



Fraser
River
Estuary
Management
Program

Sediment Budget
&
Dredging Activities
Annual Report
For the Fiscal Year
April 1, 2000 to March 31, 2001

Prepared by FREMP's Dredge Management Advisory Committee



2000/01 SEDIMENT BUDGET AND DREDGING ACTIVITIES ANNUAL REPORT

1. INTRODUCTION

The Fraser River Estuary Management Program (FREMP) is a partnership among federal, provincial and regional government agencies to foster co-ordinated and sustainable activities in the Fraser River estuary.

FREMP is guided by its Estuary Management Plan (EMP). Developed through a multi-stakeholder consensus process in 1994, the EMP outlines a shared vision, goals and an action plan for improving the environmental, economic, and social health of the estuary. A key target in the EMP is to manage the removal of sand from the Fraser River while maintaining the sediment regime of the river in balance. Through the work of its Dredge Management Advisory Committee, FREMP has developed a tool, called the “Sediment Budget”, which allows FREMP to deliver on this key EMP target.

2. THE FREMP SEDIMENT BUDGET

FREMP’s Sediment Budget is used to ensure that the average amount of sediment removed over a five- to ten-year period does not change the shape of the riverbed. This “averaging” approach acknowledges two factors:

- The amount of sediment deposited by the Fraser River’s annual Spring flood fluctuates widely from year to year.
- Even in years where little sediment flows into the estuary, water action may form underwater sandbars that need to be removed to prevent grounding of ships using the Fraser River. Conversely, in years where large amounts of sediment may enter the estuary, not all of it will pose a navigational hazard, and therefore, all of it may not need to be removed.

The FREMP Sediment Budget covers sand-sized sediment in the estuary as far upstream as Mission. For the purposes of the Budget, “sand” is any material that has a grain size between 0.177mm and 2.000mm. All other materials are not considered in the budget because coarser material does not generally enter the estuary and finer materials do not deposit in the main navigation channel.

The Sediment Budget is derived from a mathematical model which is described in detail in a report entitled “Lower Fraser River Sediment Budget Analysis” prepared for FREMP by Northwest Hydraulic Consultants in February 1999.

3. THE 2000/01 BUDGET

The Sediment Budget is calculated annually for what is called the “freshet” year. This is the period of time between freshets (and fish closures) during which dredging may occur. Generally, the dredging period runs from August of one calendar year to March of the next calendar year.



For the fiscal year April 2000 to March 2001, the mathematical model estimated the Sediment Budget (inflow) to be 1.19 million cubic metres. In comparison to historical data, the 2000/01 Sediment Budget can be classified as a moderately low inflow year.

4. DREDGING ACTIVITIES IN 2000/01

During the period April 2000 to March 2001, 1.2 million cubic metres of sediment were removed from the navigation channel of the Fraser River. Thus, dredging managers were slightly above the Sediment Budget in the 2000/01 dredging year. Sediment was removed as follows:

Amount of sediment removed from the river and taken to upland sites (A): 0.9 million m³
 Amount of sediment removed from the river and disposed in ocean (B): 0.3 million m³
 Total removed from River = (A) + (B) = 1.2 million m³

The map (attached to the end of this report) shows the locations where sediment was dredged during 2000/01. The legend to the map is on the page following the map, and it lists quantities dredged and location where the sediment was subsequently deposited.

5. OVERALL SEDIMENT BUDGET BALANCE DURING PAST FOUR YEARS

2000/01 marks the fourth year that FREMP's Dredge Management Advisory Committee forecast the sediment (size between 0.177 mm and 2.000 mm) that enters the Lower Fraser River. The table below summarizes the annual Sediment Budget forecasts (in millions of cubic metres) and the actual dredged amount (in millions of cubic metres) during the past four years:

Year	Sediment Forecast (0.177mm to 2.000mm)	Actual Dredged	Forecast Inflow Remaining In River	% of Forecast Dredged
1997/98	3.30	1.47	1.83	44.5%
1998/99	0.78	1.11	(0.33)	141.8%
1999/00	3.16	1.99	1.17	63.0%
2000/01	1.19	1.20	(0.01)	100.5%
1997/98 to 2000/01	8.43	5.77	2.66	68.4%

The February 1999 report by Northwest Hydraulic Consultants states that "Using the results of the Sediment Budget, an approximate long-term equilibrium can be maintained if the net dredging volumes are maintained at about 70% of the incoming bed material load." As can be seen from the table, during the past four years, the volume of dredged material amounts to 68.4% of the forecasted incoming bed material load. Thus, the cumulative result during the past four fiscal years has been a slight aggradation of the riverbed.



6. OTHER DREDGING-RELATED ACTIVITIES DURING 2000/01

Impact Assessment of Dredging Activities at Proposed Transfer Pit Site on Barnston Island

In 2000, the Fraser River Port Authority (FRPA) contracted Limnotek Research & Development Inc. to conduct a three-year \$225,000 study to assess the possible impact that dredging may have on the aquatic community in the Fraser River near Barnston Island. The results of the study will be used to determine if a permanent transfer pit site can be established upstream in this reach of the Fraser River near Barnston Island. The study is being coordinated by FRPA with the assistance of FREMP through the Dredge Management Advisory Committees.

The study area covers a portion of the Fraser River upstream of the Port Mann Bridge near Barnston Island adjacent to the main navigation channel. The project at Barnston Island is structured into two assessments: one at a temporary transfer pit site located at the lower end of Barnston Island and the other at the proposed permanent transfer pit site at the upper end of Barnston Island, adjacent to the Katzie First Nations dock.

The project design involves comparison of ecological measurements over a time series before and after dredging at both control and dredge sites. The design allows for immediate impacts to be determined and provides evidence of site recovery after disturbance. A wide range of parameters including benthic invertebrates, resident fish, physical habitat features, sturgeon movement, and effects on eulachon distribution are being examined. New technologies in hydroacoustics, imaging, and radiotracking are linked with conventional sampling gear and methods to provide some of the most advanced assessment techniques available anywhere.

Dredging occurred at the temporary transfer pit from March 6 to 15, 2000 and at present all field tasks related to assessment of the temporary transfer pit are complete. The final report of this phase of the work will be submitted in fall 2001. The field tasks for the next phase (proposed permanent pit) are underway and Limnotek Research will provide an update after each sampling episode. Dredging at the proposed permanent transfer pit is scheduled for November 2001. It is anticipated that the field tasks for this project will be completed by December 2002 and a final report will be compiled by March 2003.

7. MEMBERS OF DMAC

The following agencies are represented on FREMP's Dredge Management Advisory Committee:

Fisheries and Oceans Canada

- Habitat and Enhancement Branch
- Canadian Coast Guard

Environment Canada

- Water Survey Branch
- Ocean Disposal Control

Fraser River Port Authority

North Fraser Port Authority

Public Works and Government Services Canada

Ministry of Water, Land and Air Protection

- Fish Protection

British Columbia Assets and Lands Corporation



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8. FOR FURTHER INFORMATION

For further information on FREMP, the Sediment Budget, or this Annual Report, please contact:

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Location of Dredging 2000/01

