



Environment Canada    Environnement Canada

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**Mr. Braulio Ferreira de Souza Dias**  
Executive Secretary  
Secretariat of the Convention on Biological Diversity  
413, Saint Jacques Street, suite 800  
Montreal QC H2Y 1N9

April 28, 2015

Dear Mr. Braulio Ferreira de Souza Dias:

In response to CBD notification 2015-016, "Follow-up to decisions X/33 and XI/20 in relation to climate-related geoengineering", Canada would like to contribute the following information.

***(a) Update on the potential impacts of geoengineering techniques on biodiversity, and on the regulatory framework of climate-related geoengineering relevant to the Convention on Biological Diversity***

To support decision XI/20, paragraph 16(a), Canada looks forward to the opportunity to review the CBD Secretariat's update on the potential impacts of geoengineering techniques on biodiversity and on the regulatory framework of climate related geoengineering. Please direct the draft update to the following potential peer review experts:

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Canada 

***(b) Further views of Parties, other governments, indigenous and local communities and other stakeholders on the potential impacts of geoengineering on biodiversity, and associated social, economic and cultural impacts***

Canada would like to acknowledge the information on potential impacts of geoengineering provided in the Synthesis Report of the IPCC Fifth Assessment Report.

Page 89 of IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

This report states that limited evidence precludes a comprehensive assessment of the side effects and environmental impacts of geoengineering techniques, including carbon dioxide removal (CDR) and solar radiation management (SRM). It states that maritime CDR techniques may involve significant risks for ocean ecosystems; therefore their deployment could pose challenges for cooperation between countries. It further states that deployment of SRM techniques would entail numerous uncertainties, side effects, risks and shortcomings.

Three iron fertilization events took place in 2012 near Haida Gwaii, British Columbia in the North East Pacific (Bird et al, 2013). Due to the high nutrient, low chlorophyll nature of the Gulf of Alaska, iron plays a critical role in modulating ocean productivity and carbon cycling in the North East Pacific Ocean (Boyd et al, 2004). Satellite imagery and results from a Continuous Plankton Survey suggested that the iron enrichment could have caused an increase in zooplankton that in turn exerted heavy grazing pressure on the large phytoplankton and microzooplankton by the autumn of 2012 (Batten and Gower, 2014). Another study which considered phytoplankton blooms induced by natural and artificial addition of iron to the area reported that the iron fertilization events in 2012 resulted in strong localized chlorophyll anomalies (Xiu et al, 2014). These authors estimate that a small amount of CO<sub>2</sub> drawdown may have occurred (Xiu et al, 2014).

The full impact of these iron fertilization events to carbon cycling and ecosystem responses, particularly at higher trophic levels has yet to be understood. These iron fertilization events were not authorized by the Government of Canada and are under current investigation.

***References:***

Bird, J. S., Gross, P., McNea, W. and H. Judd. (2013) Initial Investigation of the North East Pacific Salmon Feeding Waters with Slocum Gliders. Oceans, San Diego, pp. 1–10, 23–27 September 2013. <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6740994&isnumber=6740936>.

Boyd, P. W., Law, C. S., Wong, C. S. et al. (2004) The decline and fate of an iron-induced subarctic phytoplankton bloom. *Nature*, 428, 549–553. <http://dx.doi.org/10.1038/nature02437>.

Batten, S.D. and J.E.R. Gower 2014. Did the iron fertilization near Haida Gwaii in 2012 affect the pelagic lower trophic level ecosystem? *J. Plankton Res.* (2014) 36(4): 925–932. First published online June 5, 2014 doi:10.1093/plankt/fbu049

Xiu, P., Thomas, A. C. and Chai, F. (2014) Satellite bio-optical and altimeter comparisons of phytoplankton blooms induced by natural and artificial iron addition in the Gulf of Alaska. *Remote Sens. Environ.*, 145, 38–46.

*(c) Information on measures undertaken in accordance with decision X/33, subparagraph 8(w)*

Consistent with paragraph 8(w) of CBD decision X/33, Canada has a history of supporting compatible decisions when participating in relevant international fora. In 2013, Canada supported amendment of the London Protocol to further regulate ocean fertilization by creating a permitting regime for legitimate scientific research, and to create a mechanism for regulating other types of marine geoengineering in the future. In 2010, 2012 and 2014, Canada supported CBD decisions that no climate engineering activities take place, except for small-scale scientific research.

Canada has also been seeking to understand and share information on possible climatic responses to climate engineering. For instance, Canada is collaborating in the Geoengineering Model Intercomparison Project (GeoMIP) of the World Climate Research Program. In 2015, the International Maritime Organization will host a session on marine geoengineering techniques during Meetings of the Scientific Groups of the London Protocol and the representative from Canada will chair this session as Vice Chair of the Scientific Group.

Sincerely,

A handwritten signature in black ink, appearing to read "R McLean". The signature is fluid and cursive, with the first letter of the first name being a large, stylized "R".

Robert McLean  
CBD National Focal Point