider caps and offsets, which would drive industry to innovate and create market pressure. He stated that a market could be created by a nitrogen budget or a deposition budget and an allocation that caps industry emissions. He stated that ceilings make engineers work to get their industries underneath them and he recommended that the Task Force consider this as a facet of their work. He argued that this would be longer lasting than any report that could come out of this or any task force.
    - Chairman Gennaro stated that there are multiple Task Force members who have this same train of thought and that this is a perspective that the task force will address.

Chairman Gennaro thanked the members of the public for their comments.

<u>Summary and Plan for Next Meeting</u>

Chairman Gennaro expressed that a plan for how to proceed had already been discussed earlier in the meeting and asked if any of the Task Force members had anything to add. With no additional comments from the task force, the Chairman moved on to discussing planning for the next meeting. Before the next meeting, the ideas from this meeting would be written in the minutes and the Task Force would then try to figure out what presentations they would need to further their work. A part of this process would be to collaborate with LINAP. Chairman Gennaro stated that he thought all of the presentations

were compelling and needed to be considered thoroughly, after which they could be discussed. He urged Task Force members to reach out to the Task Force staff to include any new ideas or any more details regarding current ideas in the report in the best way possible. He reiterated the need for an ultimate ranking of mitigation measures and ideas for the Task Force. He concluded by thanking everyone for being there and motioned to adjourn. The motion was seconded by David Gugerty and the vote adjourn was unanimous.