The Honourable Christian Paradis, P.C., M.P.
(Mégantic–L’Érable)
Natural Resources Canada
House of Commons
Ottawa, Ontario
K1A 0A6

The Honourable John Duncan, P.C., M.P.
Indian Affairs and Northern Development Canada
House of Commons
Ottawa, Ontario
K1A 0A6

Dear Ministers:

On behalf of the Environmental Studies Research Funds Management Board, it is my pleasure to submit the 2010 Annual Report for the Environmental Studies Research Funds in accordance with paragraph 79(1)(d) of the Canada Petroleum Resources Act.

Sincerely yours,

Paul Barnes
Chairman
Environmental Studies Research Funds Management Board
2010

ANNUAL REPORT FOR THE

ENVIRONMENTAL STUDIES RESEARCH FUNDS

FEBRUARY 2011

Environmental Studies Research Funds
Profile

The Environmental Studies Research Funds (ESRF) is a research program that sponsors environmental and social studies. It is designed to assist government decision-making related to oil and gas exploration and development on Canada's frontier lands. The ESRF program, initiated in 1983 under the Canada Oil and Gas Act (COGA), now receives its legislated mandate through the superseding legislation, the Canada Petroleum Resources Act (CPRA), proclaimed in February 1987. Funding for the ESRF is provided through levies on frontier lands by interest holders such as oil and gas companies. The ESRF is directed by a joint government/industry/public Management Board and is administered by a Secretariat that resides within the Office of Energy Research and Development of Natural Resources Canada in Ottawa, Ontario.

Published under the auspices of the Environmental Studies Research Funds
ISBN NE22-4/2010E-PDF
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background on the Structure and Operation of the Funds</td>
</tr>
<tr>
<td>Study Program - 2010</td>
</tr>
<tr>
<td>Financial Statement</td>
</tr>
<tr>
<td>Plans for 2011</td>
</tr>
<tr>
<td>Publication of Reports</td>
</tr>
<tr>
<td>Appendix 1 - ESRF Reports, 1985 - 2010</td>
</tr>
<tr>
<td>Appendix 2 – 2010 ESRF Management Board Members</td>
</tr>
</tbody>
</table>
**Background on the Structure and Operation of the Funds**

The Environmental Studies Research Funds (ESRF) finance environmental and social studies pertaining to the manner in which, and to the terms and conditions under which, petroleum exploration, development and production activities on frontier lands should be conducted. Subsection 101(1) of the *Canada Petroleum Resources Act* (CPRA) defines an environmental study as “work pertaining to the measurement or statistical evaluation of the physical, chemical, and biological elements of the lands, oceans, or coastal zones, including winds, waves, tides, currents, precipitation, ice cover and movement, icebergs, pollution effects, flora and fauna, both onshore and offshore, human activity and habitation, and any related matter.”

The Environmental Studies Research Funds are directed by a twelve-member Management Board that has representation from the federal government, the Canada–Nova Scotia Offshore Petroleum Board (CNSOPB), the Canada–Newfoundland and Labrador Offshore Petroleum Board (CNLOPB), the oil and gas industry and the general public. Mr. Paul Barnes, Manager, Atlantic Canada, Canadian Association of Petroleum Producers, is the chairman of the ESRF Management Board.

The ESRF Management Board directs the business of the ESRF, sets priorities for study topics, determines the program budget and facilitates the development of study proposals on behalf of the Minister of Natural Resources Canada and the Minister of Indian and Northern Affairs Canada.

The program operates on a calendar year basis. The Board generally meets three times a year; however, the frequency of meetings may be adjusted as circumstances dictate. The Board assesses the information requirements of government and industry to determine priorities for the study program for the coming year. The budget to support the study program and its administration forms the basis for the calculation of the levy rate schedule. The budget and levy rates are submitted to the Ministers for approval by November 1 of each year. The projects under the study program are initiated following the collection of levies that generally occurs in the first quarter of the calendar year.
ESRF Regions

Descriptions and maps can be viewed on the ESRF website at: [http://www.esrfunds.org/legloi_e.php](http://www.esrfunds.org/legloi_e.php)
Study Program - 2010

The ESRF Management Board approved the following eight new studies for the 2010 study program:

Northern Studies – 2010

Regional Effects Management
  - Development of a Regional Waste Management Strategy (NWT)

Oil Spill Prevention/Management
  - Detection of Oil Under Ice with Helicopter-borne Ground Penetrating Radar
  - Tracking Oil Spills and Ice Hazards in the Canadian Beaufort Sea with a Sub-Grid Ice Ocean Forecast Model

Regional Effects Management
  - Legacy Data Review for Melville Island
  - Seabed Stability Conditions in the Shelf/Slope Transition Zone, Canadian Beaufort Sea

Oil and Gas Effects on Marine Mammals
  - Comparison of Model Predictions versus Actual Seismic Sound Measurement in the Beaufort Sea.

East Coast Studies – 2010

Seismic Activity

- Labrador Coast Seabird Baseline Survey
- Labrador Coast Marine Mammal Baseline Survey

Report 183  *Offshore Seabird Monitoring Program.*
December. 2009.

Continuing Studies 2010 – Northern

*Oil and Gas Effects on Northern Use of Land and Water*
  - An Analysis of Historical Water Quality Data for Bosworth Creek

*Seismic Issues – Offshore*
  - Development of Aerial Survey Techniques and Whale Detection Methods for Seismic Operations in the Beaufort Sea
Development of Ecologically-Based Criteria to Assess the Impact and Recovery of Seismic Lines

Report 173  

Assessment of Drilling Waste Disposal Options in the Inuvialuit Settlement Region.

Continuing Studies 2010 – East Coast

Socio-Economic

Evaluation of potential socio-economic effects on the Labrador coast as a result of the resumption of offshore oil and gas exploration and development and possible future production
Air Emissions
  o Modelling Emissions from Offshore Installations

Seabirds
  o Simulation of fate and “Detectability” of “Dead” Seabirds

Seismic
  o Mapping of Sensitive Fish Habitat Areas on the Labrador Coast
  o Seismic and Lobster Feeding
  o Marine Mammal Observation Data Synthesis for the East Coast

Wastes
  o Publication of International Conference Volume
  o Biological Effects of Produced Water on Life Stages of Fish
  o Validation of Risk Assessment Numeric Models

Report 181  *Sable Island Air Monitoring Program Report, 2003-2006*
**Financial Statement**

The total value of the 2010 ESRF program was $2,880,949. The budget included $2,304,250 for the proposed studies and $576,699 for the administration of the ESRF research activities program (refer to Levy #22 – Table 1).

The difference in the total required levy and total revenue collected is the result of land sales after the calculation of the levy as well as changes in interest owner holdings. The collection of unpaid levies is pursued on an ongoing basis by the ESRF Secretariat.

January 1, 2010 to December 31, 2010
(in dollars)

<table>
<thead>
<tr>
<th>REGIONS</th>
<th>Opening Cash Balance</th>
<th>Levies and Back Levies Collected</th>
<th>Administrative Costs</th>
<th>Study Program Expenditures</th>
<th>Closing Cash Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUTH: Regions 1 to 16</td>
<td>$3,093,434</td>
<td>$1,130,428</td>
<td>-$156,812</td>
<td>-$439,108</td>
<td>$3,627,943</td>
</tr>
<tr>
<td>NORTH: Regions 17 to 31</td>
<td>$1,154,570</td>
<td>$1,389,012</td>
<td>-$188,299</td>
<td>-$149,160</td>
<td>$2,206,123</td>
</tr>
</tbody>
</table>
Table I: ESRF Revenues
January 01, 2010 to December 31, 2010 (in dollars)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>2</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>3</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>4</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>5</td>
<td>$1,489.02</td>
<td>$251.33</td>
<td>$25,000.00</td>
<td>-$137.23</td>
<td>-$64.27</td>
<td>$26,538.85</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$122,574.96</td>
<td>$389,982.88</td>
<td>$25,000.00</td>
<td>-$12,116.82</td>
<td>-$35,096.61</td>
<td>$490,344.41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>$20,787.96</td>
<td>$162,698.87</td>
<td>$25,000.00</td>
<td>-$6,028.08</td>
<td>-$17,460.45</td>
<td>$184,998.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>$16,475.42</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$16,475.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>$727,920.10</td>
<td>$116,103.71</td>
<td>$44,505.89</td>
<td>-$34,486.32</td>
<td>-$132,463.99</td>
<td>$721,579.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>$985,368.18</td>
<td>$53,613.28</td>
<td>$31,440.64</td>
<td>-$15,924.77</td>
<td>-$61,168.82</td>
<td>$993,328.51</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>$70,797.77</td>
<td>$91,930.30</td>
<td>$0.00</td>
<td>-$27,306.08</td>
<td>-$40,777.94</td>
<td>$94,644.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>$352,689.98</td>
<td>$55,923.93</td>
<td>$2,134.89</td>
<td>-$16,611.10</td>
<td>-$20,019.04</td>
<td>$374,118.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>-$43,606.97</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>-$43,606.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>$772,465.13</td>
<td>$65,744.28</td>
<td>$0.00</td>
<td>-$19,528.04</td>
<td>-$72,599.50</td>
<td>$746,081.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>$66,419.91</td>
<td>$41,098.71</td>
<td>$0.00</td>
<td>-$24,673.43</td>
<td>-$59,457.06</td>
<td>$23,388.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>$52.93</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$52.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOUTH</td>
<td>$3,093,434.39</td>
<td>$977,347.29</td>
<td>$153,081.42</td>
<td>-$156,811.87</td>
<td>-$439,107.68</td>
<td>$3,627,943.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>$155,247.47</td>
<td>$133,573.97</td>
<td>$38,405.09</td>
<td>-$30,440.59</td>
<td>-$16,632.00</td>
<td>$280,153.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>$632,084.22</td>
<td>$819,670.28</td>
<td>$0.00</td>
<td>-$56,914.28</td>
<td>-$78,865.00</td>
<td>$1,315,975.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>$2,937.82</td>
<td>$1,928.74</td>
<td>$0.00</td>
<td>-$1,227.36</td>
<td>-$251.00</td>
<td>$3,388.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>$25,898.26</td>
<td>$20,582.96</td>
<td>$0.00</td>
<td>-$13,098.06</td>
<td>-$2,679.00</td>
<td>$30,704.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>-$2,793.74</td>
<td>$2,957.14</td>
<td>$0.00</td>
<td>-$1,016.72</td>
<td>-$208.00</td>
<td>-$1,061.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>-$1,188.03</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>-$1,188.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>$700.03</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$700.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>$11,263.98</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$11,263.98</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>$237,961.14</td>
<td>$31,295.01</td>
<td>$0.00</td>
<td>-$10,759.85</td>
<td>-$36,240.50</td>
<td>$222,255.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>$20,207.34</td>
<td>$72,099.62</td>
<td>$0.00</td>
<td>-$29,080.18</td>
<td>-$5,927.00</td>
<td>$57,299.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>$105,782.66</td>
<td>$222,854.27</td>
<td>$0.00</td>
<td>-$36,918.43</td>
<td>-$6,564.00</td>
<td>$285,154.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>-$38,818.03</td>
<td>$38,448.04</td>
<td>$0.00</td>
<td>-$6,369.37</td>
<td>-$1,299.00</td>
<td>-$8,038.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>$513.89</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$513.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>$6,555.38</td>
<td>$6,529.86</td>
<td>$0.00</td>
<td>-$2,245.10</td>
<td>-$447.00</td>
<td>$10,393.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>-$1,782.68</td>
<td>$667.40</td>
<td>$0.00</td>
<td>-$229.46</td>
<td>-$47.00</td>
<td>-$1,391.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORTH</td>
<td>$1,154,569.69</td>
<td>$1,350,607.29</td>
<td>$38,405.09</td>
<td>-$188,299.41</td>
<td>-$148,159.50</td>
<td>$2,206,123.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>$4,248,004.08</td>
<td>$2,327,954.58</td>
<td>$191,486.51</td>
<td>-$345,111.28</td>
<td>-$588,267.18</td>
<td>$5,834,066.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Plans for 2011

In September 2010, the ESRF Management Board established the budget for the 2011 program which will be supported by Levy #23. This program was recommended by the Management Board and has been approved by the Minister of Natural Resources Canada and the Minister of Indian and Northern Affairs Canada. The study program has a total value of $2,595,343 and an administration budget of $475,500.00 for new programs. Continuing studies from 2010 will be funded from the balance of existing funds.

The ESRF Management Board has established the following priority areas for 2011:

<table>
<thead>
<tr>
<th>North</th>
<th>East Coast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine Seismic</td>
<td>Air Emissions</td>
</tr>
<tr>
<td>Regional Effects Management</td>
<td>Seabirds</td>
</tr>
<tr>
<td>Oil Spill Prevention &amp; Management</td>
<td>Seismic</td>
</tr>
<tr>
<td>Changing Sea Ice Conditions</td>
<td>Wastes</td>
</tr>
</tbody>
</table>

**Publication of Reports**

All ESRF studies are subject to a scientific/technical peer review. Reports that are deemed to be scientifically or technically significant are published in the ESRF Technical Report Series.

Since its inception in 1983, the ESRF has published 177 reports. All reports are available to download for free on the [ESRF website](https://esrf.eu).

Publications are listed under the following categories:
- Bibliographies
- Environmental Effects and Monitoring
- Environmental Loading and Design
- Frontier Social and Economic Issues
- Ice-Icebergs-Ice Detection
- Oil Spill Research and Countermeasures
- Sea Bottom Ice Scour
- Sediment Transport
- Waves

**Recent Publications - 2010**


Appendix 1 – ESRF Publications 1985–2010

Bibliographies

136 Coastal Resource Inventory: Great Northern Peninsula. Not published.

Environmental Effects and Monitoring


147 Dillon Consulting Limited with DMT Cordah. *Pollution Prevention Opportunities in the


Environmental Loading and Design


**Frontier Social and Economic Issues**


Ice – Icebergs – Ice Detection


Warbanski G. and E. Banke. *Evaluation of a Modified Water Cannon System to Control*


Oil Spill Research and Countermeasures


Belore, R.C. Development of a High Pressure Water Mixing Concept for Use with Ship-
084 S.L. Ross Environmental Research Limited and D. MacKay. Laboratory Studies of the


Oil Pollution Seabird Mortality Assessment on the Sable Island Bank. Not published.


Sea Bottom Ice Scour
<table>
<thead>
<tr>
<th>No.</th>
<th>Author(s)</th>
<th>Title</th>
<th>Date</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>157</td>
<td>Sonnichsen, G.V., T. Hundert, P. Pocklton and R. Myers</td>
<td><em>Documentation of Recent Iceberg Grounding Events and a Comparison with Older Events of Known Age - Northern Grand Banks, Canada</em></td>
<td>April 2006</td>
<td>206 p.</td>
</tr>
</tbody>
</table>

**Sediment Transport**


**Waves**


076  Eid, B.M. and V.J. Cardone.  *Operational Test of Wave-Forecasting Models During the


## Appendix 2
### ESRF Management Board

<table>
<thead>
<tr>
<th>Chair</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul Barnes</td>
<td>Ruth McKechnie</td>
</tr>
<tr>
<td>Manager, Atlantic Canada</td>
<td>Science Advisor</td>
</tr>
<tr>
<td>Canadian Association of Petroleum Producers</td>
<td>Northern Oil and Gas Branch</td>
</tr>
<tr>
<td>403, 235 Water Street</td>
<td>Indian &amp; Northern Affairs Canada</td>
</tr>
<tr>
<td>St. John's NL A1C 1B6</td>
<td>Room 10E1 15 Eddy Street</td>
</tr>
<tr>
<td>Lynne Patenaude</td>
<td>Patrice Simon</td>
</tr>
<tr>
<td>Manager, Natural Gas and Crude Oil</td>
<td>Director, Environment &amp; Biodiversity Science Br.</td>
</tr>
<tr>
<td>Oil, Gas and Alternative Energy Division</td>
<td>Ecosystems Sciences</td>
</tr>
<tr>
<td>Environment Canada</td>
<td>Fisheries and Oceans Canada</td>
</tr>
<tr>
<td>351 St. Joseph Blvd</td>
<td>200 Kent Street</td>
</tr>
<tr>
<td>Gatineau QC K1A 0H3</td>
<td>Ottawa ON K1A E6</td>
</tr>
<tr>
<td>Robert Steedman</td>
<td>Greg Janes</td>
</tr>
<tr>
<td>Professional Leader, Environment</td>
<td>Team Lead Environment, Emergency Response and</td>
</tr>
<tr>
<td>National Energy Board</td>
<td>Security</td>
</tr>
<tr>
<td>444-7th Avenue S.W.</td>
<td>Suncor Energy</td>
</tr>
<tr>
<td>Calgary AB T2P 0X8</td>
<td>Suite 201, Scotia Centre</td>
</tr>
<tr>
<td>Alan Kennedy</td>
<td>Francine Wight</td>
</tr>
<tr>
<td>Environment/Regulatory Manager</td>
<td>Health, Safety &amp; Environment Lead</td>
</tr>
<tr>
<td>Syncrude Development</td>
<td>Husky Energy</td>
</tr>
<tr>
<td>Imperial Oil Resources</td>
<td>Suite 901, Scotia Centre</td>
</tr>
<tr>
<td>237 4th Avenue, S.W.</td>
<td>235 Water Street</td>
</tr>
<tr>
<td>Calgary AB T2P 3M9</td>
<td>St. John's NL A1C 1B6</td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>David Burley</td>
<td>Manager, Environmental Affairs</td>
</tr>
<tr>
<td>Eric Theriault</td>
<td>Advisor, Environmental Affairs</td>
</tr>
<tr>
<td>Norman Snow</td>
<td></td>
</tr>
<tr>
<td>Gerard Chidley</td>
<td></td>
</tr>
</tbody>
</table>