

1	COLD OPEN	
2	01:00:20:08	<i>Pete: If you ask most New Yorkers, what's the deal with New York Harbor. They'll say it's toxic, polluted, you shouldn't touch it. It's dangerous.</i>
3		<i>Pete: I want everyone who lives around New York Harbor to see New York Harbor as this incredible, natural, biodiverse place</i> <i>Pete: And so what we're trying to do is to build a community led movement to restore nature where we live.</i> <i>Pete Sync: Inside... lots of oysters.</i>
4		<i>Pete: We want to get New York Harbor to the point where every piling, every bulkhead is just completely covered with live oysters.</i>
5		TITLE – WILD HOPE
6		MOST DAYS PETE MALINOWSKI CAN BE FOUND IN NEW YORK HARBOR – ONE OF THE LARGEST HARBORS IN THE WORLD.
7		Pete: The Harbor's actually almost the same size as the land area of the city. It's about 200,000 acres. And most of it looks like this where it's all hard shorelines, there's industry or residential right up to the edge... Pete: Right, there's a ton of commercial traffic... and obviously the helicopters but right now there's nobody – there's no other boats. It's the biggest open space in New York City, and it's underutilized.
8	01:02:21:08	OVER THE LAST FIFTEEN YEARS, PETE'S BEEN LEADING AN EFFORT TO RESTORE THE HARBOR--AND ITS WILDLIFE... BY REINTRODUCING A CREATURE WITH THE POWER TO REVIVE THIS ENTIRE ECOSYSTEM. IT'S CALLED THE BILLION OYSTER PROJECT- OR BOP. A NAME THAT PROCLAIMS ITS AMBITIOUS GOAL.

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9	01:02:40::23	<p>Pete: Billion Oyster Project is a nonprofit aimed at restoring 1 billion oysters to New York Harbor through education initiatives.</p> <p>Pete: We don't know if we'll be able to do it, but we think if we get as many people involved as possible, that we'll be able to do this hard thing together.</p>
10		<p>IT'S A MONUMENTAL EFFORT THAT'S INSPIRED THE COLLABORATION OF THOUSANDS OF NEW YORKERS, THE LOCAL AND FEDERAL GOVERNMENT, AND CLOSE TO ONE HUNDRED OF THE CITY'S BUSINESSES.</p> <p>IT ALL BEGAN AS A CLASS PETE TAUGHT AT A VERY UNUSUAL HIGH SCHOOL.</p>
11	01:03:18:16	<p>LOCATED ON GOVERNOR'S ISLAND – THE URBAN ASSEMBLY NEW YORK HARBOR SCHOOL SITS BETWEEN BROOKLYN AND MANHATTAN.</p> <p>THE ONLY WAY TO REACH IT IS BY FERRY.</p>
12		<p>Jaylen: We have various different programs like marine biology and diving and aquaculture and vessel ops. And we all work together to like help better the environment in different ways.</p>
13		<p>Teacher in Class: Yeah, so the EPA is studying whether to make it a superfund site.</p> <p>Pete: Harbor School is a regular Regents public high school, available to any eighth grader in New York City.</p> <p>The difference between Harbor School and other schools is students specialize after their ninth-grade year in one of seven Marine fields and then spend a lot of their time in those classes.</p>
14	01:04:07 :16	<p>PETE AND JULIET SYNC:</p> <p>-Let's look at the oysters over here.</p> <p>-Yeah so right here, this is the um...where the broodstock where we breed oysters.</p>
15	01:04:24:16	<p>IT'S HERE THAT PETE BEGAN AN AQUACULTURE CLASS ON OYSTERS THAT BECAME THE SEED FOR THE BILLION OYSTER PROJECT.</p>

16		<p>Pete: The idea for oyster restoration was to be a part of bringing this hands-on learning, but it's also access to the natural world, experiences in nature, doing purposeful work outside. And those opportunities to do that are just fewer and farther between for all young people, especially young people in cities.</p>
17		<p>SO PETE DECIDED TO INTRODUCE THE STUDENTS TO A CREATURE HE'S KNOWN HIS WHOLE LIFE.</p>
18		<p>Pete: I grew up on Fishers Island, New York on an oyster farm.</p> <p>Pete: All of my first memories was working with oysters. I learned how to drive a boat before I learned how to ride a bike.</p>
19		<p>Pete: I was never a good student, and the school part was always frustrating. So, I don't know if it's a good reason, but that was why I wanted to get into teaching. For kids like me, school should be different than it was for me.</p>
20		<p>IN PETE'S CLASS, STUDENTS GOT SOME REAL WORLD EXPERIENCE GROWING AND PLANTING OYSTERS IN THE HARBOR...</p>
21	01:04:58:10	<p>AND SEEING WHAT MAKES OYSTERS A KEYSTONE SPECIES - A CREATURE THAT HAS A SUPER-SIZED IMPACT ON ITS ECOSYSTEM.</p> <p>OYSTERS CREATE GIANT REEFS THAT PROVIDE THE INFRASTRUCTURE FOR AN ENTIRE MARINE COMMUNITY. AND KEEP IT HEALTHY BY FILTERING THE WATER CLEAN ON A MASSIVE SCALE.</p> <p>JUST BY PLANTING OYSTERS THE SCHOOL COULD HELP TRANSFORM THE HARBOR AND THE CITY ITSELF.</p> <p>SO THEY SET A STAGGERING GOAL: RESTORE A BILLION OYSTERS BY 2035...</p>
23		<p>Pete: We realized very early on that the only chance for us to be successful in restoring one billion oysters to New York Harbor was to find, you know, leverage the incredible diversity of talent and expertise that exists in New York city. So we have all kinds of different partnerships with creative firms, with scientists, with marine contractors, all over the place. And we rely on those partnerships and that help to get our work done.</p>

24		PARTNERS SHOW UP FROM ALL OVER - AND OFTEN LEARN ON THE JOB.
25	Jonathan “Johnny” Anderson Fabrication Coordinator , Billion Oyster Project	Johnny (Jonathon Anderson): These volunteers here are public New Yorkers, or even from out of town. It's always a pleasure to see that New Yorkers can come here and say oh, I didn't know this existed. I didn't know this island existed.
26		TODAY, IT’S THEIR FIRST STEP IN OYSTER RESTORATION. GIVING OYSTERS A PLACE TO CALL HOME. THEY’RE BUILDING SPECIAL CAGES CALLED GABIONS.
27		Johnny (Jonathon Anderson)): So a gabion is actually a mesh structure, which typically is used for putting rocks in and holding up shorelines. But we're using it with oyster shells.. and they actually hold about 800 to 900 pounds of shell. We can have up to 150 to 250,000 oysters in one gabion.
28		THESE CAGES PACKED WITH EMPTY SHELLS WILL BE DROPPED INTO THE HARBOR ALONG WITH OYSTER LARVAE GROWN BY THE BOP. THEY WILL BECOME NURSERIES FOR GROWING OYSTERS.
29	GFX 103A Oyster Reef	OYSTER LARVAE FREE SWIM FOR THE FIRST TWO WEEKS OF THEIR LIVES. AFTER THAT, THEY ANCHOR THEMSELVES, USUALLY TO OLDER OYSTER SHELLS, AND BECOME IMMOBILE. THE BABY OYSTERS, CALLED SPAT, THEN RECYCLE CALCIUM CARBONATE FROM THESE OLD SHELLS TO FORM THEIR OWN.
30	t	AS THEY GROW ON THE BACKS OF EACH OTHER, OYSTERS ANCHOR THEIR ECOSYSTEM BY FORMING MASSIVE REEFS.
31	Benjamin LoGuidice Employee, Billion Oyster Projectl	Ben: So, in the wild you would go out and you would see a reef, but it would just be filled with oysters growing on top of other oysters. So, what we’re trying to do is reproduce that reef by giving them a head start by giving them the clean shell to attach themselves to.
32	Stephen Villegas	PROJECT EMPLOYEES BENJAMIN LoGUIDICE AND STEPHEN VILLEGAS ARE MONITORING AN OLDER NURSERY.

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	Employee, Billion Oyster Project	
33		Ben: What we're looking for is growth and mortality of the oysters. And if we see a lot of mortality, we know that maybe that site's not the best.
34		Ben: So, this is what we call spat-on-shell and all of these oblong or circular little things here, those are actually living oysters that are about a year old. So there's probably 10 or 15 oysters on this one shell alone. Yeah, so this is exactly what we're hoping to put back in the harbor and in different locations to help rebuild that ecosystem.
35		<p>WITH SO MUCH GROWTH, IT WON'T BE LONG BEFORE THESE OYSTERS ARE TRANSFERRED TO OTHER LOCATIONS THROUGHOUT THE HARBOR — A PLACE THAT OYSTERS HAVE INHABITED FOR AGES.</p> <p>IT'S BELIEVED NEW YORK HARBOR WAS ONCE HOME TO HALF THE WORLD'S OYSTERS.</p>
36		Pete: 450 years ago, there were oyster shoals throughout the whole harbor, over 200,000 acres of reef.
37		<p>THESE REEFS FORMED UNDERWATER HABITATS TEEMING WITH LIFE.</p>
38		<p>Pete: This was a center for biodiversity for the whole Western North Atlantic. Everywhere you looked you saw fish, dolphins, whales, every manner of sea creature was all here in the harbor.</p> <p>Pete: Early colonists described actually not being able to see the sky for minutes at a time because there were so many birds. Oysters are a keystone species, so all of that abundance and diversity relied on the oyster reefs for habitat, food, shelter. So, without the reefs, you lose all those animals pretty quick.</p>
39		<p>FROM THE TIME THE EUROPEAN SETTLERS MOVED IN THEY BEGAN HARVESTING THIS SEEMINGLY LIMITLESS RESOURCE.</p> <p>NEW YORK BECAME THE OYSTER CAPITAL OF THE WORLD.</p>
40		Pete: Oysters used to be enjoyed by everybody rich and poor alike. You could

		<p>buy oysters for a penny in a cart on a street corner or eat them at a fancy restaurant.</p> <p>BY THE LATE 19TH CENTURY, NEW YORKERS WERE CONSUMING A MILLION OYSTERS A DAY. AND SELLING MILLIONS MORE TO CITIES ACROSS THE US AND EUROPE.</p>
41		<p>Pete: Eating them was the main. That's what removed all the natural oyster reefs. And then the Harbor just went to shit. And then we just dumped sewage and trash and industrial chemicals into the harbor for about a hundred years.</p> <p>Pete: To the point where the harbor actually became very off- putting. People describe it being smelling bad, looking bad, seeing dead horses floating by, seeing these noxious bubbles come up from the bottom. And we still carry a lot of that legacy today, people thinking that New York Harbor is a toxic polluted place.</p>
42		<p>IN REALITY, THE LEGACY IS A MIXED ONE.</p>
43		<p>IN 1972, THE CLEAN WATER ACT BANNED THE FLOW OF INDUSTRIAL POLLUTANTS INTO THESE WATERS.</p> <p>TODAY THE HARBOR IS CLEANER THAN IT'S BEEN AT ANY TIME IN THE LAST 100 YEARS.</p> <p>BUT DURING HEAVY RAINS, THE CITY'S OUTDATED SEWAGE SYSTEM STILL EMPTIES RIGHT INTO IT.</p>
44		<p>Pete: So, this drains North Brooklyn into this water body, averages 700 million gallons of untreated household wastewater every year, which is the same volume as the Empire State Building, just to put that in its context. So, the water quality here as a result of that is...not great.</p>
45	01:13:31:15	<p>BUT EVEN HERE, OYSTER BEDS THE BOP HAS PLANTED ARE TAKING HOLD.</p>
46		<p>Pete: In 2013, there was one oyster, one wild oyster on the wall in here. There's a bunch of them under this piece of wood here. See them down there -see there's a lot more.</p> <p>So this a huge deal, it means the oysters are reproducing effectively.</p>

47	01:14:05:13	<p>THEIR GROWING NUMBERS HAVE HUGE IMPLICATIONS FOR THE HARBOR – BECAUSE OYSTERS POSSESS A SUPERPOWER...</p>
48		<p>THESE TWO TANKS CONTAIN WATER FROM THE HARBOR. ONE ALSO CONTAINS A DOZEN OYSTERS, WHICH CLEAN THE WATER IN A MATTER OF HOURS.</p> <p>THE OTHER TANK, WITHOUT OYSTERS, STAYS DIRTY.</p>
49		<p>Pete : The oysters filter the water. They improve water quality a hundred percent because they're filter feeders, oysters pull water through their bodies. And the gills sort through the different particles in the water, decide what the oyster's going to eat and what it's going to reject.</p> <p>AS THEY FEED OYSTERS REMOVE ALGAE, NITROGEN AND CONTAMINANTS FROM THE WATER.</p> <p>IN THE WILD, AN ADULT OYSTER CAN FILTER UP TO TWELVE AND A HALF GALLONS OF WATER A DAY. THAT’S A BATHTUB-FULL EVERY THREE DAYS, PER OYSTER.</p>
50		<p>THE BOP HAS ALREADY PLANTED ONE 100 MILLION OYSTERS IN THE HARBOR -THAT’S LIKE ONE HUNDRED MILLION WATER PURIFIERS ALREADY AT WORK.</p> <p>BUT THEY STILL NEED A HELPING HAND.</p> <p>Pete: As long as we're pouring sewage into the Harbor, you have more dirty water to filter. So, oysters are not going to solve the water quality problems in New York Harbor, but they certainly play a role in making it cleaner.</p>
51		<p>THAT ROLE WILL BECOME EVEN MORE POWERFUL WHEN MORE PEOPLE GET BEHIND THE RESTORATION.</p> <p>SO THE BOP HAS A RANGE OF PARTNERS TO HELP WITH OUTREACH–AND EACH DOES IT THEIR OWN WAY.</p>

52		<p>AMONG THE CITY’S 5000 FOOD CARTS...THERE’S A SPECIAL ONE HEADED TO THE WATERFRONT IN BROOKLYN.</p> <p>IT'S CALLED MOTHERSHUCKERS.</p>
53	Moody Owner, Mothershuckers Food Cart	Moody: My name is Moody. I run Mother Shuckers, we're the only oyster cart in New York city. As of right now until somebody else copies me.
54		<p>MOODY STARTED SHUCKING OYSTERS IN FLORIDA FOR THE MONEY. BUT IT WASN’T EXACTLY LOVE AT FIRST SIGHT.</p>
55		Moody: Crazy, I didn't like oysters, I thought oysters was disgusting. The thing that really changed my mind was like all of this information about how oysters are good for the environment, how the oysters are the backbone of New York City.
56		<p>MOODY IS HELPING TO EDUCATE THE PUBLIC ABOUT OYSTERS</p> <p>BUT HE’S GOING ABOUT IT IN HIS OWN WAY...</p>
57		Moody: Back in the days, instead of selling hot dogs on the street, we used to sell oysters. And that was like the common man's food.
58		<p>Moody: Right now it's like, my objective is really ,you know, jeez, how about we get some oysters into the hood.</p> <p>NEW YORK HARBOR’S OYSTERS ARE TOO CONTAMINATED FOR EATING AND MORE USEFUL FOR BUILDING REEFS. SO, MOODY SERVES FARMED OYSTERS INSTEAD.</p>
59	01:17:20:18	<p>MOODY AND WOMEN SYNC:</p> <p>-Those are the west coast and the flat shell, those are the east coast oysters.</p> <p>-Excellent. As usual, beautiful. Thank you.</p> <p>-My pleasure. hehehe.</p> <p>-Let’s go, let’s go. lets go...hehe.</p>
60		<p>Moody: You know somebody will come up to me and they'll say, "I've had oysters before, but I don't like them."</p> <p>MOODY AND WOMAN SYNC:kj</p> <p>-You wanna try it.</p>

		<p>- yeah...(indistinguishable) -Yeah, yeah - try the candy apple - here.</p>
61	01:17:36:06	<p>Moody: You know it gives me an opportunity to run them down on some oysters. My thing is turning people on. And then when it comes to like Black people, oh my God...</p> <p>MOODY AND MAN SYNC: -oh nah, oh nah, oh nah.</p> <p>Moody: When we like stuff we freaking love it, so it's like...</p> <p>-And I am going to come back, you know what I am saying brother. You know what it is. -Appreciate the appreciation.</p> <p>Moody: And so it makes it a good time, yo know?</p>
62		<p>AS THE SHELLS PILE UP, MOODY SETS THEM ASIDE. FOR A RECYCLING SERVICE – OF A SPECIAL KIND.</p>
63	Borys Delgado Oyster Collector	<p>Borys: My name is Borys Delgado. I have been collecting oyster shells for six years in different parts of Manhattan, Brooklyn, and Long Island City.</p>
64		<p>Borys: We collect oysters from restaurants. They're cleaned one after the other, then thrown into the sea to be reborn.</p>
65		<p>AROUND 50 RESTAURANTS ARE PARTICIPATING IN THIS SPECIAL ROUNDUP.</p> <p>THESE ARE THE SHELLS THAT WILL END UP IN THE GABIONS BUILT BY THE BILLION OYSTER PROJECT.</p>
66		<p>Pete: We work with restaurants to source all of our shells.</p> <p>Pete: And our restaurant partners do the work of separating out shells from the other trash. And the shell comes out to Governor's Island as sort of building blocks for our reefs.</p>
67		<p>SINCE 2014 PETE AND THE BOP HAVE BEEN RESTORING THE REEFS TO REVIVE</p>

		THE CITY’S PAST. NOW THEY ARE JOINING FORCES WITH ANOTHER NEW YORKER ON A LANDMARK PROJECT - ONE TO TURN OYSTERS INTO GUARDIANS OF THE CITY’S FUTURE.
68		IT’S CALLED LIVING BREAKWATERS. AND IT’S BECOME THE CITY’S RESPONSE TO A DISASTROUS WAKE-UP CALL...
69		Kate: We were, you know, looking at the news reports, seeing this giant front of weather coming our way. Like many New Yorkers, I felt like, okay, well, we're New York. We can handle this. And it caught us just really by surprise.
70		LANDSCAPE ARCHITECT KATE ORFF IS THE VISIONARY BEHIND THE LIVING BREAKWATERS PROJECT.
71		<p>Kate: So, in the aftermath of Superstorm Sandy, there was just a real sense that New York had to think differently about climate and how we were going to mitigate and adapt.</p> <p>AS A CITY SURROUNDED BY WATER AND WITH AN ASTOUNDING 520 MILES OF COASTLINE, NEW YORK HAS BECOME INCREASINGLY VULNERABLE TO BIGGER STORMS AND RISING SEAS. ITS TRADITIONAL INFRASTRUCTURE CAN’T KEEP UP.</p> <p>And so, rather than building a \$100 billion vertical sea wall to block ourselves off, we said, we're going to really embrace our watery context and try to modify our shorelines, modify our edges. So, we made a big choice, we took a different path.</p>
72	01:21:37:12	<p>THAT’S WHERE LIVING BREAKWATERS COMES IN.</p> <p>KATE AND HER ARCHITECTURE FIRM, SCAPE, HAVE BEEN WORKING WITH PETE AND THE BOP TO HARNESS ANOTHER OYSTER SUPERPOWER – OYSTER REEFS’ ABILITY TO COMBAT BOTH BIG WAVES AND RISING SEAS.</p> <p>Pete: Historically, oyster reefs probably played a huge role in protecting New York from storm surges and waves. Preventing those waves from crashing onto the shore. And they're absolutely part of the solution to protecting New York again.</p>

73		<p>KATE’S USING OYSTERS TO REIMAGINE URBAN INFRASTRUCTURE.</p> <p>Kate: We actually have oyster shells inside the unit itself.</p>
74		<p>SCAPE HAS DESIGNED A 2400 FOOT LONG SET OF BREAKWATERS IN RARITAN BAY NEAR THE SHORELINE OF STATEN ISLAND.</p> <p>Kate: Living breakwaters is like a pile of rocks that calm the waves and it creates that thick layered shoreline that is safe and protective.</p>
75	<p>GFX 103B Oyster Breakwater</p>	<p>THIS WALL WILL BE A COLLABORATION BETWEEN HUMANS—AND OYSTERS.</p> <p>THE BREAKWATERS PROVIDE SCAFFOLDING ON WHICH THE OYSTERS CAN BUILD REEFS.</p> <p>OYSTER REEFS ARE NATURE’S STORM BARRIERS - THEY DEFLECT AND DIFFUSE THE POWER OF WAVES PROTECTING THE LAND BEHIND THEM.</p> <p>AND UNLIKE MANMADE DEFENSES, THEY GROW VERTICALLY KEEPING PACE WITH RISING SEAS.</p> <p>THESE LIVING BREAKWATERS WILL BECOME STURDIER OVER TIME...AND EXPAND TO ACCOMODATE MORE LIFE.</p> <p>KATE AND HER TEAM HAVE DESIGNED EACH ELEMENT WITH MARINE LIFE IN MIND.</p>
76		<p>Kate: It looks like Legos, but it's a model of one of the many breakwater units.</p> <p>Kate: What's fun to see on this model is what we're calling reef streets. Small fish need places to hide from the larger fish in order to survive. And it's this kind of rocky complexity that enables that</p> <p>THE UNITS ARE MADE OF A FORM OF CONCRETE—CALLED E-CONCRETE—THAT SUPPORTS BIOLOGICAL GROWTH.</p>
77		<p>Kate: In addition we have this, when the water recedes in the low tide, you still have a tide pool here. So over time these become little mini worlds, in and of themselves.</p>

78	k	Kate: So we envision the living breakwaters project to align ourselves around nature not being something that we take for granted, but something that we have intentionally and purposefully designed for and cultivate.
79		OUT NEAR STATEN ISLAND ALL OF THESE SEEMINGLY DISPARATE PIECES ARE COMING TOGETHER.
80		<p>Kate: Well, it's so fun to see it under construction after what, eight years?</p> <p>Pippa Brashear: Almost nine.</p> <p>Kate: Almost nine years of blood, sweat and tears.</p>
81		ALREADY, THE TEAM HAS BEGUN SEEING THE FIRST SIGNS OF LIFE.
82		<p>Pippa: We're already seeing birds perch on it, seeing critters in the tide pools.</p> <p>Kate : We've already seen a lot of clams, lobsters... this whole shoreline is going to be booming with life.</p>
83		Kate: A couple weeks ago right on this stone over here we saw a harbor seal. That was a big moment for us. We saw the vision coming to life.
84		ONCE THE BREAKWATERS ARE ASSEMBLED PETE AND HIS TEAM WILL HELP WITH THE NEXT PHASE.
85	<p>01:25:27:17</p> <p>01:25:47:15</p>	<p>Pete: Our role is to put live oysters on the Breakwaters, so we're really excited about all the work that we've done with SCAPE and it's a really cool proof of concept that's going in the water right now.</p> <p>IT'S ALSO AN ENTIRELY NEW WAY OF REVIVING A CITY'S RELATIONSHIP WITH THE WILD.</p> <p>Kate: We used to think about the wilderness and we used to think about city building, and now we have to think about both of those things at the same time. You can't just sit back and say, well, we'll just let nature take its course. We'll just let the rewilding happen. We actually have to actively make infrastructure to enable nature to take hold again.</p>

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86		<p>Pete: We're trying to figure out how to solve the environmental challenges of the planet, we have to have more people who have fallen in love with nature, through their actions, the things that they do. And you're not going to do that if you're not trying to save something that you care deeply about.</p> <p>Pete: I know for sure that if everyone in New York City knew New York Harbor like I know New York Harbor, all of this pollution would stop immediately because you're destroying something that has this incredible value, that's full of all these cool animals and should be protected and preserved and enjoyed. I've seen ibises and kingfishers, giant flocks of gannets, I've seen whales and dolphins, by restoring the ecosystem and bringing some of those animals back into the Harbor, you can really have a city that's surrounded by wild animals again.</p>
87	01:27:14:07	PERHAPS, IN THE NOT TOO DISTANT FUTURE, THE BIG APPLE COULD RECLAIM THE NICKNAME IT WENT BY SO LONG AGO: THE BIG OYSTER.
88		END