

Welcome to Doing What Works: Exploring the Blue Economy, a podcast series that dives deep into the vast potential and challenges of the blue economy. I'm your host, Ashanti Blaize Hopkins, Interim Associate Dean at Santa Monica College's Center for Media and Design. Together, we'll navigate the uncharted waters of this exciting and rapidly growing sector.

Joining us on the podcast today is someone who has been involved in the blue economy way before the term was even coined. In the '60s, he helped run a tropical fish breeding business in Australia, where he spent much of his youth. His focus on oceans continued in the Bahamas, where he studied conch depletion in the region. He also monitored manatee populations off the Florida coast and studied mariculture in the Gulf at Texas A&M University.

In 2003, he became Secretary of the California Environmental Protection Agency under Governor Arnold Schwarzenegger and ascended to the role of Cabinet Secretary, making him the chief policy adviser to the governor. He is the architect of California's Landmark Global Warming Solutions Act of 2006, the Hydrogen Highway Network, and the Million Solar Roofs initiative.

Currently, he is the President and CEO of AltaSea, an organization based at the Port of Los Angeles that is dedicated to advancing the emerging blue economy through business innovation and job creation.

I could literally spend an entire podcast reading off our guest's long and impressive resume, but why do that when I have the man sitting in front of us? Terry Tamminem, thank you so much for joining us on the podcast today.

Terry Tamminem: My pleasure to be here.

Ashanti: So, we have a question that we ask every single one of our podcast guests on Doing What Works, and it's always the same. Tell me your first job ever and tell me what did you learn from that job that helps you do the work that you do now?

Terry: My first job? I was in high school, and on evenings and weekends, I worked in a nursery. I had to water the plants and sweep up and do all the menial chores. This was in Australia, when I was going to high school. It's the only job I have had in my entire career that I considered a "job." I can honestly tell you that every single thing I've done since then, I would have done for free if I was independently wealthy. I've been so fortunate, and that was the lesson I learned: do what you love because it makes the

days go by, and it makes you happy at the end of a long life. Hopefully not quite the end for me yet, but you get what I'm saying.

Ashanti: Yeah, we hope you're around for very, very, very long because you're doing so many impactful things in the space. And it's interesting to hear you say, and it seems like you have been doing what works in the area of the blue economy pretty much for your entire career. So, if I really think about the moment you became interested in the ocean in general and discovered that you can make a career out of it, when was that moment for you?

Terry: It was in 1992 or '93, when I met a guy named Mike HS, who was the San Francisco Baykeeper. He had started a nonprofit organization; there were four or five others, the first one was started on the Hudson River in New York by John Cronin. It was citizen nonprofits that went out and found out what was harming the environment in the ocean in their coastal region or their river, and then stopping it, drawing attention to it, doing advocacy campaigns, even using the Clean Water Act to sue polluters. And I said to myself, "That's what Santa Monica Bay needs," where I was living at the time in Los Angeles. And I said, "I want to be the Santa Monica Baykeeper." And that was it. And you mentioned all those other interactions I've had with the ocean and studying wildlife and so forth. In 1993, I founded the Santa Monica Baykeeper, and I got to go to work in a wetsuit and plant kelp off Palos Verdes as a way of restoring the ecosystem but also fighting the sources of pollution that were harming it in the first place. So that was my first job in the blue economy, but as a citizen activist and citizen habitat restorer.

Ashanti: So let's talk about some of the work that you did in the Schwarzenegger Administration here in California. I mentioned a few of the initiatives that you played a major role in getting implemented. Did you take the role of Secretary of the California Environmental Protection Agency knowing that these were the kind of policy issues you wanted to champion, or did that evolve through time as you kind of got your footing into the role?

Terry: So, this Austrian movie star bodybuilder decides he wants to run for governor. This is like the beginning of a bad joke, but in fact, that's what happened when Gray Davis was facing a recall, you may remember, in 2003, and Arnold threw his hat in the ring. And I was introduced to him by Bobby Kennedy Jr., who had been one of the other leaders in that Waterkeeper Movement. We were working together, starting Waterkeepers all over the country, and Bobby said to Arnold, as you know, Bobby's related to Maria Shriver, who was married to Arnold, said, "Listen, I know that you are an environmentalist at heart, but most people just see you as an action hero, blowing

things up and driving a Hummer. So, if you want to be a great governor, I know you care about the environment, you should talk to this guy, Terry Tamminem, who knows a lot about it and can help you." So, he introduced me, we hit it off, I talked about all the things you could do that would support the economy at the same time as you're supporting the environment, and at the time, there was just this strange belief that the two couldn't coincide.

And so, we hit it off, we wrote an environmental action plan that he campaigned on, and that's where all the ideas came from. We sat down and worked together on what were the things we'd want to accomplish, including tackling climate change as if we were a separate country, including setting aside millions of acres, not only on land for habitat preservation but in the ocean, marine protected areas, and including developing a lot of these blue and green jobs, because that would be the way to try to break this divide, which tends to be a left/right divide about, "Well, is it the environment or the economy?" when in fact, it can be both. I think, and it has to be both, really, especially here in Southern California. You can't really do one without the other, or talk about it in ways where the two aren't intertwined.

Terry: Right, and for good reason. I think we started to realize globally that we're simply going to run out of all of these resources that we used to take for granted, which includes not just, say, forests and trees and wood and minerals and so forth, but also clean air and a habitable climate, and the ocean, which, because of our carbon pollution, we've actually started to impact dramatically. And it, and two-thirds of the planet is covered by ocean, not land, and it sustains half the world's population in terms of its source of food, protein, and so on. And if we kill the ocean, we're literally killing ourselves. So I think our laws, our Environmental Protection laws, have started to realize that, and certainly, more and more people do that when you're going to develop something that you've got to take the environment into consideration, but in 100% of the cases, it always makes things better for jobs, for people, for the community, even for profits in a company.

Ashanti: Let's switch gears a little bit. So, you spent that time under the Schwarzenegger Administration doing that very important work. Shifting to AltaSea, can you tell me how AltaSea came to be in the first place and what makes that operation and that organization so unique in this space?

Terry: You know, I'm so excited. This is an example of where I would go to work for free, if I could afford it. Don't tell my board that. But the fact is, that it's almost the culmination of all the things I've been doing in my career because it brings together the nonprofit side, obviously the citizen activism side, the business side. Since I left the

Schwarzenegger Administration, I've been working in both the green and blue economy with investment firms and technology firms, and the UN Green Climate Fund, and others, to try to help the world do what California has done in terms of sustainability and clean energy and so forth. So here we are at AltaSea, where I get to do all of that right in my own backyard in San Pedro, in the Port of Los Angeles.

And so, about eight years ago, long before I got involved, there was the Annenberg Foundation, and our founder, Jenny Cruso, and others who got together. Our current board chair, Geraldine Knatz, was, at the time, the head of the port, and they all got together, and they said, "What are we going to do with this 35-acre historic campus that's called City Dock Number 1?" It was literally the first place that ships could dock and offload cargo in Los Angeles and had long since become irrelevant because of container ships and cruise ships and all those things. So, "What are we going to do with this?" And they envisioned a place where you could educate kids, K through 12, about the importance of the ocean, where you could then do job training for the blue economy, hopefully get some of those kids to be excited about the job opportunities. But then, importantly, to incubate and accelerate and develop the businesses in the blue economy.

And so, the nonprofit was created, a long-term lease was put together that essentially is free to AltaSea as long as we raise the tens of millions of dollars to renovate these 110-year-old historic warehouses on this campus into this modern Blue Economy Hub, which we're doing. And then, of course, educate and engage the public as well. So, when we say "blue economy," we mean aquaculture, both on land and at sea, to help sustainably produce food and fuel and pharmaceutical and industrial products. It's amazing what you can get from seaweed, not to mention, obviously, fish and other seafood. We also mean renewable energy, so things like wave and tidal energy. Just this year, we passed Senate Bill 605, which, with bipartisan unanimous support, I should add, that will incentivize wave and tidal energy production the same way the state has incentivized things like solar and wind.

It also includes extracting carbon from seawater, which is much more efficient than trying to take carbon pollution out of the air. And one of the byproducts is green hydrogen, so that's something we can then use to help decarbonize ships and container handling equipment in the ports. And then, lastly, we focus on blue technology, like underwater robotics and mapping and different kinds of ways to understand our changing planet.

Ashanti: You mentioned renovating those tens of millions of dollars to renovate that area that you all occupy at the Port of Los Angeles. Tell me where we are right now with

those renovations and what's coming. Obviously, you have some tenants that are already there; they're kind of shifting around as you do the renovations. But what is this going to look like when it's completely complete, and when is it going to be fully operational and online?

Terry: Well, first of all, I want to make sure your listeners know how to find us. It's AltaSea.org, A-L-T-S-E-A.org, and we will update everybody there all the time. And I have to tell you, I go into work every day, and it's literally different for me every day. I say, "Wait a minute, where did that come from?" We have so many exciting things going on, even when, before the renovation began. But right now, we're in the middle of this tens of millions of dollars of renovation where 180,000 square feet of these historic 110-year-old warehouses will be modernized with modern plumbing and electrical and restrooms and offices and those things, but also maker spaces. In other words, where researchers can come in and set up water tanks, or underwater robotics design centers, or whatever it might be, and then work with the companies that will spin those out into technologies and companies, which then, of course, creates jobs.

And so, we've already started. We have, for example, the University of Southern California has a kelp lab. There's about 5,500, 100-gallon tanks. It looks like a Jacuzzi farm, and they're all bubbling, and there's grow lights on top of them because it's indoors. And you look inside, and here's all these different forms of kelp and seaweed growing, and they're learning which types of these kinds of seaweed will survive in a warming ocean because our planet is changing, and which ones will extract more protein or more fuel if you're trying to get that out of those fast-growing plants. We have a hatchery for mussels, clams, and oysters called Holdfast, and that's a for-profit company. They produced, this year, 500 million baby mussels, clams, and oysters. Now, not all of those will survive, but the ones that do, they send out to oyster farmers and mussel farmers all up and down the state and the west coast to be turned into food, which is really exciting.

We have Bob Ballard, who found the Titanic. He builds his underwater drones and various kinds of mapping devices and tests them at AltaSea, and then sends them out to the Nautilus, his vessel, where he teaches more about the undersea world but then also explores and looks for more scientific discoveries, as well as more Titanics. And we have EVE, is another good example of one of our technology companies. It's from the Middle East, where they've figured out how to harness the energy from waves that come ashore on breakwaters and jetties, which are already designed to protect infrastructure. They absorb the waves, so instead of just absorbing the waves, this technology turns that into electricity. And is already doing it throughout the Mediterranean, so now can do it here in California. And the list goes on. But it's a really

exciting, dynamic place. We have a company called Vertical Oceans coming in soon, which, as the name implies, will be growing shrimp in vertical tanks indoors, all automated with AI and robotics, looking at every single shrimp for its health, for its growth, and in 90 days, from the time it's born in our facility till the time it's on your plate, you'll have a jumbo shrimp that was all produced by a great team of workers right at AltaSea.

Ashanti: Exciting time to be in the business that you're in.

Terry: You bet.

Ashanti: So, you mentioned earlier about kind of the policy part of the blue economy. Senate Bill 605, just signed into law recently, authored by State Senator Steve Padilla, AltaSea, and your organization, that... How do you think that particular policy is going to impact the blue economy and help it move forward here in the state of California?

Terry: Well, I think the first thing it's going to do is create a lot of clean energy but a lot of clean energy jobs that are very different from, say, solar or wind energy jobs today. And I must tell you, this is one of the things that keeps us awake at night, and why we're so excited about partnering with our 13 community colleges, including SMC, to work on workforce training and workforce certificate programs in these blue economy sectors because a bill like Senate Bill 605 was modeled after the one in 2021 that incentivized offshore wind. Well, two years later, there's 300 or about three-quarters of a billion dollars of offshore wind leases that were authorized in California, and a whole wind energy sector that grew overnight. Well, the same thing is going to happen with wave and tidal energy because of Senate Bill 605, and we don't have the trained workers.

So, we need people to come and get into these exciting jobs of designing and deploying and maintaining and innovating. There's so much innovation. 30 different wave and tidal energy companies are part of our coalition already that are informing the state about how to draft this policy and how to make it probable for them to be able to succeed in California. And so, again, it's all about the jobs and the workforce opportunities that will accelerate this.

Ashanti: With innovation often comes additional companies and organizations that are getting into the space. I know that permitting has been a challenge here in the state of California, with some companies waiting two, five, even ten years to be able to go through the process. What do you think needs to happen to streamline the processes that are already in place to make sure that as this blue economy starts to expand, we

can have more innovative companies and organizations being able to set up shop and start their production and processes in the state of California?

Terry: The first thing we need to do is have a place like AltaSea, and not to be too self-serving, but because it's a place where you can bring the parties together, show them what's possible. You know, for example, if we had just brought to Sacramento the one company I mentioned, EVE, that's at our site, and said, "Hey, there's this great wave energy company that wants to come to California," they'd say, "Okay." But when we brought 30 companies that are innovative from all over the world, they said, "Alright, that deserves a new law and streamlined permitting and perhaps financial incentives and so forth."

So, I think by bringing the parties together, showing policymakers, the community, that's really important. Our work on hydrogen is one of those things where there's a lot of people skeptical about, "How is it produced, and does it go boom in my community?" and things like that. "Will it be safe? Will it be good for jobs?" So, we hold community exercises, community opportunities in our open houses and so forth, to make sure everybody understands these technologies and can be part of it, and that we hear their concerns and we can address those concerns because that's usually what stalls out permitting and projects.

And I think it's also important to use a place like AltaSea to bring the feds together with the state because too often, state agencies are saying, "Well, go talk to the Army Corps of Engineers, or go talk to this one or that one," and then the feds are saying, "Well, what does your state think? What does your Coastal Commission think?" And the next thing you know, everyone's just going back and forth to different offices, and nothing gets done. So, I think, again, having a coalition that's organized by a nonprofit like us can make all the difference.

Ashanti: Shrinking the numbers seems to be a way to move forward in many industries, but especially when it comes to the blue economy here in California. If I think about some of the innovations that four-year institutions and two-year institutions are doing in this space, it seems like there are things that are starting to develop that are going to help to train the future workforce that is going to be needed for these blue economy jobs. Santa Monica College, for example, has an aquaculture certificate coming online in the spring. If you look at programs like that and certificate programs like that, what types of skills do you think students need to master in order to be able to get jobs at either AltaSea or other organizations that might inhabit AltaSea as tenants? And what do you think the benefit is of starting at the community college level to educate students about what's happening next in the blue economy space?

Terry: I'd say the first thing is, community colleges tend to be much more close to the ground, so to speak. Nothing against our four-year colleges or private universities or other institutes of higher learning, but there's a certain amount of kind of ivory tower and theoretical, academic qualities to some of those universities and classes. I think the mere fact that, for example, as you mentioned, SMC has a certificate program where a person can come out of high school with some STEM classes, go through a less than two-year certificate program, come out with a certificate that qualifies them to get a great job. That's real, on the ground, roll up your sleeves, and do something with that education. Now, that doesn't stop them from then going on to a four-year degree or something additional once they find their passion and they find the jobs they would do for free if they were independently wealthy.

And I think the opportunity exists to also harness what's already there. So, for example, our communities around the ports, in San Pedro and Wilmington and Long Beach, these are typically very underserved communities, and that are often downwind of refineries or, of course, the pollution generated by ships and the ports. So, they get underserved in many ways. But because of automation in the ports and containerization, the longshore workers, the manual laborers that used to unload ships are far fewer now. There's... It doesn't take as many people to do those jobs, and yet the skills are there. The same thing is true of the fishing industry, which has been decimated because of overfishing and various other challenges, and the food preparation business. It used to be that there were canneries for tuna and other fish right in the Port of Los Angeles. Those are all gone, but the skills are still in the community, sometimes many generations that were doing those jobs. So, here's a chance for those folks to go to a community college, maybe change careers. Might not just be kids coming out of high school. This could be somebody who has always wanted to work in and around the ports in their own community. Here's a chance for them to learn how to do that.

And then, to answer the second part of your question, I think while it's important to understand the nuts and bolts of things, like literally nuts and bolts of how do you attach a wave turbine to a jetty so that it can generate electricity and how does all that work, what's the engineering, we also live in a digital world. And I think, for example, with our underwater robotics, even with the thing like I mentioned with Vertical Oceans growing shrimp in a warehouse, it takes artificial intelligence and cameras to look at every single shrimp and tell you its health and its growth cycle and how much food to give it and the rest of it. So that kind of thing takes a lot of digital knowledge. And so, young people today, even older people that are interested in computer coding and computerization and artificial intelligence, don't think that just because we're talking about things like wave energy or aquaculture that that doesn't include you. It certainly does.

Ashanti: I mentioned early on when I was introducing you that you've been really a part of the blue economy, even before it was a term that had a name. And if you think about the length of time that you've kind of seen the evolution of what the blue economy has become and what it will become, what is your dream state for the blue economy? What does it mean for you if you had a magic wand and you could just, you know, "This is what it's going to be, and this is what it needs to be." What does that look like for you?

Terry: I'd say the number one thing is a balance between protecting and restoring the ocean and harvesting sustainably from it because we haven't done that. And, as you probably know, many of your listeners may know, that the excess carbon pollution we've been pumping into the atmosphere for more than 100 years, about a third of that has been absorbed by the ocean, and it, it's turned it more acidic. We literally, as human beings, we literally are powerful enough and, frankly, stupid enough to have changed the very chemistry of the ocean, the thing that covers two-thirds of this planet and gives us most of our oxygen and various other aspects of life, controls our weather, and you name it. And we've got to reverse that. We have to figure out ways to do what's happening at AltaSea. We're the only place in the world where three universities are testing and demonstrating how to remove that carbon pollution from the ocean, and in the process, create green hydrogen that, as I mentioned before, can be used to decarbonize shipping and goods movement.

But, we've got to restore the ocean at the same time as we're using it. And so, any kind of aquaculture offshore needs to be restorative or regenerative and not just extractive. And then, again, we can do much of that on land, as I mentioned, whether it's shrimp or other kinds of what are called recirculating aquaculture systems or RAS systems. That's a whole new group of technologies that's waiting to grow and can be located anywhere. It doesn't have to be on the coast; it could be in Bakersfield.

Ashanti: What would be, you think, the biggest hurdles or challenges to getting to that dream state? And do we have any room for any missteps? Do we have any room to get this wrong?

Terry: Well, no, I don't really think we have a whole lot more time left. I think the climate disasters we're seeing every single day... I was having a conversation with my insurance broker the other day, from my home, and they don't want to renew my homeowner's policy when it comes up next spring because they're leaving the California market because of climate change and the number of catastrophic fires and floods and other costs of doing business in California. So, they're literally leaving the state. That's costing people... My sister lives in Florida, where, for years, you couldn't get homeowner insurance living along the coast. You had to buy into the state-propped up insurance

pool, much like here in California we do for earthquakes. But that just shows you the cost of climate change has already exceeded our ability to pay for it. So, we can't keep making the same mistakes and hope to have a sustainable future.

But, again, that's the good news. We don't have to make that false choice between a strong economy and a strong environment. If we do this right, especially with the blue economy, we can be restoring that two-thirds of the planet that's covered by saltwater.

We can sustainably harvest food and fuel for the future, even things that we've never thought about. There's a protein in a common clam shell that's now been found to cure cancer. If we continue to destroy the ocean or make it more acidic, those clams can't form those shells. We're harming ourselves. We have the ability to heal ourselves and our planet by treating the ocean sustainably and then using it sustainably.

Ashanti: We have a lot of wiggle room to be able to do what works. We just got to kind of do it right.

Terry: Get on with it, exactly. And I think it starts with podcasts like this, to be honest, because you're telling more people about the blue economy, why the ocean is important to them, even if they don't live anywhere near it, and that this is really the key to life on our planet.

Ashanti: Terry Tamminem, thank you so much for sharing your thoughts and insights with us today, and thank you for joining us on this incredible journey through the blue economy. We hope this episode has inspired you to explore further and learn more about this vital sector. If you enjoyed *Doing What Works: Exploring the Blue Economy*, be sure to subscribe to our podcast and leave us a review. Stay tuned for more exciting episodes that push the boundaries of knowledge and open new possibilities. Until next time.