

# MOCEAN Workshop #3 “Driving Opportunities for Diversity, Equity, and Excellence throughout the Offshore Wind Workforce Pipeline”

## Webinar Schedule

- 10:00 – 10:05: *MOCEAN Initiative: Motivation, Signals, and Scale* (Dan Kuchma – Tufts University)
- 10:05 – 10:10: Webinar Overview (Fara Courtney – Outer Harbor Consulting)
- 10:10 – 10:35 ***Panel 1 Industry Insights***
- 10:35 – 10:50 Panel 1 Discussion
- 10:50 – 11:15 ***Panel 2 Workforce Readiness and Development Best Practices***
- 11:15 – 11:30 Panel 2 Discussion

**Meeting Logistics** Please stay muted unless speaking; meeting will be recorded

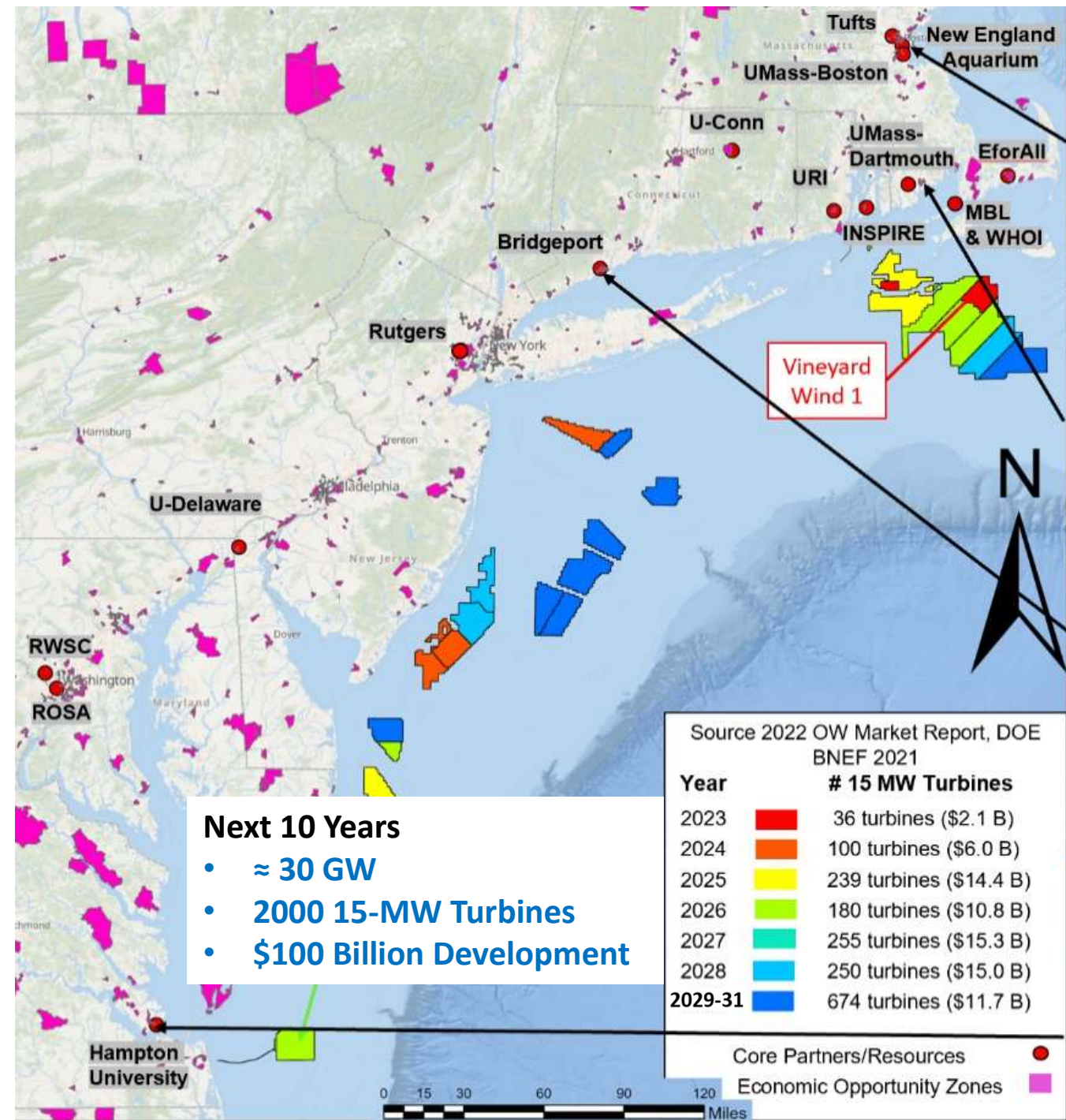
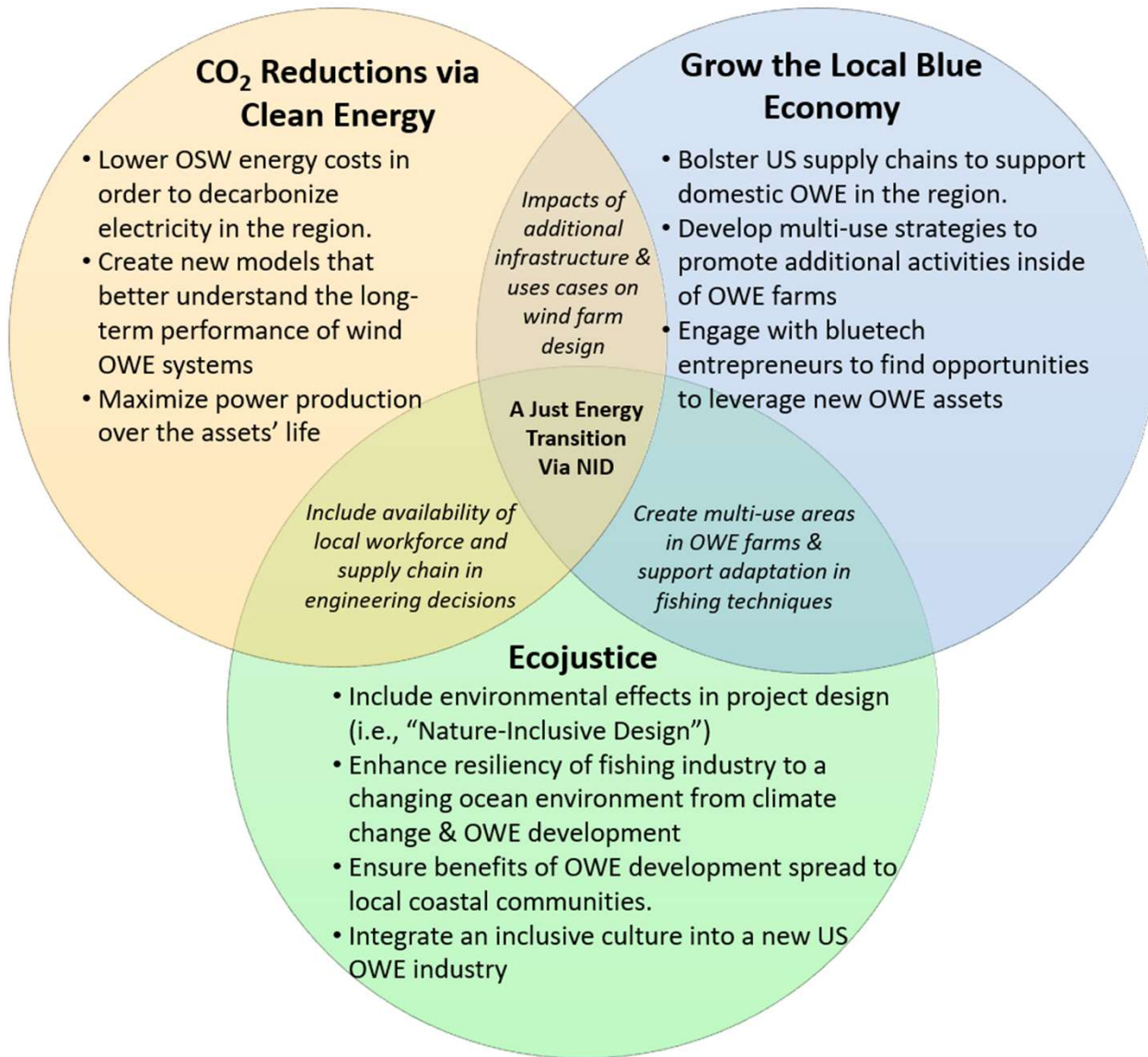
## Use of Chat

- Self Introductions – Organization and Role in Offshore Wind Industry and Marine Environment – with links
- References to Projects and the Literature – with links
- Questions for Panelists and Everyone (monitored with selected questions identified for discussion)
- Questions that could not be addressed in workshop will try to be answered in the distributed summary
- Suggestions for Ongoing or Future work
- Chat will be recorded and included with the summary of the workshop

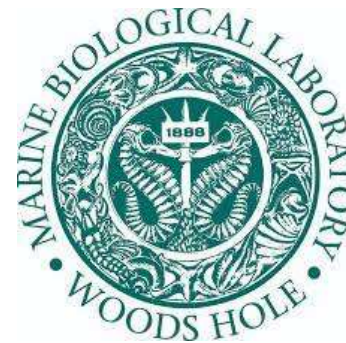
## Additional Questions during Discussion (time permitting)

- Raise hand if you have a question and you would like to ask, and you will be called in sequence; turning your video from being off to being on is a helpful way to identify that you have a question or comment

# Accelerating a Just Energy Transition While Nurturing Healthy Oceans and New Blue Economies Through Innovative Nature-Inclusive Offshore Wind Farms



NSF  
Engine's  
Team



# Motivation, Signals, and Scales

## 14% of world's coral lost in less than a decade, study shows

**Largest analysis of reef health reveals equivalent of more than all living coral in Australia was lost in 2009-18**



📷 A shark swims on a reef in the Ailinginae atoll in the Marshall Islands. Researchers analysed 10 regions with coral reefs globally. Photograph: Greg Asner/AP



ollution Green light

## Can New England's cod fishing industry survive?





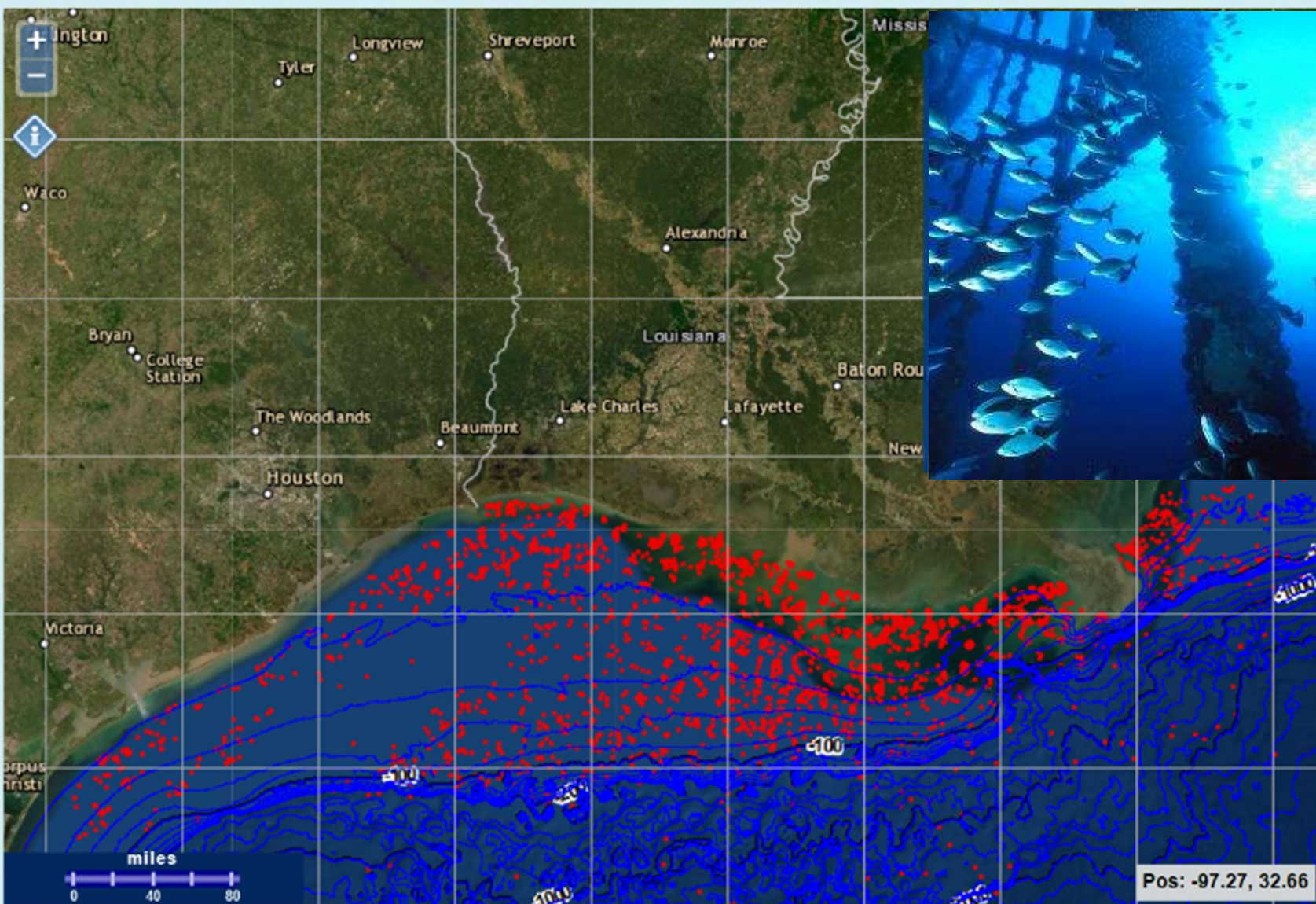
## Habitat and Biodiversity Loss

Marine habitats and biodiversity are declining faster than at any other time in human history.<sup>1</sup> While biodiversity and habitat decline can seem like a niche concern, far removed from the daily lives of most people, it has vital connections to the health and prosperity of humanity—whether through the integrity of food and health systems to the discovery of new drugs or the disruption of entire supply chains. Habitat loss and encroachment can also introduce new viruses that destabilize society, public health, and the global economy.<sup>2</sup> The conservation of biodiversity is reflected in both national and international goals, such as targets in the United Nations Convention on Biological Diversity (CBD) and Sustainable Development Goal 14. In October 2021, governments will negotiate a post-2020 global framework for biodiversity at the Conference of the Parties 15 (COP15) in Kunming, China. The current target for this negotiation includes a goal to protect at least 30 percent of the ocean by 2030.

# National Centers for Environmental Information National Oceanic and Atmospheric Administration Gulf of Mexico Data Atlas

Basemap Physical Biotic Living Marine Resources Socioeconomic Conditions Environmental Quality Jurisd

## Oil and Gas Structures



Plants and invertebrates attach to petroleum platforms only weeks after the platforms are placed in the marine environment. Within a year, the platform can be completely covered with plants and sessile (stationary) invertebrates. The attached plant life and stationary invertebrates attract mobile invertebrates and fish species, and thus form a highly complex food chain.

Petroleum structures provide niches for countless animals. They serve as hunting grounds for swift, open-ocean pelagic fishes, such as mackerel, tuna, jacks, and sharks. At the same time, they provide many species with habitat and places to hide from predators. They also harbor numerous species of juvenile fish and adult life stages. Marine researchers have reported fish densities to be 20 to 50 times higher at oil and gas platforms than in nearby open water. Each platform seasonally serves as critical habitat for 10,000 to 20,000 fishes, many of which are of great recreational and commercial importance.

Oil and gas structures in the Gulf of Mexico create a large network of standing structures, interconnected by hundreds of miles of pipelines. This network effect adds to the value of the structures as an artificial reef ecosystem. Many common species are



Underwater, the steel monopile of Dominion Energy's first two Virginia offshore wind turbines has turned into a sort of artificial reef habitat. (Dominion Energy)

**Virginia Offshore Wind Farm (after 2 years)**



**Block Island Wind Farm**

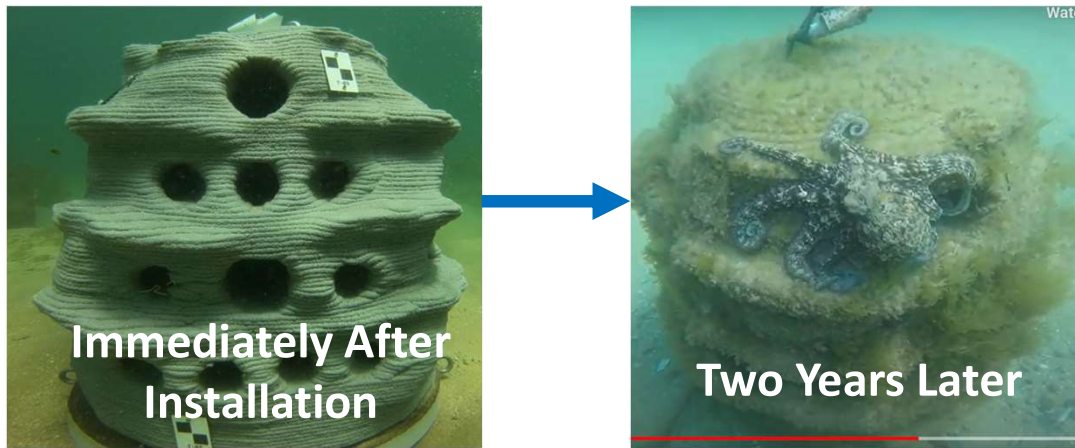


**Figure 12: Photographs showing North Hoyle turbine towers and associated young whiting (left) and dense settlement of mussels (right) observed during 2004 monitoring surveys. (Photos reproduced courtesy of Francis Bunker, MarineSeen, Pembroke, SA71 5RN).**



**Concrete offshore gravity-based wind turbine foundation, blue mussels, plumose anemones, sea urchins, common starfish, barnacles, and tubeworms. Photo credit: Royal Belgian Institute of Natural Sciences, Alain Norro.**

# Examples of Marine Growth and Habitats Attracted to Artificial Reefs



**Example 1**



**Example 2**



**Example 3**



Concrete Bases can provide Anchors for Kelp & Other Farms (illustration from fishreef.org)





# Turbine Reefs

## Nature Based Design of Offshore Wind Infrastructure

Nature-based Design includes options that can be integrated in or added to the design of offshore wind infrastructure to create, expand, enhance, or restore habitat for native species or communities.

### Enhanced Scour Protection Layers

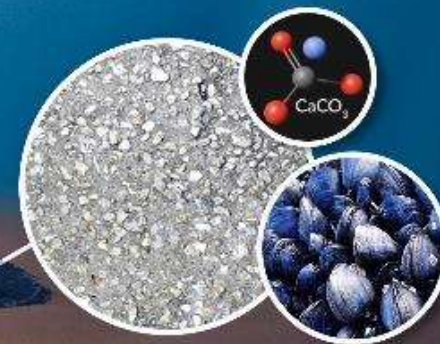
A combination of large and small structures with various sized holes and/or rocks with a range of shapes and sizes increases the surface area and habitat complexity of scour protection layers. This promotes biodiversity by providing adequate shelter for large, mobile species and suitable refuge for smaller species, juvenile life stages, and attached organisms.

Scour Protection



### Mimicking Existing Complex Habitat

Habitats created by installation of offshore wind infrastructure can be optimized by mimicking naturally occurring complex habitat features.



### Materials Designed to Promote Growth

Calcium carbonate ( $\text{CaCO}_3$ ) or natural shell can be mixed into concrete structures to provide suitable chemical composition for larval settlement of calcareous organisms such as bivalves.



## Panel 1 of 2: Industry Insights (6-minute presentations):

**Guiding Questions:** What unaddressed offshore wind workforce needs/opportunities do you see in your area of focus? What skillsets are needed? What are the opportunities for acquiring the necessary skills? What are your thoughts on creating effective pathways to opportunity for under-represented communities?

- Joel Whitman, President of Foss Offshore Wind: *maritime workforce-recruitment challenges*
- Bob Snook, Assistant Attorney General, Connecticut DEEP: *who will reinvent transmission systems to bring offshore wind into the grid?*
- Jennifer Downing, Executive Director, New Bedford Ocean Cluster: *growing an entrepreneurial ocean innovation cluster that supports the offshore wind industry and fisheries?*
- Mark Huang, SeaAhead: *the digital future of offshore wind*

*Panelist/audience discussion*





**FOSS**  
**OFFSHORE WIND**

# ABOUT FOSS OFFSHORE WIND



Foss was founded in 1889 in Tacoma, Washington.

Foss Offshore Wind was created in 2020, to service the growing Offshore Renewables market in the United States and globally.

Encompassing service offerings from Saltchuk family of companies, Foss Offshore Wind are uniquely positioned on the East and West Coasts to provide clients with the full range of on- and offshore support services.



# FOSS OFFSHORE WIND INVESTMENT: NEW BEDFORD



NEW BEDFORD  
FOSS MARINE TERMINAL

- Office space for Project Teams, Crews and Technicians
- Lay down space – storage and marshalling
- Terminal warehousing logistics and workshop
- Marine Coordination Center
- Berths and facilities required by T&I and O&M vessels: CTV, W2W/SOV, Tug & Barge, CLV
- Fueling facilities (vessels, generators, battery packs etc.)

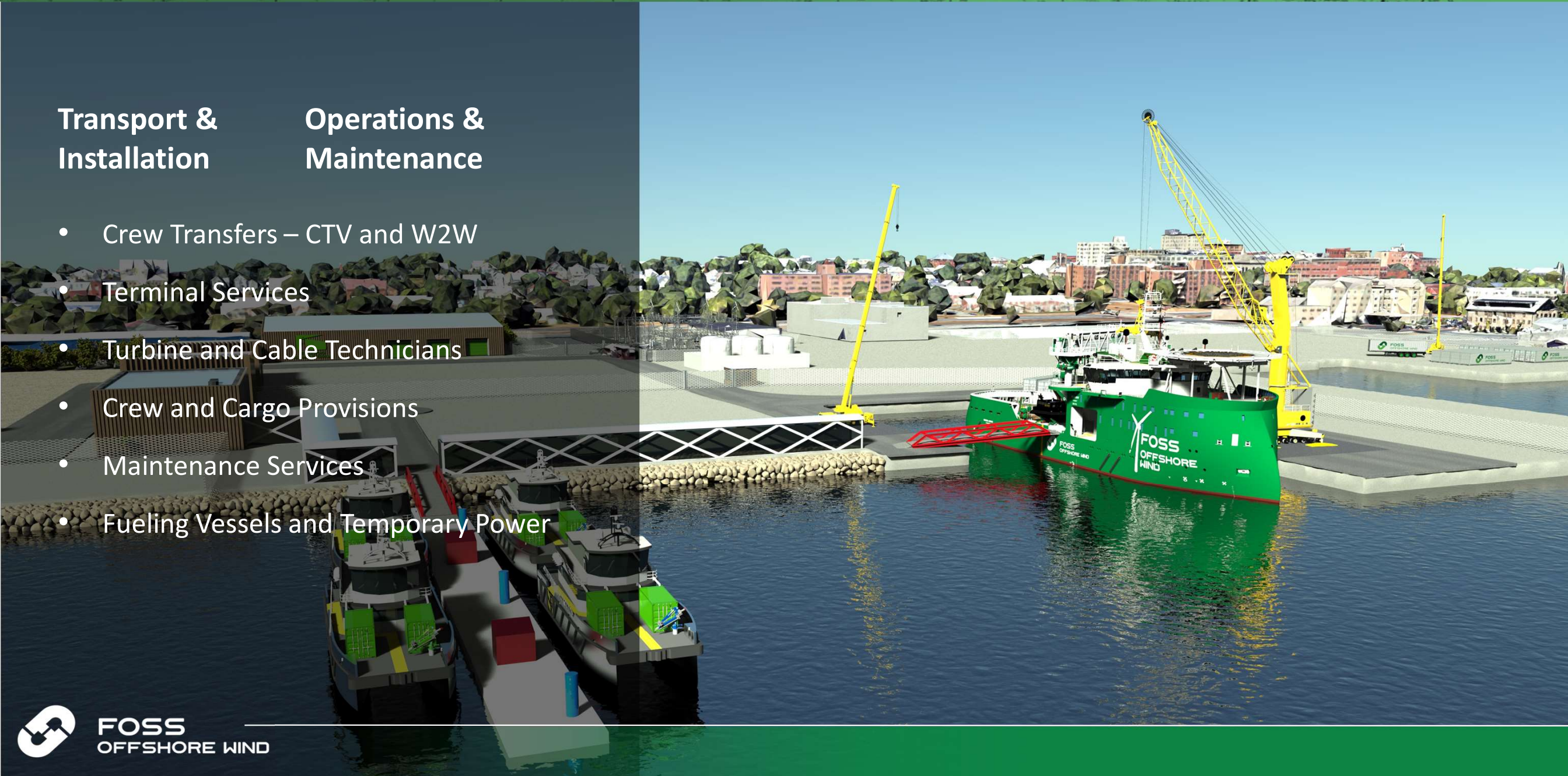


# FOSS OFFSHORE WIND LINES OF BUSINESS: SUPPLY

## Transport & Installation

- Crew Transfers – CTV and W2W
- Terminal Services
- Turbine and Cable Technicians
- Crew and Cargo Provisions
- Maintenance Services
- Fueling Vessels and Temporary Power

## Operations & Maintenance



**FOSS**  
OFFSHORE WIND

# FOSS OFFSHORE WIND LINES OF BUSINESS: TRANSPORTATION

## International and US Domestic Transportation Services

### Transport & Installation

### Operations & Maintenance

- Turbines + Nacelles
- Blades
- Foundations + Transition Pieces
- Export Cable + Array Cable
- Port to Port Transportation
- Port to Installation Vessel

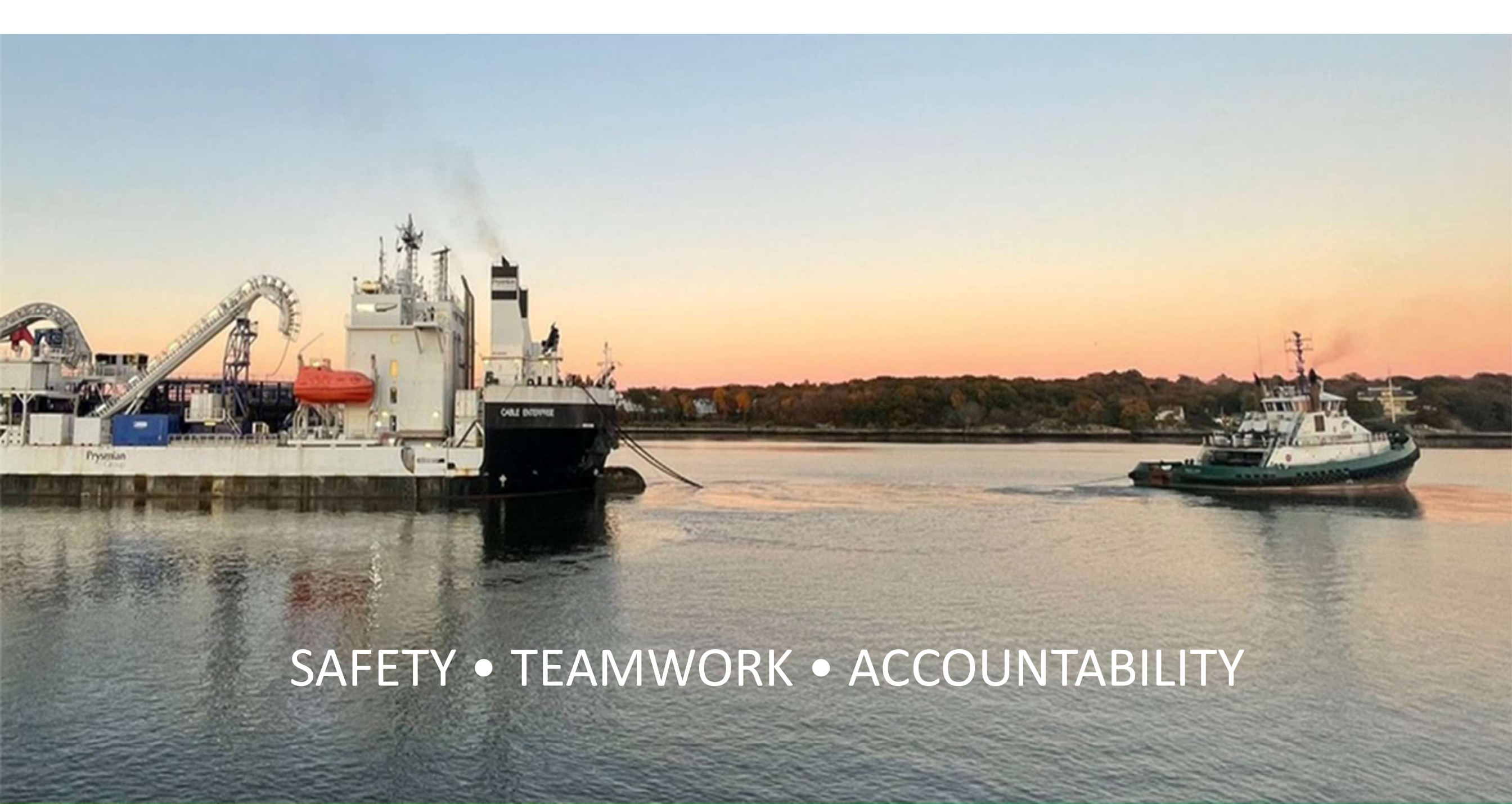




# FLEET

- The Foss offshore towing and project services fleet consist of 11 tugboats ranging in power up to 7,268 HP
- Between 2015-2017, Foss project services added four Tier 3 sister-class towing tugs with bollard pull exceeding 100 tons to the fleet
- Foss's barge fleet consists of 12 deck, project, and specialty barges ranging from 185 to 400 feet
- Harbor services fleet currently has 65 tugboats in operation
- Foss built four new ASD-90 tugs, welcoming them to the fleet in 2020-2021





SAFETY • TEAMWORK • ACCOUNTABILITY



# NEW BEDFORD OCEAN CLUSTER

Serving Maritime Businesses  
in Greater New Bedford





# Our Mission

*Leverage New Bedford's maritime strengths to attract investment, support the formation and growth of local maritime businesses, and create more value from our ocean resources to drive employment and local wealth.*

# Our Pillars



Aquaculture



Commercial Fishing  
& Processing



Innovation &  
Technology



Offshore Renewable  
Energy



## Act Local

*Supporting the development of a diverse and equitable offshore wind supply chain in greater New Bedford through outreach, information sharing, and assistance to local businesses.*

# Growing an Equitable and Inclusive Ocean Cluster in New Bedford

- Prepare current maritime workers for jobs in OSW (e.g., fishing vessels and crews)
- Meet people where they are - expand pre-training and apprenticeship programs
- Engage and educate the future workforce early
- Create an ecosystem for innovation and entrepreneurship



# Thank you!

## Contact Information:

Jennifer Downing, Executive Director  
jennifer.downing@nboceancluster.org  
508-474-8902

## Visit our website:

[www.newbedfordoceancluster.org](http://www.newbedfordoceancluster.org)



Follow us on social media:

[www.facebook.com/newbedfordoceancluster](https://www.facebook.com/newbedfordoceancluster)



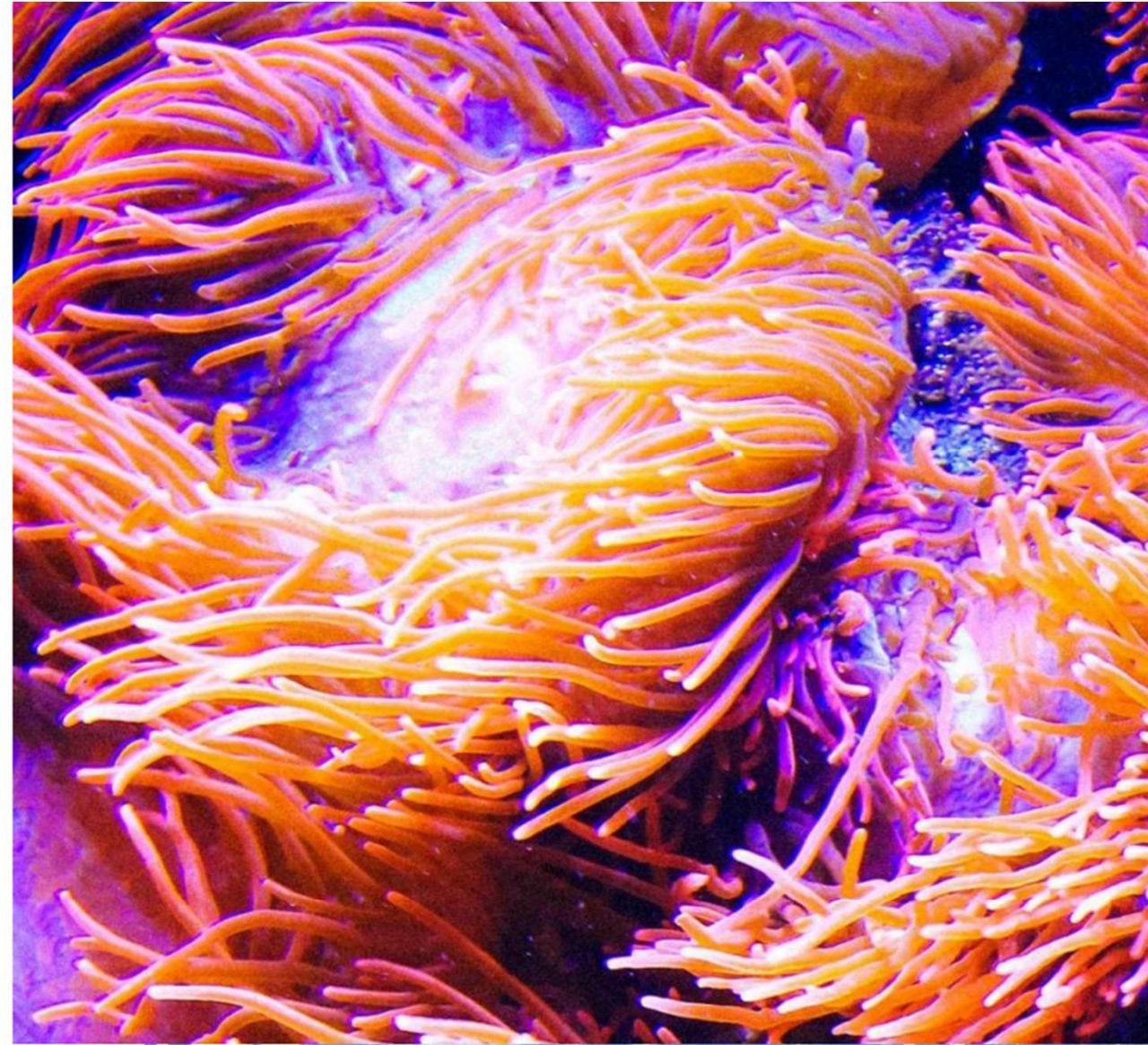
[www.linkedin.com/company/  
new-Bedford-ocean-cluster/](https://www.linkedin.com/company/new-Bedford-ocean-cluster/)





May 2023

# MOcean: Enter Bluetech





# SeaAhead's Theory of Change

**The ocean is on a negative trajectory...**

New stakeholders are needed and novel approaches

**...Entrepreneurship can break us out of old paradigms**

Catalyze *new* technology advances to 'go-out-to sea'

Not Intuitive

**Leading to SeaAhead's Venture Studio...**

2018 Formation – a Bluetech first mover

**...To create companies with scalable impact**

Measuring our impact

DEI Construct includes income disparity and environmental equity



# History rarely repeats itself, but always rhymes.

Venture Innovations are playing key roles in these historically siloed sectors as they face market step changes.

Utilities - Renewables



Big Three - EV



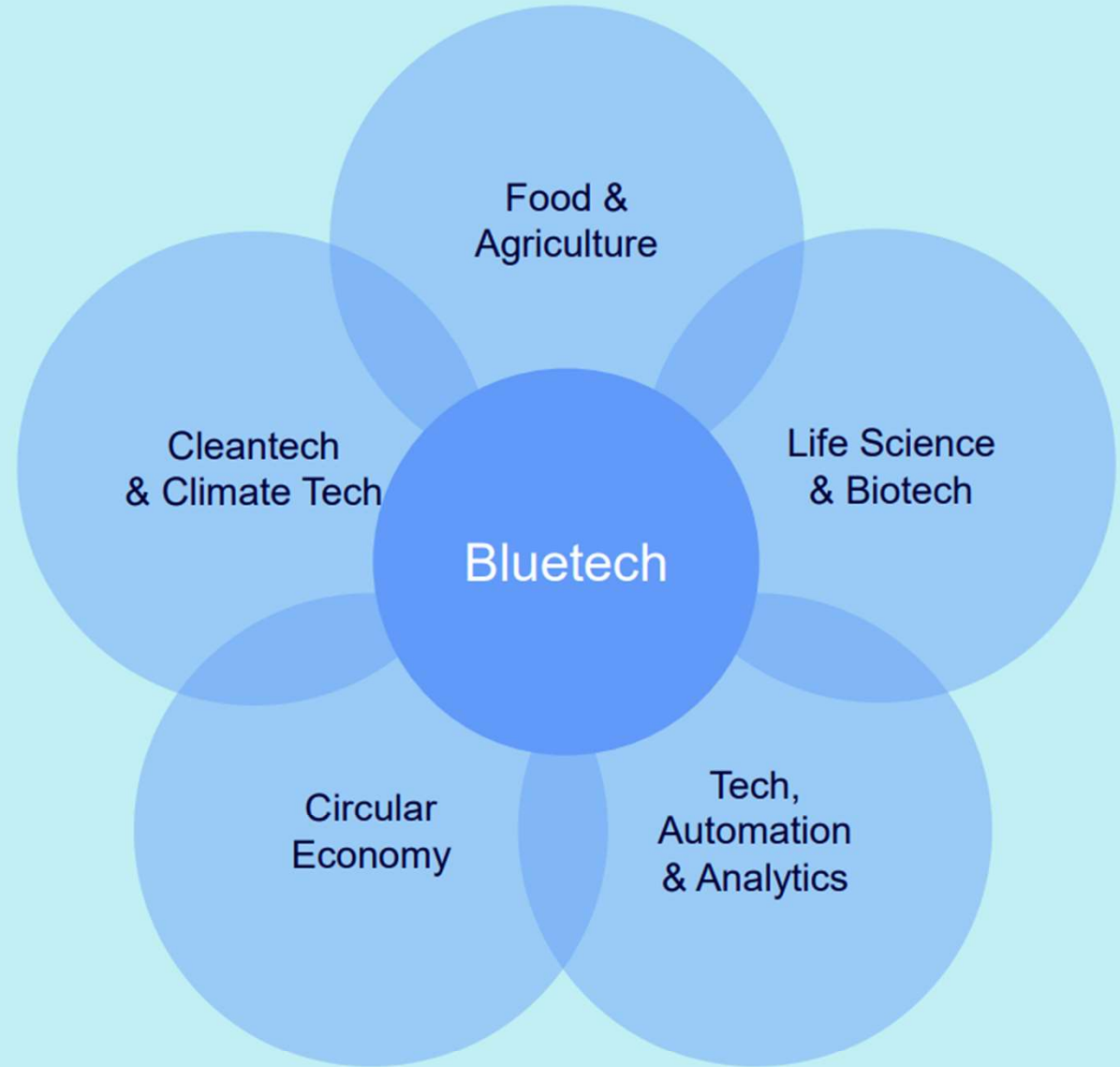
Big Food - Organic



OUR THESIS

We bridge  
new technologies  
to 'go-out-to-sea'.

Ocean centric, not an afterthought.



OUR SOLUTION

# Our Bluetech Open Innovation Platform



Inspire new company development

Create bluetech economic clusters

**CATALYZE**

**BUILD**

BlueSwell Incubator

Gulf Blue Navigator

Venture Studio

SeaAhead's Open Innovation Platform

**INVEST**

Blue Angels Investor Group

SeaAhead Ventures, LLC

## OUR SOLUTION

# Northeast's first dedicated bluetech incubator

Build company capacity, focusing on 4 key pillars: Team, Product-Market Fit, Business Strategy & Wins to Build On

We develop relationships and get a first look



# BlueSwell

19

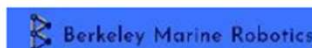
Companies graduated in  
Cohorts I - III

<10%

Acceptance Rate

\$20M+

Raised by  
the startups



OUR SOLUTION

Designed and launched the first bluetech accelerator in the Gulf of Mexico

Blue innovation through an economic cluster to drive a triple bottom line

ACTING FROM STRENGTH AND POSITIONING FOR THE FUTURE

A Narrative for The University of Southern Mississippi's Role in the Mississippi Gulf Coast's New Blue Economy



**GULF BLUE** ◆ **NAVIGATOR**



Focus on aquaculture, autonomous vehicles, ocean data, coastal restoration and 'The Future of Maritime'

## OUR SOLUTION

# The Blue Angels gives us an initial investment footing

40+

Experienced investors & industry veterans in the Blue Angels program

Convened in 2020 to fill a gap in early-stage funding. We screen startups to select two pitches per month, facilitate due diligence and investment, and lead educational sessions for members. Angels make personal investment choices. For SAV, the angels create a source of deal flow, diligence & company building expertise, and additional capital for portfolio companies



## Blue Angels Investments

(as of November '22)



THE CROP PROJECT





OUR THESIS

# US Offshore Wind: A Once in a Generation Opportunity

**80%**

Of Americans live within 200mi of the coast

**30 GW**

Goal by 2030 for installed offshore wind capacity

**83k**

Jobs estimated to as a result

**>\$4B**

In associated investments – in supply chain, workforce, research, etc





# Sample Bluetech Sector: US Offshore Wind + Innovation



Enhancing  
Biodiversity



Ocean Data  
Collection



Field Workers'  
Training, Safety  
& Support



Green Logistics  
& Sustainable  
Supply Chains



Power-to-X:  
Green H2



End-of-Life  
Challenge

CASE STUDY

# VINCI

VR for workforce training



First Offshore Wind Workers in the World certified with Virtual Reality in New Bedford

NEWS PROVIDED BY  
[VinciVR →](#)  
Jul 19, 2022, 07:00 ET

OUR OCEAN: A THEORY OF CHANGE

CASE STUDY



Seafloor mapping

Soundscape monitoring

Hurricane prediction

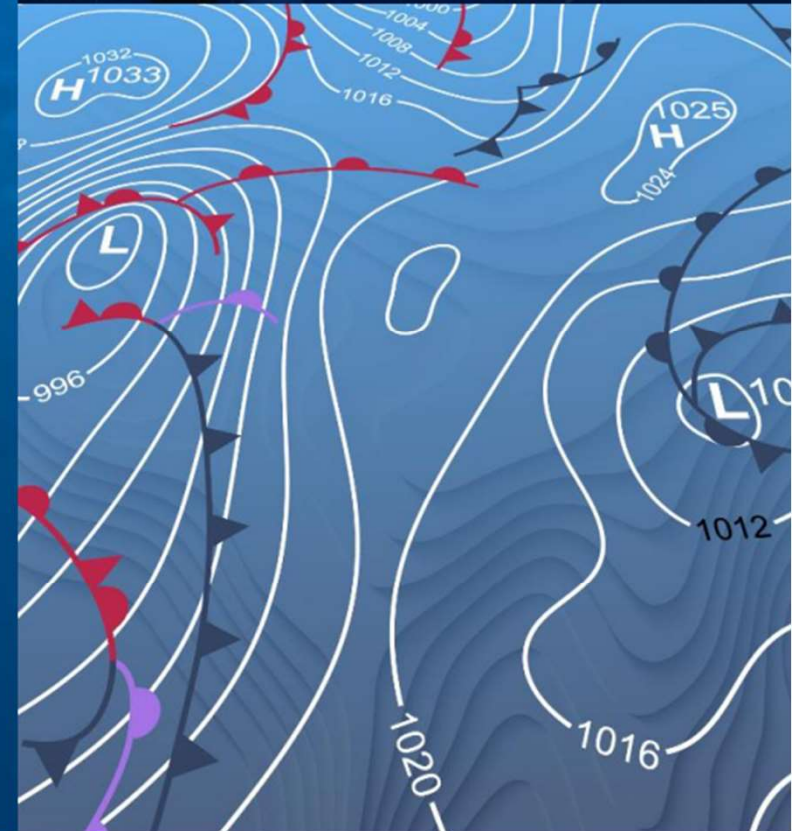
OUR OCEAN: A THEORY OF CHANGE



## Project FISH

Fast Insights to Scope Hurricanes

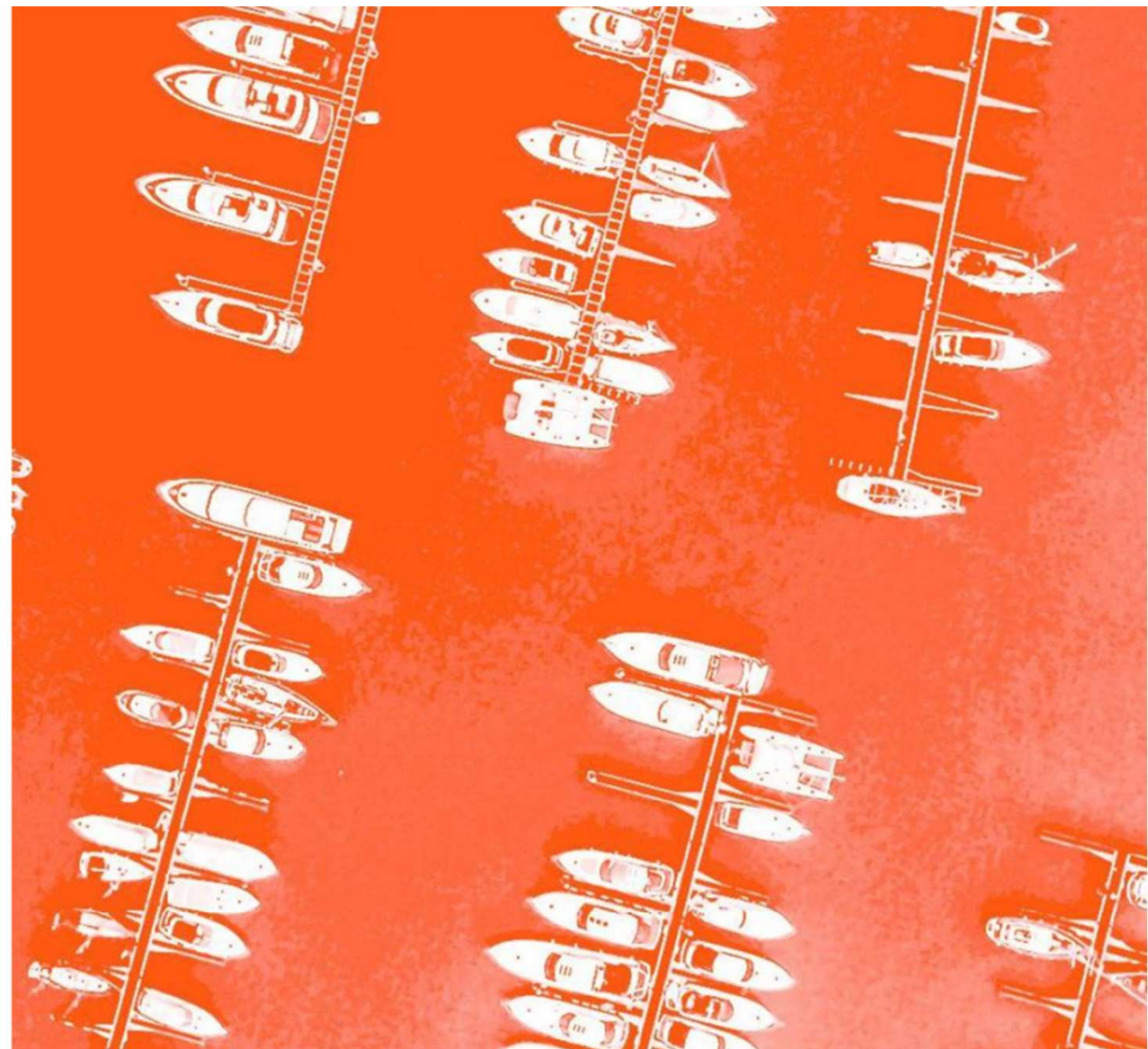
Promotes collaborations with fishing associations, charters, and world-class anglers to promote ocean science by sharing transportation costs when bluetech or scientists need to deploy oceanic equipment quickly



**Website:**

<https://www.sea-ahead.com/>

Mark.Huang@sea-ahead.com



## Panel 2 of 2: Workforce Readiness Best Practices (6-minute presentations):

**Guiding Questions:** *What are the specific populations that your programs target? What roles are you preparing your students for? What is your program model and key success factors? How do you engage with industry to support building equity into recruitment processes?*

- Bob Chen: Dean, U Mass Boston School for the Environment, and Kerrie Wilkens, UMass Boston, Assistant Professor of Counseling Psychology: *community-based programs and micro-credentials*
- Chris Bolzen: Executive Director, Gloucester Marine Genomics Institute/Gloucester Biotechnology Academy: *building a bridge to careers in biotech: lessons for the offshore wind industry*
- Rhea Gordon: Executive Director, Elevate New England - *equipping urban youth to harness opportunity*
- Jeanette Davis, Associate Professor, Hampton University – *building the professional skills needed for students to thrive in industry internships.*

*Panelist/audience discussion*



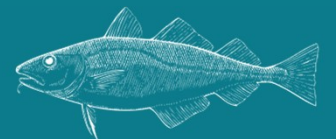


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**Robert F. (Bob) Chen** is a Professor and Interim Dean of the School for the Environment at the University of Massachusetts Boston. He received his AB from Harvard University in Chemistry and Physics in 1986 and his PhD in Oceanography from Scripps Institution of Oceanography in 1992. After an NSF Postdoctoral Fellowship at the Woods Hole Oceanographic Institution, he has remained at UMass Boston since 1993, serving as Graduate Program Director, Director of the Center for Coastal Environmental Sensing Networks (CESN), and presently Interim Dean. His research interests include the cycling of chromophoric dissolved organic matter (CDOM), carbon biogeochemistry in coastal systems, and the development of sensor networks in shallow water systems. He has explored dissolved organic carbon (DOC) outwelling from salt marshes, remote sensing of coastal water quality, and indicators of estuarine health. He is also dedicated to ocean and environmental science education and outreach at the local, national, and international levels. He is the Principal Investigator of the NASA PATHS Diversifying Engineering project ([www.pathspartners.org](http://www.pathspartners.org)), and serves on the boards of the Association of the Sciences for Limnology and Oceanography (ASLO) and the New England Aquarium. He was an ONR Young Investigator, he has published over 80 peer-reviewed articles, and is an active researcher in the area of coastal observations, carbon cycling, and contaminant distribution and fate.

# MOCEAN: Workforce Readiness Best Practices

Christine Bolzan, Executive Director



GLOUCESTER MARINE  
GENOMICS INSTITUTE





GMGI

## **GLOUCESTER MARINE GENOMICS INSTITUTE**

*Addresses critical challenges facing our oceans, human health and the environment through innovative scientific research and education.*

*By bringing world-class science and transformative workforce development to Gloucester's historic waterfront, GMGI is catalyzing the regional economy.*

# A strategy triad has guided our work since 2013

## 1 RESEARCH INSTITUTE

Establish a marine biotechnology research institute that is powered by genomics



## 2 EDUCATION

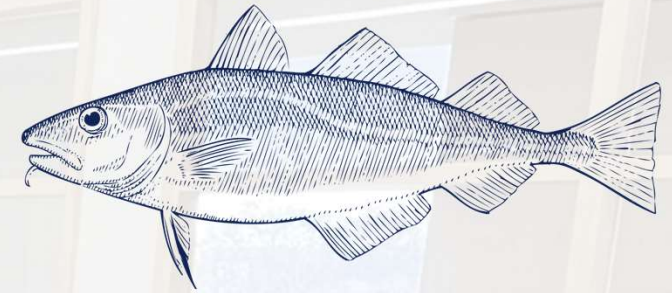
Create a vibrant science learning environment and train local high school graduates for careers as professional lab technicians



## 3 SCIENCE COMMUNITY

Promote conditions that encourage the development of a science hub in and around Gloucester





# GLOUCESTER BIOTECHNOLOGY ACADEMY

**Creating a vibrant science  
learning environment by  
training high school  
graduates for careers as  
professional lab technicians**

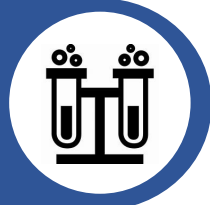
# Gloucester Biotechnology Academy

## Proven Concept



- “Workforce development model for an innovation economy”
- 80% graduation rate surpasses vocational norms
- 95% career placement rate

## State-of-the-Art Facilities



- Cutting-edge teaching lab, classrooms, and proprietary curriculum
- Alignment with current industry needs

## Ability to Scale



- In 2021, doubled size of facility by adding biomanufacturing
- Evaluating options to extend reach into Boston
- Expanded programs for middle and high school youth



Building long term, life-changing relationships with New England’s urban youth, equipping them to thrive and contribute to their communities.



# GETTING TO KNOW ELEVATE

In-Class, Mentoring, Adventure and College and Career



**CLASSES:** Middle and high school curriculum focused on developing their leadership skills as well as character qualities and life skills. Our full-time Teacher-Mentors come from the communities we serve.



**LEADERSHIP/TEACH BACK**



**ADVENTURE:** Activities such as biking, hiking, canoeing, and bowling. Our purpose is for students to get out of their comfort zones through new experiences.



**COLLEGE AND CAREER:** Each of our students graduates with a plan for the future (2 year college, 4 year college, trade, career or military). We continue providing support and resources into young adulthood.



**MENTORING:** We work with students 50% in school and 50% outside of school (evenings, weekends and summer). Teacher-Mentors are trusted, positive influences in students’ lives.

