

REPORT

# TAR SANDS IN THE ATLANTIC OCEAN: TRANSCANADA'S PROPOSED ENERGY EAST PIPELINE

**AUTHORS**

Joshua Axelrod, NRDC  
Mitchell Beer, Smarter Shift  
Anthony Swift, NRDC



## Acknowledgments

Thanks to the many people who contributed to the research, drafting, and review of this report. Any mistakes are wholly the responsibility of the authors and review does not necessarily mean endorsement of this report. Maps were designed by Carrie Robb and updated by Liza Hoos. Refinery and tanker research was performed by Shelley Kath. Special thanks to Elizabeth Shope and Jennifer Skene for research and editorial support. We would also like to acknowledge the substantive edits and contributions of Matthew Abbott, Catherine Abreu, Lois Corbett, Danielle Droitsch, Mary Heglar, Michael Jasny, Kim Knowlton, Hannah McKinnon, Greg Muttitt, Regan Nelson, and Adam Scott.

Special recognition is also due to the many First Nations across Canada who are working daily to uphold their rights and protect their traditional territories from the dangers of oil spills and to the coastal communities on the East and Gulf Coasts who would be most impacted by an increase in oil tanker traffic discussed in this report.

We would also like to thank and acknowledge the commitment and focus of the many non-government organizations and community associations across Canada who have been working on the issues discussed in this report for many years.

## About NRDC

The Natural Resources Defense Council is an international nonprofit environmental organization with more than 2.4 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at [nrdc.org](http://nrdc.org).

*NRDC Chief Communications Officer:* Lisa Benenson

*NRDC Deputy Directors of Communications:* Michelle Egan and Lisa Goffredi

*NRDC Policy Editor:* Mary Annaisé Heglar

*Design and Production:* [www.suerossi.com](http://www.suerossi.com)

Cover image: © Andrew Priest/Flickr

© Natural Resources Defense Council 2016

# Table of Contents

---

Executive Summary .....	1
I. Introduction: The Proposed Energy East Pipeline Project .....	1
National Academy of Sciences: Diluted Bitumen Tar Sands Spills Into Water Mean Trouble .....	3
A Waterborne Tar Sands Pipeline Off the East Coast.....	4
Increased Tanker Traffic: 328 Million Barrels of Tar Sands on Atlantic Waters Every Year .....	6
Which Refinery Markets Would Receive Energy East Tar Sands Crude Oil? .....	8
II. Energy East’s Threat to Iconic Species .....	9
North Atlantic Right Whale .....	9
Fin Whale.....	10
Lobster .....	11
Sea Scallops.....	11
III. Special Places Threatened by Energy East .....	12
New Brunswick’s and Nova Scotia’s Bay of Fundy .....	13
Gulf of Maine .....	14
Maine’s Acadia National Park .....	15
New England’s Coral Canyons and Seamounts .....	15
Florida Keys.....	16
IV. Major Ecosystem Threats Posed by Energy East .....	17
Oil Spills: Tar Sands Tankers Navigating Dangerous Waters.....	17
Ship Strikes: A Serious Threat to Marine Mammals .....	18
Noise Pollution: Disrupting Marine Mammals .....	19
Ballast Water and Invasive Species: “Marine Ecological Roulette” .....	21
Climate Change: Locking in More Carbon Pollution .....	22
Cumulative Impacts: Crowding Out Ocean Wildlife and Marine Users .....	22
V. Opposition to Energy East .....	23
VI. Recommendations .....	24

# Executive Summary

---

As international attention on tar sands oil has escalated, TransCanada—the same company that was poised to drive Keystone XL through America’s heartland—is pushing for a pipeline to bring tar sands oil to the east coast of Canada. This proposed pipeline would cross Canada from Alberta to New Brunswick, moving at least 900,000 barrels per day (bpd) of tar sands oil from Alberta and up to 200,000 bpd of light, tight oil from the Bakken formation in Saskatchewan and North Dakota to the Atlantic coast. If the pipeline were built and this oil reached the east coast of Canada, most of the 1.1 million bpd would be loaded onto oil supertankers. From there, almost 300 supertankers per year would form a high-risk, waterborne pipeline down the U.S. Eastern Seaboard, around the Florida Panhandle, and on to refineries along the Gulf Coast.

Energy East, the name of this proposed pipeline, would increase current tanker traffic (including crude oil and refined products) in New Brunswick and Nova Scotia’s Bay of Fundy by nearly 75 percent and could also increase tanker traffic through the St. Lawrence River and Gulf. For tankers loaded with crude oil alone, Energy East would drive a 300 percent increase in existing traffic through these areas. Once loaded, the oil would travel a shipping route notorious for its extreme tides, dense fogs, and treacherous weather. Meanwhile, the last remaining North Atlantic right whales—in addition to several other iconic whale and dolphin species and hundreds of other ocean species—would be directly threatened by this traffic. Worse still, the majority of Energy East’s crude oil would be heavy tar sands diluted bitumen, a manufactured combination of extra-heavy bitumen and volatile natural gas liquids. Spills of this type of oil have proved particularly damaging to water bodies. In fact, a recent study by the National Academy of Sciences found that current regulations and spill response techniques are incapable of managing the unique behavior and higher risks of tar sands diluted bitumen spills in water.

The Energy East proposal threatens vibrant and irreplaceable ocean and coastal areas all along the U.S. east coast—along with economies that depend on them and the animals that live in them. Risks include ships running over marine mammals, injuring or killing them, a significant increase in underwater noise pollution, and an elevated risk of devastating oil spills. Meanwhile, large-scale fossil fuel projects like Energy East exacerbate the effects of climate change. In fact, the production, transport, and consumption of oil from Energy East would emit as much annual greenhouse gas as 54 million passenger vehicles—the equivalent of all registered vehicles on the road in Germany.

This report focuses primarily on the potential marine impacts from the waterborne pipeline created by Energy East’s tar sands oil tankers. Our analysis reveals that the scope of the forthcoming environmental review by Canadian authorities is sorely lacking. Our findings also suggest that Energy East is just another TransCanada project that is all risk and no reward for millions of Canadians and Americans. In concluding, we offer a series of recommendations for reforming the current regulatory review process and propose several critical safety regulations for the United States and Canada, the lack of which places communities in both countries at risk from tar sands spills every day.

## I. Introduction: The Energy East Pipeline Project

---

In May 2016, TransCanada filed a consolidated application with Canada’s National Energy Board (NEB) to build the Energy East pipeline as an update to an original proposal filed in October 2014.<sup>1</sup> The Energy East application outlines a more than \$12 billion, 2,850-mile (4,600-kilometer) pipeline to carry 1.1 million bpd of crude oil to eastern Canada. The pipeline is expected to bring at least 900,000 bpd of tar sands oil (predominantly in the form of diluted bitumen, or “dilbit”) from Alberta, plus up to 200,000 bpd of light, tight oil from the Bakken formation in Saskatchewan and North Dakota, to the Atlantic coast.<sup>2</sup>

---

1 TransCanada Pipeline Limited, Energy East Pipeline Ltd., Consolidated Application, Volume 1, Section 2: “Project Overview,” submitted to the Canada National Energy Board (hereinafter NEB), May 2016, docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2957695/A76905-4\_V1\_Sec2\_Project\_Overview\_-\_A5A0G7.pdf?nodeid=2957146&vernum=-2.

2 The 900,000/200,000 bpd split mentioned in this report is based on comments TransCanada has made to investors as well as its application for the Upland Pipeline, which was submitted to the U.S. State Department. Currently, TransCanada highlights 930,000 bpd of committed shipments from Alberta, leaving 170,000 bpd of open capacity in the line. Of this, 70,000 bpd has been committed by shippers on the Upland proposal. While TransCanada could fill the entire Energy East line (1.1 million bpd) with crude oil from Alberta (assuming production levels matched take-away capacity), the existence of the Upland Pipeline proposal (which is for a 300,000 bpd pipeline) suggests that the company hopes to move large volumes of light, tight oil out of North Dakota and Saskatchewan. “TransCanada’s CEO Russ Girling on Q4 2014 Results, conference call transcript, February 13, 2015, seekingalpha.com/article/2917086-transcanadas-trp-ceo-russ-girling-on-q4-2014-results-earnings-call-transcript?part=single; Upland Pipeline, LLC, “Application of Upland Pipeline, LLC for a Presidential Permit Authorizing the Construction, Operation, and Maintenance of Pipeline Facilities for the Exportation of Crude Oil to Be Located at the United States–Canada Border,” submitted to U.S. Department of State, revised July 8, 2015, www.state.gov/documents/organization/245275.pdf.



If built, the pipeline would use a single port in eastern Canada<sup>3</sup> to move tar sands via oil tankers along the East and Gulf coasts to refineries equipped to process the heavy crude oils.<sup>4,5</sup> This would effectively create a waterborne tar sands pipeline with hundreds of new oil tankers traversing the Atlantic coastline, making vast areas of the Eastern Seaboard vulnerable to a dangerous tar sands spill. If approved and permitted, some analysts now believe, Energy East would not enter service until at least 2021.<sup>6</sup> In summary, the project will require:

- Building 930 miles (1,500 kilometers) of new pipeline in six provinces—Alberta, Saskatchewan, Manitoba, Ontario, Québec, and New Brunswick;<sup>7</sup>
- Building a new export terminal on the Bay of Fundy in Saint John, New Brunswick;<sup>8</sup>
- Loading up to 281 tankers per year with predominantly tar sands oil for transport to the U.S. Atlantic and Gulf coasts, and eventually even Europe and India;<sup>9</sup>
- Converting 1,860 miles (3,000 kilometers) of natural gas pipeline in Saskatchewan, Manitoba, and Ontario to handle crude oil;<sup>10</sup> and
- Building a new pipeline—and obtaining the appropriate permits to build and operate it—from the Williston, North Dakota, area, with an interconnection into the main Energy East line in Saskatchewan or Manitoba.<sup>11</sup>



3 There remains some question as to TransCanada's final plans for export terminals. Their May 2016 application for the pipeline contains a note that up to 150,000 bpd are committed under contracts for shipment from Quebec and/or New Brunswick. Though "commercial discussions with affected shippers are ongoing" to change the terms of these contracts for shipment from New Brunswick, TransCanada continues to consider "the future development of a project, for delivery to a marine facility in Québec." This 150,000 bpd of oil, in addition to uncommitted capacity on the pipeline, could load as many as 115 tankers on the St. Lawrence River in Quebec if a marine export facility were located there. [https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2671689/2957699/A76908-3\\_V3\\_Sec2\\_Transportation\\_Terms\\_and\\_Tolls\\_-\\_A5A0J5.pdf?nodeid=2958032&vernum=2](https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2671689/2957699/A76908-3_V3_Sec2_Transportation_Terms_and_Tolls_-_A5A0J5.pdf?nodeid=2958032&vernum=2), pp. 3-4. The tanker estimate is based on 255,000 bpd of oil carried on a tanker fleet with a similar makeup as discussed elsewhere in TransCanada's application.

4 In its filings, TransCanada expects to load 70 Aframax, 175 Suezmax, and 36 Very Large Crude Carriers (VLCCs) each year. Each of these tankers can carry at least 720,000 barrels, 1.2 million barrels, and 1.92 million barrels of diluted bitumen, respectively. The 900,000 bpd estimate extrapolates the total shipping capacity provided by TransCanada (more than 329 million barrels per year) and divides it by 365 days. We assume that the majority of this exported oil will be sourced from the tar sands because of recent pipeline upgrades to Enbridge's Line 9, continued—minimal—shipment to eastern Canadian refineries by rail, and receipt of crude oil from price-advantaged sources all leading to minimal demand for tar sands crude at target refineries. TransCanada Pipeline Limited, Energy East Pipeline Ltd., Consolidated Application, Volume 7, Section 5: "Marine Operations," submitted to the NEB, May 2016, [docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2957554/A76944-6\\_V7\\_Sec5\\_Marine\\_Operations\\_-\\_A5A3E2.pdf?nodeid=2957867&vernum=2](https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2957554/A76944-6_V7_Sec5_Marine_Operations_-_A5A3E2.pdf?nodeid=2957867&vernum=2); Maritime Connector, "Ship Sizes," [maritime-connector.com/wiki/ship-sizes/](http://maritime-connector.com/wiki/ship-sizes/); Canadian Fuels Association, "The Economics of Petroleum Refining," December 2013; [www.canadianfuels.ca/website/media/PDF/Publications/Economics-fundamentals-of-Refining-December-2013-Final-English.pdf](http://www.canadianfuels.ca/website/media/PDF/Publications/Economics-fundamentals-of-Refining-December-2013-Final-English.pdf) (page 11); Enbridge Energy Partners, LP, Investment Community Presentation, June 2015, p. 12, <https://www.enbridgepartners.com/~media/EepEqMep/Events/EEPEEQ/2016/EEP%20Investment%20Community%20Presentation%20June%202016.pdf>. The Canadian Association of Petroleum Producers (hereinafter CAPP) states: "Long-term declines are offset by production from satellite fields. The Hebron project, expected to start in 2017, will contribute additional production." CAPP, "Crude Oil Forecast, Markets & Transportation," June 2015, p. 10, [capp.ca/~media/capp/customer-portal/publications/264673.pdf](http://capp.ca/~media/capp/customer-portal/publications/264673.pdf); see also forecast on p. 37.

5 "2015 Worldwide Refining Survey," *Oil and Gas Journal*, January 2015, [www.ogj.com/ogj-survey-downloads.html](http://www.ogj.com/ogj-survey-downloads.html); "Refinery Report: Refineries," Oil Change International, 2013, [refineryreport.org/refineries-list.php](http://refineryreport.org/refineries-list.php).

6 Gregg Quinn and Rebecca Penty, "Canada Sees Lower Gain From Energy East as Brent Premium Narrows," *Bloomberg News*, May 31, 2016, [www.bloomberg.com/news/articles/2016-05-31/canada-sees-lower-gain-from-energy-east-as-brent-premium-narrows](http://www.bloomberg.com/news/articles/2016-05-31/canada-sees-lower-gain-from-energy-east-as-brent-premium-narrows).

7 TransCanada, Energy East Pipeline Ltd., Consolidated Application, Volume 1, Section 2: "Project Overview."

8 Ibid.

9 TransCanada Pipeline Limited, Energy East Pipeline, Consolidated Application, Volume 1, Section 1: "Executive Summary," submitted to the NEB, May 2016, [docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2957695/A76905-3\\_V1\\_Sec1\\_Executive\\_Summary\\_-\\_A5A0G6.pdf?nodeid=2957481&vernum=2](https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2957695/A76905-3_V1_Sec1_Executive_Summary_-_A5A0G6.pdf?nodeid=2957481&vernum=2).

10 TransCanada, Energy East Pipeline Ltd., Volume 1, Section 2: "Project Overview."

11 TransCanada, "Proposed Project: Upland Pipeline Project," December 2015, [www.transcanada.com/docs/Key\\_Projects/TransCanada-Proposed-Upland-Pipeline-Project-United-States-December-2015.pdf](http://www.transcanada.com/docs/Key_Projects/TransCanada-Proposed-Upland-Pipeline-Project-United-States-December-2015.pdf).

Despite the significant impacts this project could have on U.S. coastlines, fisheries, ports, and refinery areas—not to mention the global climate—the NEB has severely limited the scope of its environmental review. Although it is purportedly interested in the project’s “cumulative effects” and the impacts of increased marine shipping, the NEB has stated that it “will not consider matters related to upstream activities associated with the development of [tar sands] or the downstream and end use of the oil transported by the project.”<sup>12</sup> This means Energy East’s cumulative climate impacts, as well as the risk of damage to U.S. waters from an up to fivefold increase in crude oil tanker traffic along sensitive portions of the Eastern Seaboard, will not be studied.<sup>13,14,15</sup>

The decision to avoid considering upstream and downstream environmental impacts is especially alarming given recent scientific reviews, discussed below, of the dangers posed by a diluted bitumen spill into water.

## NATIONAL ACADEMY OF SCIENCES: DILUTED BITUMEN TAR SANDS SPILLS INTO WATER MEAN TROUBLE

Because tar sands bitumen is too thick and heavy to move in pipelines, many producers mix it with volatile natural gas liquids to create diluted bitumen, an engineered heavy crude oil that meets existing pipeline specifications but possesses a number of characteristics that pose new risks. The development of Alberta’s tar sands has led to a flood of tar sands diluted bitumen into North America’s pipeline system in recent years. In fact, the volume has increased more than fourfold from 440,000 bpd in 2001 to nearly 1.9 million bpd in 2015.<sup>16</sup> At the same time, emergency responders confronted with tar sands spills have found they lack the tools to effectively contain and clean up diluted bitumen, particularly when it is spilled into water bodies.

Enbridge’s 2010 tar sands spill in Michigan’s Kalamazoo River has proved to be a particularly important case study of the challenges associated with cleaning up diluted bitumen spills. In that instance, a ruptured pipeline led to the discharge of more than 840,000 gallons of tar sands diluted bitumen into the Kalamazoo River.<sup>17</sup> After the diluted bitumen was released into the environment, the natural gas liquids used to dilute the bitumen began to evaporate, causing negative health impacts for nearby residents.<sup>18</sup> As the light diluent evaporated, the tar sands bitumen sank below the river’s surface, evading spill containment tactics designed for conventional oil, which floats on water. Over six years, more than \$1 billion was spent on cleanup—making it the most expensive pipeline spill in U.S. history. Today, remediation has stopped, although nearly 40 miles of the Kalamazoo River are still contaminated by tar sands crude.<sup>19</sup>

In 2013, ExxonMobil’s Pegasus pipeline ruptured and spilled in Mayflower, Arkansas, releasing up to 300,000 gallons of oil into a nearby neighborhood and creeks.<sup>20</sup> In the aftermath, cleanup crews faced many of the same challenges as their counterparts in Michigan.

In response to concerns about the dangers of diluted bitumen spills, the National Academy of Sciences (NAS) undertook a yearlong study of the environmental fate of tar sands oil when it is spilled from pipelines, including into water.<sup>21</sup> Its report, published in early 2016, confirmed that many of the concerns about tar sands spills (in the form of diluted bitumen) into water are well founded due to the substantial differences in the chemical composition of diluted bitumen (compared with other crude oils) and its behavior when released into the environment.<sup>22</sup>

---

12 NEB, “TransCanada Energy East Pipeline Project—List of Issues,” September 16, 2015, [www.neb-one.gc.ca/pplctnflng/mjrpp/nrgyst/nrgystlstfsss-eng.html](http://www.neb-one.gc.ca/pplctnflng/mjrpp/nrgyst/nrgystlstfsss-eng.html).

13 McKinnon, H., G. Muttitt, and L. Stockman, “Lockdown: The End of Growth in the Tar Sands,” Oil Change International, October 2015, p. 27, [priceofoil.org/content/uploads/2015/10/Lockdown\\_Final.pdf](http://priceofoil.org/content/uploads/2015/10/Lockdown_Final.pdf).

14 This number is an estimate of existing crude oil tanker traffic along the Atlantic coast north of New York. Because there are no U.S. refineries north of the New York City area, a limited number of oil tankers travel off this coast. However, the recent drop in oil prices, increased Texas production, and the low cost of ocean shipping have led to an increase in U.S. oil exports to eastern Canadian refineries. At the same time, some refiners have begun looking to European and African producers, holding tanker increases in U.S. waters in check. In addition, Enbridge’s Line 9 has now been reversed and reopened, providing much of the capacity needed by Quebec refineries. Thus, we estimate fewer than 50 tankers per year traveling along this portion of the coast (running north to New Brunswick). Fritelli, J., “Shipping U.S. Crude Oil by Water: Vessel Flag Requirements and Safety Issues,” Congressional Research Service, July 2014, p. 1, Figure 1, [www.fas.org/sgp/crs/misc/R43653.pdf](http://www.fas.org/sgp/crs/misc/R43653.pdf); Maritime Administration, “2011 U.S. Water Transportation Statistical Snapshot,” U.S. Department of Transportation, November 2013, p. 10, [www.marad.dot.gov/wp-content/uploads/pdf/US\\_Water\\_Transportation\\_Statistical\\_snapshot.pdf](http://www.marad.dot.gov/wp-content/uploads/pdf/US_Water_Transportation_Statistical_snapshot.pdf); Friedman, N., “Crude-Oil Exports to Canada Kept U.S. Gulf Coast Storage Hubs Below Capacity,” *Wall Street Journal*, May 18, 2015, [www.wsj.com/articles/exports-to-canada-kept-u-s-gulf-coast-storage-hubs-below-capacity-1431977743](http://www.wsj.com/articles/exports-to-canada-kept-u-s-gulf-coast-storage-hubs-below-capacity-1431977743); Lewis, J., “Eastern Refineries Processing More Foreign Oil as Crude Price Gap Narrows,” *Globe and Mail*, January 30, 2015, [www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/eastern-refineries-processing-more-foreign-oil-as-crude-price-gap-narrows/article22727311/](http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/eastern-refineries-processing-more-foreign-oil-as-crude-price-gap-narrows/article22727311/).

15 In a slight change, the Canadian government is now requiring that the NEB consider the climate impacts of upstream (i.e., production) emissions associated with Energy East. Fekete, J., “Federal Government Defines ‘Upstream Emissions’ for Proposed Energy Regulations,” *National Post*, March 18, 2016, [news.nationalpost.com/news/canada/canadian-politics/federal-government-defines-upstream-emissions-for-proposed-energy-regulations](http://news.nationalpost.com/news/canada/canadian-politics/federal-government-defines-upstream-emissions-for-proposed-energy-regulations).

16 CAPP, Canadian Crude Oil Production and Supply Forecast 2006–2020, May 2006, p. 10; CAPP, Crude Oil Forecast, Markets and Transportation.”

17 U.S. Environmental Protection Agency (hereinafter EPA), “EPA’s Response to the Enbridge Oil Spill,” June 8, 2015, [www3.epa.gov/region5/enbridgespill/](http://www3.epa.gov/region5/enbridgespill/).

18 Michigan Department of Community Health, “Public Health Assessment, Final Release: Evaluation of Air Contamination, Kalamazoo River Enbridge Oil Spill,” September 30, 2015, [www.michigan.gov/documents/mdch/Enbridge\\_Air\\_PHA\\_FINAL\\_RELEASE\\_9-30-2015\\_501495\\_7.pdf](http://www.michigan.gov/documents/mdch/Enbridge_Air_PHA_FINAL_RELEASE_9-30-2015_501495_7.pdf)

19 Enbridge Energy Ltd., “Kalamazoo River Residual Oil Monitoring and Maintenance Work Plan,” prepared for the Michigan Department of Environmental Quality, July 8, 2014, [www.michigan.gov/documents/deq/wrd-enbridge-residual-oil-report\\_464692\\_7.pdf](http://www.michigan.gov/documents/deq/wrd-enbridge-residual-oil-report_464692_7.pdf).

20 White, S., “Exxon Oil Spill Could Be 40% Larger Than Company Estimates, EPA Figures Show,” *Inside Climate News*, April 5, 2013, [insideclimatenews.org/news/20130405/exxon-oil-spill-could-be-40-larger-company-estimates-epa-figures-show](http://insideclimatenews.org/news/20130405/exxon-oil-spill-could-be-40-larger-company-estimates-epa-figures-show).

21 Committee on the Effects of Diluted Bitumen on the Environment et al., *Spills of Diluted Bitumen from Pipelines: A Comparative Study of Environmental Fate, Effects, and Response* (Washington, D.C.: National Academies Press, 2016), [www.nap.edu/catalog/21834/spills-of-diluted-bitumen-from-pipelines-a-comparative-study-of](http://www.nap.edu/catalog/21834/spills-of-diluted-bitumen-from-pipelines-a-comparative-study-of).

22 “Diluted bitumen has unique properties, differing from those of commonly transported crude oils, which affect the behavior of diluted bitumen in the environment following a spill.” *Ibid.*, at p. 5.

---

***“When all risks are considered systematically, there must be a greater level of concern associated with spills of diluted bitumen compared to spills of commonly transported crude oils.” National Academy of Sciences, 2016<sup>23</sup>***

---

The NAS committee noted that approaches developed by the oil and pipeline industry and various response agencies for addressing oil spills have been based on experiences with conventional, floating crudes.<sup>24</sup> However, the committee observed that “there are no known, effective strategies for recovery of crude oil that is suspended in the water column.”<sup>25</sup> In other words, when faced with tar sands diluted bitumen—which sinks into the water column or the bottom of water bodies as its lighter diluents evaporate—responders have little recourse to recover, contain, or even detect the spilled tar sands.<sup>26</sup> Moreover, the risk of long-term environmental impacts is especially high because dilbit’s adhesion (essentially its ability to stick to other objects) is up to 100 times greater than that of conventional oils, because burned diluted bitumen creates “sticky” and “easily submerged” residues,<sup>27</sup> and because dilbit does not quickly biodegrade.<sup>28</sup> The NAS committee concluded that “the properties of diluted bitumen and weathered bitumen put such spills in a class by themselves,” concluding that regulators and emergency responders do not have the necessary tools and techniques to address a tar sands diluted bitumen spill into water.<sup>29</sup>

---

***“Broadly, regulations and agency practices do not take the unique properties of diluted bitumen into account, nor do they encourage effective planning for spills of diluted bitumen.” National Academy of Sciences, 2016<sup>30</sup>***

---

In the context of Energy East—indeed, of any oil project that relies on shipping tar sands products by water—the findings and recommendations of the NAS report are profound. At its core, the report confirms what has been long suspected: that when diluted bitumen from tar sands is spilled into water, our first responders and our government agencies are unprepared, lacking the tools and technologies to even begin to confront the threat.

## **A WATERBORNE TAR SANDS PIPELINE OFF THE EAST COAST**

The proposed Energy East pipeline would end in the city of Saint John, New Brunswick, 50 miles northeast of the Maine border. Saint John sits on the edge of two of the world’s most remarkable water bodies: the Bay of Fundy and the Gulf of Maine. From there, tar sands oil would be loaded onto enormous tankers—some of which have the capacity of nearly 130 Olympic-size swimming pools, or 40 acres covered with more than six feet of oil—that would travel through feeding and calving grounds for many of the east coast’s beloved whale populations.<sup>31</sup> The tankers would also traverse world famous fishing grounds that support billion-dollar commercial and sport fisheries, biologically rich and economically important coastal waters such as the Chesapeake Bay and iconic and pristine ecosystems of Maine, Massachusetts, Florida, and the Gulf Coast. In essence, the pipeline would start on land and continue onto the sea. This would allow the Alberta tar sands industry to reach American refineries without laying pipe on U.S. soil, providing an alternative to the rejected Keystone XL pipeline. This aquatic pipeline would bring the extraordinary and unpredictable risk of a major tar sands spill to the Atlantic Ocean. In the event of such a spill, current technology provides little to no chance of ever removing the oil.

---

***Energy East is a poster child for the tar sands industry’s dreams of significantly expanding production of an ecologically destructive resource in northern Alberta.***

---

---

23 Ibid. at p. 82.

24 Ibid. at pp. 82-83.

25 Ibid. at p. 70. The committee also noted that though transmission by pipelines was the focus of their inquiry, they noted that “many of the conclusions and recommendations, will be applicable to these other transportation modes [including tankers] because many aspects of environmental impact are independent of mode of transportation.” Ibid. at p. 2.

26 Ibid. at p. 3.

27 Ibid. at p. 84.

28 Ibid. at pp. 38, 78.

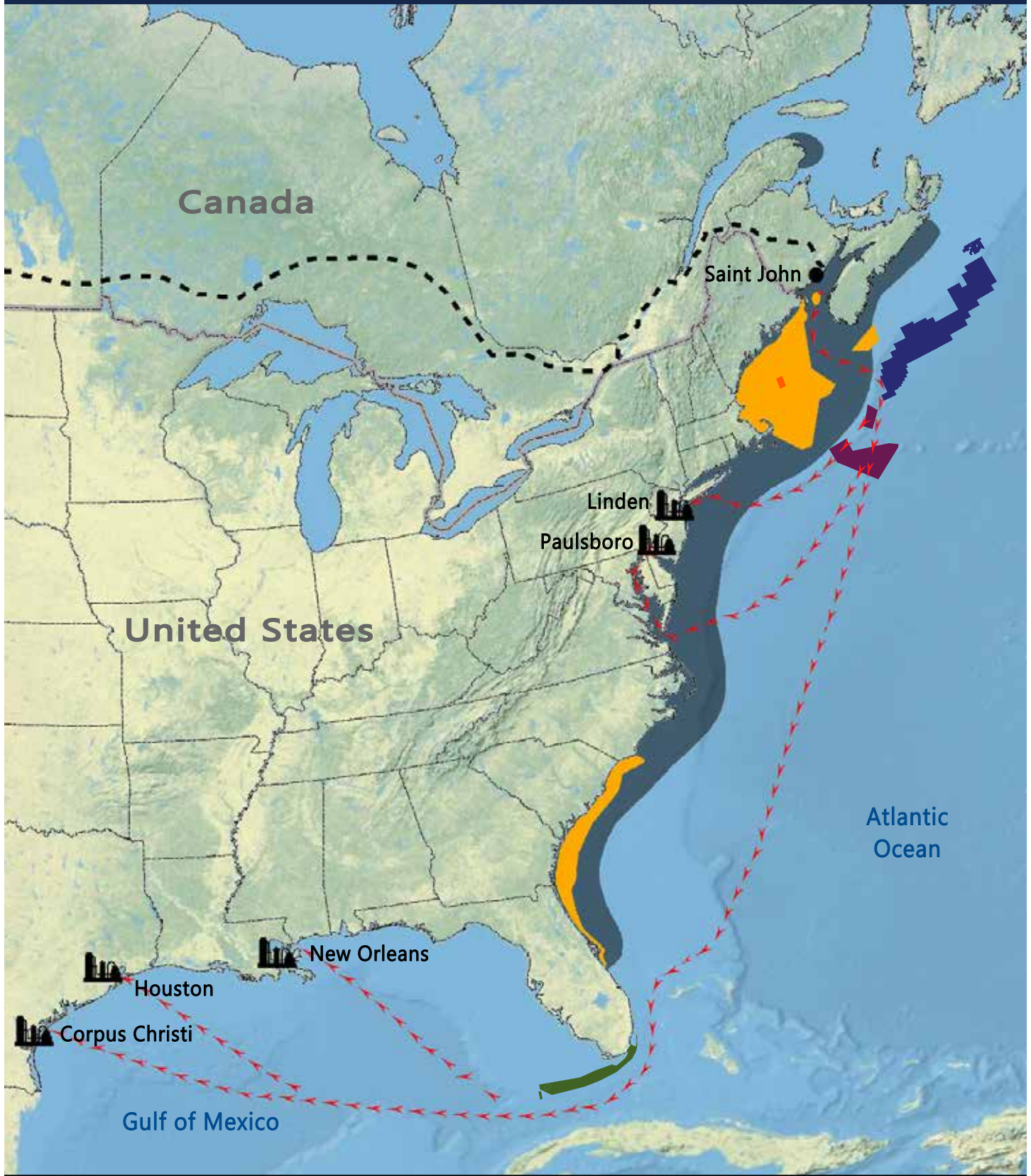
29 Ibid. at p. 83.

30 Ibid. at p. 4.

31 We converted a 660,253-gallon figure into barrels. Hoefs, J., “Measurements for an Olympic Size Swimming Pool,” Livestrong, August 20, 2013, [www.livestrong.com/article/350103-measurements-for-an-olympic-size-swimming-pool/](http://www.livestrong.com/article/350103-measurements-for-an-olympic-size-swimming-pool/).



MAP 2: PROPOSED ENERGY EAST PIPELINE ROUTE AND EXPECTED ENERGY EAST TANKER ROUTES



- Energy East Pipeline
- Energy East Tanker Route
- Key Refinery Areas
- Oil Lease Blocks (Shell, Statoil, BP)
- Cashes Ledge
- New England Coral Canyons and Seamounts
- Florida Keys National Marine Sanctuary
- N. Atlantic Right Whale Critical Habitat
- N. Atlantic Right Whale Migration Route



## INCREASED TANKER TRAFFIC: 328 MILLION BARRELS OF TAR SANDS ON ATLANTIC WATERS EVERY YEAR

Energy East is a poster child for the tar sands industry’s dreams of significantly expanding production of an ecologically destructive resource in northern Alberta. The tar sands industry is facing looming transport constraints and ongoing difficulties reaching its preferred refinery market on the U.S. Gulf Coast, forcing producers to temper their expansion plans.<sup>32,33</sup> Energy East would provide tar sands producers with 900,000 bpd of new shipping capacity capable of reaching the U.S. Gulf Coast by ocean tanker, allowing significant growth in tar sands oil production.

The Energy East pipeline would significantly change the dynamics of existing petroleum product transport in the Bay of Fundy and along much of the northeastern coastline. Currently, a relatively small number of oil tankers bring conventional crude oils to the Irving Oil refinery in Saint John, while outbound tankers carry refined product from the port to markets along the U.S. east coast and elsewhere. However, Energy East would lead to two marked and potentially devastating changes for the Bay: a nearly 74 percent increase in total tanker traffic (including a 300 percent increase in crude oil tanker traffic) and a shift to more hazardous material moving through sensitive waters.<sup>34</sup>

In its May 2016 consolidated application to the NEB, TransCanada estimated that Energy East would load up to 281 oil tankers at the Port of Saint John every year (up from 115 in its earlier proposals).<sup>35</sup> As table 1 demonstrates, a dramatic increase in tanker traffic would follow.<sup>36</sup>

TABLE 1: PROJECTED TANKER TRAFFIC FROM PORT OF SAINT JOHN DUE TO ENERGY EAST’S OPERATION<sup>37</sup>

	2014 TANKER TRAFFIC (TOTAL)	2014 CRUDE OIL TANKER TRAFFIC	ESTIMATED ENERGY EAST TRAFFIC	TOTAL TANKER PERCENTAGE INCREASE	CRUDE OIL TANKER PERCENTAGE INCREASE
Original Energy East Proposal <sup>38</sup>	380	93	115	30%	124%
Updated Energy East Proposal	380	93	281	74%	302%

These estimates are based on TransCanada’s filings, which reveal that most tankers planned for the Port of Saint John will be Suezmax or Very Large Crude Carriers (VLCCs).<sup>39</sup> These vessels carry up to 1.2 million and 1.92 million barrels of oil, respectively.<sup>40</sup> In other words, a Suezmax tanker can carry the equivalent of 76 Olympic-size pools filled with oil, while a VLCC can carry the equivalent of 127.<sup>41</sup> Over the course of a single year, 328 million barrels of tar sands oil could be moved by tanker down the east coast—that’s 20,465 Olympic-size pools.

The tankers from Energy East pose a significant threat to marine mammals and other sensitive marine species from deafening ocean noise, oil spills, and ship strikes. Meanwhile, the Saint John area has seen a number of recent industrial proposals that would have exacerbated the threat if they had moved forward—a fact that suggests the possibility of new threats in the coming years.<sup>42</sup> The threat from potential growth in tanker traffic follows a period of relatively light industrial activity along the northeastern coast, which some have pinned on the use of larger vessels and the economic

32 McKinnon, H., G. Muttitt, and L. Stockman, “Lockdown,” at pg. 4.

33 CAPP, “2015 CAPP Crude Oil Forecast, Markets & Transportation,” at p. 18.

34 See table 1.

35 TransCanada, “Energy East Pipeline Ltd., Consolidated Application, Volume 1, Section 2: Project Overview,” at p. 28.

36 It has been suggested that the volume of oil transported via Energy East could offset some of the inbound crude oil tankers arriving at the port. But any decrease would depend on the volume of light crude or synthetic oil Energy East delivers to the Irving Oil refinery in Saint John and whether shipment costs for this oil would be lower than similar tanker shipments from Texas and abroad. Because of the economic advantages of tankers, it is more likely that Energy East would first displace rail shipments before any appreciable decrease in existing inbound tanker traffic. The Council of Canadians et al., “TransCanada’s Energy East: An Export Pipeline, Not for Domestic Gain,” Environmental Defence, April 2015, <http://environmentaldefence.ca/report/report-transcanadas-energy-east-export-pipeline-not-domestic-gain/>. [http://business.financialpost.com/news/energy/irving-oils-president-says-it-would-keep-saudi-imports-even-if-energy-east-goes-ahead?\\_lsa=4b57-8659](http://business.financialpost.com/news/energy/irving-oils-president-says-it-would-keep-saudi-imports-even-if-energy-east-goes-ahead?_lsa=4b57-8659)

37 Traffic figures for 2014 and 2015 were derived from the Port of Saint John activity logs. Port Saint John, “Daily Vessel Activity Report,” [www.sjport.com/business-resources/cargo-movement/daily-vessel-activity-report/](http://www.sjport.com/business-resources/cargo-movement/daily-vessel-activity-report/). Energy East tanker number figures found through proposal filings. TransCanada, Energy East Pipeline Ltd., Consolidated Application, Volume 1, Section 2: “Project Overview.”

38 The original Energy East proposal included two separate ports: one in Cacouna, Quebec, and one in Saint John, New Brunswick. The Cacouna port has now been cancelled and Energy East’s entire capacity directed to Saint John.

39 TransCanada, Energy East Pipeline Ltd., Consolidated Application, Volume 7, Section 5: “Marine Operations”; Maritime Connector, “Ship Sizes”; Canadian Fuels Association, “The Economics of Petroleum Refining”; Enbridge Energy Partners, LP, Investment Community Presentation; CAPP, “Crude Oil Forecast, Markets & Transportation.”

40 Ibid.

41 Hoefs, J., “Measurements for an Olympic Size Swimming Pool.”

42 All proposals with a marine shipping component have now been cancelled or indefinitely delayed. These included Canaport’s switch to LNG exports, a new barge terminal in west Saint John, and a container port expansion in Saint John. Canaport LNG, “LNG Shiploading: Environmental Impact Assessment,” July 24, 2013, [www.canaportlng.com/userimages/files/13-9743\\_Ship\\_Loading\\_EIA-FINAL.PDF](http://www.canaportlng.com/userimages/files/13-9743_Ship_Loading_EIA-FINAL.PDF); Saint John Industrial Parks, “Spruce Lake Barge Facility Project,” [www.saintjohnindustrial.ca/spruce-lake-barge-facility-project/#specifications](http://www.saintjohnindustrial.ca/spruce-lake-barge-facility-project/#specifications), accessed December 23, 2015; Ridler, N., “The Economic Impact of the Barge Loading Facility in Saint John NB for Fabricated Steel Modules for Heavy Industry,” Saint John Industrial Parks, December 2012, p. 3, [www.saintjohnindustrial.ca/sjindustrialpark/wp-content/uploads/2014/04/Barge-Economic-Outputs-Report.pdf](http://www.saintjohnindustrial.ca/sjindustrialpark/wp-content/uploads/2014/04/Barge-Economic-Outputs-Report.pdf); CBC News, “Port Saint John gets \$68M from N.B. to Upgrade Container Terminals,” July 30, 2015, [www.cbc.ca/news/canada/new-brunswick/port-saint-john-gets-68m-from-n-b-to-upgrade-container-terminals-1.3173726](http://www.cbc.ca/news/canada/new-brunswick/port-saint-john-gets-68m-from-n-b-to-upgrade-container-terminals-1.3173726).



downturn of 2008 through 2009.<sup>43</sup> Elsewhere, processing Energy East oil would increase hazardous emissions and refining by-products, like petroleum coke and sulfur, that often accumulate near fence-line refinery communities.<sup>44</sup> At the same time, communities up and down the eastern and Gulf coasts could see damage to water resources and ocean life. For instance:

- The increased risk of a tar sands oil spill along the Eastern Seaboard, in the Gulf of Maine, near the Florida Keys, or in the Great Lakes region could lead to billions of dollars' worth of cleanup costs, long-term contamination of key commercial fishing areas, and pollution of critical freshwater supplies.
- Endangered whale and dolphin species, including the critically endangered North Atlantic right whale, endangered sea turtles, and other vulnerable coastal and marine species will be placed at risk of ship strikes, oil spills, and noise pollution and could undermine the recovery and survival of endangered and threatened species.
- The coastal economies up and down the Atlantic seaboard that depend on healthy and clean ocean waters—tourism, recreation and vibrant seafood industries—would be one major spill away from devastating job loss and economic hardship.
- Tanker bilge water could bring invasive species into Maine, New Brunswick, and Nova Scotia's sensitive marine environments, possibly decimating native species on which coastal economies rely for sport and commercial harvest.
- Significantly increased Canadian greenhouse gas emissions could amplify global climate change, including related changes in the Bay of Fundy and Gulf of Maine, while locking in a large piece of high-carbon infrastructure for the next 50 years.

## THE EXXON VALDEZ: 11 MILLION GALLONS OF OIL, 1,000 MILES OF COASTLINE

On March 24, 1989, the *Exxon Valdez* struck a reef in Alaska's Prince William Sound and released 11 million gallons of oil.<sup>45</sup> The oil fouled 1,300 miles of coastline, killing hundreds of thousands of animals.<sup>46</sup> Exxon spent more than \$2.5 billion on the cleanup alone, as well as another \$1 billion on fines and compensation.<sup>47</sup> The Herculean cleanup effort required thousands of workers to remove oil from Alaska's sensitive beaches.<sup>48</sup> A quarter century later, many Alaskan beaches continue to suffer, as crude oil can be found buried inches below the sand.<sup>49</sup>

While some wildlife populations have returned to the area, researchers are studying the chronic effects of the spill as they wait for the ecosystem to fully recover. Many species, including salmon, otters, and shorebirds, have largely rebounded. However, despite this progress, at least four species—orcas, Pacific herring, marbled murrelets, and pigeon guillemots—are not recovering.<sup>50</sup>

43 Silber, G. et al., "The Right Whale Mandatory Ship Reporting System: A Retrospective," *Peer J*, March 31, 2015, [www.readcube.com/articles/10.7717/peerj.866](http://www.readcube.com/articles/10.7717/peerj.866).

44 Hawthorne, M., "BP to Stop Sending Petcoke to Chicago," *Chicago Tribune*, February 18, 2015, [www.chicagotribune.com/news/ct-bp-petcoke-met-20150218-story.html](http://www.chicagotribune.com/news/ct-bp-petcoke-met-20150218-story.html); EPA, "Sulfur Recovery," January 1995, [www3.epa.gov/ttnchie1/ap42/ch08/final/c08s13.pdf](http://www3.epa.gov/ttnchie1/ap42/ch08/final/c08s13.pdf).

45 Exxon Valdez Trustee Council, "Questions and Answers About the Spill," [www.evostc.state.ak.us/?FA=facts.QA](http://www.evostc.state.ak.us/?FA=facts.QA), accessed December 28, 2015.

46 Ibid.

47 Pitts, B., "Exxon Valdez Oil Spill: 20 Years Later," CBS Evening News, February 2, 2009, [www.cbsnews.com/news/exxon-valdez-oil-spill-20-years-later/](http://www.cbsnews.com/news/exxon-valdez-oil-spill-20-years-later/).

48 TransCanada, "Energy East Project, Consolidated Application, Volume 19, "Accidents and Malfunctions."

49 Taylor, A., "The Exxon Valdez Oil Spill: 25 Years Ago Today," *The Atlantic*, March 24, 2014, [www.theatlantic.com/photo/2014/03/the-exxon-valdez-oil-spill-25-years-ago-today/100703/](http://www.theatlantic.com/photo/2014/03/the-exxon-valdez-oil-spill-25-years-ago-today/100703/).

50 Exxon Valdez Oil Spill Trustee Council, "Status of Injured Resources and Services," [www.evostc.state.ak.us/index.cfm?FA=status.injured](http://www.evostc.state.ak.us/index.cfm?FA=status.injured), accessed December 28, 2015; Matkin, C., et al., "Ongoing Population-Level Impacts on Killer Whales *Orcinus orca* Following the Exxon Valdez Oil Spill in Prince William Sound, Alaska," *Marine Ecology Progress Series* 356 (March 2008): pp. 269–281, [www.researchgate.net/profile/Craig\\_Matkin/publication/237336306\\_Ongoing\\_population-level\\_impacts\\_on\\_killer\\_whales\\_Orcinus\\_orca\\_following\\_the\\_Exxon\\_Valdez\\_oil\\_spill\\_in\\_Prince\\_William\\_Sound\\_Alaska/links/0c96053447a881e2d5000000.pdf](http://www.researchgate.net/profile/Craig_Matkin/publication/237336306_Ongoing_population-level_impacts_on_killer_whales_Orcinus_orca_following_the_Exxon_Valdez_oil_spill_in_Prince_William_Sound_Alaska/links/0c96053447a881e2d5000000.pdf).

## WHICH REFINERY MARKETS WOULD RECEIVE ENERGY EAST TAR SANDS CRUDE OIL?

Processing heavy crude oil like the oil extracted from the Alberta tar sands requires highly specialized refineries with high-cost coking units. Therefore, after offloading small quantities of oil at refineries in Quebec and New Brunswick, TransCanada would need to find a market capable of handling as much as 900,000 bpd of tar sands oil.<sup>51</sup> The majority of the world's specialized heavy crude refineries are located in the United States, and the Gulf Coast holds the highest concentration. Energy East would allow TransCanada to access many of the same refinery markets that would have been supplied by its proposed Keystone XL tar sands pipeline, which President Barack Obama rejected in 2015.<sup>52</sup>

© Steve/Flickr



While the Gulf Coast is the key market for tar sands producers, tankers serving northern New Jersey refineries could travel through the entrance of the New York Harbor, introducing the threat of a tar sands spill to one of the world's busiest bodies of water.

There are 25 refineries along the U.S. Gulf Coast capable of handling heavy (non-upgraded) tar sands oil, making it the global hub for heavy oil refining and a critical market for Alberta's oil producers.<sup>53</sup> In addition, at least three refineries in New Jersey and Delaware are known to have taken tar sands oil in the past, suggesting that they are also likely targets for Energy East's oil.<sup>54</sup> Globally, the refinery markets targeted by Energy East hold at least 42 refineries with the technological capacity to take tar sands oil in the form of diluted bitumen.<sup>55</sup> Table 2 summarizes the diluted bitumen refining capacity of these markets.

TABLE 2: TARGET REFINERY MARKETS FOR ENERGY EAST<sup>56</sup>

REGION	REFINERIES	COKING CAPACITY (BPD)	REFINERIES WITH COKERS	REFINERIES WITH HISTORY OF PROCESSING HEAVY TAR SANDS CRUDE <sup>56</sup>
Eastern Canada	4	0	0	1
U.S. East Coast	6	27,000	2	3
U.S. Gulf Coast	25	1,468,715	25	17
Europe	19	414,515	16	Unknown <sup>57</sup>
<b>TOTAL</b>	<b>53</b>	<b>1,910,230</b>	<b>42</b>	<b>26</b>

51 The estimated export volume is based on TransCanada's proposed tanker configurations as well as on oil transport dynamics involving refining capacities near Montreal, the start-up of Enbridge's Line 9 (which can now feed the Montreal area refineries), and the current configuration of the Irving Oil refinery in Saint John. "TransCanada's CEO Russ Girling," conference call transcript; Upland Pipeline, LLC, "Application for a Presidential Permit; see also Williams, N., "Suncor Expects Enbridge Line 9B to Start Up Towards End of Q2 2015," *Financial Post*, January 22, 2015, business.financialpost.com/news/energy/suncor-expects-enbridge-line-9b-to-start-up-towards-end-of-q2-2015?\_\_lsa=2ead-6b47; Van Praet, N., "Valero Moves to Source All Crude for Quebec Refinery from North America by End of 2014," *Financial Post*, March 20, 2014, business.financialpost.com/news/energy/valero-strikes-deal-to-ship-line-9-crude-from-montreal-to-quebec-city-by-tanker?\_\_lsa=453a-bf2b; U.S. Energy Information Agency, "U.S. Exports to Canada of Crude Oil," November 30, 2015, www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCREXCA2&f=M; CAPP, "2015 CAPP Crude Oil Forecast, Markets & Transportation."

52 The White House, "Statement by the President on the Keystone XL Pipeline," press release, November 6, 2015, www.whitehouse.gov/the-press-office/2015/11/06/statement-president-keystone-xl-pipeline.

53 See "2015 Worldwide Refining Survey," *Oil and Gas Journal*; "Refinery Report: Refineries," Oil Change International.

54 Ibid.; Deloitte and Touche, "Energy East—The Economic Benefits of TransCanada's Canadian Mainline Conversion Project," Appendix G, September 2013, p. 35, www.energyeastpipeline.com/wp-content/uploads/2013/09/Energy-East-Deloitte-Economic-Benefits-Report.pdf; TransCanada Pipeline Limited, Energy East Pipeline Ltd., Consolidated Application, Volume 3, Appendix 3-6, "IHS Report, Supply and Market Study for the Energy East Project," submitted to the Canada NAB, May 2016, docs.neb-one.gc.ca/11-eng/11sapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2957152/A76909-6\_V3\_Appendix\_3-6\_IHS\_Report\_Supply\_and\_Market\_Sept\_2015\_-A5A0K5.pdf?nodeid=2957372&vernum=-2.

55 This figure represents only refineries with coking capacity. However, there is evidence that refineries without cokers are taking tar sands products in the form of synthetic crude oil, a partially refined product that more closely approximates lighter, conventional oils and therefore does not require heavy oil processing equipment to be refined.

56 "2015 Worldwide Refining Survey," *Oil and Gas Journal*; "Refinery Report: Refineries," Oil Change International.

57 Because some tar sands oil is shipped in the form of partially refined synthetic oil (or SCO), it is possible for refineries without specialized equipment to refine this form of tar sands oil.

58 Eighteen European refineries have recently been identified as "high risk" or "likely" candidates to receive tar sands oil in the form of diluted bitumen or other heavy blends (versus synthetic crude oil). Friends of the Earth Europe and European Federation for Transport and Environment, "Tar Sands: Coming to a Refinery Near You?" September 2015, www.transportenvironment.org/sites/te/files/Background.pdf; MathPro, Inc., "Assessment of the European Refining Sector's Capability to Process Unconventional, Heavy Crude Oils," prepared for Friends of the Earth Europe and the European Federation for Transport and Environment, September 2015, www.transportenvironment.org/sites/te/files/FoEE\_TE\_03\_Final\_Project\_Report\_091015.pdf.



## II. Energy East's Threat to Iconic Species

---

Energy East would threaten thousands of marine animals with potentially devastating tar sands oil spills that could jeopardize their survival. It would also increase the risk of tanker-animal collisions and disruptive and possibly deafening ocean noise. We offer a brief glimpse into the status and threats facing several well-known species likely to be impacted.

### NORTH ATLANTIC RIGHT WHALE

The majestic but critically endangered North Atlantic right whale was driven close to extinction by unregulated hunting dating back to the eleventh century.<sup>59</sup> Despite international protections dating back to 1935 and 1949, the North Atlantic right whale population is estimated at only 450 individuals.<sup>60</sup> The U.S. National Oceanographic and Atmospheric Administration (NOAA) has repeatedly stated that “the loss of even a single individual may contribute to the extinction of the species.”<sup>61</sup> The 450 remaining whales are well known and beloved to a growing whale-watching community along the North American east coast. That interest translates into significant tourism revenue for coastal jurisdictions like New Brunswick, Nova Scotia, Maine, and Massachusetts.<sup>62,63,64</sup> North Atlantic right whales have also received considerable conservation investment from numerous government agencies and economic sectors, all aiming to prevent future harmful impacts to this struggling species.

---

*Despite international protections dating back to 1935 and 1949, the North Atlantic right whale population is estimated at only 450 individuals.*

---

© NOAA/NMFS



---

59 Right whales are considered endangered under the U.S. Endangered Species Act (ESA) and the Canadian Species at Risk Act (SARA). They are also considered depleted under the U.S. Marine Mammal Protection Act (MMPA). NOAA Fisheries, “Endangered and Threatened Marine Species Under NMFS’ Jurisdiction,” U.S. National Oceanographic and Atmospheric Administration (hereinafter NOAA), April 27, 2015, [www.fisheries.noaa.gov/pr/species/esa/listed.htm#mammals](http://www.fisheries.noaa.gov/pr/species/esa/listed.htm#mammals); Species at Risk Public Registry, “North Atlantic Right Whale,” Government of Canada, August 14, 2015, [sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=780](http://sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=780); NOAA Fisheries, Marine Mammal Protection Act (MMPA), October 8, 2014, [www.fisheries.noaa.gov/pr/laws/mmpa/](http://www.fisheries.noaa.gov/pr/laws/mmpa/).

60 NOAA Fisheries, “North Atlantic Right Whale (*Eubalaena glacialis*),” NOAA, updated February 20, 2015, [www.nmfs.noaa.gov/pr/species/mammals/whales/north-atlantic-right-whale.html](http://www.nmfs.noaa.gov/pr/species/mammals/whales/north-atlantic-right-whale.html).

61 See 69 Federal Register 30,857, 30,858 (June 1, 2004); see also 73 Fed. Reg. 60,173, 60,173 (Oct. 10, 2008); 72 Fed. Reg. 34,632, 34,632 (June 25, 2007); 66 Fed. Reg. 50,390, 50,392 (Oct. 3, 2001).

62 Bay of Fundy Tourism Partnership, “Whale Watching,” [bayoffundytourism.com/do/whale-watching/](http://bayoffundytourism.com/do/whale-watching/), accessed January 21, 2016.

63 Maine Office of Tourism, “Whale Watching Trips,” [visitmaine.com/things-to-do/outdoors-adventure/wildlife-watching/whale-watching-trips/](http://visitmaine.com/things-to-do/outdoors-adventure/wildlife-watching/whale-watching-trips/), accessed January 21, 2016.

64 Massachusetts Office of Travel and Tourism, “Explore Outdoors: Whale Watching,” [www.massvacation.com/explore/outdoors/whale-watching/](http://www.massvacation.com/explore/outdoors/whale-watching/), accessed January 21, 2016.

TransCanada's Energy East proposal threatens to undermine much of this investment and conservation effort by adding nearly 300 oil tankers per year to waters that include the North Atlantic right whale's critical habitat. As these tankers travel south to East and Gulf Coast refineries, they will approach the whale's designated critical habitat in at least three areas off the coasts of Maine, Massachusetts, and Florida.<sup>65</sup> Because North Atlantic right whales—particularly mothers and calves—spend a considerable amount of time at or near the surface, ship collisions pose one of the most serious threats to the recovery of this species.<sup>66</sup> In addition, these whales have been chronically distressed by acoustic disturbances from existing commercial shipping, which would significantly worsen with an increase in oil tanker traffic.<sup>67</sup> This increased marine noise undermines the whales' foraging and navigation abilities, which could threaten the population's viability in the area.

In recent years, shifting internationally mandated shipping lanes by about four nautical miles has reduced ship-whale collisions by 80 percent.<sup>68</sup> NOAA has also imposed seasonal vessel speed limits in portions of right whale habitat along the east coast to accommodate whale migration.<sup>69</sup> But east coast shipping lanes and routes still overlap key right whale habitats, and researchers are concerned that shifts in the whales' behavior could bring them into more frequent contact with ship traffic in the future.<sup>70</sup>

## FIN WHALE

The second-largest species of whale on the planet (behind only the blue whale), the fin whale can grow to 75 feet in length and weigh in at an astonishing 80 tons.<sup>71</sup> Protected under the Endangered Species Act, the western North Atlantic fin whale has a population estimated at around 1,670 individuals.<sup>72</sup> The migratory fin whale is known to appear in significant numbers in the Bay of Fundy, the Gulf of Maine, and on down to the coast of southern New Jersey<sup>73</sup>

Like the North Atlantic right whale, significant portions of the fin whale's habitat and migration path lie directly in the expected route of Energy East's oil tankers. Though commercial whaling led to the species's historic decline, today ship strikes, entanglement, noise pollution, and contamination of key habitats pose the most serious threats.<sup>74,75</sup> Thus, Energy East, with its massive tanker traffic, could lead to significant harms, especially in the Bay of Fundy and Gulf of Maine, where interaction between fin whales and oil tankers is highly likely.

© Chris Buelow/Flicker



---

*Like the North Atlantic right whale, significant portions of the fin whale's habitat and migration path lie directly in the route of Energy East's oil tankers.*

---

65 See Map 2, Tanker routing data were gathered from MarineTraffic, an ocean vessel tracking service that allows users to track individual vessels by class (e.g., oil tanker). Right whale habitat data are based on the map provided by the Government of Canada. MarineTraffic, [www.marinetraffic.com/](http://www.marinetraffic.com/), accessed January 21, 2016; Species at Risk National Registry, "Eubalaena glacialis," Government of Canada, [www.registrelep-sararegistry.gc.ca/56C3488F-08D1-42F0-9E54-A1FAB8D04818/fig04\\_eng.jpg](http://www.registrelep-sararegistry.gc.ca/56C3488F-08D1-42F0-9E54-A1FAB8D04818/fig04_eng.jpg), accessed January 21, 2016.

66 NOAA Fisheries Service: North Atlantic Right Whale, [http://sero.nmfs.noaa.gov/protected\\_resources/outreach\\_and\\_education/documents/rightwhale\\_factsheet.pdf](http://sero.nmfs.noaa.gov/protected_resources/outreach_and_education/documents/rightwhale_factsheet.pdf).

67 Dawicki, S., "Are North Atlantic Right Whales Mating in the Gulf of Maine?" NOAA Northeast Fisheries Science Center, July 2013, [www.nefsc.noaa.gov/press\\_release/2013/SciSpot/SS1308/](http://www.nefsc.noaa.gov/press_release/2013/SciSpot/SS1308/).

68 Brown, M., "Right Whales & Shipping Lanes," Marine GIS Group at the New England Aquarium, 2012, [www.marinegis.org/shippingLanes.html](http://www.marinegis.org/shippingLanes.html).

69 73 Federal Register 60173, 60173-60191 (Oct. 10, 2008).

70 Recent observers have seen marked changes in historic North Atlantic right whale behavior. Cairn, N., "Fewer Right Whales Seen, Counted in Gulf of Maine," *Portland Press Herald*, November 30, 2013, [www.pressherald.com/2013/11/30/right\\_whale\\_population\\_down\\_in\\_gulf\\_of\\_maine\\_count/](http://www.pressherald.com/2013/11/30/right_whale_population_down_in_gulf_of_maine_count/); Calich, H., "Mating Grounds for North Atlantic Right Whales Discovered in the Gulf of Maine," University of Miami, R.J. Dunlap Marine Conservation Group, January 14, 2014, [sharkresearch.rsmas.miami.edu/conservation/mating-ground-for-north-atlantic-right-whales-discovered-in-the-gulf-of-maine](http://sharkresearch.rsmas.miami.edu/conservation/mating-ground-for-north-atlantic-right-whales-discovered-in-the-gulf-of-maine).

71 NOAA Fisheries, Office of Protected Resources, "Fin Whale (*Balaenoptera physalus*)," September 4, 2013, [www.nmfs.noaa.gov/pr/species/mammals/cetaceans/finwhale.htm#habitat](http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/finwhale.htm#habitat).

72 Ibid.

73 TransCanada Pipeline Limited, Energy East Pipeline Ltd., Consolidated Application, Volume 17, Part A, Section 11: "Marine Wildlife and Wildlife Habitat," submitted to the Canada NEB, May 2016, [docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2967860/A77025-15\\_V17\\_PartA\\_Sec11\\_Marine\\_Terminal\\_Marine\\_Wildlife\\_and\\_Habitat\\_l0f2\\_-\\_A5A7Y3.pdf?nodeid=2968155&vnum=-2](http://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2967860/A77025-15_V17_PartA_Sec11_Marine_Terminal_Marine_Wildlife_and_Habitat_l0f2_-_A5A7Y3.pdf?nodeid=2968155&vnum=-2).

74 Jensen, A., and G. Silber, "Large Whale Ship Strike Database," NOAA, Technical Memorandum, NMFS-OPR-25, January 2004, p. 2.

75 NOAA Fisheries, "Fin Whale."

## LOBSTER

The commercial lobster (*Homarus americanus*) fishery is worth hundreds of millions of dollars annually.<sup>76</sup> These crustaceans are central to New England culture, shaping restaurant menus and drawing waterfront tourists from Maine to Massachusetts and beyond.<sup>77,78</sup> Energy East tankers would pose dramatic threats to these industries because even a very small concentration of oil in seawater can kill lobsters at the larval stage.<sup>79</sup> Thus, a tanker spill could devastate the New England lobster fishery five to seven years into the future, when those larvae would have been ready to harvest.<sup>80</sup> The economic impact on the region's fishing industry would be pronounced: In 2012 and 2013, the U.S. commercial lobster catch totaled 150 million pounds, an all-time record and a massive increase from a threshold of about 25 million pounds in the 1940s. In 2013, the harvest was valued at \$460 million.<sup>81</sup> In the same year, Canadian lobster landings totaled 165 million pounds and were valued at \$680.5 million.<sup>82</sup>

© Tris Hussey/Picker



---

*The increased risk of an oil spill posed by Energy East places an undue burden on an ecosystem nearing the breaking point.*

---

## SEA SCALLOPS

In 2014, commercial fishermen in New England and the Mid-Atlantic landed \$424 million worth of sea scallops, the fourth most valuable fishery in the nation.<sup>83</sup> Sea scallops are bivalve mollusks, in the same family as oysters. The threat that an oil spill poses to the lucrative sea scallop fishery was born out in the impacts suffered by oysters as a result of the 2010 BP Deepwater Horizon disaster in the Gulf of Mexico. Up to 8.3 billion oysters—508 million pounds of fresh oyster meat—were lost due to direct death and subsequent reproductive loss from a combination of the effects of and response to the oil spill.<sup>84</sup> But the long-term impacts are most shocking. Dramatic decreases in oyster densities, and the loss of habitat for nearshore oysters, has compromised the long-term sustainability of oysters in the Gulf of Mexico.<sup>85</sup> Natural recovery is unlikely to occur, meaning without substantive restoration, the oyster culture of the Gulf may be a thing of the past.<sup>86</sup> Heavy, sticky tar sands oil that is prone to sinking presents a grave risk to New England's sea scallop fishery.

---

76 Marine Stewardship Council, "Gulf of Maine Lobster," January 5, 2015, [www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-west-atlantic/gulf-of-maine-lobster](http://www.msc.org/track-a-fishery/fisheries-in-the-program/in-assessment/north-west-atlantic/gulf-of-maine-lobster); FishWatch, "American Lobster," NOAA, November 25, 2015, [www.fishwatch.gov/profiles/american-lobster](http://www.fishwatch.gov/profiles/american-lobster).

77 Canada's Department of Fisheries and Oceans has mapped "lobster fishing areas" off Canada's Atlantic coast, demonstrating the potential overlap between Energy East's tanker routes and commercial lobstering areas. Sharp, D., "New England Balances Tourism and Traditional Businesses in Port Cities," *Skift*, September 6, 2015, [skift.com/2015/09/06/new-england-balances-tourism-and-traditional-businesses-in-port-cities/](http://skift.com/2015/09/06/new-england-balances-tourism-and-traditional-businesses-in-port-cities/); Fisheries and Oceans Canada, "Lobster," Government of Canada, updated March 6, 2015, [www.dfo-mpo.gc.ca/fm-gp/sustainable-durable/fisheries-peches/lobster-homard-eng.htm](http://www.dfo-mpo.gc.ca/fm-gp/sustainable-durable/fisheries-peches/lobster-homard-eng.htm).

78 Pauli's, "What Lobster Rolls Mean to Boston and New England," August 4, 2015, [paulisnorthend.com/lobster-rolls-mean-boston-new-england-paulis-north-end/](http://paulisnorthend.com/lobster-rolls-mean-boston-new-england-paulis-north-end/).

79 Gulf of Maine Research Institute, "Lobsters and Oil Spills," February 24, 2012, [www.gma.org/lobsters/allaboutlobsters/news.html](http://www.gma.org/lobsters/allaboutlobsters/news.html).

80 Ibid.

81 Atlantic States Marine Fisheries Commission, "American Lobster," [www.asmf.org/species/american-lobster](http://www.asmf.org/species/american-lobster), accessed December 22, 2015.

82 Fisheries and Oceans Canada, "Lobster."

83 National Marine Fisheries Service. 2016. Fisheries Economics of the United States, 2014. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-163, 237p.

84 Deepwater Horizon Natural Resource Damage Assessment Trustees. (2016). *Deepwater Horizon oil spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement*, p. 4-391. Retrieved from <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.

85 Ibid. at p. 4-392.

86 Ibid.



In addition, most major New England fisheries lie within the path of Energy East's tankers. These include the Gulf of Maine stock and Georges Bank stock, both of which are managed for the commercial take of numerous species.<sup>87</sup> Farther south, tankers accessing New Jersey, Delaware, and Pennsylvania refineries would traverse the Southern New England and Mid-Atlantic Bight stock, potentially imperiling Atlantic fisheries along more than 50 percent of the U.S. east coast.

A series of investigative reports by the *Portland Press Herald* on the health of the Gulf of Maine ecosystem underscores the grave threat posed by Energy East's oil tankers.<sup>88</sup> The impacts already observed include significant shifts in species location due to warming water, increasing numbers of invasive species, and shellfish populations struggling with accelerating ocean acidity that compromises shell-building.<sup>89</sup> The increased risk of an oil spill posed by Energy East places an undue burden on an ecosystem nearing the breaking point.

The American lobster and sea scallop fisheries are not the only fisheries that could be devastated by an oil spill. Most major Gulf of Maine fisheries lie within the path of Energy East's tankers. These include groundfish fisheries like cod and haddock, as well as herring, clam, and tuna, in addition to the lobster and scallop fisheries discussed above.<sup>90</sup>[FN1] Farther south, tankers accessing New Jersey, Delaware, and Pennsylvania refineries would traverse the southern New England and Mid-Atlantic fisheries, potentially imperiling Atlantic fisheries along more than 50 percent of the U.S. east coast. In 2014 alone, New England and Mid-Atlantic commercial fisheries landings were valued at over \$1.6 billion, and supported nearly 300,000 jobs.<sup>91</sup>[FN2] Additionally, recreational fisherman took nearly 21 million fishing trips in these two regions, with sales from recreational fishing expenditures totaling over \$7.5 billion.<sup>92</sup>

### III. Special Places Threatened by Energy East

---

The Energy East pipeline threatens the Atlantic coast's important and fragile ecological and aesthetic heritage and the interdependence between marine environments and local economic development and tourism. The Energy East pipeline magnifies the threat posed to the region by dramatically boosting the volume of tanker traffic along an often perilous shipping route and increasing the risk of a devastating tar sands oil spill.

A tar sands oil spill poses a particularly profound risk to oceans and marine ecosystems. From scientific studies to real-world experience, a growing body of evidence shows tar sands oil (in its most common form, diluted bitumen) is much more difficult to contain and clean up than conventional crude oil.<sup>93</sup> The 2016 NAS study, discussed earlier, showed that marine tar sands diluted bitumen spills are beyond the current cleanup capabilities of our first responders, our government, or even the industry responsible for producing and transporting tar sands oil.<sup>94</sup>

Despite the evidence of diluted bitumen's unique characteristics, agencies that would play a critical role in the event of a marine spill, like the U.S. Coast Guard, do not currently require different spill response plans for tar sands oil and conventional oil.<sup>95</sup> This is particularly concerning given the number of tankers loaded with tar sands oil that Energy East would bring to the U.S. east coast. Specific areas under threat include the Bay of Fundy, the Gulf of Maine, Acadia National Park, and the Florida Keys.

---

87 See, e.g., Connecticut Department of Energy & Environmental Protection, "Interstate Marine Fisheries Management," [www.ct.gov/deep/cwp/view.asp?a=2696&q=322652&devNav\\_GID=1647](http://www.ct.gov/deep/cwp/view.asp?a=2696&q=322652&devNav_GID=1647).

88 Woodard, C., "MAYDAY: Gulf of Maine in Distress," *Portland Press Herald*, October 25, 2015, [www.pressherald.com/2015/10/25/mayday-gulf-maine-distress-six-part-series-from-colin-woodard/](http://www.pressherald.com/2015/10/25/mayday-gulf-maine-distress-six-part-series-from-colin-woodard/).

89 Woodard, C., "Gulf of Maine's Cold-Craving Marine Species Forced to Retreat to Deeper Waters," *Portland Press Herald*, October 27, 2015, [www.pressherald.com/2015/10/27/gulf-maines-cold-craving-marine-species-retreat-deeper-waters/](http://www.pressherald.com/2015/10/27/gulf-maines-cold-craving-marine-species-retreat-deeper-waters/); Woodard, C., "Invasive Species Exploit a Warming Gulf of Maine, Sometimes with Destructive Results," *Portland Press Herald*, October 28, 2015, [www.pressherald.com/2015/10/28/invasive-species-exploit-warming-gulf-maine-sometimes-destructive-results/](http://www.pressherald.com/2015/10/28/invasive-species-exploit-warming-gulf-maine-sometimes-destructive-results/); Woodard, C., "Shellfish Can't Keep Up with Shifting Ocean Chemistry," *Portland Press Herald*, October 29, 2015, [www.pressherald.com/2015/10/29/ocean-acidification-threatens-future-aquaculture-shellfish-industries/](http://www.pressherald.com/2015/10/29/ocean-acidification-threatens-future-aquaculture-shellfish-industries/).

90 Gulf of Maine Council on the Marine Environment. The State of the Gulf of Maine Report. Commercial Fisheries. November 2013. <http://www.gulfofmaine.org/2/sogom-homepage/>.

91 National Marine Fisheries Service. 2016. Fisheries Economics of the United States, 2014. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-163, 237p.

92 Ibid.

93 EPA, "Cleanup Continues; Focus on Submerged Oil," August 2011, [www3.epa.gov/region5/enbridgespill/pdfs/enbridge\\_fs\\_20110811.pdf](http://www3.epa.gov/region5/enbridgespill/pdfs/enbridge_fs_20110811.pdf); NAS at pp. 2-7.

94 See generally: Committee on the Effects of Diluted Bitumen on the Environment et al., Spills of Diluted Bitumen.

95 Hansen, K., and S. Booth, "America's Energy Renaissance: The Coast Guard Prepares for Maritime Transportation System Changes," *The Coast Guard Journal of Safety & Security at Sea, Proceedings of the Marine Safety & Security Council* 72, no. 3 (Fall 2015): 61, [https://www.uscg.mil/proceedings/archive/2015/Vol72\\_No3\\_Fall2015.pdf](https://www.uscg.mil/proceedings/archive/2015/Vol72_No3_Fall2015.pdf).



## NEW BRUNSWICK AND NOVA SCOTIA'S BAY OF FUNDY

The Bay of Fundy is a diverse, exceptionally biologically productive ecosystem, home to an awe-inspiring mix of whales, porpoises, dolphins, and seals, as well as many kinds of fish, birds, scallops, clams, and crustaceans.<sup>96</sup> Its extraordinary natural capital is a result of a unique geophysical environment, defined by the 42 trillion gallons of tidewater that rush into and out of the bay twice a day.<sup>97</sup> The Bay of Fundy ecosystem is also the mainstay of an economic, cultural, and culinary tradition that has depended on wild seafood for thousands of years.

The bay's unique features include the world's highest tides, a high concentration of whales, rich tidal salt marshes, deep-sea corals, and undeveloped shoreline that supports more than one million migratory shorebirds per year.<sup>98</sup> Humpback whales, fin whales, North Atlantic right whales, porpoises, and puffins are just a few of the key species at risk from existing and planned industrialization of the bay.<sup>99</sup> New Brunswick's major tourism economy could also face serious impacts in the event of a marine oil spill. Indeed, Fundy National Park, which accounts for nearly 25 percent of all visits to the province's major tourist attractions, could suffer major economic damages if a tar sands oil spill were to occur just offshore, due to the potential for fouled beaches and the persistent pollution from sunken oil that could not easily be removed from the nearby seafloor.<sup>100</sup>

96 Abbott, M., "TransCanada's Energy East Pipeline: Too Much Risk for the Bay of Fundy–Gulf of Maine," Conservation Council of New Brunswick, August 19, 2015, [www.conservaioncouncil.ca/transcanadas-energy-east-pipeline-too-much-risk-for-the-bay-of-fundy-gulf-of-maine/](http://www.conservaioncouncil.ca/transcanadas-energy-east-pipeline-too-much-risk-for-the-bay-of-fundy-gulf-of-maine/).

97 Ibid. at p. 5. Conversion from metric tons to gallons based on: 1 metric tonne of water = 264.17 U.S. gallons of water. "Convert To" website, [convert-to.com/conversion/water-weight-volume/convert-metric-tonne-t-water-weight-to-us-gal-of-water-volume.html](http://convert-to.com/conversion/water-weight-volume/convert-metric-tonne-t-water-weight-to-us-gal-of-water-volume.html).

98 Canadian Parks and Wilderness Society, Nova Scotia Chapter, "Bay of Fundy: What Do You Mean It's Not Protected?" [cpawns.org/campaigns/bay-of-fundy](http://cpawns.org/campaigns/bay-of-fundy), accessed December 22, 2015.

99 Ibid.

100 Province of New Brunswick, "New Brunswick Tourism Indicators Summary Report," September 2014, [www2.gnb.ca/content/dam/gnb/Departments/thc-tpc/pdf/RSP/NBTourismIndicatorsSummaryReport2013.pdf](http://www2.gnb.ca/content/dam/gnb/Departments/thc-tpc/pdf/RSP/NBTourismIndicatorsSummaryReport2013.pdf).





## GULF OF MAINE

The 36,000-square-mile Gulf of Maine is a regional treasure, featuring one of the world’s most biologically productive ecosystems. It supports a wide diversity of marine microorganisms, plants, and animals that are already threatened by a complex mix of factors driven by climate change, including changing temperature and salinity.<sup>101</sup> The Gulf is also perilously close to the Great Circle Route, an international shipping channel between the Eastern Seaboard and Europe that brings a thousand large ships per year to the region’s ports.<sup>102</sup> This activity leaves the Gulf vulnerable to the accumulated disposal of bilge water, graywater, sewage waste, ballast water, and a constant threat of oil spills.<sup>103</sup>

NRDC scientists have documented concerns about ocean acidification along the coasts of Maine and Massachusetts and into Georges Bank, citing experts’ views that polluted runoff and global greenhouse gas emissions represent a double dose of pollutants threatening the ecosystem’s functionality.<sup>104</sup> The Gulf of Maine’s ecosystem supports seafood landings that, in 2010, brought in \$478.8 million in Massachusetts and \$375 million in Maine and supported 4,500 direct jobs in Maine’s lobster fishery.<sup>105</sup> The Gulf also supports 88,585 jobs in Maine’s tourism industry, which generated more than \$5.2 billion in consumer spending and \$2 billion in household income in 2013.<sup>106</sup>

101 New England Coastal Wildlife Alliance, “The Gulf of Maine,” [www.necwa.org/gulf-maine.html](http://www.necwa.org/gulf-maine.html), accessed December 22, 2015.

102 Gulf of Maine Regional Ocean Science Council, “Gulf of Maine Strategic Regional Ocean Science Plan,” 2009, [seagrant.mit.edu/rosi/draft\\_final\\_rop.pdf](http://seagrant.mit.edu/rosi/draft_final_rop.pdf).

103 Pederson, J. (ed.), *Offshore Ecosystems and Habitats: State of the Gulf of Maine*, Gulf of Maine Regional Ocean Science Council, October 2012, p. 7, [www.gulfofmaine.org/2/wp-content/uploads/2014/03/offshore-ecosystems-and-habitats.pdf](http://www.gulfofmaine.org/2/wp-content/uploads/2014/03/offshore-ecosystems-and-habitats.pdf).

104 Ekstrom, J. et al., “Vulnerability and Adaptation of U.S. Shellfisheries to Ocean Acidification,” *Nature Climate Change* 5 (2015): 207-214, [www.nature.com/nclimate/journal/v5/n3/full/nclimate2508.html#access](http://www.nature.com/nclimate/journal/v5/n3/full/nclimate2508.html#access).

105 Ibid.

106 Maine Office of Tourism, “Maine Tourism Highlights,” 2013, [visitmaine.com/assets/downloads/2013\\_MaineFactSheet.pdf](http://visitmaine.com/assets/downloads/2013_MaineFactSheet.pdf).



## MAINE'S ACADIA NATIONAL PARK

Acadia National Park covers 47,000 acres on the Maine coast and boasts rich biodiversity, an extensive historical record, and stunning aesthetic value. The park receives more than two million recreational visits per year, making it the eighth most visited national park in the United States.<sup>107</sup>

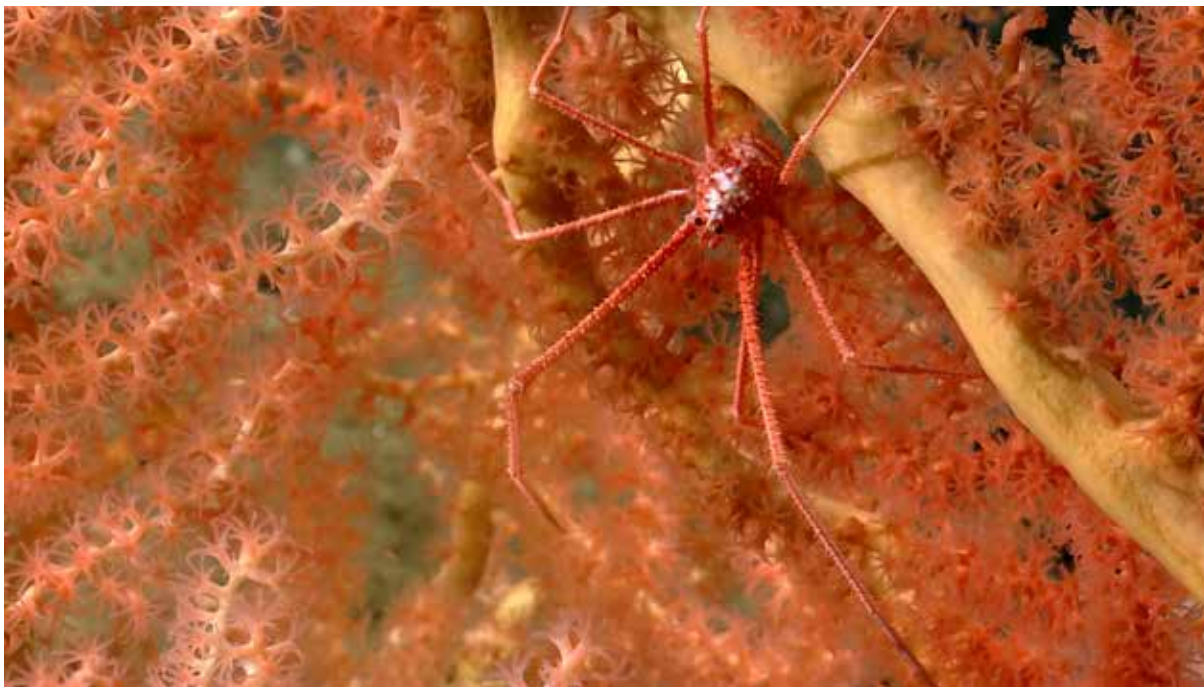
The recorded history of Mount Desert Island, which holds most of the park's acreage, dates back more than five thousand years. It includes a period of fishing, shipbuilding, farming, and lumbering in the 1800s, followed by conservation efforts beginning in the early 1900s.<sup>108</sup> Pollution from upwind urban and industrial areas has already been identified as a periodic environmental threat to the park.<sup>109</sup> Because of the direction of key currents and the park's proximity to Saint John, New Brunswick, and to common oil tanker routes, its iconic beaches, wave-battered granite shorelines, forests, geological formations, and intertidal and subtidal zones would be extremely vulnerable to a tar sands oil spill from one of Energy East's tankers.<sup>110,111</sup>

## NEW ENGLAND'S CORAL CANYONS AND SEAMOUNTS

Deep beneath the surface of the Atlantic Ocean and 150 miles off the coast of Cape Cod, a series of ocean canyons and seamounts are home to an astonishing array of marine life. Of particular importance are cold-water corals that provide food, spawning habitat, and shelter for numerous deepwater species.<sup>112</sup> This diverse ecosystem, in turn, provides essential food sources for more well-known marine species, including tuna and other commercially harvested fish as well as endangered marine mammals like sperm whales and the North Atlantic right whale.

As shown in Map 2, Energy East tankers would traverse the waters covering many of these marine treasures. In the process, they would place entire rare and critical ecosystems at increased risk of an oil spill with substantial volumes of submerged and sunken oil that would be likely to persist in the environment for a number of years.

© NOAA OKEANOS Explorer Program, 2013 Northeast U.S. Canyons Expedition.



Squat Lobster on Coral in Nygren Canyon.

107 National Park Service, "Acadia National Park/Park Statistics," U.S. Department of the Interior, accessed December 22, 2015, [www.nps.gov/acad/learn/management/statistics.htm](http://www.nps.gov/acad/learn/management/statistics.htm).

108 National Park Service, "The History of Acadia National Park and Mount Desert Island," U.S. Department of the Interior, [www.nps.gov/acad/planyourvisit/upload/history.pdf](http://www.nps.gov/acad/planyourvisit/upload/history.pdf), accessed January 21, 2016.

109 National Park Service, "Acadia National Park/Environmental Factors," U.S. Department of the Interior, [www.nps.gov/acad/learn/nature/environmentalfactors.htm](http://www.nps.gov/acad/learn/nature/environmentalfactors.htm), accessed January 21, 2016.

110 National Park Service, "Acadia National Park/Natural Features & Ecosystems," U.S. Department of the Interior, [www.nps.gov/acad/learn/nature/naturalfeaturesandecosystems.htm](http://www.nps.gov/acad/learn/nature/naturalfeaturesandecosystems.htm), accessed January 21, 2016.

111 Pettigrew, N. and Xue, H., "The Response of the Gulf of Maine Coastal Current System to Late-Spring Northeasterly Wind Forcing," University of Maine, 2005, [web.mit.edu/seagrant/rt06/Pettigrew.pdf](http://web.mit.edu/seagrant/rt06/Pettigrew.pdf).

112 Natural Resources Defense Council (hereinafter NRDC), "Protecting America's Deep-Sea Treasures," 2015, [www.nrdc.org/sites/default/files/new-england-deep-sea-treasures-IB\\_0.pdf](http://www.nrdc.org/sites/default/files/new-england-deep-sea-treasures-IB_0.pdf).



## FLORIDA KEYS

The Florida Keys are among the best-known natural wonders in the United States. Home to the world's third-largest barrier reef and thousands of species of marine plants and animals, the Keys support a major tourist economy and provide a natural buffer that protects the coast of mainland Florida from erosion and its wetlands from saltwater incursion.<sup>113</sup> In fact, the Florida Keys National Marine Sanctuary protects nearly 3,000 square nautical miles in the waters surrounding the Florida Keys.<sup>114</sup>

Energy East tankers would have to pass through a narrow channel between Florida and the Bahamas, entering the Gulf of Mexico along the southern edge of the Keys. Here, they would travel as little as 15 miles from shore, placing the entire area at risk of a spill.<sup>115</sup> In the worst cases, northbound ocean currents could carry floating and submerged oil back toward the mainland, where it could impact wildlife and foul Florida's beaches, affecting millions of residents. Long-term effects could include the appearance of residue, like tar balls, due to the likelihood of submerged oil persisting on the seafloor for many years.<sup>116</sup>

113 Ibid.

114 NOAA, "About Florida Keys National Marine Sanctuary," updated June 5, 2012, [floridakeys.noaa.gov/about/welcome.html?s=about](http://floridakeys.noaa.gov/about/welcome.html?s=about).

115 Tanker routes around the Florida Keys can be found at the MarineTraffic website. To view, zoom into the southern tip of Florida, select the "Filters" icon to view only tankers, click on a visible tanker, and select the "Past Track" option. MarineTraffic, [www.marinetraffic.com/](http://www.marinetraffic.com/).

116 National Marine Sanctuaries, "Florida Keys National Marine Sanctuary: 2011 Condition Report," NOAA, 2011, [sanctuaries.noaa.gov/science/condition/fkms/history.html](http://sanctuaries.noaa.gov/science/condition/fkms/history.html).



## IV. Major Ecosystem Threats Posed by Energy East

Coastal ecosystems—along with their environmental grandeur, economic importance, and existing vulnerabilities—provide the backdrop for TransCanada’s proposal to ship 328 million barrels of tar sands oil to refineries on 281 tankers each year. The Energy East pipeline and its massive supertankers would create major ecosystem impacts along the Eastern Seaboard through routine operations, and potentially catastrophic results in the event of a tar sands oil spill.

### OIL SPILLS: TAR SANDS TANKERS NAVIGATING DANGEROUS WATERS

The navigation routes through eastern Canadian ports and along the U.S. east coast can be hazardous due to weather, heavy shipping traffic, narrow shipping channels, and close proximity to major population centers, such as New York City, Philadelphia, Baltimore, and Miami. With single vessels carrying up to two million barrels of tar sands oil each, the environmental risks attached to Energy East’s shipments could be exceptionally high.

### THE DEEPWATER HORIZON: 205 MILLION GALLONS, BILLIONS IN ECONOMIC LOSSES



The 2010 Deepwater Horizon disaster provides a critical reminder of the kinds of impacts that oil spills can have on coastal communities and marine wildlife. In the summer of 2010, BP’s Macondo offshore oil well spilled 134 million gallons of oil into the Gulf of Mexico. The disaster killed as many as 1 million birds,<sup>117</sup> and led to the largest die-off of bottlenose dolphins in the Gulf’s history.<sup>118</sup> All five of the Gulf’s sea turtle species are either threatened or endangered, and as many as 300,000 sea turtles died as a result of oil spill contamination, spill response activities, or foregone reproduction.<sup>119</sup> The cost to the Gulf Coast economy included at least \$22 billion in losses to the tourism industry and \$247 million to the region’s fisheries.<sup>120</sup> The public collectively lost over 16 million user days of boating, fishing and beach-going experiences due to the spill, with the value of recreational losses to the public estimated to be \$693.2 million.<sup>121</sup>

The emergency response included the spraying of 1.8 million gallons of Corexit, a chemical used to treat and disperse spilled oil. This chemical has come under fire for its own hazards, including harmful health effects among response workers and toxic impacts to certain species.<sup>122</sup> As of April 2016, BP has paid more than \$56 billion as a result of their gross negligence in the Deepwater Horizon disaster, and the costs will continue to rise as more economic damage claims are resolved.<sup>123</sup>

117 Haney, C.J., Geiger, H.J., & Short, J.W., Bird mortality from the Deepwater Horizon oil spill. I. Exposure probability in the offshore Gulf of Mexico. *Marine Ecology Progress Series* Vol 513:225-237, 2014(a); Haney, C.J., Geiger, H.J., & Short, J.W., Bird mortality from the Deepwater Horizon oil spill, II, Carcass sampling and exposure probability in the coastal Gulf of Mexico, *Marine Ecology Progress Series*, vol. 513, pp. 239-252, 2014(b). The NRDA reports a much more conservative mortality rate for birds. The NRDA acknowledges the Haney et al. studies, but does not discuss them. A comment on these Haney studies was published by NRDA-affiliated researchers: Sackmann, B.S., & Becker, D.S., Bird mortality due to the Deepwater Horizon oil spill: Comment on Haney et al. (2014a,b), *Marine Ecology Progress Series*, Vol 534:273-277, 2015. A reply to this comment was also published: Haney, C.J., Geiger, H.J., & Short, J.W., Bird mortality due to the Deepwater Horizon oil spill: Reply to Sackmann & Becker (2015), *Marine Ecology Progress Series*, Vol 534:279-283, 2015.

118 Deepwater Horizon Natural Resource Damage Assessment Trustees. (2016). *Deepwater Horizon oil spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement*. Retrieved from <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.

119 Ibid.

120 Alvarez, S., et al., A revealed preference approach to valuing non-market recreational fishing losses from the Deepwater Horizon oil spill, *Journal of Environmental Management*, Vol. 145, pp. 199-209, 2014; Sumaila, U.R., et al., Impact of the Deepwater Horizon well blowout on the economics of U.S. Gulf fisheries. *Canadian Journal of Fisheries and Aquatic Sciences*, Vol. 69(3), pp. 499-510, 2012, [www.nrcresearchpress.com/doi/full/10.1139/f2011-171#.VKL\\_D14DxA](http://www.nrcresearchpress.com/doi/full/10.1139/f2011-171#.VKL_D14DxA).

121 Deepwater Horizon Natural Resource Damage Assessment Trustees. (2016). *Deepwater Horizon oil spill: Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement*. Retrieved from <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.

122 Miller, M.E., “Study Suggests Chemical Used in BP Oil Spill Clean-up Capable of Injuring People and Wildlife,” *Washington Post*, April 7, 2015, [www.washingtonpost.com/news/morning-mix/wp/2015/04/07/study-suggests-chemical-used-in-bp-oil-spill-clean-up-capable-of-injuring-people-and-wildlife/](http://www.washingtonpost.com/news/morning-mix/wp/2015/04/07/study-suggests-chemical-used-in-bp-oil-spill-clean-up-capable-of-injuring-people-and-wildlife/); Kirby, D., “Corexit, Oil Dispersant Used by BP, Is Destroying Gulf Marine Life, Scientists Say,” *Huffington Post*, April 25, 2013, [www.huffingtonpost.com/2013/04/25/corexit-bp-oil-dispersant\\_n\\_3157080.html](http://www.huffingtonpost.com/2013/04/25/corexit-bp-oil-dispersant_n_3157080.html).

123 Kent, S. & Christopher Matthews, April 26, 2016, BP Results Still Hurt by Gulf of Mexico Spill, *The Wall Street Journal*, <http://www.wsj.com/articles/bp-reports-first-quarter-pretax-loss-1461651961>.






---

***With single vessels carrying up to two million barrels of tar sands oil each, the environmental risks attached to Energy East’s shipments could be exceptionally high.***

---

Oil tankers carry many well-known risks, but those loaded with tar sands crude oil create many unique hazards. Past spills of tar sands into water have shown that there will likely be impacts at the surface, subsurface, and ocean or river bottom due to the oil’s propensity to sink.<sup>124</sup> These risks were highlighted in the 2016 study from the NAS, which found that tar sands oil (in the form of diluted bitumen) differs substantially from other types of oil commonly transported in the United States.<sup>125</sup> These differences lead tar sands oil to quickly change character when spilled in water. The light natural gas liquids that are mixed with the heavy bitumen evaporate, leading to submerged, sinking, and sunken oil.<sup>126</sup> Making matters worse, the NAS found that first responders at the local, state, and national levels lack the technology and resources necessary to effectively remedy a tar sands oil spill.<sup>127</sup> In addition, a recent study from Environment Canada found that tar sands spilled into saltwater environments is likely to sink if not quickly remediated because of the presence of sediments and wave energy.<sup>128</sup> A November 2015 study by the Royal Society of Canada raised additional concern over tar sands oil spills in water when it confirmed that diluted bitumen often sinks when spilled in water and identified many of the same research needs as those identified by the NAS.<sup>129</sup>

These risks apply to any water body, but the Atlantic coast is a particularly dangerous place to gamble with tanker safety. Powerful currents, towering waves, submerged reefs and shoals, and heavy storms and hurricanes are well-known hazards to Atlantic shipping.<sup>130</sup> The impacts of a major coastal tanker accident would begin with loss of marine life, damage to vessels, and spilled cargo. Impacts would ultimately disrupt economic activity throughout the region and across North America. A spill of this toxic cargo could affect dozens of coastal communities, threaten fish stocks, and cause serious and possibly irreparable harm to fragile marine and shoreline ecosystems.

## **SHIP STRIKES: A SERIOUS THREAT TO MARINE MAMMALS**

The Energy East project proposes a drastic increase in oil tankers off the Northeast coast (from around 50 per year to more than 300),<sup>131</sup> which would increase the risk of ship collisions with marine species including the North Atlantic right whale. Vessel collisions have been recognized as a leading cause of the endangered right whale’s mortality since the 1970s.<sup>132</sup> Out of 75 carcasses reported between 1970 and 2007, 28 were killed by ship strikes. Ship strikes were responsible for an even

124 NOAA, “NOAA Technical Memorandum NOS OR&R 44: Transporting Alberta Oil Sands Products: Defining the Issues and Assessing the Risks,” September 2013, p.7, [crcc.unh.edu/sites/crrc.unh.edu/files/media/noaa\\_oil\\_sands\\_report\\_09.2013.pdf](http://crcc.unh.edu/sites/crrc.unh.edu/files/media/noaa_oil_sands_report_09.2013.pdf).

125 Committee on the Effects of Diluted Bitumen on the Environment et al., *Spills of Diluted Bitumen*, at 2.

126 Ibid.

127 Ibid., at 3.

128 Environment Canada, “Properties, Composition and Marine Spill Behaviour: Fate and Transport of Two Diluted Bitumen Products from the Canadian Oil Sands,” Government of Canada, November 2013, p. 5, [www.ec.gc.ca/Publications/default.asp?lang=En&xml=D6AB8B67-73F5-48B6-B3D1-AAE1B06FF9A2](http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=D6AB8B67-73F5-48B6-B3D1-AAE1B06FF9A2).

129 Boufadel, M., et al., “The Behaviour and Environmental Impacts of Crude Oil Released into Aqueous Environments,” Royal Society of Canada Expert Panel, 2015, [rsc-src.ca/sites/default/files/pdf/OIW%20Report\\_1.pdf](http://rsc-src.ca/sites/default/files/pdf/OIW%20Report_1.pdf).

130 Green, J., *Atlantic Ocean*, World Almanac Library: Oceans and Seas (Milwaukee: World Almanac Library, 2006), p. 33, [buff.ly/1MwestE](http://buff.ly/1MwestE).

131 Fritelli, J., “Shipping U.S. Crude Oil by Water”; Maritime Administration, “2011 U.S. Water Transportation Statistical Snapshot”; Friedman, N., “Crude-Oil Exports to Canada”; Lewis, J., “Eastern Refineries Processing More Foreign Oil.”

132 Fisheries and Oceans Canada, “Recovery Strategy for the North Atlantic Right Whale (*Eubalaena glacialis*) in Atlantic Canadian Waters,” Government of Canada, Species at Risk Registry, last modified April 14, 2014, [www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=717856D0-1](http://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n=717856D0-1).



greater portion of right whale deaths (50 percent) from 1991 on. A whale that initially survives a ship strike can sustain major propeller wounds on its back or tail peduncle, which can compromise swimming efficiency and cause infection, eventually leading to death.<sup>133</sup>

While Canada has altered shipping routes through the Bay of Fundy to avoid current right whale habitat, scientists expect this habitat to change over time, due to fluctuations in ocean conditions. Even a small shift to the east could bring the whales back into a shipping thoroughfare that would be much busier if the Energy East pipeline is built, seriously threatening their survival prospects.<sup>134</sup> Furthermore, the threat of ship strikes posed by Energy East tankers should be considered in the context of the cumulative potential impact alongside other existing and proposed shipping projects.

## NOISE POLLUTION: DISRUPTING MARINE MAMMALS

Increased commercial shipping traffic will significantly alter the underwater sonic atmosphere throughout the Bay of Fundy and Gulf of Maine. Noise pollution can mask social communication, reducing marine mammals' mating opportunities and inhibiting mother-calf interactions.<sup>135</sup> Even if individual noise sources are insignificant on their own, researchers are concerned about the cumulative impacts of a continuing barrage of noise from multiple sources, as well as the synergies between noise pollution and other risk factors.<sup>136</sup> A key question is how soon and how severely the level, frequency, duration, and location of "introduced sound" will exceed marine mammals' adaptive capacity and cause behavioral disturbances, hearing impairment, or death.<sup>137,138</sup>

North Atlantic right whales are already highly vulnerable to such impacts. According to a recent study from NOAA and Cornell University researchers, existing levels of ocean noise, largely produced from distant and nearby shipping traffic, have reduced the right whale's calling range by 60 to 80 percent from pre-shipping levels, grossly undermining the species's ability to communicate in its foraging habitat.<sup>139</sup> Another study found that *decreased* noise in the Bay of Fundy due to reduced traffic after the attacks of September 11, 2001, was associated with lower baseline levels of stress-related hormones in the same species.<sup>140</sup>

133 Ibid.

134 TransCanada, Energy East Pipeline Ltd., Consolidated Application, Volume 17, Part A, Section II: "Marine Wildlife and Wildlife Habitat."

135 Fisheries and Oceans Canada, "Recovery Strategy for the North Atlantic Right Whale," at pp. 25-26.

136 Ibid.

137 Marine Mammal Commission, "Marine Mammals and Noise: A Sound Approach to Research and Management," March 2007, [www.mmc.gov/reports/workshop/pdf/fullsoundreport.pdf](http://www.mmc.gov/reports/workshop/pdf/fullsoundreport.pdf).

138 Fisheries and Oceans Canada, "Recovery Strategy for the North Atlantic Right Whale."

139 Hatch, L., et al., "Quantifying Loss of Acoustic Communication Space for Right Whales in and Around a U.S. National Marine Sanctuary," *Conservation Biology* 26, no. 6 (December 2012): 983-994., [www.dtic.mil/dtic/tr/fulltext/u2/a563664.pdf](http://www.dtic.mil/dtic/tr/fulltext/u2/a563664.pdf).

140 Rolland, R.M., et al., "Evidence That Ship Noise Increases Stress in Right Whales," *Proceedings of the Royal Society B* 279, no. 1737 (June 22, 2012): rspb.royalsocietypublishing.org/content/279/1737/2363.



The overlap between commercial shipping noise and the sound frequency range used by various marine mammals is a recurring theme in literature on ocean ecosystems. Between 1950 and 1998, the worldwide commercial tanker fleet grew from about 30,000 vessels and 85 million gross tons to more than 85,000 vessels and more than 525 million gross tons.<sup>141</sup>

An example of what this increase has meant for ocean noise is encapsulated in a study of underwater noise off the coast of California. Between the mid-1960s and early 2000s, ambient ocean noise at acoustic monitoring sites off the California coast rose by about three decibels per decade at frequencies associated with commercial shipping—likely due to significant increases in the number, size, speed, and horsepower of commercial ships.<sup>142</sup> Shipping has increased background noise levels even more dramatically in heavily trafficked areas.<sup>143</sup>

Given the severe and known cumulative effects of noise pollution on marine mammals, it is especially important to assess the impact of the current and expected tanker traffic in the region as a whole—not just the impact of Energy East tankers.

Energy East could increase tanker traffic in the Bay of Fundy and elsewhere by at least 74 percent, exacerbating some of the most significant risks faced by marine mammals: ship strikes and marine noise pollution. This increase also has the potential to severely undermine long-term efforts to ensure the survival of iconic regional species. Unfortunately, Canada has limited the cumulative impacts analysis for Energy East to “the mouth of the area defined as the Bay of Fundy,” thereby ignoring the Gulf of Maine and nearby projects and traffic that will compound the potential impacts on marine life.<sup>144</sup> Further, TransCanada’s most recent revision to its project application does not consider the impact of noise produced by 562 new tanker transits in the Bay of Fundy, despite significant scientific evidence that these operations could cause serious disruptions for marine mammals in the area.<sup>145</sup> TransCanada similarly rejected the risk of vessel strikes, concluding summarily that “there is a low likelihood of a tanker strike as a result of increased tanker traffic associated with the Project.”<sup>146</sup>

141 Southall, B., “Shipping Noise and Marine Mammals: A Forum for Science, Management and Technology,” Final Report of the NOAA International Symposium, Arlington, VA, May 18–19, 2004, pp. 9–11, [www.nmfs.noaa.gov/pr/pdfs/acoustics/shipping\\_noise.pdf](http://www.nmfs.noaa.gov/pr/pdfs/acoustics/shipping_noise.pdf).

142 Andrew, R., B. Howe, and J. Mercer, “Ocean Ambient Sound: Comparing the 1960s with the 1990s for a Receiver off the California Coast,” *Acoustics Research Letters Online*, February 4, 2002, pp. 65–70, [oe.soest.hawaii.edu/OE/Prof.Howe\\_PDF/2002,%20Andrew,%20Ocean%20ambient%20sound%20Comparing,%20Acoust.%20Res.%20Lett.%20online.pdf](http://oe.soest.hawaii.edu/OE/Prof.Howe_PDF/2002,%20Andrew,%20Ocean%20ambient%20sound%20Comparing,%20Acoust.%20Res.%20Lett.%20online.pdf); McDonald, M., J. Hildebrand, and S. Wiggins, “Increases in Deep Ocean Ambient Noise in the Northeast Pacific West of San Nicolas Island, California,” *Journal of the Acoustical Society of America* 120, no. 2 (August 2006): 711–718, [cet.uscd.edu/Publications/Publications/PAPERS/McDonaldJASA2006.pdf](http://cet.uscd.edu/Publications/Publications/PAPERS/McDonaldJASA2006.pdf).

143 Basset, C., et al., “A Vessel Noise Budget for Admiralty Inlet, Puget Sound, Washington (USA),” *Journal of the Acoustical Society of America* 132, no. 6 (December 2012): 3706–3719, [faculty.washington.edu/jmt3rd/Publications/Bassett\\_etal\\_2012\\_VesselNoise.pdf](http://faculty.washington.edu/jmt3rd/Publications/Bassett_etal_2012_VesselNoise.pdf).

144 NEB, “TransCanada Energy East Pipeline Project—List of Issues.”

145 TransCanada, Energy East Pipeline Ltd., Consolidated Application, Volume 17, Part A, Section II: “Marine Wildlife and Wildlife Habitat,” at pp. 31–34.

146 TransCanada Pipeline Limited, “Energy East Project, Consolidated Application, Volume 19, “Accidents and Malfunctions,” submitted to Canada NEB, May 2016, [docs.neb-one.gc.ca/11-eng/11isapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2968053/A77029-2\\_V19\\_Accidents\\_and\\_Malfunctions\\_-\\_A5A8A9.pdf?nodeid=2967572&vernum=-2](http://docs.neb-one.gc.ca/11-eng/11isapi.dll/fetch/2000/90464/90552/2432218/2540913/2543426/2968053/A77029-2_V19_Accidents_and_Malfunctions_-_A5A8A9.pdf?nodeid=2967572&vernum=-2).





*Energy East could increase tanker traffic in the Bay of Fundy and elsewhere by at least 74 percent, exacerbating some of the most significant risks faced by marine mammals: ship strikes and marine noise pollution.*

### **BALLAST WATER AND INVASIVE SPECIES: “MARINE ECOLOGICAL ROULETTE”**

Many Energy East tankers would travel back and forth between the Port of Saint John and refineries on the U.S. Gulf Coast. En route to the refineries, the tankers would be loaded with crude oil, but on the return trips to Saint John, it is unlikely they would be fully loaded, so they would carry ballast water for stability. The ballast water would then need to be discharged before the tankers could be loaded with oil. Ten years ago, the volume of ballast water discharged into U.S. waters from international ports totaled more than 21 billion gallons per year.<sup>147</sup> NOAA estimates this extraordinary volume of ballast water transports more than 10,000 marine species each day, often into waters where they are not native.<sup>148</sup>

The release of ballast water has been described as “marine ecological roulette.”<sup>149</sup> It is a source of the more than three dozen invasive species that have already established themselves in the Gulf of Maine.<sup>150</sup> U.S. Coast Guard regulations require that vessels entering U.S. coastal waters discharge their ballast water in the open ocean, where foreign species are less likely to thrive. However, this does not eliminate all risks.<sup>151</sup> Ships may be unable to comply with the regulation due to storms or stability issues, and mid-ocean ballast exchange does not always fully remove invasive species, leaving coastal areas like the Gulf of Maine still vulnerable. Invasive species are a major force of ecological and evolutionary change, and are capable of changing the structure and function of coastal and marine ecosystems.

### **CLIMATE CHANGE: LOCKING IN MORE CARBON POLLUTION**

While the bulk of this report has focused on possible and likely marine impacts if Energy East were built, it is important to remember that Energy East would hit these ecosystems doubly hard. On top of direct marine impacts, the pipeline also poses serious threats to our shared climate. Climate change is already impacting ecosystems across the United States. California, for example, is coping with unprecedented drought. In 2015, the entire western United States experienced one

<sup>147</sup> NOAA, “Ballast Water—A Pathway for Aquatic Invasive Species,” NOAA’s State of the Coast, February 7, 2012, [stateofthecoast.noaa.gov/invasives/ballast\\_water.html](http://stateofthecoast.noaa.gov/invasives/ballast_water.html).

<sup>148</sup> Ibid.

<sup>149</sup> Fried, S., “Ballast Water a Vehicle for Exotic Marine Species Invasions,” *Gulf of Maine Times* 2, no. 2 (Summer 1998), [gulfofmaine.org/times/summer98/summer98.pdf](http://gulfofmaine.org/times/summer98/summer98.pdf).

<sup>150</sup> Deitz, A., “What Is an Invasive Species?” Gulf of Maine Area Census of Marine Life, [www.gulfofmaine-census.org/education/tools-resources/overviews/invasives/](http://www.gulfofmaine-census.org/education/tools-resources/overviews/invasives/), accessed January 21, 2016.

<sup>151</sup> NOAA Office of General Counsel, “Ballast Water: U.S. Federal Management,” [www.gc.noaa.gov/gcil\\_ballast\\_federal.html](http://www.gc.noaa.gov/gcil_ballast_federal.html), accessed January 21, 2016.

of its worst wildfire seasons in history, with drought slowly creeping north and snowpack dropping to historic lows.<sup>152,153,154</sup> Ocean acidification is accelerating all over the world, with alarming impacts for the Atlantic coast including the Gulf of Maine. Meanwhile, communities in the Southeast are experiencing sea level rise and increased storm surge and hurricane intensity.<sup>155</sup> In the Northwest, Native Alaskan communities are abandoning their homes due to a loss of sea ice and coastal erosion.<sup>156</sup>

The Energy East pipeline would enable a significant increase in tar sands production, locking in numerous new sources of carbon pollution for the duration of the project's 50-year life span.<sup>157</sup> The Pembina Institute reports that the pipeline "could generate up to 32 million metric tons of additional greenhouse gas emissions each year" from production alone,<sup>158</sup> equivalent to the annual emissions of seven million cars. In addition, the proposal supports an approximately 34 percent to 39 percent increase in tar sands oil production over 2012 levels.<sup>159</sup> Annually, the oil moved by Energy East—including production, transport, and use—could emit at least 256 million metric tons of greenhouse gases, equivalent to the annual emissions from nearly 54 million cars.<sup>160</sup> The Alberta government has recently committed to ensuring that any tar sands production emission increases do not bring the sector's total emissions above 100 MT CO<sub>2</sub>e/yr (a 43% increase over 2016 levels).<sup>161</sup> Concern exists that the volumes of oil to be transported in the Energy East pipeline would result in the exceedance of this cap.<sup>162</sup>

Because tar sands oil production facilities and pipelines can operate for more than 50 years, they create a lock-in on greenhouse gas emissions that can be expected to continue at high levels for the project's entire useful life, despite worldwide efforts to transition almost completely away from most fossil fuels by 2050.<sup>163,164</sup> Projects like Energy East pose serious threats in a climate-constrained world, as they spur growth in high-carbon resources, lock in high levels of new carbon emissions for decades, and slow the transition to a low-carbon world economy. Thus, Canadian regulators must ensure that new oil infrastructure proposals—including Energy East—do not result in Canada failing to meet its international climate change commitments nor lead to Alberta exceeding its promised emissions cap.

---

***The Energy East pipeline would enable a significant increase in tar sands production, locking in numerous new sources of carbon pollution for the duration of the project's 50-year life span.***

---

## **CUMULATIVE IMPACTS: CROWDING OUT OCEAN WILDLIFE AND MARINE USERS**

The U.S. Atlantic coastal and marine waters are busy places, with fishing and tourism and shipping and renewable energy development all demanding space and impacting the health and integrity of marine wildlife and their habitats. The Northeast and Mid-Atlantic ocean regions are currently finalizing new ocean action plans that provide a blueprint for balancing ocean uses with healthy ocean ecosystems.<sup>165</sup> Energy East and its waterborne pipeline of tar sands tankers is not on the radar in either planning effort. The addition of hundreds of new super tankers carrying an extremely hazardous form of oil threatens to disrupt the ability of these ocean regions to sustainably accommodate existing uses while protecting and restoring critical ocean habitats.

---

152 Brumfield, B., and Capelouto, S., "California Wildfires Kill One Person, Destroy More Homes," CNN, September 21, 2015, [www.cnn.com/2015/09/20/us/california-wildfires-homes-burned/](http://www.cnn.com/2015/09/20/us/california-wildfires-homes-burned/).

153 National Drought Mitigation Center, "U.S. Drought Monitor Change Maps" [droughtmonitor.unl.edu/MapsAndData/ChangeMaps.aspx](http://droughtmonitor.unl.edu/MapsAndData/ChangeMaps.aspx). Drought conditions over the past year can be seen by selecting current date, "National," "CONUS," and "Calendar Year."

154 Natural Resources Conservation Service, "Western Snowpack and Water Supply Conditions," U.S. Department of Agriculture, April 2015, [www.wcc.nrcs.usda.gov/ftpref/downloads/wsf/201504wsfwww.pdf](http://www.wcc.nrcs.usda.gov/ftpref/downloads/wsf/201504wsfwww.pdf).

155 EPA, "Climate Change Impacts," [www3.epa.gov/climatechange/impacts/](http://www3.epa.gov/climatechange/impacts/).

156 Mooney, C., "The Remote Alaskan Village That Needs to Be Relocated Due to Climate Change," *Washington Post*, February 24, 2015, [www.washingtonpost.com/news/energy-environment/wp/2015/02/24/the-remote-alaskan-village-that-needs-to-be-relocated-due-to-climate-change/](http://www.washingtonpost.com/news/energy-environment/wp/2015/02/24/the-remote-alaskan-village-that-needs-to-be-relocated-due-to-climate-change/).

157 McKinnon, H., G. Muttitt, and L. Stockman, "Lockdown," at 28.

158 Flanagan, E., and Demerse, C., "Climate Implications of the Proposed Energy East Pipeline," Pembina Institute, February 21, 2014, p. 21, [www.pembina.org/pub/2519](http://www.pembina.org/pub/2519).

159 Ibid.

160 Carnegie Endowment for International Peace, "Assessing Global Oils"; EPA, "Greenhouse Gas Equivalencies Calculator."

161 Alberta Government, "Climate Leadership Plan," <http://www.alberta.ca/climate-leadership-plan.cfm>. (Accessed July 21, 2016.).

162 Flanagan, E., and Demerse, C., "Climate Implications of the Proposed Energy East Pipeline."

163 Erickson, P., "Carbon Lock-in From Fossil Fuel Supply Infrastructure," Stockholm Environment Institute, 2015, [www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-DB-2015-Carbon-lock-in-supply-side.pdf](http://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-DB-2015-Carbon-lock-in-supply-side.pdf).

164 NRDC, "The Paris Agreement on Climate Change," December 2015, [www.nrdc.org/sites/default/files/paris-climate-agreement-IB.pdf](http://www.nrdc.org/sites/default/files/paris-climate-agreement-IB.pdf); NRDC, "What Is the Paris Agreement?" December 21, 2015, [www.nrdc.org/resources/what-paris-agreement](http://www.nrdc.org/resources/what-paris-agreement).

165 See, e.g. Mid-Atlantic Regional Planning Body, <http://www.boem.gov/MidA-New/>; and Ocean Planning in the Northeast, <http://neooceanplanning.org/>.

## V. Opposition to Energy East

---

Due to the risks posed by the Energy East project, it is no surprise that many communities are in opposition. In January 2016, the Montreal Metropolitan Community (MMC)—representing 82 municipalities and four million residents—announced its opposition to the project, bringing the number of municipalities in opposition to more than 300 in Quebec.<sup>166,167</sup> Even more recently, Quebec’s major farmers’ union, l’Union des producteurs agricoles (UPA), announced its formal opposition to Energy East.<sup>168</sup> The union represents more than 41,000 people operating 28,000 farms in the province.

---

***“The MMC is against the Energy East pipeline project because it still represents a serious environmental threat, with too little economic benefits for the greater Montreal region.”***

–Dennis Coderre, Montreal mayor and president of the Montreal Metropolitan Community<sup>169</sup>

---

Dozens of First Nations are also fighting Energy East, concerned about the threats it poses to their livelihoods, culture, lands, and waters and to our shared climate. The Assembly of First Nation Chiefs in New Brunswick spoke out against Energy East as early as August 2013.<sup>170</sup> In June, the First Nation Chiefs of Quebec-Labrador, representing 43 communities, passed a resolution officially opposing Energy East and tasking the Assembly of First Nations Quebec-Labrador (AFNQL) with ensuring that their opposition is respected.<sup>171</sup> More recently, the Iroquois Caucus announced its opposition “in order to safeguard its territories, its peoples and its cultures from the major threats posed by this dangerous project,” and noted “serious concerns with respect to the devastating effects this project can have on our lands and waters, our way of life and our cultures.”<sup>172</sup> Additionally, the Wolastoq Grand Council, which represents the Maliseet people in New Brunswick, expressed its opposition in a February 2016 news conference. At the conference, one representative emphasized, “We are not allowing the pipeline to come through our homeland.”<sup>173</sup> Because the Maliseet people never ceded their land in treaties, their stance is especially powerful.<sup>174</sup> In Quebec, the Mohawk Council of Kanestake—with support from the Chiefs of Quebec—is also rejecting the Energy East pipeline due to the “extraordinary danger that a toxic pipeline spill presents to Kanestake’s lands and waters but also because of the unacceptable process put in place to review and authorize the project.”<sup>175</sup>

The Ontario Energy Board (OEB) has also expressed concerns about Energy East, following a major series of consultations. In a press release, the board stated, “After the most comprehensive consultation it has ever undertaken, the OEB has determined that there is an imbalance between the economic and environmental risks of the Project, and the expected benefits for Ontarians.”<sup>176</sup>

---

***“The primary concerns of Ontarians are about pipeline safety, and the impact of Energy East on their lakes, rivers and drinking water in the event of a spill.”***

–Rosemarie Leclair, chair and CEO of the Ontario Energy Board<sup>177</sup>

---

---

166 Bruemmer, R., “Montreal-Area Municipalities Formally Oppose Energy East Pipeline” *Montreal Gazette*, January 21, 2016, [montrealgazette.com/news/local-news/montreal-area-municipalities-formally-oppose-energy-east-pipeline](http://montrealgazette.com/news/local-news/montreal-area-municipalities-formally-oppose-energy-east-pipeline).

167 Équiterre, “Rejecting the Energy East Project: Équiterre Applauds CMM Decision,” press release, January 21, 2016, [www.equiterre.org/en/communiquer/rejecting-the-energy-east-project-equiterre-applauds-cmms-decision](http://www.equiterre.org/en/communiquer/rejecting-the-energy-east-project-equiterre-applauds-cmms-decision).

168 Bergeron, P., L’UPA sort de sa réserve et s’oppose à Énergie Est, *Le Devoir*, May 9, 2016, [www.ledevoir.com/environnement/actualites-sur-l-environnement/470323/transcanada-l-upa-prend-position-contre-energie-est](http://www.ledevoir.com/environnement/actualites-sur-l-environnement/470323/transcanada-l-upa-prend-position-contre-energie-est).

169 NRDC, “The Paris Agreement on Climate Change”; NRDC, “What Is the Paris Agreement?”

170 CBC News, “First Nations Chiefs Worried About West-East Pipeline Terminal,” August 15, 2013, [www.cbc.ca/news/canada/new-brunswick/first-nations-chiefs-worried-about-west-east-pipeline-terminal-1.1409641](http://www.cbc.ca/news/canada/new-brunswick/first-nations-chiefs-worried-about-west-east-pipeline-terminal-1.1409641).

171 <http://www.newswire.ca/fr/news-releases/first-nations-of-quebec-officially-oppose-energy-east-pipeline-583165411.html>.

172 Iroquois Caucus, “Iroquois Caucus Addresses the Energy East Pipeline,” January 28, 2016, [www.westmeetseast.ca/wp-content/uploads/2016/01/Iroquois-Caucus-Officially-Opposes-Energy-East.pdf](http://www.westmeetseast.ca/wp-content/uploads/2016/01/Iroquois-Caucus-Officially-Opposes-Energy-East.pdf).

173 Morris, C., “NB First Nations Group Vows to Veto Pipeline Project,” *Telegraph-Journal*, February 9, 2016, [www.telegraphjournal.com/telegraph-journal/story/45747848-nb-first-nations-group](http://www.telegraphjournal.com/telegraph-journal/story/45747848-nb-first-nations-group).

174 Ibid.

175 <http://www.westmeetseast.ca/wp-content/uploads/2015/06/FINAL-Kanesatake-EE-press-release.pdf>

176 Ontario Energy Board, “Risks and Benefits of Energy East Need Better Balance,” press release, August 13, 2015, [www.ontarioenergyboard.ca/html/oebenergyeast/documents/report\\_to\\_minister/news\\_release\\_energyeast\\_20150813.pdf](http://www.ontarioenergyboard.ca/html/oebenergyeast/documents/report_to_minister/news_release_energyeast_20150813.pdf).

177 Ibid.





On March 1, 2016, the Quebec government announced that it would seek an injunction to ensure that Energy East was subject to the province's environmental regulations. TransCanada has since backtracked on its initial refusal to comply with Quebec provincial law, a move that will subject the Energy East project to an environmental assessment by Quebec's Bureau d'audiences publiques sur l'environnement (BAPE).<sup>178</sup>

To date, concerns about the environmental impacts from Energy East have come largely from the Canadian side of the border. In the United States, very few people have heard of Energy East, despite its potentially devastating impact on our waters, the global climate, and refinery-related pollution. This lack of coverage and attention means that many U.S. residents—including those along the U.S. east coast, who stand to be directly affected—are unaware of the looming risks of a major tar sands tanker spill in coastal waters.

## VI. Recommendations

A project like Energy East has no place in a world facing the daily threats of a changing climate, and in which policymakers strive to implement the changes necessary to mitigate these threats as much as possible. In the face of this threat, robust, objective environmental review is a necessity—both because it allows the public to fully grasp the potential impacts, and because it places major oil infrastructure projects like Energy East within the global environmental context.

Currently, the scope of environmental review for Energy East under Canada's NEB is woefully inadequate. First, the review does not consider upstream environmental impacts of expanded tar sands oil production, even though hoped-for expansions in production are the reason the pipeline was proposed. Second, potential climate impacts will be considered in an as-yet-undefined process that is expected to lack any meaningful consideration of the life cycle impacts of the tar sands diluted bitumen moved by the pipeline and tankers. Third, it remains unclear whether Canadian regulators are willing to seriously consider the growing body of evidence showing that neither Canada nor the United States is prepared to deal with tar sands oil spills. In light of the project's substantial negative impacts, an objective and robust review of Energy East would almost certainly support its rejection.

Because we believe that robust, objective review is necessary, we offer the following recommendations for improving the regulatory process applicable to projects like Energy East. In addition, we recommend that Canadian and U.S. regulators issue a tar sands oil tanker moratorium long enough to allow industry and government to research, develop, and test spill response techniques to address a diluted bitumen spill into water.

<sup>178</sup> Dougherty, K., "Quebec Launches New Evaluation of Energy East, Scuttles Previous Effort," iPolitics, April 26, 2016, [ipolitics.ca/2016/04/26/transcanada-agrees-to-new-quebec-evaluation-of-energy-east-quebec-suspends-ongoing-evaluation/](http://ipolitics.ca/2016/04/26/transcanada-agrees-to-new-quebec-evaluation-of-energy-east-quebec-suspends-ongoing-evaluation/).

- 1. Institute a tar sands oil tanker moratorium** in U.S. and Canadian waters until the knowledge gaps identified by the NAS have been filled. Given the scarcity of research, regulators should embrace precaution and ensure that no tar sands oil is loaded onto tankers before tar sands spill behavior and appropriate spill response techniques are fully understood. The U.S. Coast Guard and Canadian response organizations should require tankers to develop spill response plans that are tailored to the unique risks associated with diluted bitumen—particularly those associated with sinking crude—before permitting them to move tar sands in their jurisdictions.
- 2. Improve vessel operations to ensure absolute minimum impacts to marine ecosystems, especially marine mammals.** Reforms should include: (1) the highest possible level of quiet-ship notation available from the International Association of Classification Societies (IASC) for all Energy East tankers, (2) mandatory speed limit reductions, and (3) vessel routing that avoids key habitat along the entire route, including frequent monitoring to update routing as conditions and habitats change and/or shift.
- 3. Overhaul the Canadian Environmental Assessment Act** and apply the reforms to all current and future NEB review processes.<sup>179</sup> This is especially pertinent to the Energy East proposal, as TransCanada failed to submit a complete application to Canadian regulators until May 2016. This failure fractured the board’s procedural steps and undermined the public’s perception of the NEB as an objective, responsible overseer of Canada’s energy development. An updated environmental review process should require:
  - An environmental impact assessment that considers both upstream and downstream impacts, especially the global climate and public health impacts from increased tar sands oil production in Alberta, as well as marine impacts in Canadian and U.S. waters. The economic justification for and the climate impacts of a project should be assessed in the context of global energy supply and demand scenarios consistent with international climate goals set in Paris in December 2015;<sup>180</sup>
  - Robust public participation opportunities, including an expansion of intervention rights and funding so that those impacted or potentially impacted have a voice;
  - Reformed consultation, accommodation, and consent obligations to First Nations communities impacted by energy infrastructure projects; and
  - A cumulative economic risk analysis (for all impacted jurisdictions) that considers factors like the social cost of carbon pollution, the cost of climate disruption driven by fossil fuels and fossil fuel infrastructure, and the cost of potential spills in regard to both cleanup and recovery.
- 4. Ensure U.S. engagement in the regulatory process.** Though the United States does not have direct decision-making power over Energy East’s permitting and construction, it will be directly impacted by the project. Pathways for engagement should be opened, including:
  - A risk assessment for key areas likely to be impacted by Energy East’s oil tanker traffic (including the Gulf of Maine, New York Harbor, Chesapeake Bay, the Florida Strait, and the Gulf Coast);<sup>181</sup>
  - Appropriate analysis of impacts to shared resources, especially endangered species and commercial fisheries throughout the Energy East tanker route in both U.S. and Canadian waters; and
  - A requirement by U.S. authorities that tanker operators carrying tar sands products file documentation with local, regional, and federal agencies to ensure that the types, volumes, and frequencies of products shipped by Energy East are known and emergency response resources are pre-positioned and ready for immediate deployment in the case of an accident or emergency.
- 5. Permanently protect vulnerable special areas.** U.S. protection of vulnerable and special ocean areas—through national monument designation, for example—would enhance public visibility of the resources at risk in such areas, and would increase U.S. leverage to secure such areas from harm due to the Energy East project. The New England Coral Canyons and Monuments are one such special ocean area that remains unprotected, putting its centuries-old cold-water corals and associated species at risk. Another is Cashes Ledge, an underwater mountain range off the coast of Massachusetts whose peaks, ridges, basins and plains encompass one of the most diverse, intact and dynamic ecosystems in the U.S. North Atlantic. The U.S. risks extraordinary ecological loss if it does not take steps to permanently protect such areas.

179 Allan, R., “Open Letter to Justin Trudeau: Fix the NEB, ASAP,” *National Observer*, October 25, 2015, [www.nationalobserver.com/2015/10/25/opinion/open-letter-justin-trudeau-fix-neb-asap](http://www.nationalobserver.com/2015/10/25/opinion/open-letter-justin-trudeau-fix-neb-asap).

180 Palmer, B., “We Have an Agreement,” NRDC, December 12, 2015, [www.nrdc.org/onearth/we-have-agreement](http://www.nrdc.org/onearth/we-have-agreement); *see also* Oil Change International et al., “Climate Test,” [www.climatestest.org/](http://www.climatestest.org/), accessed March 2, 2016.

181 Similar assessments have been conducted in U.S. waters on the west coast. NOAA, “NOAA Technical Memorandum NOS OR&R 44: Transporting Alberta Oil Sands Products: Defining the Issues and Assessing the Risks,” September 2013, p. 7, [crcc.unh.edu/sites/crcr.unh.edu/files/media/noaa\\_oil\\_sands\\_report\\_09.2013.pdf](http://crcc.unh.edu/sites/crcr.unh.edu/files/media/noaa_oil_sands_report_09.2013.pdf); Van Dorp, J., and J. Merrick, “Vessel Traffic Risk Assessment (VTRA): Preventing Oil Spills from Large Ships and Barges in Northern Puget Sound & Strait of Juan de Fuca,” Puget Sound Partnership, January 2014, [www.seas.gwu.edu/~dorjpr/VTRA/PSP/FINAL%20REPORT/PSP%20FINAL%20REPORT%20-%20DRAFT%2012214%20-%20HQ.pdf](http://www.seas.gwu.edu/~dorjpr/VTRA/PSP/FINAL%20REPORT/PSP%20FINAL%20REPORT%20-%20DRAFT%2012214%20-%20HQ.pdf).