

# THE WHALE WHO DANCED THE BLUES: SOME THOUGHTS ON SAVING THE WORLD'S OCEAN

BY

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*This Lecture uses the story of Tahlequah, a Southern Resident orca who carried her dead calf for seventeen days across the Salish Sea, as a narrative entry point into a broader inquiry about the vulnerability and resilience of the world's marine habitats.*

*The world's oceans and coastal waters—on which we depend for food, oxygen, and climate control—are in desperate shape because of poorly managed human activity, namely pollution, overfishing, and unwise development and extraction. As if that is not enough, climate breakdown has now turbocharged the ocean's unravelling. Existing ocean governance regimes have failed us. They are too fragmented, fixed, and detached from both ecological reality and coastal communities to meet today's challenge.*

*This Lecture proposes an alternative approach, one that is deep, dynamic, and engaged. This approach emphasizes ecosystem-scale management, adaptive legal tools capable of responding to rapid ecological change, and meaningful participation by local and Indigenous communities. Using examples of marine protected areas, mobile conservation zones, dam removal in the Pacific Northwest, and emerging "rights of nature" movements, this Lecture shows how law can be reimagined to support ocean resilience and climate justice. Ultimately, it argues that effective ocean protection is not only a scientific or legal necessity, but a moral project—one that transforms grief and empathy into collective action to sustain the ocean systems on which human and nonhuman life depend.*

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Thumping across the waves in an open skiff, Lynda Mapes, a local journalist, was scanning the water for any sign of the mother Tahlequah or of the baby she had recently lost.<sup>1</sup> As the sun fell behind the mountains, the sky took on a pinkish glow. Visibility was low, Mapes recalls, as she describes the scene to me years later. The sea was getting rough, but the writer's patience would pay off. Across the buckling waters of the Southern Gulf Islands in British Columbia, Tahlequah's silhouette eventually slid into view, encircled by members of her traveling clan. And sure enough, Mapes tells me, the orca was still holding her dead calf.

The baby was easiest to see, she says, when Tahlequah balanced the calf on her head; less so when clasped in the mother's teeth. Mapes stresses that Tahlequah took great care not to damage the fragile carcass. Researchers have observed orcas and other whales carrying their dead, but usually only for a few hours.<sup>2</sup> The evening Mapes spotted Tahlequah near the Gulf Islands, the whale had been carrying the calf for several days. It could not have been easy—the baby's body was seven feet long and weighed more than four hundred pounds. Tahlequah's traveling family—her pod—swam dozens of miles a day through jolting seas. All the way, Mapes says, Tahlequah would nose the calf a few feet forward, plunge and grip the body as it sank, hoist it out of the water to take a breath, and repeat.

Deborah Giles, an orca researcher at the University of Washington in Seattle, was similarly amazed by the effort. “She has to prime herself six, seven breaths to take a deep, long dive to get that carcass,” Giles said.<sup>3</sup> “What is killing me is when is it going to be the last time? And she has to make the decision not to go get it.”<sup>4</sup>

Giles and other orca experts were worried that Tahlequah was putting herself at risk. “A healthy, young female orca at just twenty years old,” says Mapes, “is crucial to the future of this family of orcas.”<sup>5</sup> Every baby matters too. In the summer of 2018, there were only about seventy-five individuals left in this endangered population, known in these waters overlaying the United States-Canadian border as the “southern residents.”<sup>6</sup> By all accounts, their luck was running out.<sup>7</sup>

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<sup>1</sup> My description of Tahlequah's journey, unless otherwise noted, is based on LYNDIA V. MAPES, ORCA: SHARED WATERS, SHARED HOME 15–23 (2021) and a Virtual Interview with Lynda V. Mapes, Environmental Reporter, Seattle Times (Sep. 16, 2024).

<sup>2</sup> Giovanni Bearzi et al., *Whale and Dolphin Behavioural Responses to Dead Conspecifics*, ZOOLOGY, June 2018, at 1, 2.

<sup>3</sup> Lynda V. Mapes, *Grieving Mother Orca Falling Behind Family as She Carries Dead Calf for a Seventh Day*, SEATTLE TIMES (May 13, 2019), <https://www.seattletimes.com/seattle-news/environment/grieving-mother-orca-falling-behind-family-as-she-carries-dead-calf-for-a-seventh-day/> [<https://perma.cc/P5R2-JEMH>] (quoting Deborah Giles).

<sup>4</sup> *Id.*

<sup>5</sup> MAPES, *supra* note 1, at 17.

<sup>6</sup> *Id.*; Press Release, Ctr. for Biological Diversity, Death Brings Endangered West Coast Orca Population to Lowest in Decades: Trump Administration Stalls Protections as Southern Resident Killer Whales Drop to 75 (June 18, 2018), <https://>

For generations, these whales have battled an armada of stressors, from pollution to ship collisions to industrial marine noise.<sup>8</sup> But the most obvious problem is lack of food.<sup>9</sup> The southern residents feed on salmon, and overfishing and reckless development have decimated the stock.<sup>10</sup> Experts say the region's hotter waters—caused by climate disruption—now make everything worse.<sup>11</sup>

Tahlequah's calf, a female, was born on July 24, 2018.<sup>12</sup> She lived for less than half an hour, departing this world before human researchers could even assign her a name. The calf was malnourished and lacked enough blubber to stay afloat. Tahlequah would carry her baby for seventeen days across more than a thousand miles before finally releasing the decomposed body and rejoining her pod, showing no signs of injury or ill health. Tahlequah's so-called "dance of grief" captured news headlines and social media posts around the world. Avi Selk of the *Washington Post* wrote: "People wrote poems about Tahlequah and drew pictures. People lost sleep thinking about the whale. A scientist cried thinking of her. Tahlequah inspired . . . a sense of interspecies kinship in some mothers who had lost children."<sup>13</sup> Members of the Lummi Nation, one of several coastal tribes occupying lands from British Columbia to Oregon, pledged to do everything in their legal and political power to protect the resident orcas, whom they see as spiritual relatives.<sup>14</sup>

"Heartbreaking." I read the word again and again in news stories, blogs, and Instagram posts recounting Tahlequah's plight.<sup>15</sup> Anyone who

[www.biologicaldiversity.org/news/press\\_releases/2018/southern-resident-killer-whale-06-18-2018.php](http://www.biologicaldiversity.org/news/press_releases/2018/southern-resident-killer-whale-06-18-2018.php) [<https://perma.cc/FTV2-H6AU>].

<sup>7</sup> See MAPES, *supra* note 1, at 18 ("These orcas have been in trouble for years, listed in the United States for protection as an endangered species since 2005 and in Canada under the Species at Risk Act since 2003.").

<sup>8</sup> MONIKA WIELAND SHIELDS, ENDANGERED ORCAS: THE STORY OF THE SOUTHERN RESIDENTS 248–49, 254–55 (Orca Watcher 2019).

<sup>9</sup> *Id.* at 266–67.

<sup>10</sup> See MAPES, *supra* note 1, at 83–85 (explaining how overfishing, hatchery practices, and urban development are a driving force of salmon decline in the Pacific Northwest).

<sup>11</sup> ERICH HOYT, ORCA: THE WHALE CALLED KILLER 283 (5th ed. 2019); MAPES, *supra* note 1, at 75.

<sup>12</sup> See MAPES, *supra* note 1.

<sup>13</sup> Avi Selk, *Update: Orca Abandons Body of Her Dead Calf After a Heartbreaking, Weeks-Long Journey*, WASH. POST: ANIMALS (Aug. 12, 2018), <https://www.washingtonpost.com/news/animalia/wp/2018/08/10/the-stunning-devastating-weeks-long-journey-of-an-orca-and-her-dead-calf/> [<https://perma.cc/R96T-5LTH>].

<sup>14</sup> See *Tribes Support Southern Resident Killer Whale Task Force*, NW TREATY TRIBES (Oct. 12, 2018), <https://nwtreatytribes.org/tribes-support-southern-resident-killer-whale-task-force> [<https://perma.cc/HD8N-8YJT>] (quoting Lummi Nation Chairman Jay Julius: "Lummi Nation is just stepping up to do the right thing and do what we can to help").

<sup>15</sup> See, e.g., Beau Denton, *The Dynamic Grief of Tahlequah: What a Whale Can Teach Us About Grief*, FATHOM (Oct. 15, 2018), <https://www.fathommag.com/stories/the-dynamic-grief-of-tahlequah> [<https://perma.cc/GU39-BA4A>] (reflecting on the story of Tahlequah and grief); Laura Berman, *Carrying Loss: What Tahlequah the Whale Teaches Us About Grief*, DR. LAURA BERMAN (Jan. 16, 2025), <https://drlauraberman.com/carrying-loss-what-tahlequah-the-whale-teaches-us-about-grief/> [<https://perma.cc/UR3Y-XZ3X>] (discussing

has ever lost a family member knows that feeling. But while heartbreak may be the starting point for this senseless loss, our next step is to turn that empathy into some kind of meaningful action. Because what we risk losing, as portended in those chilly coastal waters, is more than a newborn calf, a venerable whale community, or even a priceless ecosystem. It is, to use Rachel Carson's titular phrase, all "[t]he [s]ea [a]round [u]s"—the whole global ocean.<sup>16</sup>

This is not an exaggeration. The world's oceans and coastal waters—on which we depend for food, oxygen, and climate control—are in desperate shape because of things humans are doing.<sup>17</sup> And every category of those activities—from pollution to overfishing to unwise development and extraction—contributes to the threat that Tahlequah and her extended family now face.<sup>18</sup> Although that alone would be bad enough, climate breakdown has accelerated the ocean's unravelling.<sup>19</sup> If we do not recognize and address this challenge, we could lose much of what has kept our species alive and thriving for 300,000 years—the food stocks, the protective reefs, the climate-regulating currents, and more. Humans will soon be dancing the blues unless we turn this ship around; and, believe me, we can.

I may be the last person you would expect to know something about the ocean. I am a lawyer from Las Vegas. My maternal grandparents moved west from their home in Tulsa, Oklahoma soon after the Dustbowl. The only thing they knew about water, according to my grandmother, was that there was never enough of it. That was not entirely true. By the 1930s, Hoover Dam had already corralled a lake of

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grief, Tahlequah's story, and the experience of losing a child); *Tribute to Tahlequah*, NW. ARTISTS AGAINST EXTINCTION & SAVE OUR WILD SALMON, <https://nwaae.org/art-in-action/tribute-to-tahlequah> [<https://perma.cc/4DY6-CKCW>] (honoring Tahlequah through a collection of artwork and poetry); Rosemary Ellis, *Tahlequah's Story*, INTL. MARINE MAMMAL PROJECT (Feb. 19, 2025), <https://savedolphins.eii.org/news/tahlequahs-story> [<https://perma.cc/KZ3K-MNQ3>] (sharing Tahlequah's story and the threats facing southern resident orcas); Image posted by American Rivers (@americanrivers), INSTAGRAM, *Heartbreaking images of Tahlequah* [...] (Jan. 10, 2025), <https://www.instagram.com/p/DEpxyD4Prtv/> [<https://perma.cc/9987-2Q7B>] (depicting Tahlequah carrying her dead calf through the waters of the Puget Sound); Image posted by National Geographic, FACEBOOK, *Tragedy has again struck Tahlequah, the orca mom* [...] (Jan. 9, 2025), <https://www.facebook.com/natgeo/posts/tragedy-has-again-struck-tahlequah-the-orca-mom-who-captured-the-worlds-attention/1162135675283861/> [<https://perma.cc/VC5A-SDW7>] (showing Tahlequah carrying her dead calf and offering an explanation for viewers).

<sup>16</sup> RACHEL CARSON, *THE SEA AROUND US* (3d ed. 2018).

<sup>17</sup> Jan McDonald, Jeffrey McGee & Richard Barnes, *Oceans and Coasts in the Era of Anthropogenic Climate Change*, in RESEARCH HANDBOOK ON CLIMATE CHANGE, OCEANS AND COASTS 2, 2 (Jan McDonald, Jeffrey McGee & Richard Barnes eds., 2020).

<sup>18</sup> See MAPES, *supra* note 1, at 18; SHIELDS, *supra* note 8, at 247.

<sup>19</sup> Intergovernmental Panel on Climate Change [IPCC], *Summary for Policymakers*, in IPCC SPECIAL REPORT ON THE OCEAN AND CRYOSPHERE IN A CHANGING CLIMATE 3, 9–10, 13–14 (Hans-Otto Pörtner et al. eds., 2019).

several square miles.<sup>20</sup> By the 1970s, it was sending gushes of potable water through Las Vegas faucets.<sup>21</sup> I profited from both, learning to swim in one of the city's abundant hotel swimming pools (the Stardust) and fishing for trout on Lake Mead. More importantly, thanks to the opening of Interstate 15 around the time I was born, short jaunts from Vegas to the California coast were possible for a working-class family like mine. I quickly embraced Sea World, sandcastles, and boogie boarding.

Since moving to New Orleans more than twenty years ago and experiencing the destruction of Hurricane Katrina, I have built a career wrestling with laws to help people transcend ecological breakdown.<sup>22</sup> Much of my work involves studying coastal areas in the United States and around the world. I have trawled the Gulf of Mexico with Louisiana shrimpers, toured marine labs at the Woods Hole on Cape Cod, dived with Polynesian spear fishers, and, for over thirty years, I have regularly kayaked the Salish Sea—the place that Tahlequah and her family call home.

In the classroom, I often start my environmental law course by showing a color photograph of Earth taken on December 7, 1972, by an astronaut aboard Apollo 17 on the way to the moon. Known as the “Blue Marble,” the photograph is one of the most reproduced images in history.<sup>23</sup>

“Amid the turmoil of Vietnam and the stirrings of the world's modern environmental movements,” I say, easing into a smooth baritone, “this image forever changed the way people would imagine our planet. See how tiny we are, how vulnerable—you and me—sailing together on this spaceship called *Earth*.”

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<sup>20</sup> *Storage Capacity of Lake Mead*, U.S. NAT'L PARK SERV. (Dec. 13, 2022), <https://www.nps.gov/lake/learn/nature/storage-capacity-of-lake-mead.htm> [<https://perma.cc/ZK98-9WUF>]; see generally, MICHAEL HILTZIK, COLOSSUS: HOOVER DAM AND THE MAKING OF THE AMERICAN CENTURY 119, 389 (2010) (“Once full, its reservoir would hold 30.5 million acre-feet of water, or ten trillion gallons, inundating 227 square miles of grassed valley to an elevation of 1,229 feet above sea level.”).

<sup>21</sup> *A Familiar History of Water and Population Growth*, PENN. ST. UNIV., <https://courses.ems.psu.edu/earth111/node/950> [<https://perma.cc/4C7X-DN2H>] (last visited Feb. 5, 2026).

<sup>22</sup> See, e.g., ROB VERCHICK, THE OCTOPUS IN THE PARKING GARAGE: A CALL FOR CLIMATE RESILIENCE (2023); DANIEL A. FARBER ET AL., DISASTER LAW AND POLICY xxi–xxii (2d ed. 2010); ROBERT R. M. VERCHICK, FACING CATASTROPHE: ENVIRONMENTAL ACTION FOR A POST-KATRINA WORLD 3 (2010).

<sup>23</sup> Nat'l Aeronautics & Space Admin. (NASA), Eugene A. Cernan, Ronald E. Evans & Harrison H. Schmit, *Blue Marble* (photograph 1972), posted by NASA (Nov. 30, 2007), <https://www.nasa.gov/image-article/blue-marble-image-of-earth-from-apollo-17/> [<https://perma.cc/8PB5-W4M3>]; see Gregory A. Petsko, *The Blue Marble*, GENOME BIOLOGY, Apr. 2011, at 1, 1 (comparing the popularity of the Blue Marble photo to other iconic pictures).



*“Blue Marble,” NASA photograph, credited to astronauts Eugene A. Cernan, Robert E. Evans, and Harrison H. Schmitt (1972) (public domain)*

Years earlier, I first saw the “Blue Marble” picture in another classroom—in a little Catholic school not far from downtown Las Vegas. I was in third grade, and Sister Virginia had turned to the photo in *Life* magazine and asked us what we saw. Someone said “Africa,” and Sister Virginia said that was right and noted that if you looked carefully at the shading on that continent you could see two big deserts—the Sahara in the north and the Kalahari in the south. “My mom’s a *cashier* at the Sahara,” I recall saying, always looking for the laugh. Someone else asked if *our* desert, the Mojave, looked like that from space, and we all agreed that it probably did. If anyone mentioned water, I do not remember it—you see what you know.

Because Apollo 17 was the last manned lunar mission,<sup>24</sup> no human being has since travelled far enough into space to capture the whole planet in a single shot. But in 2005, NASA released a fascinating view of the globe, which I also show in my lectures. That picture, assembled from satellite images, is called “Water Planet.”<sup>25</sup>



“Water Planet,” NASA image, created by Robert Simmon and Marit Jentoft-Nilsen based on satellite data (2005) (public domain).

What I love about this picture is that no matter how hard you try, you cannot avoid the most striking feature of our home: “water, water everywhere.”<sup>26</sup> In the seas, at the poles, filling every cloud that rolls: 332,500,000 cubic miles of water.<sup>27</sup> Nearly all of it—about ninety-seven percent—is sloshing in the ocean, a body so vast it covers nearly all of

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<sup>24</sup> See Sarah Scoles, *Why Is It So Hard to Go Back to the Moon*, SCI. AM. (Sep. 17, 2024), <https://www.scientificamerican.com/article/why-is-it-so-much-harder-for-nasa-to-send-people-to-the-moon-now-than-it-was-during-the-apollo-era/> [<https://perma.cc/RJ6E-XA44>].

<sup>25</sup> NASA, *The Water Planet* (photograph 2005), posted by NASA (Apr. 22, 2011), <https://www.nasa.gov/image-article/water-planet/> [<https://perma.cc/7DAM-RSK6>] (created by Robert Simmon and Marit Jentoft-Nilsen, based largely on observations from the Moderate Resolution Imaging Spectroradiometer on NASA’s Terra Satellite).

<sup>26</sup> SAMUEL TAYLOR COLERIDGE, *THE RIME OF THE ANCIENT MARINER* (1798), reprinted in *ENGLISH ROMANTIC WRITERS* 404, 407 (David Perkins ed., 1967).

<sup>27</sup> U.S. Geological Surv., *How Much Water is There On, In, and Above the Earth?* WATER SCI. SCH. (Nov. 13, 2019), <https://www.usgs.gov/water-science-school/science/how-much-water-there-earth> [<https://perma.cc/6N9P-U3MP>].

Earth's surface.<sup>28</sup> Consider that phrase, “*the* ocean.” As the words suggest, it is one blanket of water, singular and determinative. To help our brains comprehend the immensity of just what is in that picture, mappers of yore scissored it into smaller pieces—the Pacific, the Arctic, the Southern Oceans; the Salish, the Bering, the Tasman Seas; Hanalei Bay, the Kamchatka Strait, the Tetamanu Pass, and more. But the truth is we are talking about one vast, circumspherical body of liquid whose waves and particles could conceivably visit any point on any shore.

The global ocean covers more than seventy percent of the Earth's surface and makes up ninety-nine percent of all the space available for life.<sup>29</sup> It provides a universe of free goods and services, from the food we eat to the oxygen we breathe.<sup>30</sup> The ocean regulates the global climate and provides an enormous buffer against climate change impacts.<sup>31</sup> In the last 200 years, the oceans have absorbed nearly one-third of the carbon dioxide we have pumped out and ninety percent of the extra heat that we have trapped.<sup>32</sup> But those storage services come at a cost. Carbon makes seawater more acidic, which makes it harder for shellfish, like mollusks, to grow shells and coral to build reefs.<sup>33</sup> Heat adds another stressor.<sup>34</sup> As coral reefs die, we lose healthy ocean habitat necessary for the species that rely on coral reefs for food and protection.<sup>35</sup> Yet, despite this vulnerability, our oceans have extraordinary power to rebound and thrive once more.<sup>36</sup> With smart policies, sound science, strong financing, and local wisdom, we can make the ocean more resilient and allow it to thrive for the many generations, human and non-human, to come.

We have big challenges, but they are not impossible. Tahlequah never gives up, and neither do I. Her story is not a jeremiad, but *a call to action*—a Triton's trumpet—rousing us to appreciate the marvels and frailties of the ocean, and to consider some important strategies that people, nations, and industries should adopt to make real progress at scale.

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<sup>28</sup> *Id.*

<sup>29</sup> ROBIN KUNDIS CRAIG, COMPARATIVE OCEAN GOVERNANCE: PLACE-BASED PROTECTIONS IN AN ERA OF CLIMATE CHANGE 11 (2012) (citing the United Nations Development Programme).

<sup>30</sup> *Id.* at 12–14.

<sup>31</sup> David Freestone & Millicent McCreath, *Climate Change, the Anthropocene and Ocean Law: Mapping the Issues*, in RESEARCH HANDBOOK ON CLIMATE CHANGE, OCEANS AND COASTS, *supra* note 17, at 49.

<sup>32</sup> *Id.* at 49.

<sup>33</sup> *Id.* at 54.

<sup>34</sup> *Id.*

<sup>35</sup> *Id.*

<sup>36</sup> See generally JEAN-PIERRE GATTUSO ET AL., INST. FOR SUSTAINABLE DEV. & INT'L RELS., OPPORTUNITIES FOR INCREASING OCEAN ACTION IN CLIMATE STRATEGIES (2019) (policy brief discussing opportunities to reduce the consequences of climate change in the global ocean).

The main barrier is that we lack effective governance structures, disagree about core values, and too often ignore the wisdom and needs of local communities. Having studied environmental resilience challenges for decades, I think we can plot a better course by building governance structures that are collaborative and holistic, and by involving coastal communities in the design and implementation of effective and just solutions. In this way, we can renew our oceans and strengthen local communities at the same time.

If I could name the main problems with marine governance in just a few words, I would say that our governing system is too *shallow*, *fixed*, and *detached*. Ocean law is despairingly splintered and shallow. As Robin Kundis Craig writes, “[i]n the United States, as is true in many coastal nations, the law governing human use of the ocean tends to view—and value—the marine realm as a series of discrete goods and services that benefit humans.”<sup>37</sup> International ocean governance is similarly fraught with “fragmentation . . . across jurisdictions and sectors.”<sup>38</sup> Fragmented governance has reduced the dream of a robust and vibrant ocean to a flotilla of life rings segregated by species and place. There are federal laws protecting Atlantic salmon, North Pacific halibut, and subtropical sponges.<sup>39</sup> There are treaties devoted to turtles, haddock, and Antarctic seals. But too often there is little thought given to any comprehensive vision of marine protection. And, as Craig points out, laws focused on individual species tend to dwell on restrictions on catch rather than on more foundational concerns like health and habitat.<sup>40</sup> We need ocean law that is *deep*, not shallow.

Ocean law must also be *dynamic*. Ecologists have long known that complex ecosystems can slip in and out of balanced states. In the Salish Sea, the decimation of salmon runs (attributable to dams, pollution, and overfishing) has pushed Southern Resident orcas to the brink of extinction.<sup>41</sup> Conversely, a surge in seal and sea lion populations in the Salish Sea (attributable to federal protections for marine mammals) has

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<sup>37</sup> Robin Kundis Craig, *Re-Envisioning the Value of Marine Spaces in Law: Massachusetts Lobstermen’s Association v. Ross*, in RE-ENVISIONING THE ANTHROPOCENE OCEAN 151, 151 (Robin Kundis Craig & Jeffrey Mathes McCarthy eds., 2023) [hereinafter Craig, *Re-Envisioning the Value of Marine Spaces in Law*].

<sup>38</sup> McDonald, McGee & Barnes, *supra* note 17, at 19.

<sup>39</sup> See Atlantic Salmon Convention Act of 1982, 16 U.S.C. §§ 3601–3608 (2018); Northern Pacific Halibut Act of 1982, 16 U.S.C. §§ 773–773k (2018); Regulation of Landing, Curing, and Sale of Sponges Taken From Gulf of Mexico and Straits of Florida, 16 U.S.C. §§ 781–785 (2018) (protecting sponges in the Gulf of Mexico and the Strait of Florida).

<sup>40</sup> See Craig, *Re-Envisioning the Value of Marine Spaces in Law*, *supra* note 37, at 152 (asserting that the Magnuson-Stevens Fishery Conservation and Management Act “did not enact a comprehensive ecosystem-based regulatory scheme” and that “federal laws often [create] significant blinders to the effects of fishing and overfishing on the ocean’s overall health”).

<sup>41</sup> See MAPES, *supra* note 1, at 23, 38–39, 83.

resulted in an expanded presence of so-called Bigg's orcas, a subpopulation of killer whale that prefers flipped mammals to fish.<sup>42</sup>

Climate breakdown will accelerate such shifts in ecosystem balance, rearranging the geography of fish stocks, threatening coral reefs throughout the world, and more.<sup>43</sup> Allow me one more example involving cetaceans. While researching marine governance at the Harvard Radcliffe Institute a few years ago, I treated my research assistants to a commercial whale watching tour in the Stellwagen Bank National Marine Sanctuary, an 842-square-mile protected marine area off the coast of Massachusetts. This hub of biodiversity is a popular feeding ground for humpback whales and right whales because of a unique upwelling effect that pushes nutrient-rich waters to the surface.<sup>44</sup> There is perhaps no better place in the world to see humpbacks so close to a major urban area. Federal protections within the sanctuary protect the whales and other sea animals from aggressive boat traffic, destructive fishing techniques, and other assaults.<sup>45</sup> But the Gulf of Maine, where Stellwagen Bank is located, is heating ninety-nine percent faster than the rest of the world's oceans.<sup>46</sup> This heating alters the life cycles and distribution of smaller organisms, including crucial prey species like sand lance and copepods.<sup>47</sup> As these smaller animals move further north to seek colder waters, the whales that feed on them may follow suit.<sup>48</sup> Fifty years from now, the Stellwagen Bank National Marine Sanctuary will still be there. The humpbacks, however, may not.

The third challenge is a conceptual one. As a terrestrial species, we humans have developed cultures that are estranged from the ocean. The *land* is our known world. The sea is something mysterious, unreadable,

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<sup>42</sup> *Id.* at 27–28, 32.

<sup>43</sup> Freestone & McCreath, *supra* note 17, at 50.

<sup>44</sup> Nat'l Oceanic & Atmospheric Admin., *Underwater Plateau in Stellwagen Bank*, EARTH IS BLUE MAG., Oct. 2021, at 40, <https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/mag/6/earth-is-blue-magazine-v6.pdf> [<https://perma.cc/2Y59-CBQY>].

<sup>45</sup> *Protect*, NAT'L OCEANIC & ATMOSPHERIC ADMIN.: STELLWAGEN BANK NAT'L MARINE SANCTUARY, <https://stellwagen.noaa.gov/protect/> [<https://perma.cc/2TEQ-URGU>] (last visited Feb. 28, 2026).

<sup>46</sup> STELLWAGEN BANK NAT'L MARINE SANCTUARY, NAT'L OCEANIC & ATMOSPHERIC ADMIN., 2020 CONDITION REPORT: FINDINGS OF STATUS AND TRENDS FOR 2007–2018, at 10 (2020) [hereinafter 2020 CONDITION REPORT].

<sup>47</sup> Derrick Z. Jackson, *A Big Climate Warning From One of the Gulf of Maine's Smallest Marine Creatures*, INSIDE CLIMATE NEWS (Feb. 20, 2022), <https://insideclimatenews.org/news/20022022/maine-marine-ecosystem-calanus-finmarchicus-climate-change/> [<https://perma.cc/Z8EA-39J8>]; *The Little Fish with a Big Impact*, WOODS HOLE OCEANOGRAPHIC INST.: SEA GRANT (Apr. 2020), <https://seagrants.whoi.edu/the-little-fish-with-a-big-impact/> [<https://perma.cc/R3UW-V2RR>].

<sup>48</sup> Tammy L. Silva et al., *High Collocation of Sand Lance and Protected Top Predators: Implications for Conservation and Management*, CONSERVATION SCI. & PRAC., Feb. 2021, at 1, 5–6; 2020 CONDITION REPORT, *supra* note 46, at 180.

and often menacing.<sup>49</sup> This perspective is confirmed in the Western literary tradition, from Homer's *Odyssey*,<sup>50</sup> to Melville's *Moby Dick*,<sup>51</sup> to Ursula Le Guin's *Earthsea* cycle.<sup>52</sup> Very often, the ocean is a hazard to be endured on the way to something else—food, scientific knowledge, trade, a far-flung people to exploit and control. The Law of the Sea—the body of law that establishes international coastal boundaries, rules of marine use and navigation, and ocean protection—descended from the 17<sup>th</sup> century legal theories of Hugo Grotius, whose utilitarian approach to the seas was heavily influenced by fishing, trade, and Europe's hunger for world empire.<sup>53</sup>

Anthropologists tell us that, with the exception of Polynesian society, most populous civilizations conceived of the ocean as inherently different from terrestrial space—a space where less could be known, fewer obligations would apply, and utilitarian goals would ascend in priority.<sup>54</sup> A related point is that most people probably do not think much about where their oxygen or grocery-store sushi comes from. More than eighty-five percent of the world's population lives more than ten kilometers from ocean shorelines.<sup>55</sup> Americans may have more access to the ocean than many other populations, but how many have swum above a wild coral reef or paddled through the blades of a kelp forest? Substantially fewer, I would bet, than how many have hiked through a forest or gazed at a deer. Lasting environmental advocacy requires large groups of people who care and are engaged. There is much more work to do in this area.

The problem, then, is that our policies affecting the ocean are not up to the task. They are *shallow*, *fixed*, and *detached*. Instead, we need policies that are *deep*, *dynamic*, and *engaged*. To appreciate the difference, let us consider the international trend toward “marine protected areas,” or MPAs.<sup>56</sup> MPAs are like the conservation areas we

<sup>49</sup> See generally Craig, *Re-Envisioning the Value of Marine Spaces in Law*, *supra* note 37 (“Yet we are trained by art and habit to experience the ocean as a spectacle and not as the crucial, defining part of our life that it actually is.”).

<sup>50</sup> HOMER, *Athena Inspires the Prince*, in *THE ODYSSEY* 77, 77 (Robert Fagles trans., Penguin Books 1997).

<sup>51</sup> HERMAN MELVILLE, *MOBY-DICK; OR, THE WHALE* (Howard Mumford Jones ed., W. W. Norton & Company, Inc. 1976).

<sup>52</sup> URSULA K. LE GUIN, *THE BOOKS OF EARTHSEA: THE COMPLETE ILLUSTRATED EDITION* (2018).

<sup>53</sup> See generally Peter Borschberg, *Hugo Grotius' Theory of Trans-Oceanic Trade Regulation: Revisiting Mare Liberum (1609)* (N.Y.U. Inst. for Int'l L. & Just. Working Paper, Paper No. 2005/14, 2005).

<sup>54</sup> See PHILIP E. STEINBERG, *THE SOCIAL CONSTRUCTION OF THE OCEAN* 42–43, 42 tbl. 4 (2001).

<sup>55</sup> Robert McAllister, *15% of People Live Near Coasts—And the Number Keeps Rising*, N. AM. CMTY. HUB STAT. (Dec. 16, 2024), <https://nchstats.com/people-live-near-coasts/> [<https://perma.cc/N9Y6-YQKU>].

<sup>56</sup> Danielle Smith, *Global Network of MPAs: An Important Tool in Addressing Climate Change*, in *RESEARCH HANDBOOK ON CLIMATE CHANGE, OCEANS AND COASTS*, *supra* note 17, at 425, 426.

have on land—a kind of zoning for the sea.<sup>57</sup> They have clearly defined boundaries, are managed under formal laws or cultural norms, and seek the long-term conservation of natural systems.<sup>58</sup>

In 2022, the United Nations sponsored an agreement where more than 190 nations pledged to use MPAs to conserve thirty percent of the world's ocean by 2030—a goal called “30x30.”<sup>59</sup> But progress has been slow. MPAs today cover only eight percent of the world's ocean, and scientists estimate that less than three percent of the ocean is protected effectively enough to halt or reverse ecological damage.<sup>60</sup> Still, the “30x30” goal can help us see what better policy looks like. First, well-designed MPAs are *deep*. Rather than focus on a single species, an MPA considers the sustainable *function* of an ecosystem over time.<sup>61</sup> That means paying attention to many pieces of the puzzle—limits on fishing, boat traffic, pollution, coastal development, and more (a common criticism of MPAs, incidentally, is that many do not limit fishing as much as they should).<sup>62</sup> There is strong evidence that MPAs, when well-crafted, strengthen climate resilience for marine biodiversity, particularly in reef-based ecosystems. Side-by-side comparisons of reef responses to El Niño warming events in the Pacific, for instance, have shown better recovery rates on protected reefs than on unprotected reefs.<sup>63</sup>

MPAs also have the potential to be dynamic. Take Australia's Great Barrier Reef Marine Park, whose domain includes more than 3,000 individual reef systems;<sup>64</sup> it uses a sophisticated zoning approach to protect the ecological functions of seventy different bioregions, regulating a myriad of human uses such as shipping, fishing, recreation, and scientific research.<sup>65</sup> But it also builds the possibility of dramatic change, particularly where climate is concerned. A recent climate action plan for the park integrates an ongoing climate research program into

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<sup>57</sup> *Id.* at 428.

<sup>58</sup> *Id.* at 428, 430.

<sup>59</sup> *Id.*

<sup>60</sup> Martina Igini, *Just 2.8% of the World's Ocean Is 'Effectively' Protected Despite 2030 Conservation Target, Report Warns Ahead of UN Biodiversity Conference*, EARTH.ORG: GLOB. COMMONS BLOG (Oct. 17, 2024), <https://earth.org/just-2-8-of-the-worlds-ocean-is-effectively-protected-despite-2030-conservation-target-report-warns-ahead-of-un-biodiversity-conference/?utm> [<https://perma.cc/ZF5H-FC8D>].

<sup>61</sup> CRAIG, *supra* note 29, at 95.

<sup>62</sup> See Kirsten Grorud-Colvert et al., *The MPA Guide: A Framework to Achieve Global Goals for the Ocean*, 373 SCI. 1215, 1221 (2021) (explaining that highly protected areas receive positive ecological outcomes as compared to minimally protected areas that allow competing and conflicting activities).

<sup>63</sup> See Enric Sala & Sylvaine Giakoumi, *No-Take Marine Reserves are the Most Effective Protected Areas in the Ocean*, 75 ICES J. MARINE SCI. 1166, 1167 (2018) <https://academic.oup.com/icesjms/article/75/3/1166/4098821> [<https://doi.org/10.1093/icesjms/fsaf120>] (comparing coral reef recovery rates after El Niño warming events in MPA-protected coral reefs with recovery rates in non-protected reefs).

<sup>64</sup> CRAIG, *supra* note 29, at 139–140.

<sup>65</sup> *Id.* at 140.

new practical management goals.<sup>66</sup> Perhaps most notably, the plan calls for identifying and protecting *future* “alternative habitats” for turtles, birds, and other species that may be forced to abandon their current homes on account of rising heat.<sup>67</sup>

Australia’s insight into alternative habitats suggests a way to help the humpbacks and right whales who now frequent Stellwagen Bank. If, as some scientists speculate, climate change drives the whales’ food source away, a potentially helpful legal framework would be one that allows marine protections to be re-established in the new, alternative feeding ground. Even without climate change impacts, “mobile” MPAs could help animals like whales and sea turtles on their traditional migratory routes.<sup>68</sup> For instance, a scientific organization could use advanced digital technology to track important species and make the information available in real time. When a bale of sea turtles is known to be migrating, parties temporarily could alter shipping routes or the use of fishing gear.<sup>69</sup>

MPAs also suggest ways that everyday people can be more engaged in marine protection, thus strengthening the political commitment to ocean health. One reason that today’s MPAs are not as protective as they should be is that local fishing communities oppose harvest restrictions.<sup>70</sup> But experience shows that when local residents, including fisher folk, are brought into the planning process early, communities can imagine new initiatives that protect traditional practices and livelihoods while creating new jobs for residents in the areas of marine monitoring and enforcement. In fact, after years of planning of just this sort, the government of French Polynesia recently announced that it would treat its entire exclusive economic zone (nearly five million square kilometers) as an MPA, with roughly 1.1 million square kilometers placed under high or full protection—a feat only possible through sustained engagement with local communities and fishers.<sup>71</sup>

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<sup>66</sup> *Id.* at 141.

<sup>67</sup> *Id.* at 143.

<sup>68</sup> Sara M. Maxwell et al., *Mobile Protected Areas for Biodiversity on the High Seas*, 367 *SCI.* 252, 254 (2020).

<sup>69</sup> *See id.* at 253–54.

<sup>70</sup> *See generally* FOOD & AGRIC. ORG. OF THE UNITED NATIONS, *FAO FISHERIES AND AQUACULTURE TECHNICAL PAPER NO. 603: MARINE PROTECTED AREAS: INTERACTIONS WITH FISHERY LIVELIHOODS AND FOOD SECURITY* (Lena Westlund et al. eds., 2016), <https://ebcd.org/wp-content/uploads/2017/07/Marine-Protected-Areas-2016.11.15-Low-Res-single-pages-ilovepdf-compressed-1.pdf> [<https://perma.cc/BT3Y-76H8>] (collection of reports noting that MPAs can have a disparate impact on local communities that rely on fishing for sustenance).

<sup>71</sup> Rob Hutchins, *French Polynesia Will Create World’s Largest Marine Protected Area*, *OCEANOGRAPHIC MAG.* (Nov. 6, 2025), <https://oceanographicmagazine.com/news/french-polynesia-will-create-worlds-largest-marine-protected-area/> [<https://perma.cc/GV4G-L6NZ>]; *see also* Polynésie Française, *Arrêté portant classement de la ZEE en espaces protégés et création de zones de pêche réglementée* (Sep. 24, 2025), <https://www.ressources-marines.gov.pf/wp-content/uploads/sites/24/2025/09/Arrete-portant-classement-de-la-ZEE.pdf> [<https://perma.cc/QD2K-2DPK>] (noting years of participation by

French Polynesia’s new MPA—by far, the largest in the world—on its own moves the world a few percentage points closer to the United Nations’ 30x30 goal.<sup>72</sup>

This is just one example of what marine management looks like when we commit to getting *deep*, *dynamic*, and *engaged*. How might this perspective change the way law works for Tahlequah and her extended family, the Southern Residents? First, going *deep* would lead us to see the problem as going beyond the protection of individual orcas. The problems of salmon scarcity, pollution, and marine use are part of a more general problem related to the entire Salish Sea. Existing laws such as the Endangered Species Act,<sup>73</sup> which focuses on individual species or subpopulations (like the Southern Residents), can be too narrow.

But in the Pacific Northwest, many marine advocates have embraced the so-called “Rights of Nature” movement as a way of emphasizing the needs of the region’s entire marine ecosystem.<sup>74</sup> For instance, a community group called Legal Rights for the Salish Sea (LRSS), based in Gig Harbor, Washington, advocates for the inherent rights of the Salish Sea ecosystem, including Southern Resident orcas.<sup>75</sup> Several local jurisdictions in Washington state have passed non-binding proclamations supporting recognition of the orcas’ rights or

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local fishing communities’ governance structures); DIRECTION DE L’ENVIRONNEMENT DE LA POLYNESIE FRANÇAISE, *AMG Tainui Atea—Plan de gestion 2023–2037* (Mar. 14, 2023), <https://www.service-public.pf/diren/wp-content/uploads/sites/17/2024/11/AMG-Tainui-Atea-Plan-de-gestion-2023-2037.pdf> [<https://perma.cc/6KQV-ZSJK>] (same).

<sup>72</sup> My back-of-the-envelope estimate suggests a four-to-five-point jump toward the U.N. goal. Assume the Earth’s ocean covers 360 million square kilometers. *How Much Water Is in the Ocean?*, NAT’L OCEANIC & ATMOSPHERIC ADMIN.: NAT’L OCEAN SERV. (June 16, 2024), <https://oceanservice.noaa.gov/facts/oceanwater.html>. If we assume eight percent of the ocean is already covered by MPAs, *see* Martina, *supra* note 60, that means MPAs already protect 28.8 million square kilometers of ocean ( $0.08 \times 360$  million km<sup>2</sup>  $\approx$  28.8 million km<sup>2</sup>). French Polynesia’s addition of about 4.8 million square kilometers would raise that figure to around 33.6 million square kilometers. The United Nations’ thirty percent target would require coverage of 108.3 million square kilometers ( $0.30 \times 361$  million km<sup>2</sup>  $\approx$  108.3 million km<sup>2</sup>). Using these figures, the global community was 26.7 percent of the way toward the 30x30 goal *before* French Polynesia’s announcement. After French Polynesia’s MPA takes effect, we will be thirty-one percent of the way, an increase of 4.3 points. Now, my calculations are based on rough estimates, and they assume that all protected areas are equally effective (which is not always true). But the announcement of this park is still a *very* big deal—even for those who went to law school hoping to avoid math.

<sup>73</sup> 16 U.S.C. §§ 1531–1544.

<sup>74</sup> *See, e.g., NARN Recognition of the Inherent Rights of Southern Resident Orcas*, NW ANIMAL RTS. NETWORK, <https://narn.org/rights-for-southern-resident-orcas/> [<https://perma.cc/AP2G-ME4J>] (last visited Jan. 13, 2026) (describing the coalition of supporting organizations and local governments that acknowledge and support the rights of the Southern Resident Orcas to “autonomy, free and safe passage, and an adequate food supply” by protecting them from pollution and the extirpation of Chinook Salmon).

<sup>75</sup> *Id.*; *see also* Legal Rights for the Salish Sea, *About This Group*, FACEBOOK, <https://www.facebook.com/groups/178573679369852/> [<https://perma.cc/9DX7-3W36>] (last visited Jan. 13, 2026).

nature's rights more broadly.<sup>76</sup> However phrased, the advocates are clear that the commitment extends to the functioning of whole ecosystems. In Washington, it is still unclear exactly what legal weight these proclamations or resolutions carry. But they are clearly changing the rhetoric of marine protection, which is the first step in changing the law.

Looking at the problem holistically also permits us to see the relationship between destructive land uses and the decline of the Salish Sea ecosystems. For example, dams block or severely impede upstream migration of adult salmon to their spawning grounds.<sup>77</sup> They also impede or harm downstream migration of juvenile salmon, increase mortality, alter river flows, and degrade spawning habitat.<sup>78</sup> With fewer accessible spawning habitats and impaired juvenile survival, salmon populations decline, which reduces the available prey base for the orcas. In the 2010s, after years of debate, the Elwha River dams in Washington were finally removed. The project restored access to more than seventy miles of previously blocked spawning and rearing habitat. Early results showed salmon returning upstream quickly.<sup>79</sup> The improved salmon runs contribute to increased prey availability for orcas in adjacent waters, including parts of the Salish Sea ecosystem.<sup>80</sup>

Dynamism could also improve the protection of orcas and other residents of the Salish Sea. Imagine mobile MPAs that could follow orca pods, adjusting not only boat traffic (which in a way is already done through distance requirements) but also fishing, dumping, or pollution.

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<sup>76</sup> *Salish Sea Southern Resident Orcas*, EARTH L. CTR., <https://www.earthlawcenter.org/salish-sea-initiative> [<https://perma.cc/Z2NU-WXWE>] (last visited Jan. 13, 2026); *Port Townsend (USA) Proclamation: Rights of the Southern Resident Orca*, ECO JURIS. MONITOR, <https://ecojurisprudence.org/initiatives/port-townsend-u-s-proclamation-of-the-rights-of-the-southern-resident-orcas/> [<https://perma.cc/8RCD-KW9V>] (last visited Jan. 14, 2026); *Gig Harbor (USA) Proclamation: Rights of the Southern Resident Orca*, ECO JURIS. MONITOR, <https://ecojurisprudence.org/initiatives/gig-harbor-u-s-proclamation-of-the-rights-of-the-southern-resident-orcas/> [<https://perma.cc/ZPB2-QPE7>] (last visited Jan. 14, 2026); *Langley (USA) Proclamation: Rights of the Southern Resident Orca*, ECO JURIS. MONITOR, <https://ecojurisprudence.org/initiatives/langley-u-s-proclamation-of-the-rights-of-the-southern-resident-orcas/> [<https://perma.cc/V55N-38SC>] (last visited Jan. 14, 2026).

<sup>77</sup> Sarah R. Rubenstein et al., *Adult Atlantic Salmon (Salmo salar) Delayed Below Dams Rapidly Deplete Energy Stores*, 80 CAN. J. FISHERIES & AQUATIC SCI. 170, 171 (2022).

<sup>78</sup> R.W. Perry et al., *Dam Operations Affect Route-Specific Passage and Survival of Juvenile Chinook Salmon at a Main-Stem Diversion Dam*, 32 RIVER RSCH. & APPLICATIONS 2009, 2009–10 (2016).

<sup>79</sup> *Dam Removals on the Elwha River*, NAT'L OCEANIC & ATMOSPHERIC ADMIN.: FISHERIES (June 20, 2025), <https://www.fisheries.noaa.gov/west-coast/science-data/dam-removals-elwha-river> [<https://perma.cc/ZDP9-TMCB>].

<sup>80</sup> See NAT'L OCEANIC & ATMOSPHERIC ADMIN.: FISHERIES, SOUTHERN RESIDENT KILLER WHALES AND WEST COAST CHINOOK SALMON (2018), <https://media.fisheries.noaa.gov/dam-migration/srkw-salmon-sources-factsheet.pdf> [<https://perma.cc/HU26-EDBL>] (explaining that killer whales prey primarily on salmon and that crucial salmon stocks in rivers draining into the Salish Sea are increasing, in part, due to enhanced fish passage).

Imagine MPAs that could adjust with each season or along with projections of temperature or changes in acidity.

As for engagement, marine advocates in the Salish Sea are already showing the way. In Washington and British Columbia, there are several volunteer groups that monitor, track, and promote stewardship of orcas in the Salish Sea. For instance, the Orca Network based on Whidbey Island, Washington, is a nonprofit that connects people with whales of the Pacific Northwest and promotes whale sightings, situational awareness for boat pilots, and education.<sup>81</sup> In addition, there are less formal *community networks* where local residents, volunteers, and citizen scientists help track orca movements and boost situational awareness. For instance, a WhatsApp group, “Salish Wildlife Watch,” alerts roughly 1,800 members in Seattle when orcas are nearby.<sup>82</sup>

Our legal framework for ocean protection needs retooling. The current system is so shallow and fragmented that it cannot address the interdependencies among species, water, and land. It is fixed and does not easily accommodate dramatic changes, including more extreme heat waves. Finally, it is too detached from both ecological reality and coastal communities to meet today’s challenge. We need a new vision of the ocean that is, instead, *deep, dynamic, and engaged*. Fortunately, there are many innovative management tools that meet this need: underwater marine parks twice the size of Texas, laws that recognize “rights” for marine animals and for the sea itself, frameworks for involving local coastal people, and more. Many of these things, like MPAs, exist *today* around the globe. But we need to expand and improve upon these good ideas.

I promised you more on Tahlequah and her refusal to give up. Well, a few months after the mother lost her calf, an orca in the neighboring pod gave birth to a new baby. Half a year later, another was born.<sup>83</sup> Then in September 2020, two more babies arrived in the same waters—one born to Tahlequah herself.<sup>84</sup> The calf, a male, was frisky and fit. Whale researchers nicknamed him Phoenix, for the mythological bird that rises from its own ashes. But then in 2024, Tahlequah again lost a calf soon after giving birth and again carried the corpse, though for a shorter time.<sup>85</sup>

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<sup>81</sup> *Sightings*, ORCA NETWORK, <https://indigo-ukulele-jm29.squarespace.com/sightings> [<https://perma.cc/KM7D-V3AM>] (last visited Jan. 24, 2026).

<sup>82</sup> Manuel Valdes, *In Seattle, Phones Ding, Killer Whales Could Be Close*, ASSOCIATED PRESS (Oct. 28, 2023, at 19:17 PT), <https://www.apnews.com/article/orcas-killer-whales-whatsapp-facebook-salish-wildlife-0e86cd0a5403049a74386d66fc0ae8c8> [<https://perma.cc/47JA-Q827>].

<sup>83</sup> MAPES, *supra* note 1, at 23.

<sup>84</sup> *Id.*

<sup>85</sup> Brianna Charlebois, *Heartbreak for Tahlequah: Orca Mother Again Pushing Body of a Dead Calf*, TIMES COLONIST (Jan. 2, 2025, at 4:51 PM), <https://www.timescolonist.com/local-news/heartbreak-for-tahlequah-famous-orca-mom-loses-another-calf-10021639> [<https://perma.cc/42U8-SZ7A>].

Were the diving masks of those whale researchers rose-tinted? I don't think so. Neither they nor I really know what the future holds for the global ocean. But, after years of exploration and research, I know it is *possible* for us to change course—to restore important parts of the ocean system and protect them. Phoenix, a healthy young whale last seen foraging with his mother near San Juan Island, represents one possible future for the oceans, so long as we keep swimming and remember to breathe. Just like the whale who danced the blues.