ID: W2567372134

TITLE: Oil sands and the marine environment: current knowledge and future challenges

AUTHOR: ['Stephanie Green', 'Kyle W. Demes', 'Michael Arbeider', 'Wendy J. Palen', 'Anne K. Salomon', 'Thomas D. Sisk', 'Margot Webster', 'Maureen E. Ryan']

ABSTRACT:

The environmental consequences of bitumen extraction from oil sands deposits are at the center of North American natural resource and energy policy debate, yet impacts on ocean environments have received little attention. Using a quantitative framework, we identify knowledge gaps and research needs related to the effects of oil sands development on marine biota. Fifteen sources of stress and disturbance ? varying greatly in spatial and temporal scale ? are generated via two pathways: (1) the coastal storage and oceanic transport of bitumen products, and (2) the contribution of industry?derived greenhouse gases to climate change in the ocean. Of highest research priority are the fate, behavior, and biological effects of bitumen in the ocean. By contrast, climate?change impacts are scientifically well established but not considered in key regulatory processes. Most stressors co?occur and are generated by other industries, yet cumulative effects are so far unaccounted for in decision making associated with new projects. Our synthesis highlights priority research needed to inform future energy development decisions, and opportunities for policy processes to acknowledge the full scope of potential and realized environmental consequences.

SOURCE: Frontiers in ecology and the environment

PDF URL: None

CITED BY COUNT: 16

PUBLICATION YEAR: 2016

TYPE: review

CONCEPTS: ['Climate change', 'Scope (computer science)', 'Environmental resource management', 'Resource (disambiguation)', 'Oil sands', 'Environmental science', 'Biota', 'Disturbance (geology)', 'Natural resource', 'Current (fluid)', 'Asphalt', 'Environmental planning', 'Natural resource economics', 'Environmental protection', 'Oceanography', 'Ecology', 'Geography', 'Geology', 'Computer science', 'Computer network', 'Paleontology', 'Cartography', 'Economics', 'Biology', 'Programming language']