



Search

[About](#)

[View Issues](#)

[Subscribe](#)

[Order Back Issues](#)

[Author Guidelines](#)

[Permissions](#)

[Advertising](#)

[Change of Address](#)

[Contact Us](#)

[Magazine Home](#)

[TOS Home](#)

2014, *Oceanography* 27(1):217–221, <http://dx.doi.org/10.5670/oceanog.2014.25>

A Review of Observations of Floating Tar in the Sargasso Sea

[Authors](#) | [Abstract](#) | [Full Article](#) | [Citation](#) | [References](#)

Authors

[Andrew J. Peters](#) | Bermuda Institute of Ocean Sciences, St. George's, Bermuda

[Amy N.S. Siuda](#) | Sea Education Association, Woods Hole, MA, USA

[Top](#)

Abstract

Floating tar balls are a product of weathering of crude oil in the marine environment. They have been found to be prevalent in the world ocean, particularly in the 1960s and 1970s before stricter controls on petroleum transport and handling were in effect. Much of the early research on the occurrence and composition of pelagic tar balls was conducted in the North Atlantic Ocean. Research and time-series assessments in the Sargasso Sea since that time have documented that floating tar balls sampled by neuston nets in the open ocean and washed up on shorelines have declined in the past two decades.

[Top](#)

Full Article

[623 KB pdf](#)

[Top](#)

Citation

Peters, A.J., and A.N.S. Siuda. 2014. A review of observations of floating tar in the Sargasso Sea. *Oceanography* 27(1):217–221, <http://dx.doi.org/10.5670/oceanog.2014.25>.

[Top](#)

References

Anonymous. 1971. Big oil patches are sweeping in. *The Royal Gazette*, January 5, 1971.

Bernabeu, A.M., S. Fernandez-Fernandez, F. Bouchette, D. Rey, A. Arcos, J.M. Bayona, and J. Albaiges. 2013. Recurrent arrival of oil to Galician coast: The final step of the *Prestige* deep oil spill. *Journal of Hazardous Materials* 250:82–90, <http://dx.doi.org/10.1016/j.jhazmat.2013.01.057>.

Blumer, M. 1969. Oil pollution of the ocean. *Oceanus* 152:3–7.

Brunnock, J.V., D.F. Duckworth, and G.G. Stephens. 1968. Analysis of beach pollutants. *Journal of the Institute of Petroleum* 54:310–325.

Butler, J.N. 1975. Evaporative weathering of petroleum residues: The age of pelagic tar. *Marine Chemistry* 3:9–21, [http://dx.doi.org/10.1016/0304-4203\(75\)90023-7](http://dx.doi.org/10.1016/0304-4203(75)90023-7).

Butler, J.N. and J.C. Harris. 1975. Normal paraffin profiles of pelagic tar samples from the MARMAP survey. *Marine Chemistry* 3:1–7, [http://dx.doi.org/10.1016/0304-4203\(75\)90022-5](http://dx.doi.org/10.1016/0304-4203(75)90022-5).

Butler, J.N., B.F. Morris, and J. Sass. 1973. *Pelagic Tar From Bermuda and the Sargasso Sea*. Bermuda Biological Station for Research Special Publication No. 10, St. George's, Bermuda, 346 pp.

Butler, J.N., P.G. Wells, S. Johnson, and J.J. Manock. 1998. Beach tar on Bermuda: Recent observations and implications for global monitoring. *Marine Pollution Bulletin* 36:458–463, [http://dx.doi.org/10.1016/S0025-326X\(98\)00005-8](http://dx.doi.org/10.1016/S0025-326X(98)00005-8).

Coles, S.L., and A. Al-Riyami. 1996. Beach tar concentrations on the Muscat Coastline, Gulf of Oman, Indian Ocean, 1993–1995. *Marine Pollution Bulletin* 32:609–614, [http://dx.doi.org/10.1016/0025-326X\(96\)00015-X](http://dx.doi.org/10.1016/0025-326X(96)00015-X).

Heyerdahl, T. 1971. Atlantic ocean pollution and biota observed by the 'Ra' expeditions. *Biological Conservation* 3:164–167, [http://dx.doi.org/10.1016/0006-3207\(71\)90158-3](http://dx.doi.org/10.1016/0006-3207(71)90158-3).

Horn, M.H., J.M. Teal, and R.H. Backus. 1970. Petroleum lumps on the surface of the sea. *Science* 168:245–246, <http://dx.doi.org/10.1126/science.168.3928.245>.

Hostettler, F.D., R.J. Rosenbauer, T.D. Lorenson, and J. Dougherty. 2004. Geochemical characterization of tarballs on beaches along the California coast. Part I—Shallow seepage impacting the Santa Barbara Channel Islands, Santa Cruz, Santa Rosa and San Miguel. *Organic Geochemistry* 35:725–746, <http://dx.doi.org/10.1016/j.orggeochem.2004.01.022>.

Iliffe, T.M., and A.H. Knap. 1979. The fate of stranded pelagic tar on a Bermuda beach. *Marine Pollution Bulletin* 10:203–205, [http://dx.doi.org/10.1016/0025-326X\(79\)90533-2](http://dx.doi.org/10.1016/0025-326X(79)90533-2).

Joyce, P. 1998. Floating tar in the Western North Atlantic and Caribbean Sea, 1982–1996. *Marine Pollution Bulletin* 36:167–171, [http://dx.doi.org/10.1016/S0025-326X\(97\)87422-X](http://dx.doi.org/10.1016/S0025-326X(97)87422-X).

Kennicutt, M.C., and J.M. Brooks. 1983. Relationship between pelagic tar, fluorescence and biological markers in the South Atlantic Ocean. *Marine Pollution Bulletin* 14:335–342, [http://dx.doi.org/10.1016/0025-326X\(83\)90394-6](http://dx.doi.org/10.1016/0025-326X(83)90394-6).

Kiruri, L.W., B. Dellinger, and S. Lomnicki. 2013. Tar balls from the Deep Water Horizon oil spill: Environmentally persistent free radicals (EPFR) formation during crude weathering. *Environmental Science and Technology* 47:4,220–4,226, <http://dx.doi.org/10.1021/es305157w>.

Knap, A.H., T.M. Iliffe, and J.N. Butler. 1980. Has the amount of tar on the open ocean changed in the past decade? *Marine Pollution Bulletin* 11:161–164, [http://dx.doi.org/10.1016/0025-326X\(80\)90143-5](http://dx.doi.org/10.1016/0025-326X(80)90143-5).

Kornilios, S., P.G. Drakopoulos, and C. Dounas. 1998. Pelagic tar, dissolved/dispersed petroleum hydrocarbons and plastic distribution in the Cretan Sea, Greece. *Marine Pollution Bulletin* 36:989–993, [http://dx.doi.org/10.1016/S0025-326X\(98\)00102-7](http://dx.doi.org/10.1016/S0025-326X(98)00102-7).

Kvenvolden, K.A., F.D. Hostettler, P.R. Carlson, J.B. Rapp, C.N. Threlkeld, and A. Warden. 1995. Ubiquitous tar balls with a California-source signature on the shorelines of Prince William Sound, Alaska. *Environmental Science and Technology* 29:2,684–2,694, <http://dx.doi.org/10.1021/es00010a033>.

Laffoley, D.d'A., H.S.J. Roe, M.V. Angel, J. Ardron, N.R. Bates, I.L. Boyd, S. Brooke, K.N. Buck, C.A. Carlson, B. Causey, and others. 2011. *The Protection and Management of the Sargasso Sea: The golden floating rainforest of the Atlantic Ocean. Summary Science Case*. Sargasso Sea Alliance, Washington, DC, 53 pp.

Mazeas, L., and H. Budzinski. 2002. Molecular and stable carbon isotope source identification of oil residues and oiled bird feathers sampled along the Atlantic coast of France after the Erika oil spill. *Environmental Science and Technology* 36:130–137, <http://dx.doi.org/10.1021/es010726a>.

McKenna, A.M., R.K. Nelson, C.M. Reddy, J.J. Savory, N.K. Kaiser, J.E. Fitzsimmons, A.G. Marshall, and R.P. Rodgers. 2013. Expansion of the analytical window for oil spill characterization by ultrahigh resolution mass spectrometry: Beyond gas chromatography. *Environmental Science & Technology* 47:7,530–7,539, <http://dx.doi.org/10.1021/es305284t>.

Morris, B.F. 1971. Petroleum: Tar quantities floating in the Northwestern Atlantic taken with a new quantitative neuston net. *Science* 173:430–432, <http://dx.doi.org/10.1126/science.173.3995.430>.

Mulabagal, V., F. Yin, G.F. John, J.S. Hayworth, and T.P. Clement. 2013. Chemical fingerprinting of petroleum biomarkers in Deepwater Horizon oil spill samples collected from Alabama shoreline. *Marine Pollution Bulletin* 70:147–154, <http://dx.doi.org/10.1016/j.marpolbul.2013.02.026>.

NRC (National Research Council). 1975. *Petroleum in the Marine Environment*. National Academies Press, Washington, DC, 106 pp.

NRC. 2003. *Oil in the Sea III: Inputs, Fates and Effects*. National Academies Press, Washington, DC, 265 pp.

Nemirovskaya, I.A. 2011. Tar balls in Baltic Sea beaches. *Water Resources* 38:315–323, <http://dx.doi.org/10.1134/S0097807811020114>.

Owens, E.H., G.S. Mauseth, C.A. Martin, A. Lamarche, and J. Brown. 2002. Tar ball frequency data and analytical results from a long-term beach monitoring program. *Marine Pollution Bulletin* 44:770–780, [http://dx.doi.org/10.1016/S0025-326X\(02\)00057-7](http://dx.doi.org/10.1016/S0025-326X(02)00057-7).

Requejo, A.G., and P.D. Boehm. 1985. Characterization of hydrocarbons in a subsurface oil-rich layer in the Sargasso Sea. *Marine Environmental Research* 17:45–64, [http://dx.doi.org/10.1016/0141-1136\(85\)90031-5](http://dx.doi.org/10.1016/0141-1136(85)90031-5).

Sleeter, T.D., and J.N. Butler. 1982. Petroleum hydrocarbons in zooplankton faecal pellets from the Sargasso Sea. *Marine Pollution Bulletin* 13:54–56, [http://dx.doi.org/10.1016/0025-326X\(82\)90442-8](http://dx.doi.org/10.1016/0025-326X(82)90442-8).

Smith, S.R., and A.H. Knap. 1985. Significant decrease in the amount of tar stranding on Bermuda. *Marine Pollution Bulletin* 16:19–21, [http://dx.doi.org/10.1016/0025-326X\(85\)90254-1](http://dx.doi.org/10.1016/0025-326X(85)90254-1).

Suneel, V., P. Vethamony, K.V. Kumar, M.T. Babu, and K.V.S.R. Prasad. 2013. Simulation of trajectories of tar ball transport to the Goa Coast. *Water, Air, & Soil Pollution* 224:1–11, <http://dx.doi.org/10.1007/s11270-013-1538-9>.

Tao, Z., S. Bullard, and C. Arias. 2011. High numbers of *Vibrio vulnificus* in tar balls collected from oiled areas of the North-Central Gulf of Mexico following the 2010 BP Deepwater Horizon oil spill. *EcoHealth* 8:507–511, <http://dx.doi.org/10.1007/s10393-011-0720-z>.

Van Vleet, E.S., W.M. Sackett, F.F. Weber, and S.B. Reinhardt. 1983. Input of pelagic tar into the northwest Atlantic from the Gulf Loop Current: Chemical characterization and its relation to weathered IXTOC-I oil. *Canadian Journal of Fisheries and Aquatic Science* 40:s12–s22, <http://dx.doi.org/10.1139/f83-306>.

Wade, T.L., and J.G. Quinn. 1975. Hydrocarbons in the Sargasso Sea surface microlayer. *Marine Pollution Bulletin* 6:54–

57, [http://dx.doi.org/10.1016/0025-326X\(75\)90131-9](http://dx.doi.org/10.1016/0025-326X(75)90131-9).

Witherington, B.E. 2002. Ecology of neonate loggerhead turtles inhabiting lines of downwelling near a Gulf Stream front. *Marine Biology* 140:843–853, <http://dx.doi.org/10.1007/s00227-001-0737-x>.

Zakaria, M.P., T. Okuda, and H. Takada. 2001. Polycyclic aromatic hydrocarbon (PAHs) and hopanes in stranded tar-balls on the coasts of Peninsular Malaysia: Applications of biomarkers for identifying sources of oil pollution. *Marine Pollution Bulletin* 42:1,357–1,366, [http://dx.doi.org/10.1016/S0025-326X\(01\)00165-5](http://dx.doi.org/10.1016/S0025-326X(01)00165-5).

[Top](#)

[About](#) | [View Issues](#) | [Subscribe](#) | [Order Back Issues](#) | [Author Guidelines](#) | [Permissions](#) | [Advertising](#) | [Change of Address](#)
[Contact Us](#) | [Magazine Home](#) | [TOS Home](#) | [Join TOS](#)

Oceanography Magazine, The Oceanography Society, P.O. Box 1931, Rockville, MD 20849-1931, USA

Tel: (1) 301-251-7708, Fax: (1) 301-251-7709, E-mail: magazine@tos.org

Send comments about this site to webmaster@tos.org