

Great Bay Research Symposium 2022

Bold Research Ideas

Green = Highest ranked ideas

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NOTE: Ideas below were generated at the Great Bay Research Symposium, October 13, 2022 through a "Crowdsourcing" activity. GBNERR summarized and categorized these ideas to spark further research and monitoring collaboration in Great Bay.

ID #	Research Idea	Interested people (ID'ed in meeting)	Other interested people	Additional Notes
Data Synthesis - Ideas focused on combining datasets from all monitoring efforts (physical, biological, disturbance) within Great Bay that could lead to meaningful syntheses and models.				
1	How can our combined knowledge of environmental impacts on eelgrass, salt marshes, & oyster reefs be synthesized into a better understanding of overall Great Bay function?		Chris Peter, Easton White, Julie Paprocki, Brianna Group, Trevor Mattera	
2	Open access collaborative database of many various monitoring efforts-->Big Data Analysis	Easton White, Brittany Jellison	Julie Paprocki, Brianna Group, Trevor Mattera, Lara Martin	
3	An assimilative, coupled physical--biogeochemical model of the Great Bay and tributaries, which would integrate observations from all stakeholders	Taja Sims-Harper, Kim Arlen, Paula Mouser, Lindsey Williams (for stakeholder piece), Atsushi Matsuoka	Jason Demers	
4	The "Genome" of Great Bay both spatial & temporal. -> model for climate change ->interplay of oysters & eelgrass? ->more understanding of how microbial communities impact eutrophication (and remediation)	Steve Jones, Bonnie Brown	Paula Mouser, Trevor Mattera	
5	A single repository for Great Bay related data, publications, & other outputs			
6	Spatiotemporal variability in implications 1) Nitrates, 2) Phytoplankton community compositions, 3) Meteorological and hydrological data. These factors have implications on oyster/eelgrass and vibrio	Tom Gregory		
7	How do we better connect the dots between Environment (water quality, microbiota, temp)--> Ecosystem Dynamics (diversity, health role) <-->Users (Industrial, Recreation, Commercial) What are Feedback Loops?			
8	One database for all GB water quality & nutrient data (which is easily accessed). Full scale data synthesis of water quality data		Chris Peter, Jason Demers, Lara Martin	
General - ideas were diverse and were mostly at the Bay scale.				
9	A collaborative group of individuals, forming a support group to help inform/give advice on large research & restoration projects (i.e., like this symposium but much more frequently)	Rachel Stevens, Cheryl Whistler, Tom Gregory	Lynn Vaccaro, Chris Peter, Trevor Mattera	
10	Assess Nitrogen removal potential from upgrading septic systems to include nutrient removal & feasibility of implementation. Viability of a septic utility?	Michelle Shattuck, Kalle Matso, Carolyn Skinder	Paula Mouser, Boyd Allen	DES and PREP have related work underway - an expert panel will look at technologies, pollutant removal efficiencies, costs, and regulatory options (building on concept of septic utilities). Steve Couture has more info. ~S.Soule
11	The progression towards multitrophic-multispecies studies --> get beyond single species focuses	Cheri's staff, Erik Chapman, Chris Peter, NHDES Ken Edwardson	Brianna Group, Trevor Mattera	
12	Integrating the many great research programs--or at least the information generated. No idea how to do it, but think of the power!		Lynn Vaccaro	
13	Seaweed growth and movement in Great Bay at multiple scales. Can you visually show waxing and waning of seaweed in Great Bay from June to Sept and then relate to biogeochemical inputs?	Grant Milne, Steve Jones	Trevor Mattera	
14	Run Lippmann GB Model with sediments, currents, and waves for climate scenarios at 10 year intervals for 2020-2120 to highlight areas of highest societal and ecological concern in order to prioritize 2020-2030 restoration.			
15	Research what ecosystem would look like without the major anthropogenic influences affecting Great Bay. Understanding just current ecosystem affects due to climate change. Where is control?			
16	Genetic diversity of organisms living in GB			

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Monitoring - ideas focused on combining and amplifying our monitoring infrastructure/efforts via metrics, and spatial/temporal coverage. This also included emerging pollutants (microplastics, new pathogens, etc)				
17	Having long term instrumentation at replicates of every habitat type that measures/utilizes water quality (temp pH salinity) edna, hydrophones, and paired with animal, algae, plant, microbes surveys plus physiology & behavior assays multiple times a year	Tom Gregory, Grant Milne	Chris Peter, Jason Demers, Brittany Jellison, Lara Martin	
18	A more built monitoring infrastructure (telemetry, bioacoustics, tide station, etc.) to provide a thicker backbone to launch even more research	C Skinder, Aidan Barry, Brittany Jellison, Steve Couture	Chris Peter, Julie Paprocki, Rachel Stevens, Boyd Allen, Lara Martin	
19	With all the sediment mapping, have we looked into what other pollutants could be entering the Bay and how those pollutants might be harming the livelihood of oysters? (i.e. microplastics, bacteria, etc.)	Trevor Mattera, Jason Demers	Paula Mouser, Chris Peter	
20	Covid has shown us the importance of and shortcomings in public health. We need more work on pathogens to keep us safe in the future (ie Jones, whistler, oyster farmers)		Paula Mouser	
Oysters - ideas focused on ecosystem services for aquaculture and how they compare to native reefs as well as restoration resiliency and quantifying microplastics				
21	Development of a nutrient removal credit tracking program that would include oyster and seaweed growers (particularly N removal) that would eventually provide economic compensation to the growers	Bonnie Brown	Brianna Group, Trevor Mattera	
22	Calculating/restoring effective breeding population sizes for oysters in GBE to ensure enough genetic diversity in populations for future resiliency	Kelsey Meyer	Easton White, Brianna Group, Trevor Mattera	
23	What are options for oyster growers to maximize ecosystem services of their lease areas? How do aquaculture sites differ versus native/restored reefs (habitat, water quality, etc)?	Chris Peter	Easton White, Brittany Jellison, Brianna Group, Trevor Mattera	
24	Microplastics in oysters. How many microplastics are people eating when they consume an oyster? Actually in all the farmed/edible resources in Great Bay			
Oysters/Seagrass - ideas mostly focused on the positive/synergistic effects of co-located habitats with implications for restoration and overall estuarine health. Multitrophic aquaculture, restoration also noted				
25	Habitat synergies: 1. Can eelgrass help oysters build shell faster due to increased pH? 2. How does oyster aquaculture effect eelgrass recovery?	1. Kelsey Meyer, Brittany Jellison, Chris Hunt 2. Alyssa Stasse, Steve Couture, Taja Sims-Harper, Kim Arlen	1. Chris Peter, Brianna Group, Trevor Mattera 2. Chris Peter 2. Brianna Group,	
26	What are the synergistic interactions b/t eelgrass and oyster habitats and how can we engage in restoration efforts that create more favorable conditions for both, while improving overall estuarine health	Liz Gorrill, Easton White, Lara Martin, Cory Riley, Suzanne Bricker, Bonnie Brown, Liz, Brianna Group	Chris Peter, Brittany Jellison, Trevor Mattera, Lara Martin	GBNERR plans to convene a group in early 2023 to discuss planned/potential oyster+eelgrass restoration efforts.
27	Mapping of oysters combined with seagrass suitability model/restoration that re-evaluates seagrass seed and shoot restoration co-located with oysters. Also use hydrodynamics model from NSC project		Easton White, Trevor Mattera	
28	1. Consolidate data, 2. Develop multidisciplinary teams/projects 3. Multitrophic aquaculture (oysters & seaweed)			
29	To what extent do green crabs disturb eelgrass and does this disturbance influence the vegetative or sexual reproduction of eelgrass.	Kelsey Meyer	Trevor Mattera	

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Salt Marsh - ideas focused on bolstering our understanding of restoration science with a retrospective view of past practices and a prospective view of novel practices				
30	We need more salt marsh restoration and understanding of constraints on marsh migration	Cory Riley, K Lucey, Coastal Program, Susan Adamowicz (SMARTeams), Chris Peter	Jason Demers, Julie Paprocki, Rachel Stevens, Trevor Mattera	Demers interested in this from the angle of how changing salt marsh extent will impact overall biogeochemical dynamics, fluxes, blue carbon budgets within GB ecosystem.
31	Long scale sediment deposition on marshes in need of restoration/high risk marshes	Cory Riley, Bonnie Turek, Rachel Stevens	Julie Paprocki, Trevor Mattera	
32	Salt Marsh Restoration Retrospective --A field and geospatial evaluation of 50+ ditch plugs deployed in GBE marshes--and including the study of subsequent management interventions	Joanne Glode, Grace McCulloch	Chris Peter, Rachel Stevens, Trevor Mattera	
33	Map historic agriculture infrastructure (embankments & ditches)		Rachel Stevens	We have a recent update of ditches mapped from 2015 imagery
Social/Education - ideas had a large range from engaging politicians for more \$\$ support, public for behavioral change, facilitating more interdisciplinary research/management				
34	Social science research into how can interdisciplinary approaches to research & management be facilitated	Lindsay Williams, Liz Gorrill, Kelsey Meyer	Lynn Vaccaro	
35	Involving more politicians in being educated of GB. Long-term funding for essential projects/institute. Huge PR effort that involves general public	Suzanne Bricker, Kelsey Meyer	Lynn Vaccaro	
36	The impact of wider community engagement projects on the health of the estuary and access to its resources	Alyssa Stasse, Cory Riley, Lindsey Williams	Lynn Vaccaro, Liz Gorrill, Carolyn Skinder, Rachel Stevens, Brianna Group	GBNERR plans to host a workshop in 2023 to explore social science data/approaches that can inform new outreach efforts proposed under Great Bay 2030.
37	I'd like to see equivalent long-term social/demographic time series data (including perceptions of resources management) to accompany the ecological/oceanographic time series data and where possible bridge projects across the social-ecological frame	Easton White	Lindsey Williams	
38	Create an integrative course where students can join along on field work sampling and commercial fishery boats to gain hands-on experience.	Kelsey Meyer	Chris Peter, Lindsey Williams	Opportunity to build on the model from Shoals Marine Lab Sustainable Fisheries class - https://www.shoalsmarinelaboratory.org/course/sustainable-fisheries