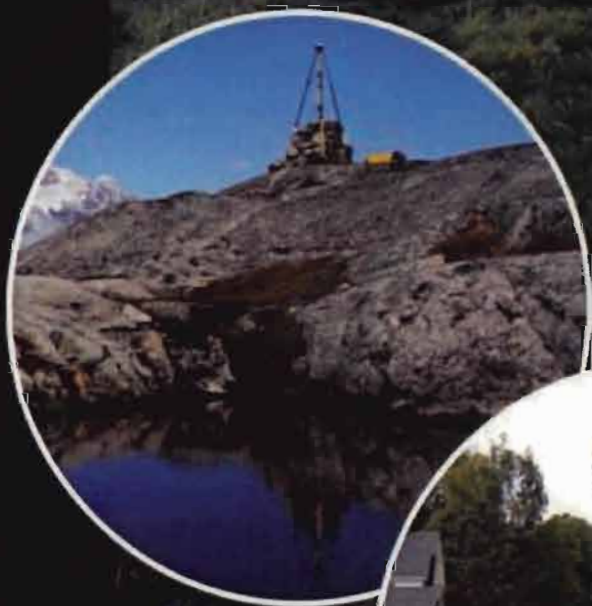
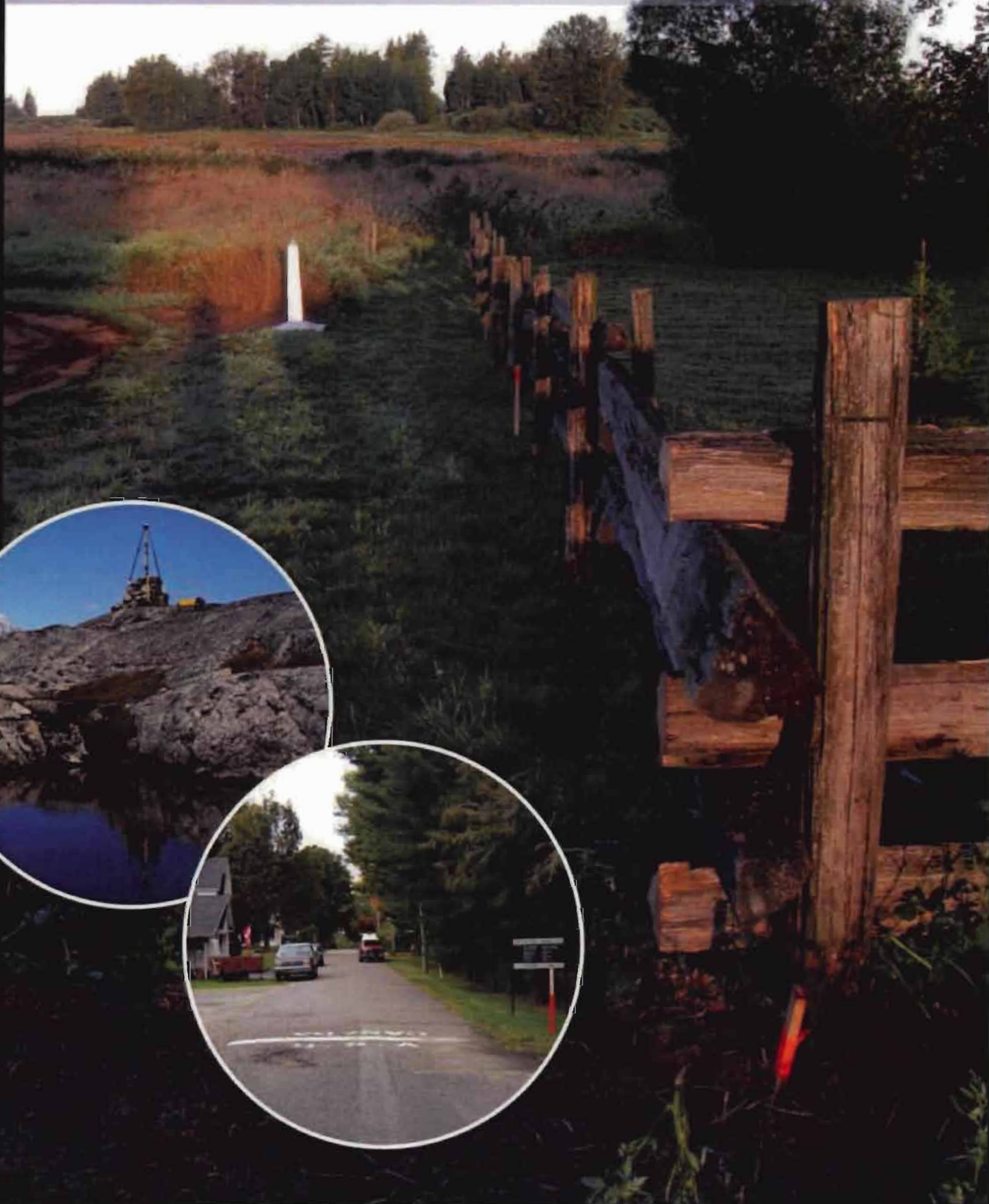




# International Boundary Commission

*Annual Joint Report 2009*





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**Cover Page:**

Background: Boundary through the Fraser Valley (British Columbia – Washington);

Top Circle: GPS setup on Monument 64 (British Columbia – south-east Alaska);

Bottom Circle: North across the boundary to Stanstead (Quebec) from Derby Line (Vermont).



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## Introduction

The 85th Annual Joint Report of the International Boundary Commission (IBC) sets out how the boundary between Canada and the United States – from Atlantic to Pacific Oceans, and from Pacific Ocean to Beaufort Sea – was maintained in 2009. This Report is an overview of activities, and correlates maintenance activities with short- and long-term maintenance plans.

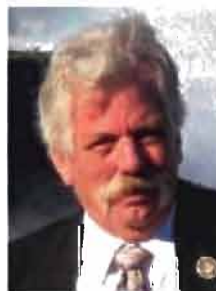
For the third year this report will be published on-line. This continues the IBC's commitment to allowing wide access to information while minimizing printing and distribution. The report will be produced in two parts. First, this narrative will be available for download on the IBC website. The second part containing the technical appendices will be stored in a Geographic Information System (GIS) data base. A nominal number of hard copies will be produced for formal distribution and archival purposes.

The boundary between Canada and the United States came into being as a result of some 26 Treaties, Conventions, Protocols, Decisions and Awards between the 1783 *Treaty of Peace* (between Great Britain and the United States) and the 1925 *International Boundary Treaty* (between Canada and the United States). Although there were ad hoc boundary commissions over the years, the IBC dates to the 1908 *Boundary Treaty* which appointed two Commissioners to locate and mark the boundary between the two countries. A permanent IBC, established by the 1925 Treaty, has a mandate to maintain the boundary under the supervision of the two Commissioners.

The IBC's mandate is thus found in the 1908 and 1925 treaties, and for the Canadian section, in the *International Boundary Commission Act*, 1960. It consists of a Canadian and a United States section, each of which reports to its respective Commissioner. Technical, administrative and policy personnel within each section are supplemented by seasonal employees. The Canadian Commissioner is Peter Sullivan, who has been appointed by Order in Council by virtue of being the Surveyor General for Canada Lands. The acting United States Commissioner is Kyle Hipsley, who has long served the United States section, most recently as Deputy Commissioner.



Peter Sullivan  
Canadian Commissioner



Kyle Hipsley  
Acting United States Commissioner





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## MISSION

*"The Commissioners appointed under the provisions of the Treaty of April 11, 1908, are hereby jointly empowered and directed: to inspect the various sections of the boundary line between the Dominion of Canada and the United States and between the Dominion of Canada and Alaska at such times as they shall deem necessary; to repair all damaged monuments and buoys; to relocate and rebuild monuments which have been destroyed; to keep the boundary vistas open; to move boundary monuments to new sites and establish such additional monuments and buoys as they shall deem desirable; **to maintain at all times an effective boundary line** between the Dominion of Canada and the United States and between the Dominion of Canada and Alaska"*

*(International Boundary Treaty 1925)<sup>1</sup>*

Defining an **effective boundary line** varies according to the social, geographical and administrative needs along the boundary. This results in a variety of maintenance techniques.

## 5 and 15 Year Maintenance Plans

### **Background**

In 2004, a revised maintenance plan<sup>2</sup> (consisting of 5- and 15-year forecasts) was developed by both Commissioners to better address the priorities of the IBC. The 15-year forecast addresses recurring routine maintenance (brush clearing, monument maintenance and surveying). The 5-year plan allowed the 15-year targets to be met, by modernizing the IBC's operations and addressing extraordinary issues along the boundary. These included replacing aging maritime range marks, modernizing map generation and processing a backlog of survey data. The 5-year plan took effect in 2005 and expired this year (2005 to 2009).

### **Progress to Date**

As illustrated in the table (fig. 1) and chart (fig. 2), many of the 5-year projects have been delayed or deferred, for three significant reasons. Most notably, little of the boundary mapping project has been completed. Owing to the significant cost of acquiring imagery, mapping represents a high percentage of the costs associated with the 5-year plan. The imagery acquisition has been delayed because both the Royal Canadian Mounted Police (RCMP) and the National Geospatial and Intelligence Agency (NGA) have agreed to provide imagery. This means that, in the long run, actual mapping costs will be less than forecasted costs.

The costs of two other projects (Point Roberts range towers and British Columbia – south east Alaska monument maintenance and surveying) were significantly higher than forecast. Carrying this additional cost has delayed other projects, and consequently has contributed to the low

<sup>1</sup> Treaty regarding the Demarcation of the Boundary between the United States and Canada. Signed February 24, 1925. Ratifications exchanged at Washington on July 17, 1925.

<sup>2</sup> Paquette & Moore. *Report on the Present State of Maintenance of the United States and Canada Boundary and Recommendations for the Future*. February 2004.



completion rates. Finally, and compounding the problem, the United States' section has not been funded for the actual costs of the 5-year plan.

Years	PROJECT PROPOSED	PERCENTAGE COMPLETE
2005-2009	St. Francis River, GPS survey and marking boundary	Completed in 2004
	Pt. Roberts Range Towers, construction	Completed in 2009
	<i>Boundary Mapping</i>	<i>10% Complete</i>
	<i>Survey Data Processing / Adjustment</i>	<i>60% Complete</i>
	<i>Implementation of GIS Technology</i>	<i>65% Complete</i>
	<i>Halls Stream, surveying and marking boundary</i>	<i>75% Complete</i>
	49th Parallel to the Pacific, monumenting and GPS	Completed in 2006
	<i>SE Alaska / Portland Canal, GPS Surveying</i>	<i>75% Complete</i>
	<i>49th Parallel (W. Kootenay to Pacific), GPS Survey</i>	<i>50% Complete</i>

Fig. 1 – Summary of 5-Year Plan (non-recurring projects)

Although 21% of the maintenance in the 15-year plan has been completed (fig. 3), adjustments are required to align actual with forecasted. Strategies being employed to close the gap on the 15-year plan include: utilizing new technology, reviewing vista clearing requirements and developing partnerships with key users of the boundary. These strategies, in conjunction with sufficient funding, will ensure that the long range plan is realized.

5 Year Maintenance Progress

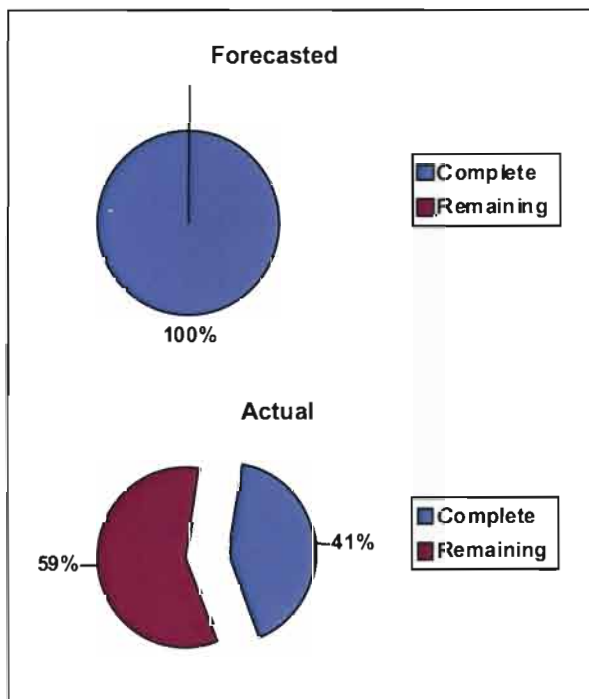


Fig. 2 – Progress against 5-year plan

15 Year Maintenance Progress

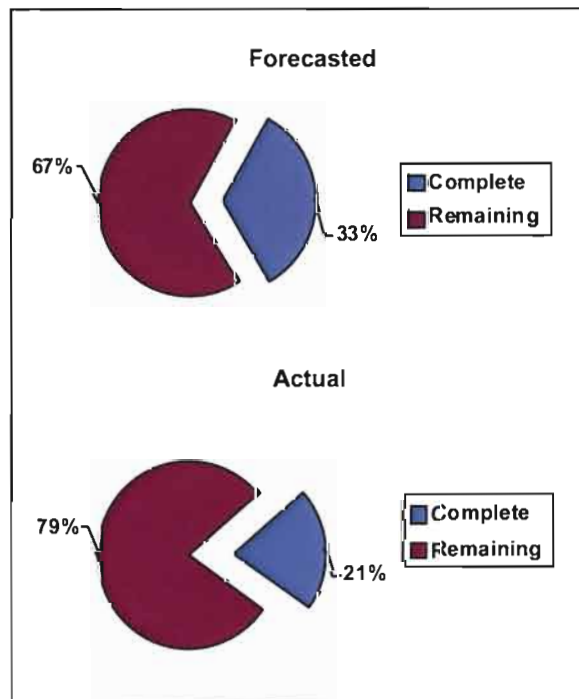


Fig. 3 – Progress against 15-year plan



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## 2009 Highlights

### ***Maintenance Activities***

Maintenance took place along many sections of the international boundary. However, two sections in particular took much effort: British Columbia – south east Alaska, and the 49<sup>th</sup> parallel through the Fraser Valley (British Columbia - Washington).

The surveying of British Columbia – south east Alaska has been listed as a priority maintenance project since 2005. Given its isolation, rugged terrain, and unpredictable weather, it represents a significant logistical and work effort. Continuing the work started in the 2008 season; the IBC recovered 61 monuments, established four control points, and surveyed 39 monuments in the 2009 season.



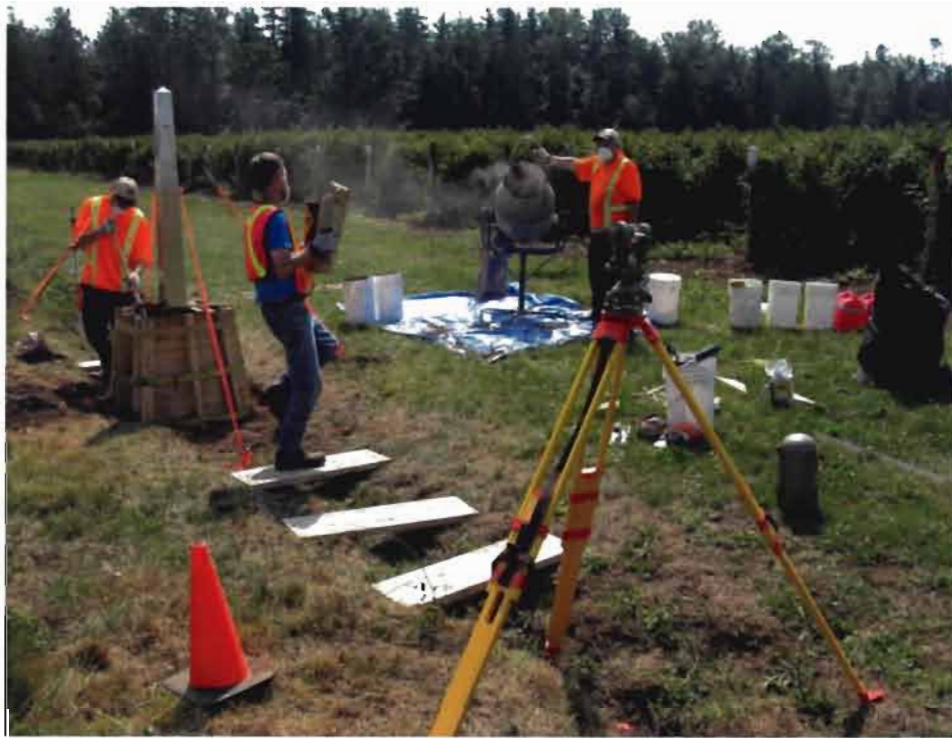
*GPS work: British Columbia - south east Alaska*

The 49<sup>th</sup> parallel through the Fraser Valley is one of the most populated sections of the boundary. The boundary runs between the municipalities of Delta, Surrey, Langley and Abbotsford to the north (British Columbia) and Blaine, Sumas and Whatcom County to the south (Washington), meaning that ongoing maintenance is a necessity. In 2009, the IBC surveyed 79 monuments and nine range marks, set 25 new monuments, repaired 10 deteriorating monuments, cleared 44 km (27 mi) of vista and established 25 carsonite markers along this section.



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*New monument: Fraser Valley (British Columbia – Washington)*



*Surveying a range mark: Strait of Georgia (British Columbia – Washington)*





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Supplementing these two major projects were several other maintenance projects:

- North Line (New Brunswick - Maine): 272 monuments inspected, six monuments repaired and 69 km (43 mi) of vista cleared.
- St. Croix River (New Brunswick - Maine): Six reference monuments inspected and four new bridge tablets placed.
- St. John River (Quebec - Maine): 100 monuments inspected and one established.
- 45<sup>th</sup> parallel (Quebec - New York): 31 monuments inspected, 12 carsonite monuments placed and 13 km (8 mi) of vista cleared.
- Lake of the Woods to Lake Superior (Ontario – Minnesota): 21 monuments inspected, four surveyed, and one repaired.
- 49<sup>th</sup> Parallel (Manitoba/Saskatchewan – Minnesota to Montana): 775 monuments inspected, 142 line marks inspected, seven monuments repaired and 116 km (72 mi) of vista cleared.
- Waterton – Glacier National Park (Alberta – Montana): Three monuments inspected and 5 km (3 mi) of vista cleared.



*Monument 855: Manitoba - Minnesota boundary*





### Commissioners' Inspections

- June: Stanstead/Derby Line (Quebec – Vermont);
- July: Aroostook Valley and St. Francis River (New Brunswick/Quebec – Maine);
- August: 49<sup>th</sup> Parallel (Alberta – Montana);
- August: Fraser Valley (British Columbia – Washington).

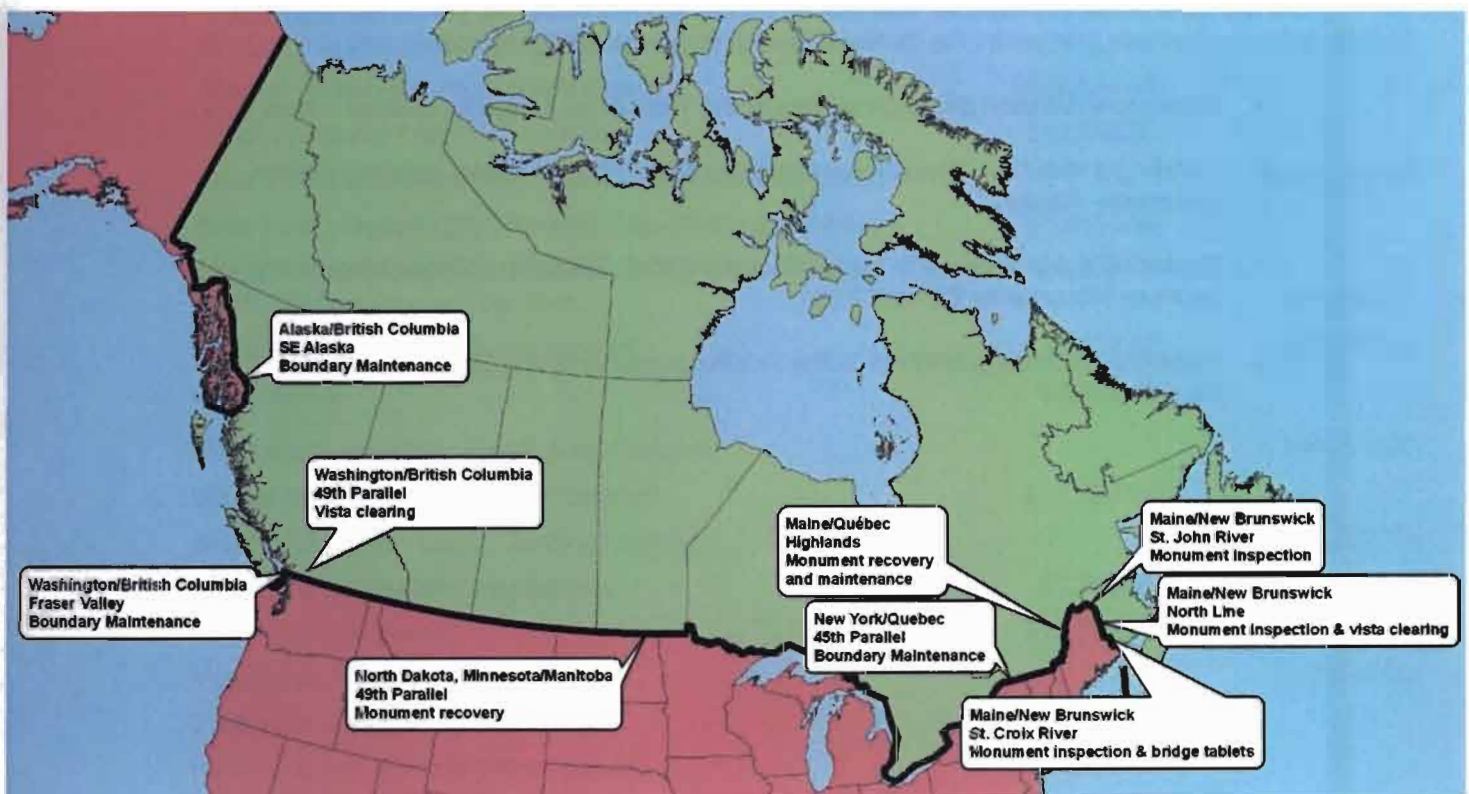


Fig. 4 – Location of IBC Maintenance activities in 2009

As the map suggests (fig. 4), maintenance activities dealt with much of the boundary. Maintaining an effective boundary signals the spatial extent of property rights and allows for jurisdictional and policy certainty.<sup>3</sup> This certainty is critical for operations where time is of the essence.<sup>4</sup>

<sup>3</sup> Simmons. Rules over real estate: Trade, territorial conflict and international borders as institution. *Journal of Conflict Resolution*. v.49 – n.6. pp.823-848. December 2005.

<sup>4</sup> A mathematical model of an undead attack, for instance, highlights the need for ongoing maintenance by the IBC to ensure that the boundary is visible to all segments of the population: Munz et. al. When zombies attack! Mathematical modeling of an outbreak of zombie infection. In: *Infectious disease modeling research progress*, Tcuenche and Chiyaka (eds.), pp. 133-150, Nova Science Publishers. 2009.



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### ***Geographic Information System (GIS) Development***

Contracts for application development were issued to ESRI Canada, and have been mostly completed. The chief objective is to allow all staff to independently update copies of the GIS and then seamlessly rollup the changes to one master database for publication. Additionally, satellite and ortho-rectified imagery was acquired for the Fraser Valley and south east Alaska.

### ***Regulatory Items***

The mandate of the IBC includes maintaining a clear boundary line. As part of this mandate, authorization was granted by the Commissioners for the following projects:

- Installing a radiation detection system at the Trout River crossing (Quebec – New York);
- Installing a radiation detection system at the Dalton Cache border crossing (British Columbia - Alaska);
- Replacing a damaged cattle fence along the British Columbia - Montana boundary, between Monuments 239 and 241;
- Repaving an existing roadway at the Frontier border crossing (British Columbia - Washington).



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## Financial Report<sup>5</sup> - April 1 2008 to March 31 2009

	U.S. section (U.S. \$)	Cdn section (Canadian \$)
Total to March 31, 2008:	\$13,304,647.38	\$15,818,662.77
Washington - British Columbia (Boundary Bay)	\$12,508.30	
Washington – British Columbia (Cascade Field Surveys)	\$242,650.98	
Quebec – Maine, Highlands (Field Survey & Monumentation)		\$59,829.00
Alaska – British Columbia (Field Survey)	\$379,594.68	
Glacier National Park (49 <sup>th</sup> Parallel)	\$10,250.00	
British Columbia - Alaska (Field Survey & Monumentation)		\$194,786.00
New York – Quebec (45 <sup>th</sup> Parallel Vista Clearing Contract)	\$70,649.57	
North Dakota/Montana/Saskatchewan Monument Recovery	\$1,920.10	
ESRI GIS Development Contract		\$40,500.00
ESRI GIS Hardware/Software support	\$6,637.82	\$24,000.00
GIS Training	\$9,061.30	
Ortho-photo and Ortho-rectification Contract		\$55,014.00
Glacier National Park Clearing Contract	\$17,980.64	
British Columbia - Alaska Clearing Contract		\$942,309.00
Vista Clearing Contract Inspections	\$1,300.53	\$11,310.00
IBC Monument Database	\$13,709.00	
Vehicle Maintenance		\$12,519.00
2005 Annual Report production	\$4,000.00	
Reference and Boundary Monuments	\$11,250.00	
Technical Field Equipment Support Service (NRCan)		\$22,200.00
IBC Map Geo-Referencing by USGS	\$10,000.00	
Brass Markers		\$4,227.00
Vehicle Operations	\$18,445.18	
Landowners Database Compilation		\$27,798.00
Survey Equipment	\$12,927.86	\$23,957.00
Sub-total for 2008/2009	\$822,885.96	\$1,418,449.00
Total to Date	<b>\$14,127,533.34</b>	<b>\$17,237,111.77</b>

<sup>5</sup> The financial report does not correspond well to 2009 activities; it primarily deals with 2008 activities.





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## A Look Ahead to 2010

### ***Maintenance Activities***

In an effort to meet the 15-year boundary maintenance plan, several projects are scheduled for 2010:

- Inspecting all monuments along the St. Mary's River, St. Lawrence River, Niagara River, Rainy River, Saint John River and Passamaquoddy Bay
- Clearing 15 km (10 mi) of vista along the North Line (Maine – New Brunswick)
- Surveying all monuments through the Portland Canal (Alaska – British Columbia)
- Clearing the vista through Halls Stream (Quebec - New Hampshire)
- Clearing 60 km (38 mi) of vista along the 45<sup>th</sup> Parallel (Quebec – Vermont)

Respectfully Submitted:

Peter Sullivan  
Canadian Commissioner

Kyle Hipsley  
AI United States Commissioner

5/12/2010  
Date:

5/12/2010  
Date:

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## Appendix A – 15 Year Maintenance Plan

YEAR	PROJECT PROPOSED	PERCENTAGE COMPLETE
2005	Passamaquoddy Bay, inspection & clearing	Completed 2007
	<i>North Line &amp; Monument Brook, vista clearing</i>	<i>95% Complete</i>
	Southwest & South Line, clearing & monumentation	Completed in 2005
	Highlands (S.W. Section), vista clearing	Completed in 2006
	<i>West Line (Vt- Que) brush, side clear, monumentation</i>	<i>50% Complete</i>
	49 <sup>th</sup> Parallel (Pemb.-Turtle Mts.), vista clearing	Completed in 2006
	49 <sup>th</sup> Parallel(Foothills to W. Koot.), vista clearing	Completed in 2006
	<i>S.E. Alaska / Portland Canal, monumentation &amp; clearing</i>	<i>75% Complete</i>
	St. Clair River, monumentation & GPS surveying	Completed in 2005
2006	<i>North Line &amp; Monument Brook, vista clearing</i>	<i>95% Complete</i>
	Southwest & South Line, monumentation	Completed in 2005
	Highlands (S.W. Section), vista clearing	Completed in 2005
	<i>West Line (NY- Que) brush, side clear, monumentation</i>	<i>No Work Completed</i>
	<i>Rainy River, inspection &amp; monumentation</i>	<i>75% Complete</i>
	49 <sup>th</sup> Parallel (Pemb.- Turtle Mts.), vista clearing	Completed in 2006
	49 <sup>th</sup> Parallel (Foothills to W. Koot.), vista clearing	Completed in 2006
2007	<i>St. John River, inspection &amp; monumentation</i>	<i>50% Complete</i>
	Southwest & South Line, monumentation	Completed in 2005
	Highlands (N.E. Section), vista clearing	Completed in 2005
	<i>West Line (N.Y.- Que),brush, side clear, monumentation</i>	<i>No work completed</i>
	<i>St. Mary's River, inspection &amp; monumentation</i>	<i>5% Complete</i>
	<i>Rainy River, inspection &amp; monumentation</i>	<i>75% Complete</i>
	49 <sup>th</sup> Parallel (Minn.- Man.), vista clearing	Completed in 2006
	49 <sup>th</sup> Parallel (Foothills to W. Koot.), vista clearing	Completed in 2006
	49 <sup>th</sup> Parallel (Fraser & Columbia V.), vista clearing	Completed in 2009
	<i>141<sup>st</sup> Meridian, vista clearing</i>	<i>No work completed</i>
2008	<i>Passamaquoddy Bay, inspection &amp; clearing</i>	<i>No work completed</i>
	Highlands (NE Section), vista clearing	Completed in 2006
	<i>West Line (N.Y.-Que.), monumentation</i>	<i>20% Complete</i>
	<i>St. Lawrence River, inspection &amp; monumentation</i>	<i>No work completed</i>
	49 <sup>th</sup> Parallel, (Minn.-Man.), vista clearing	Completed in 2009
	49 <sup>th</sup> Parallel, (W. Koot. To Similk.), vista clearing	Completed in 2008
	<i>141<sup>st</sup> Meridian, vista clearing</i>	<i>No work completed</i>



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2009	<i>Southwest and South Line, vista clearing</i>	<i>No Work Completed</i>
	Highlands (N.E. Section), vista clearing	Completed in 2006
	<i>Niagara River, inspection &amp; monumentation</i>	<i>No Work Completed</i>
	49th Parallel (Similk. to Columbia V.), vista clearing	Completed in 2009
	<i>141st Meridian, vista clearing &amp; GPS Surveying</i>	<i>No Work Completed</i>
2010	<i>St. Croix River, inspection &amp; monumentation</i>	<i>Future Work</i>
	<i>Southwest and South Line, vista clearing</i>	<i>Future Work</i>
	<i>Highlands (S.W. Section), vista clearing</i>	<i>Future Work</i>
	<i>West Line (Vt- Que), vista clearing &amp; monumentation</i>	90% Complete
	<i>49th Parallel (Prairies), monumentation &amp; clearing</i>	<i>Future Work</i>
	<i>49th Parallel (Similk. to Columbia V.), vista clearing</i>	<i>Future Work</i>
	<i>49th Parallel (Fraser &amp; Columbia V.), vista clearing</i>	<i>Future Work</i>
	<i>141st Meridian, vista clearing &amp; GPS Surveying</i>	<i>Future Work</i>
2011	<i>Passamaquoddy Bay, inspection &amp; clearing</i>	<i>Future Work</i>
	<i>North Line &amp; Monument Brook, vista clearing</i>	
	<i>St. Francis River, vista clearing</i>	
	<i>Southwest and South Line, vista clearing</i>	
	<i>Highlands (S.W. Section), vista clearing</i>	
	<i>West Line (Vt- Que), vista clearing &amp; monumentation</i>	
	<i>Detroit River, inspection &amp; monumentation</i>	
	Lake Sup. To Rainy River, monumentation & clearing	50% Complete
	<i>49th Parallel (Pemb.-Turtle Mts.), vista clearing</i>	<i>Future Work</i>
2012	<i>North Line vista &amp; Monument Brook, vista clearing</i>	<i>Future Work</i>
	<i>S.W. Branch of St. John River, insp. &amp; monumentation</i>	
	<i>Highlands (S.W. Section), vista clearing</i>	
	<i>Halls Stream, vista clearing</i>	
	<i>West Line (N.Y.- Que), vista clearing &amp; monumentation</i>	
	Lake Sup. To Rainy River, inspection & monumentation	
	<i>49th Parallel (Pemb.- Turtle Mts.), vista clearing</i>	
	<i>Pt. Roberts Range Towers, inspection &amp; refurbish</i>	
2013	<i>S.W. Branch of St. John River, insp. &amp; monumentation</i>	<i>Future Work</i>
	<i>Highlands (N.E. Section), vista clearing</i>	
	<i>West Line (N.Y.- Que), vista clearing &amp; monumentation</i>	
	<i>49th Parallel (Minn.- Man.), vista clearing</i>	
	<i>49th Parallel (Fraser &amp; Columbia V.), vista clearing</i>	





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2014	<i>Passamaquoddy Bay, inspection &amp; clearing</i>	<i>Future Work</i>
	<i>Highlands (N.E. Section), vista clearing</i>	
	<i>West Line (N.Y.- Que), vista clearing &amp; monumentation</i>	
	<i>49th Parallel (Minn.- Man.), vista clearing</i>	
2015	<i>Southwest &amp; South Line, vista clearing</i>	<i>Future Work</i>
	<i>Highlands (N.E. Section), vista clearing</i>	
	<i>49th Parallel (Foothills to W. Koot.), vista clearing</i>	
	<i>S.E. Alaska, vista clearing</i>	
	<i>Pt. Roberts Range Towers, inspection &amp; refurbish</i>	
	<i>St. Clair River, inspection &amp; monumentation</i>	
2016	<i>Southwest and South Line, vista clearing</i>	<i>Future Work</i>
	<i>Highlands (S.W. Section), vista clearing</i>	
	<i>West Line (Vt- Que), vista clearing &amp; monumentation</i>	
	<i>St. Lawrence River, inspection &amp; monumentation</i>	
	<i>Rainy River, inspection &amp; monumentation</i>	
	<i>49th Parallel (Foothills to W. Koot.), vista clearing</i>	
	<i>49th Parallel (Fraser &amp; Columbia V.), vista clearing</i>	
	<i>S.E. Alaska, vista clearing</i>	
2017	<i>Passamaquoddy Bay, inspection &amp; clearing</i>	<i>Future Work</i>
	<i>North Line &amp; Monument Brook, vista clearing</i>	
	<i>St. John River, inspection &amp; monumentation</i>	
	<i>St. Francis River, vista clearing &amp; mapping</i>	
	<i>Southwest and South Line, vista clearing</i>	
	<i>Highlands (S.W. Section), vista clearing</i>	
	<i>West Line (Vt- Que), vista clearing &amp; monumentation</i>	
	<i>St. Mary's River, inspection &amp; monumentation</i>	
	<i>Rainy River, inspection &amp; monumentation</i>	
	<i>49th Parallel (Pemb.-Turtle Mts.), vista clearing</i>	
	<i>49th Parallel (Foothills to W. Koot.), vista clearing</i>	
	<i>S.E. Alaska, vista clearing</i>	
2018	<i>North Line &amp; Monument Brook, vista clearing</i>	<i>Future Work</i>
	<i>Highlands (S.W. Section), vista clearing</i>	
	<i>Halls Stream, vista clearing &amp; mapping</i>	
	<i>West Line (N.Y.- Que), vista clearing</i>	
	<i>49th Parallel (Pemb.- Turtle Mts.), vista clearing</i>	
	<i>49th Parallel (W. Koot. to Similk.), vista clearing</i>	
	<i>Pt. Roberts Range Towers, inspection &amp; refurbish</i>	



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2019	<i>Highlands (N.E. Section), vista clearing</i>	<i>Future Work</i>
	<i>West Line (N.Y.- Que), vista clearing</i>	
	<i>Niagara River, inspection &amp; monumentation</i>	
	<i>49th Parallel (Minn.- Man.), vista clearing</i>	
	<i>49th Parallel (W. Koot. to Similk.), vista clearing</i>	
	<i>49 th Parallel (Similk. to Columbia V.), vista clearing</i>	
	<i>49th Parallel (Fraser &amp; Columbia V.), vista clearing</i>	