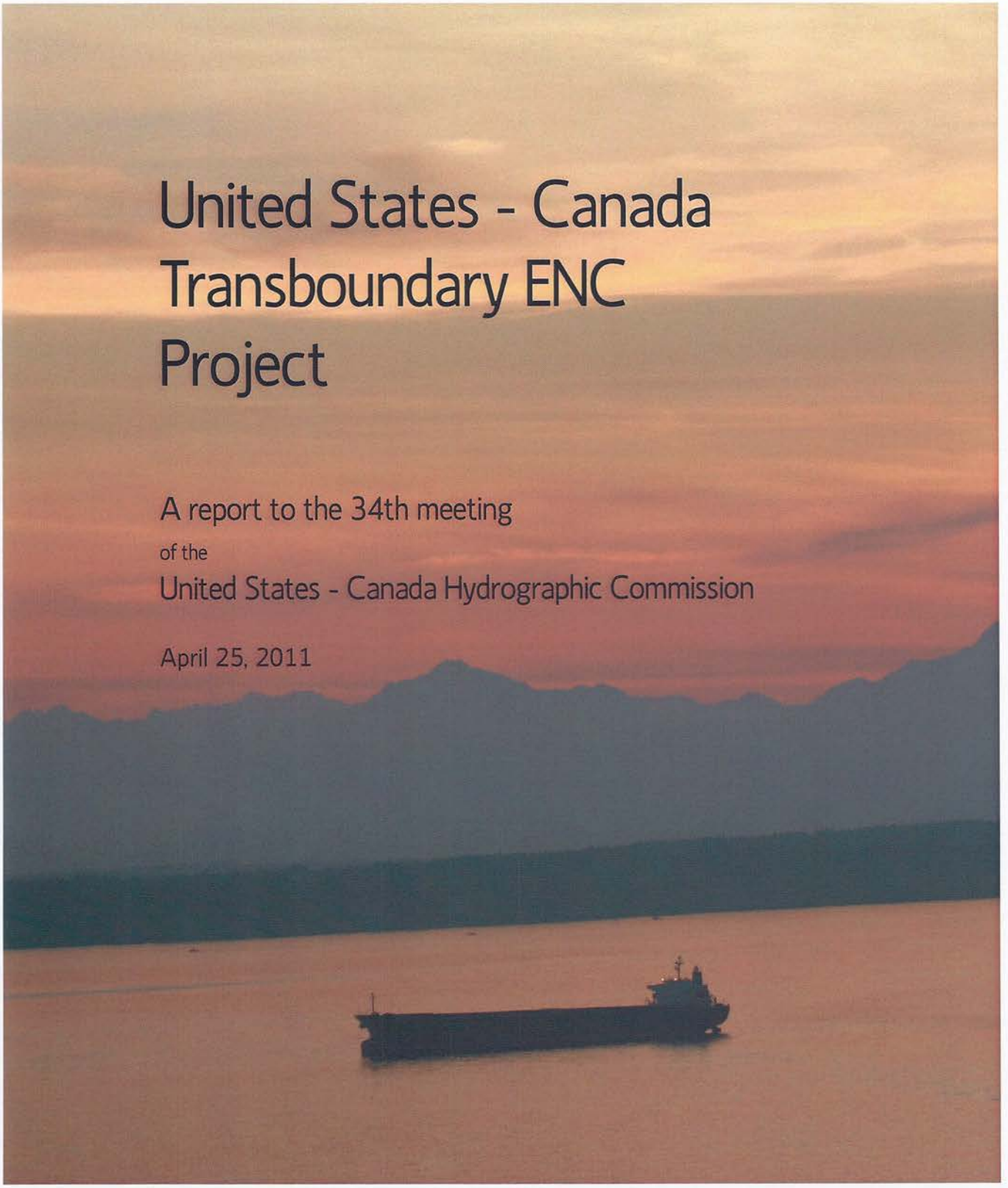
United States - Canada Transboundary ENC Project

A report to the 34th meeting

of the

United States - Canada Hydrographic Commission

April 25, 2011



Contents

Executive Summary

At the United States–Canada Hydrographic Commission (USCHC) meeting in March 2007, the United States (U.S.) and Canada proposed a framework for approaching transboundary Electronic Navigational Chart (ENC) issues along their shared international borders. The framework intends to comply with the International Hydrographic Organization (IHO) Worldwide Electronic Navigational Chart Database (WEND) principles.

The basic concept behind the WEND principles is for Member States to work together to avoid Electronic Navigational Chart (ENC) overlaps and to gain efficiencies from a single producer nation. The following excerpts are from the "Revised Wend Principles" published by the IHO and approved by Member States in 2005:

- ENC duplication should be avoided. Only one country should be responsible for ENC production in any given area.
- Responsibility for the production of ENC can be delegated in whole or in part by a country to another country, which then becomes the producing country in the considered area.
- When the production limits are the official limits for national jurisdiction waters, commercial rights shall belong to the ENC producing country.

The Canadian Hydrographic Service (CHS) and the National Oceanic and Atmospheric Administration (NOAA) agreed to focus on the needs of the customer while following the principles outlined by WEND.

In 2005, the Canadian Hydrographic Service, of Fisheries and Oceans Canada, and Office of Coast Survey, within the U.S. National Oceanic and Atmospheric Administration, began to discuss dividing transboundary ENC coverage based on the WEND principles. CHS and Coast Survey held three meetings in 2005 and 2006, in regions affected by the transboundary issues. The meetings resulted in preliminary recommendations to collaboratively scheme ENC coverage between CHS and Coast Survey in the transboundary areas of the Pacific, Great Lakes, and Atlantic.

It became evident that this project included matters of policy that needed resolution by the USCHC. In 2007, the USCHC agreed that CHS – Pacific Region and Coast Survey would begin a pilot project to: (1) address major technical and policy issues that had arisen; and (2) work toward resolutions. This collaborative effort would also become the basis to provide lessons learned for future areas.

Over the next few years, the two hydrographic offices evaluated a wide range of possible implementation options and, in 2011, agreed to execute one that includes French text in cells covering Canadian waters on ENCs that the U.S. is now responsible for producing. The Canadian national bilingual language requirement was one of several policy issue challenges faced by the USCHC. Implementation of the solution has begun in the Juan de Fuca and Haro Straits in the Pacific Northwest and, upon successful completion, will be expanded to other shared border regions.

The transboundary ENCs are a priority for USCHC, recognizing that the International Maritime Organization has set June 2012 for start of mandatory carriage of Electronic Chart Display Information Systems (ECDIS). The USCHC expects to release the first of the collaborative transboundary ENCs of Juan de Fuca and Haro Straits by December 2011.

Work Plan and Progress

The following is the work plan and continuing progress made by Canada and the United States on the transboundary ENC project. This section has two components: technical and policy issues. Technical issues are those issues where existing technology or standards may limit progress towards implementing the transboundary ENC project. Policy issues are those issues that may require a policy change in standard charting practices in order to make progress.

Technical Issues

The following is a summary of technical issues that were resolved in this project. Note that the countries determined that no new surveys were needed to complete this project.

Regional Phases: The boundary region between Canada and the United States represents a large geographic area. To manage this project and resolve both technical and policy issues, the USCHC will tackle each region as an independent project.

The regions are Pacific, Atlantic, and Great Lakes. In addition, the Pacific region is further divided into a pilot region consisting of the Strait of Juan de Fuca and the Haro Strait/Boundary Pass area and the northern Pacific region of Dixon Entrance. The desirable work plan is located in ANNEX A.

ENC Boundary Agreements: The USCHC based the approach for dividing the ENC cells on the mariner's interest. In many cases, it was not in the interest of the mariner to divide cells along the international boundary (for example, in the middle of a traffic separation scheme). At the time of this report, the only confirmed cuts are for the areas in the boundary waters of Haro Strait/Boundary Pass and Juan de Fuca Strait on the Pacific west coast. The official source for Juan de Fuca/Haro Strait/Boundary Pass transboundary ENC coordinates are in ANNEX B.

Test Report for the Inclusion of French Notes: The Office of Coast Survey conducted a small test to determine if it was viable for the United States to include French language text in US ENCs. Coast Survey successfully included Canadian data and French Language notes into a US ENC and subsequently loaded the ENC on a TRANSAS ECDIS for verification. The test plan and results are in ANNEX C.

Encoding Guideline for Transboundary ENCs: This is a set of instructions, agreed to by Canada and the United States, describing how to encode the various notes into transboundary ENC's. The encoding guidelines are located in ANNEX D.

Level of Service Arrangement: The USCHC developed a level of service arrangement to facilitate the exchange of data, for the creation and maintenance of paper and electronic charts, between Canada and the United States. The commission decided that this service level arrangement should cover all charting products in the transboundary regions, and not just those related to ENCs. While the "Level of Service Arrangement" is maintained outside this report, the data for the Transboundary Project is shared in accordance with it.

Policy Issues

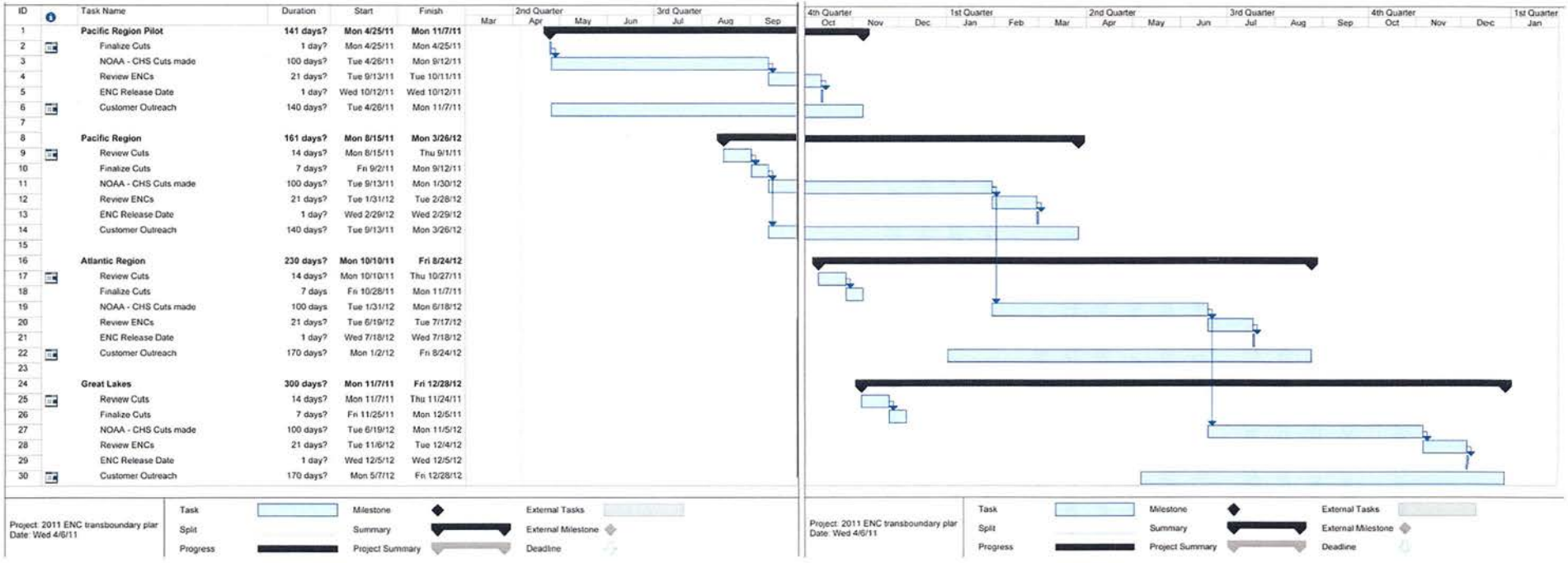
The following summarizes policy issues resolved in this project.

National Language Issues: The Official Language Act in Canada requires the CHS to ensure that English and French languages are both accommodated in the official nautical chart products for Canadian waters. As such, it was necessary to determine a methodology to incorporate French language into Coast Survey-produced ENCs that are to be the official ENC coverage of Canadian waters.

Notes for the Transboundary Project: Since Canada and the United States have different rules and regulations regarding copyright and intellectual property, the USCHC determined that specific notes should be developed for ENCs in this region. In addition, since the USCHC based cuts in the interest of the mariner, rather than on geo-political boundaries, the United States and Canada agreed on a common note that will inform the mariner that they may be traveling in a region that contains a disputed boundary. These notes are in ANNEX E.

Communications Plan: There is no "typical" ENC user who will be affected by the change. Since the users differ in their reliance on the ENCs, in their methods for acquiring ENCs, and in their sources of ENC information, Coast Survey and CHS will coordinate distinct communication efforts targeted to specific users groups. The Communications Plan is in ANNEX F.

ANNEX A — DESIRABLE PROJECT TIMELINE



ID	Task Name	Duration	Start	Finish
1	**Pacific Region Pilot**	**141 days?**	**Mon 4/25/11**	**Mon 11/7/11**
2	Finalize Cuts	1 day?	Mon 4/25/11	Mon 4/25/11
3	NOAA - CHS Cuts made	100 days?	Tue 4/26/11	Mon 9/12/11
4	Review ENCs	21 days?	Tue 9/13/11	Tue 10/11/11
5	ENC Release Date	1 day?	Wed 10/12/11	Wed 10/12/11
6	Customer Outreach	140 days?	Tue 4/26/11	Mon 11/7/11
7				
8	**Pacific Region**	**161 days?**	**Mon 8/15/11**	**Mon 3/26/12**
9	Review Cuts	14 days?	Mon 8/15/11	Thu 9/1/11
10	Finalize Cuts	7 days?	Fri 9/2/11	Mon 9/12/11
11	NOAA - CHS Cuts made	100 days?	Tue 9/13/11	Mon 1/30/12
12	Review ENCs	21 days?	Tue 1/31/12	Tue 2/28/12
13	ENC Release Date	1 day?	Wed 2/29/12	Wed 2/29/12
14	Customer Outreach	140 days?	Tue 9/13/11	Mon 3/26/12
15				
16	**Atlantic Region**	**230 days?**	**Mon 10/10/11**	**Fri 8/24/12**
17	Review Cuts	14 days?	Mon 10/10/11	Thu 10/27/11
18	Finalize Cuts	7 days	Fri 10/28/11	Mon 11/7/11
19	NOAA - CHS Cuts made	100 days	Tue 1/31/12	Mon 6/18/12
20	Review ENCs	21 days?	Tue 6/19/12	Tue 7/17/12
21	ENC Release Date	1 day?	Wed 7/18/12	Wed 7/18/12
22	Customer Outreach	170 days?	Mon 1/2/12	Fri 8/24/12
23				
24	**Great Lakes**	**300 days?**	**Mon 11/7/11**	**Fri 12/28/12**
25	Review Cuts	14 days?	Mon 11/7/11	Thu 11/24/11
26	Finalize Cuts	7 days?	Fri 11/25/11	Mon 12/5/11
27	NOAA - CHS Cuts made	100 days?	Tue 6/19/12	Mon 11/5/12
28	Review ENCs	21 days?	Tue 11/6/12	Tue 12/4/12
29	ENC Release Date	1 day?	Wed 12/5/12	Wed 12/5/12
30	Customer Outreach	170 days?	Mon 5/7/12	Fri 12/28/12

ANNEX B — PACIFIC PILOT, OFFICIAL ENC CUTS

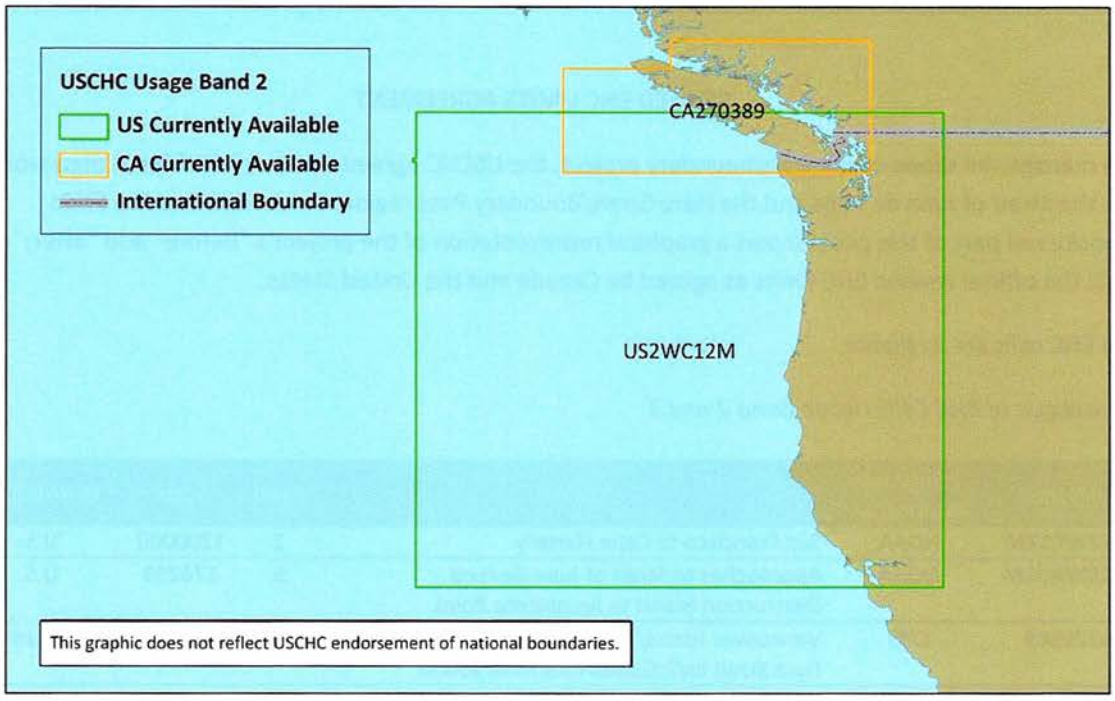
REVISED ENC LIMITS AGREEMENT

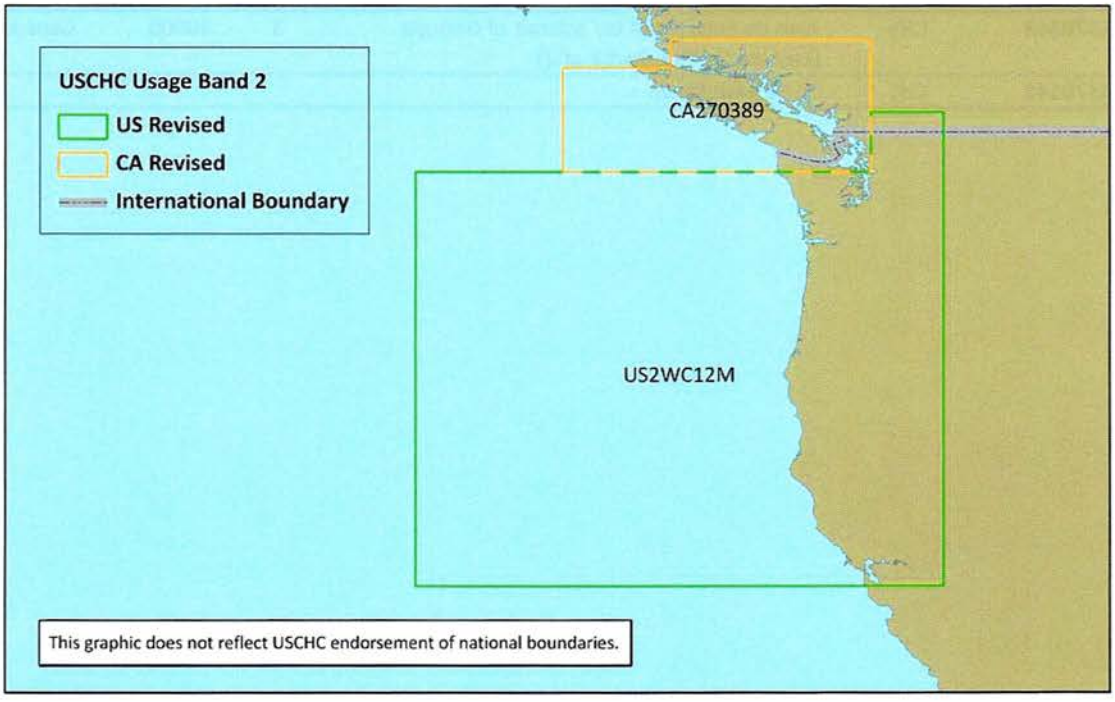
To manage the scope of the transboundary project, the USCHC agreed that the initial focus area would be the Strait of Juan de Fuca and the Haro Strait/Boundary Pass region. This annex lists the ENCs considered part of this pilot; shows a graphical representation of the project's "before" and "after;" and lists the official revised ENC limits as agreed by Canada and the United States.

All ENC cells are available.

Catalogue of ENC Cells Usage Band 2 and 3

Cell Name	Producing Authority	Title	Band	Scale	Distribution
US2WC12M	NOAA	San Francisco to Cape Flattery	2	1200000	U.S.
US3WA01M	NOAA	Approaches to Strait of Juan de Fuca Destruction Island to Amphitrite Point	3	176253	U.S.
CA270389	CHS	Vancouver Island/ Île de Vancouver - Juan de Fuca Strait to/à Queen Charlotte Sound	2	2625000	Canada
CA370203	CHS	Approaches to/Approches à Juan de Fuca Strait	3	75000	Canada
CA370367	CHS	Juan de Fuca Strait to/ à Strait of Georgia (Western Portion Part 1 of 2)	3	40000	Canada
CA370368	CHS	Juan de Fuca Strait to/ à Strait of Georgia (Eastern Portion Part 2 of 2)	3	40000	Canada
CA370141	CHS	To be withdrawn			


USCHC Usage Band 2
US Currently Available
CA Currently Available
International Boundary
CA270389
US2WC12M
This graphic does not reflect USCHC endorsement of national boundaries.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International Boundary
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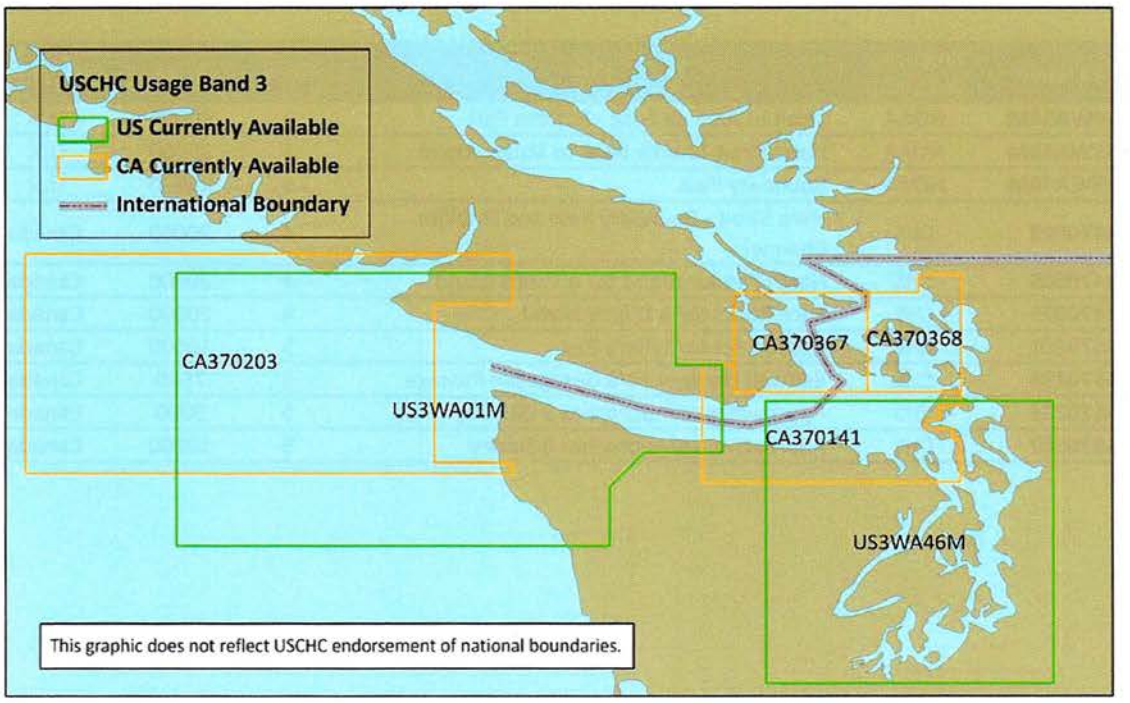
USCHC Usage Band 3
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International Boundary
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US3WA01M
CA370367
CA370368
CA370141
US3WA46M
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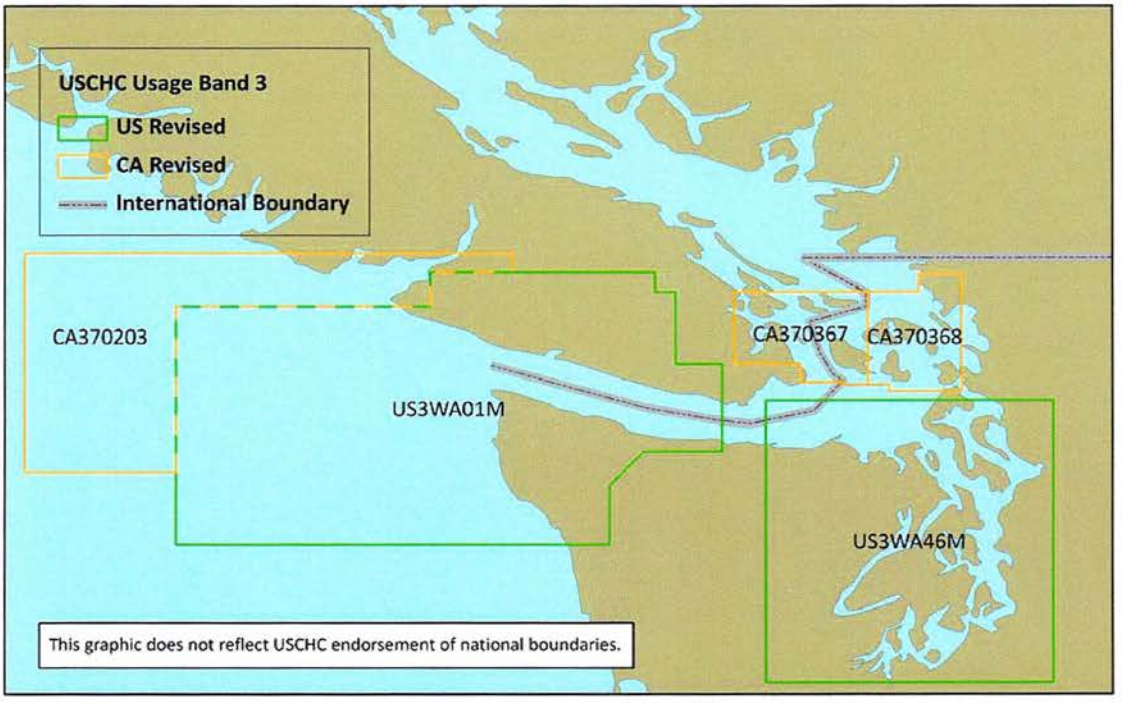
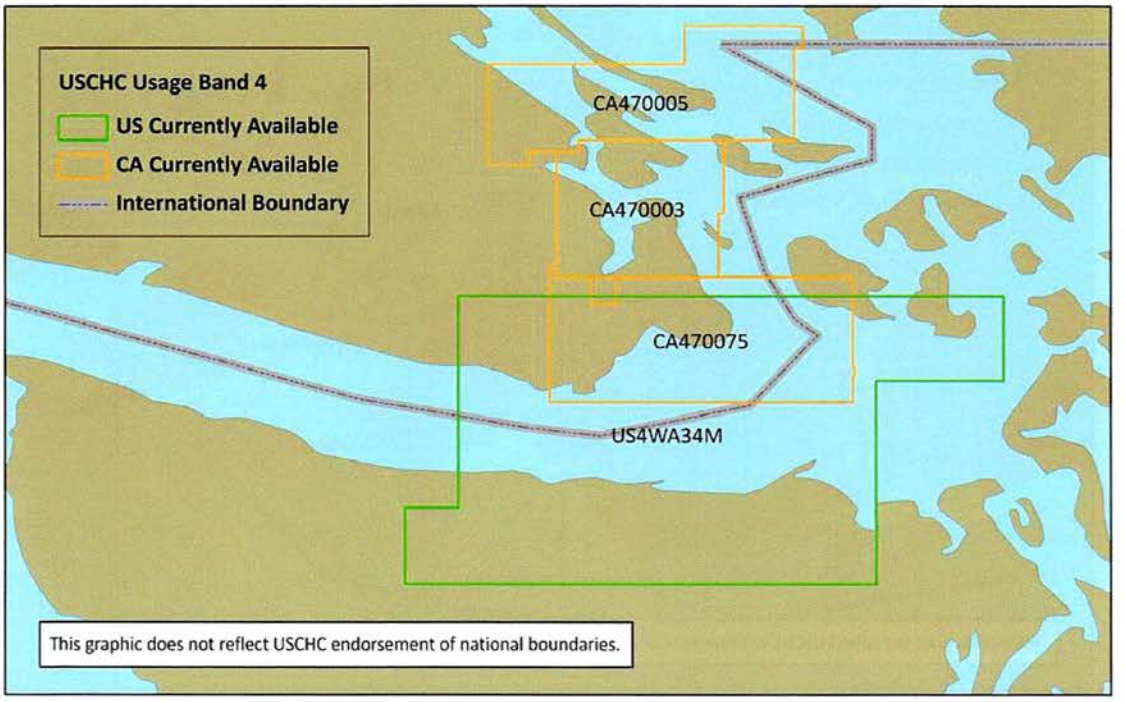
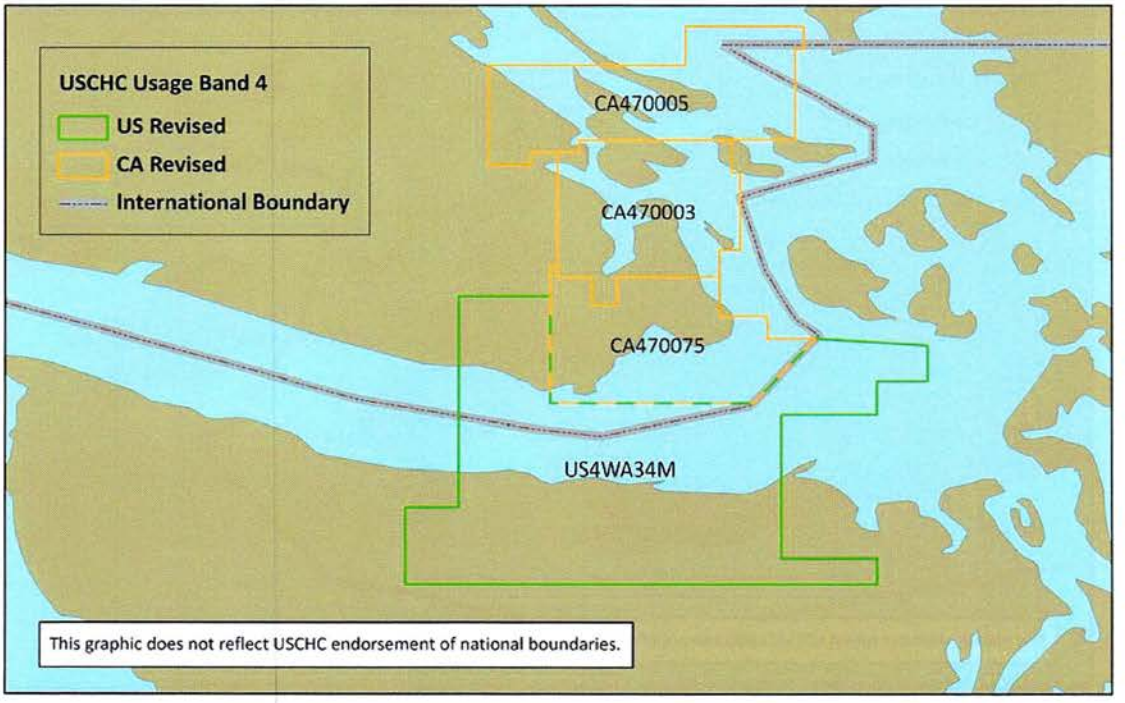

USCHC Usage Band 3
US Revised
CA Revised
International Boundary
CA370203
US3WA01M
CA370367
CA370368
US3WA46M
This graphic does not reflect USCHC endorsement of national boundaries.

Catalogue of ENC Cells Usage Band 4 and 5

Cell Name	Producing Authority	Title	Band	Scale	Distribution
US4WA34M	NOAA	Strait of Juan de Fuca - Eastern Part	4	80000	U.S.
US5WA43M	NOAA	Haro-Strait-Middle Bank to Stuart Island	5	25000	U.S.
US5WA44M	NOAA	Boundary Pass	5	25000	U.S.
CA470003	CHS	Haro Strait - Boundary Pass and Satellite Channel	4	20000	Canada
CA470005	CHS	North Pender Island to/ à Thetis Island	4	20000	Canada
CA470075	CHS	Race Rocks to/ à D'Arcy Island	4	20000	Canada
CA570101	CHS	Sooke Inlet to/à Parry Bay	5	10000	Canada
CA570186	CHS	Bedwell Harbour to/à Georgeson Passage	5	7500	Canada
CA570214	CHS	Approaches to/Approches à Oak Bay	5	5000	Canada
CA570567	CHS	Approaches to/Approches à Sidney	5	10000	Canada


USCHC Usage Band 4
US Currently Available
CA Currently Available
International Boundary
CA470005
CA470003
CA470075
US4WA34M
This graphic does not reflect USCHC endorsement of national boundaries.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CA Revised
International Boundary
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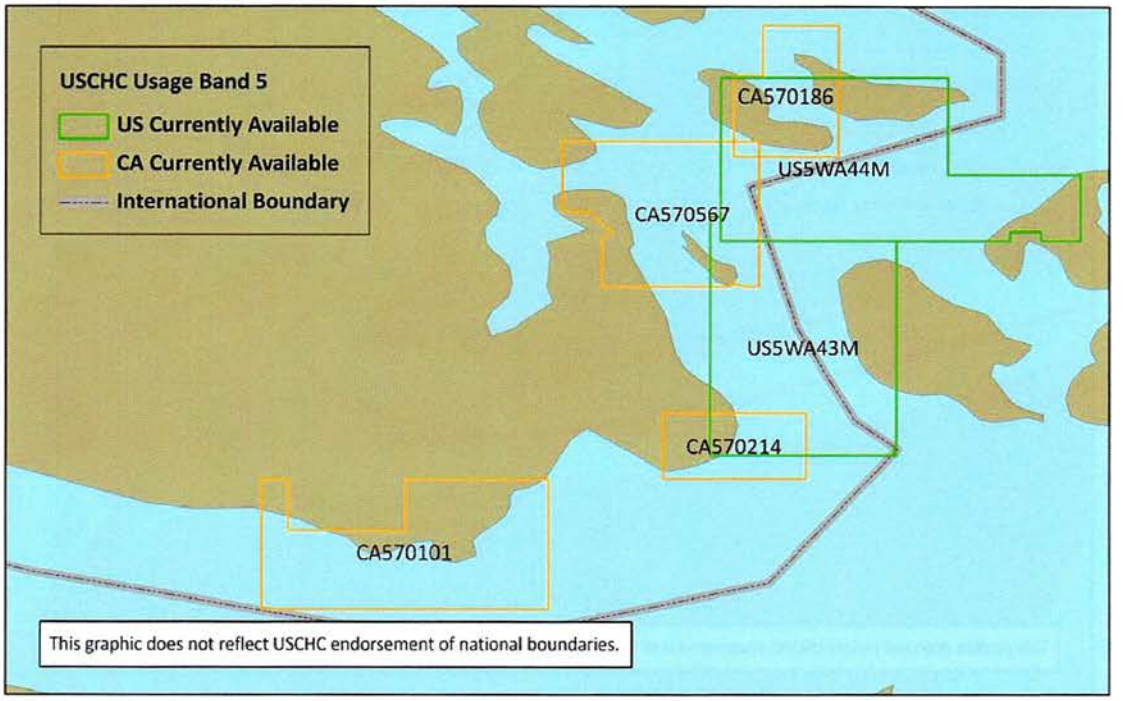
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CA570567
US5WA43M
CA570214
CA570101
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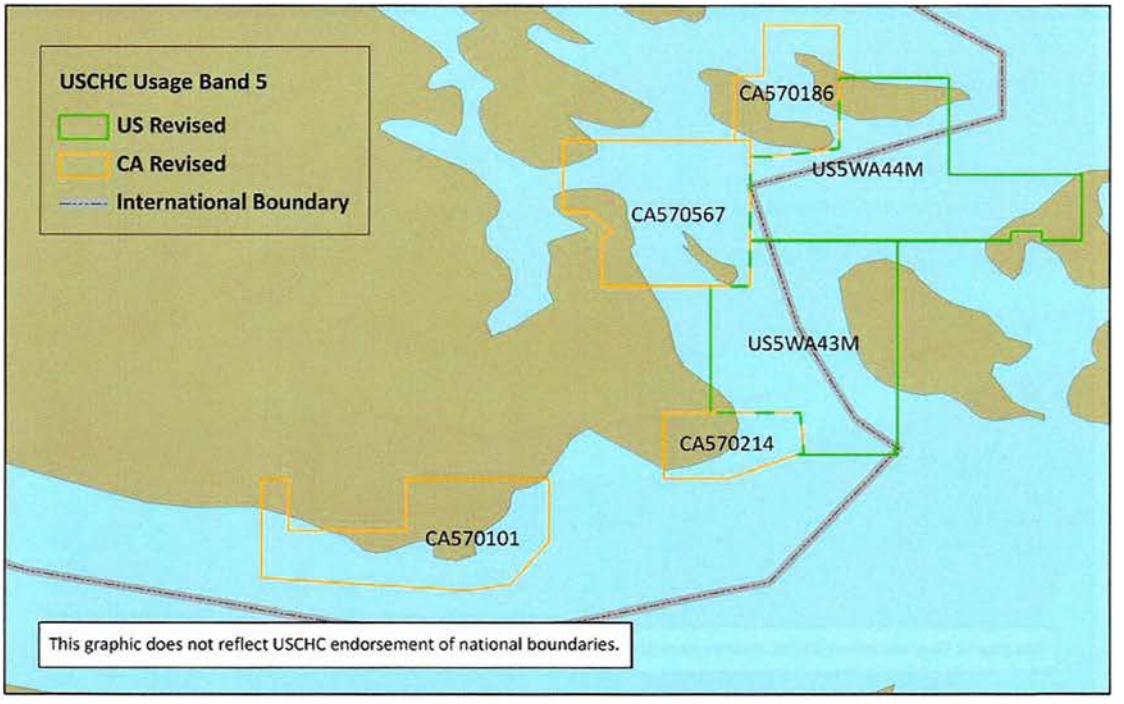

USCHC Usage Band 5
US Revised
CA Revised
International Boundary
CA570186
US5WA44M
CA570567
US5WA43M
CA570214
CA570101
This graphic does not reflect USCHC endorsement of national boundaries.

1. Approved revision cuts for Pacific Pilot ENCs

2. ENC US2WC12M (18007)

1	47° 59' 00.00"N	133° 50' 00.00"W
2	47° 59' 00.00"N	122° 19' 59.81"W
3	49° 30' 00.00"N	122° 19' 59.81"W
4	49° 30' 00.00"N	120° 30' 00.00"W
5	37° 27' 20.00"N	120° 30' 00.00"W
6	37° 27' 20.00"N	133° 50' 00.00"W
7	47° 59' 00.00"N	133° 50' 00.00"W

* = connecting position

These positions are in NAD83.

3. ENC US3WA01M (18480)

1	48-55-29.26N	123-58-28.80W
2	48-50-00.00N	123-58-28.80W
3	48-50-00.00N	123-52-52.00W
4	48-29-59.31N	123-52-52.00W
5	48-29-59.31N	123-40-04.82W
6	48-05-52.22N	123-40-04.82W
7	48-05-52.22N	124-01-30.73W
8	47-56-22.65N	124-11-02.96W
9	47-40-00.00N	124-11-02.96W
10	47-40-00.00N	126-10-04.82W
11	48-46-03.00N	126-10-04.82W
12	48-46-03.00N	125-00-05.01W
13	48-55-29.26N	125-00-05.01W
14*	48-55-29.26N	123-58-28.80W

* = connecting position

These positions are in NAD83.

4. ENC US4WA34M (18465)

1	48-24-11.48N	122-54-10.63W
2	48-20-00.00N	122-54-10.63W
3	48-20-00.00N	123-00-04.50W
4	48-15-59.30N	123-00-04.58W
5	48-15-59.30N	123-11-16.60W
6	47-58-59.30N	123-11-16.60W
7	47-58-59.30N	123-00-04.50W
8	47-55-59.31N	123-00-04.50W
9	47-55-59.31N	123-55-19.82W
10	48-04-59.28N	123-55-19.82W
11	48-04-59.28N	123-49-04.81W
12	48-29-59.31N	123-49-04.81W
13	48-29-59.31N	123-38-22.69W
14	48-17-23.34N	123-38-22.69W
15	48-17-23.34N	123-14-34.22W
16	48-24-59.36N	123-07-16.72W
17	48-24-59.36N	123-06-58.61W
18	48-24-11.48N	123-06-58.61W

19*	48-24-11.48N	122-54-10.63W

* = connecting position

These positions are in NAD83.

5. ENC US5WA43M (18433)

1	48°38'17.47"N	123°06'58.60"W
2	48°38'17.47"N	123°16'06.00"W
3	48°43'31.18"N	123°16'06.00"W
4	48°43'31.20"N	123°14'45.49"W
5	48°44'00.88"N	123°10'35.20"W
6	48°48'23.47"N	123°10'35.20"W
7	48°48'23.47"N	123°03'48.64"W
8	48°42'23.38"N	123°03'48.64"W
9	48°42'23.38"N	122°55'34.63"W
10	48°38'17.47"N	122°55'34.63"W
11	48°38'17.47"N	122°58'02.15"W
12	48°38'50.82"N	122°58'02.15"W
13	48°38'50.82"N	122°59'57.70"W
14	48°38'17.47"N	122°59'57.70"W
15*	48°38'17.47"N	123°06'58.60"W

* = connecting position

These positions are in NAD83.

6. ENC US5WA44M (18432)

1	48°38'17.47"N	123°06'58.60"W
2	48°25'34.56"N	123°06'58.60"W
3	48°25'34.56"N	123°07'07.50"W
4	48°25'06.55"N	123°07'07.50"W
5	48°25'06.55"N	123°06'58.60"W
6	48°24'59.36"N	123°06'58.61"W
7	48°24'59.36"N	123°13'09.90"W
8	48°25'07.89"N	123°12'45.28"W
9	48°27'35.34"N	123°13'00.36"W
10	48°27'35.34"N	123°18'32.39"W
11	48°35'27.00"N	123°18'32.39"W
12	48°35'27.00"N	123°16'06.00"W
13	48°38'17.47"N	123°16'06.00"W
14*	48°38'17.47"N	123°06'58.60"W

* = connecting position

These positions are in NAD83.

7. ENC CA270389 (CH3001)

1	51-19-59.75N	127-24-06.06W
2	51-19-59.75N	122-19-59.81W
3	47-59-00.00N	122-19-59.81W
4	47-59-00.00N	130-07-00.00W
5	50-36-53.21N	130-07-00.00W
6	50-36-53.21N	127-24-06.06W
7*	51-19-59.75N	127-24-06.06W

* = connecting position
These positions are in NAD83.

8. ENC CA370203 (CH3602)

1	48-00-00.75N	126-51-29.08W
2	49-00-41.99N	126-51-29.08W
3	49-00-41.99N	124-37-35.11W
4	48-55-29.26N	124-37-35.11W
5	48-55-29.26N	125-00-05.01W
6	48-46-03.00N	125-00-05.01W
7	48-46-03.00N	126-10-04.82W
8	48-00-00.75N	126-10-04.82W
9*	48-00-00.75N	126-51-29.08W

* = connecting position
These positions are in NAD83.

9. ENC CA370367 (CH3462)

1	48-50-00.00N	123-00-00.03W
2	48-24-11.48N	123-00-00.03W
3	48-24-11.48N	123-06-58.61W
4	48-24-59.36N	123-06-58.61W
5	48-24-59.36N	123-18-32.39W
6	48-29-59.31N	123-18-32.39W
7	48-29-59.31N	123-36-46.67W
8	48-50-00.00N	123-36-46.67W
9*	48-50-00.00N	123-00-00.03W

* = connecting position
These positions are in NAD83

10. ENC CA370368 (CH3462)

1	48-22-29.34N	122-34-16.68W
2	48-22-29.34N	122-54-10.63W
3	48-24-11.48N	122-54-10.63W
4	48-24-11.48N	123-00-00.0W
5	48-50.00N	123-00-00.0W
6	48-50.00N	122-46-04.78W
7	48-54-59.36N	122-46-04.78W
8	48-54-59.36N	122-34-16.68W
9*	48-22-29.34N	122-34-16.68W

* = connecting position
These positions are in NAD83.

11. ENC CA470003 (CH3441)

1	48-32-11.350N	123-37-32.710W
2	48-32-11.354N	123-33-34.717W
3	48-28-59.353N	123-33-34.717W
4	48-28-59.353N	123-30-34.718W

5	48-32-11.354N	123-30-34.718W
6	48-32-11.275N	123-18-32.390W
7	48-35-27.000N	123-18-32.390W
8	48-35-27.000N	123-16-06.000W
9	48-44-28.000N	123-16-06.000W
10	48-44-28.000N	123-17-04.710W
11	48-48-17.350N	123-17-04.710W
12	48-48-17.350N	123-35-00.000W
13	48-47-00.000N	123-35-00.000W
14	48-47-00.000N	123-37-32.710W
15*	48-32-11.350N	123-37-32.710W

* = connecting position

These positions are in NAD83.

12. ENC CA470005 (CH3442)

1	48-48-23.47N	123-09-38.75W
2	48-48-23.47N	123-17-52.68W
3	48-48-17.35N	123-17-52.68W
4	48-48-17.35N	123-35-00.00W
5	48-47-00.00N	123-35-00.00W
6	48-47-00.00N	123-40-40.75W
7	48-45-26.36N	123-40-40.75W
8	48-45-26.36N	123-45-36.74W
9	48-57-12.33N	123-45-36.74W
10	48-57-12.33N	123-22-30.83W
11	49-01-40.36N	123-22-30.83W
12	49-01-40.36N	123-09-38.75W
13	49-01-36.00N	123-09-38.75W
14	49-01-36.00N	123-08-35.88W
15	48-59-00.00N	123-08-35.88W
16	48-59-00.00N	123-09-38.75W
17*	48-48-23.47N	123-09-38.75W

* = connecting position

These positions are in NAD83.

13. ENC CA470075 (CH3440)

1	48-32-11.35N	123-18-32.39W
2	48-27-35.34N	123-18-32.39W
3	48-27-35.34N	123-13-00.36W
4	48-25-07.89N	123-12-45.28W
5	48-24-59.36N	123-13-09.90W
6	48-24-59.36N	123-07-16.72W
7	48-17-23.34N	123-14-34.22W
8	48-17-23.34N	123-38-22.69W
9	48-33-32.33N	123-38-22.69W
10	48-33-32.33N	123-37-32.71W
11	48-32-11.35N	123-37-32.71W
12	48-32-11.35N	123-33-34.72W
13	48-28-59.35N	123-33-34.72W
14	48-28-59.35N	123-30-34.71W
15	48-32-11.35N	123-30-34.71W

16*	48-32-11.35N	123-18-32.39W

* = connecting position
These positions are in NAD83

14. ENC CA570101 (CH3410)

1	48-17-20.20N	123-46-21.00W
2	48-16-31.10N	123-33-34.63W
3	48-16-55.36N	123-30-55.23W
4	48-19-33.56N	123-28-33.00W
5	48-23-30.00N	123-28-33.00W
6	48-23-30.00N	123-37-22.72W
7	48-20-17.32N	123-37-22.72W
8	48-20-17.32N	123-41-45.00W
9	48-20-24.00N	123-41-45.00W
10	48-20-24.00N	123-42-27.00W
11	48-20-17.32N	123-42-27.00W
12	48-20-17.32N	123-44-40.72W
13	48-23-30.00N	123-44-40.72W
14	48-23-30.00N	123-46-21.00W
15	48-17-20.20N	123-46-21.00W

* = connecting position
These positions are in NAD83

15. ENC CA570186 (CH3477)

1	48-43-31.20N	123-16-06.00W
2	48-43-31.20N	123-14-45.49W
3	48-44-00.88N	123-10-35.20W
4	48-51-38.36N	123-10-35.20W
5	48-51-38.36N	123-15-16.71W
6	48-48-28.16N	123-15-16.71W
7	48-48-28.16N	123-17-04.71W
8	48-44-28.00N	123-17-04.71W
9	48-44-28.00N	123-16-06.00W
10*	48-43-31.20N	123-16-06.00W

* = connecting position
These positions are in NAD83.

16. ENC CA570214 (CH3424)

1	48-27-35.34N	123-13-00.36W
2	48-25-07.89N	123-12-45.28W
3	48-23-32.34N	123-17-21.22W
4	48-23-32.34N	123-21-28.68W
5	48-27-35.34N	123-21-28.68W
6*	48-27-35.34N	123-13-00.36W

* = connecting position
These positions are in NAD83

17. ENC CA570567 (CH3479)

1	48-35-27.00N	123-25-18.00W
2	48-35-27.00N	123-16-06.00W
3	48-44-28.00N	123-16-06.00W
4	48-44-28.00N	123-27-43.00W
5	48-40-06.00N	123-27-43.00W
6	48-40-06.00N	123-26-05.60W
7	48-38-47.00N	123-24-38.00W
8	48-38-25.00N	123-25-18.00W
9*	48-35-27.00N	123-25-18.00W

* = connecting position
These positions are in NAD83.

ANNEX C — TEST PLAN AND RESULTS FOR INCLUSION OF FRENCH NOTES AND CHS DATA

In February 2011, the Office of Coast Survey (OCS) agreed to Option 5 of the six options provided to the United States – Canada Hydrographic Commission regarding the ENC transboundary project. This option states that the United States will utilize French language notes provided by the Canadian Hydrographic Service (CHS) for those areas of Canada where the United States has assumed responsibility for ENC production.

This test plan is to ensure that Option 5 is a viable solution in a production environment. It will also test the updating mechanism for when the United States receives new data from CHS. This test will exclude testing the data exchange mechanism outlined in the level of service arrangement.

Test Steps

A. OCS will load US4WA36M into ESRI ArcMap format

B. CHS will provide OCS with the following:

   a. Text file containing French Language notes (including Pan-Canadian names) for Canadian waters in the charted areas covered by CA3671 and CA3602

   b. Text file containing the equivalent notes in English

   c. .000 files containing the up-to-date charted information covered by CA3671 and CA3602 for inclusion into US4WA326M

C. OCS will replace data in Canadian waters with the data provided by CHS

D. OCS will place an M_NPUB file containing the French language notes over the area covered by Canadian waters

E. OCS will place an M_NPUB file containing United States notes over the area covered by US waters.

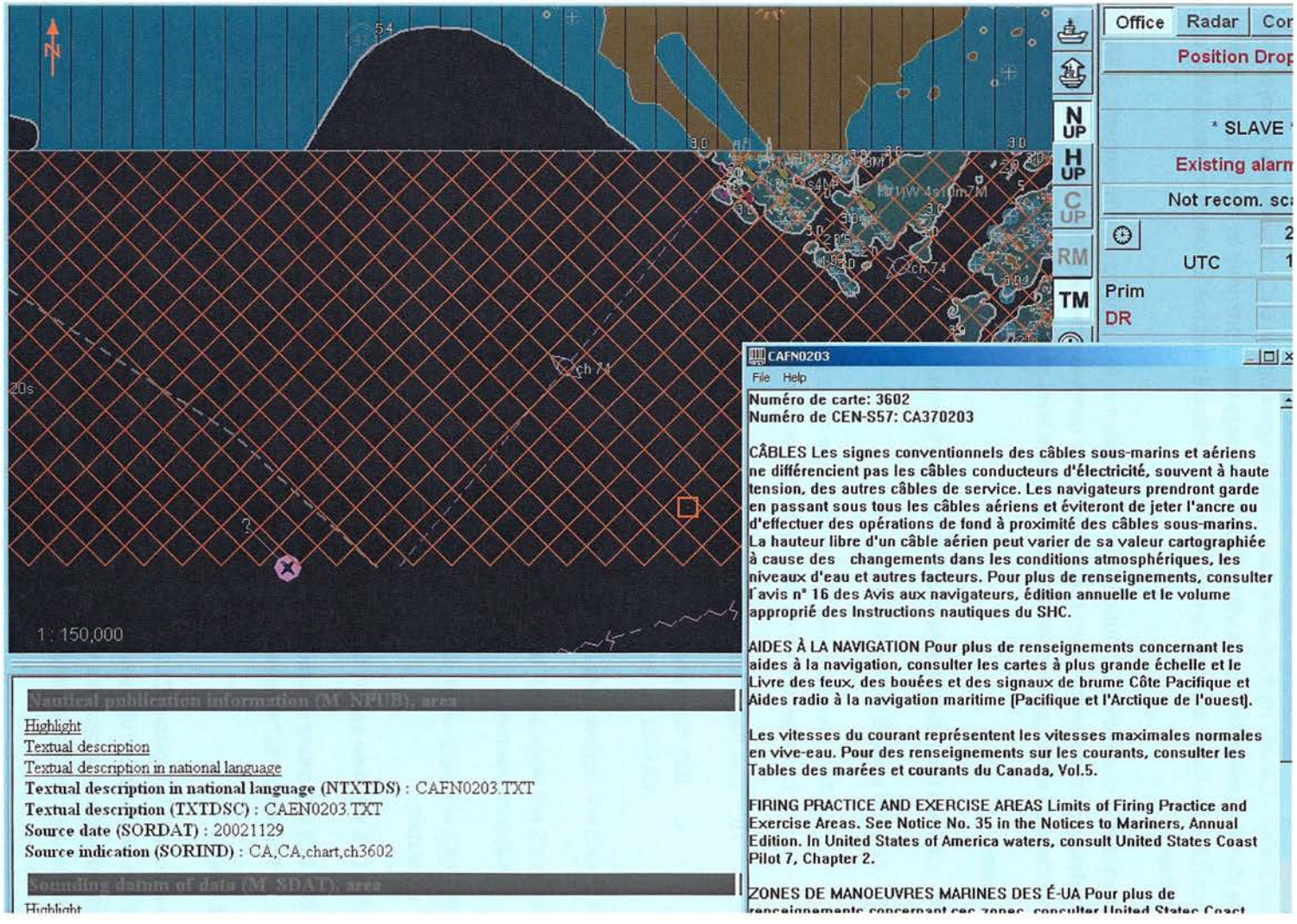
F. OCS will then export the resulting .000 file for review by both CHS and OCS.

G. OCS will create a catalogue file containing the resulting ENC and notes files and load into Transas for ECDIS verification.

Test Results

OCS successfully replaced Canadian data on the NOAA ENC with the data received in the .000 file. In addition, OCS successfully applied the French language notes to the NOAA ENC. The ENC was then exported and a catalogue file was created for load into the TRANSAS ECDIS for verification. The transboundary cell loaded with no issues.

Screen shot of data in the Transas ECDIS showing successful inclusion of French notes in the US ENC



ANNEX D — ENCODING GUIDELINE FOR TRANSBOUNDARY ENCS

This annex represents the encoding guidelines for specific issues in relation to the United States Canadian transboundary ENCs. It is expected that this document will be incorporated into ENC production guidance for each nation.

Description		Agency	Object	Attribute
Copyright note for NOAA produced ENCs containing Canadian areas		NOAA	M_NPUB Polygon of entire ENC	**TXTDSC (English) (external text file – use standard file naming convention for NOAA files e.g. US5WA20E.txt)**
French not required for NOAA files			M_NPUB Polygon of entire ENC	**NTXTDC (French) (external text file – use standard file naming convention for NOAA files)**
Standard copyright note		CHS	Readme.txt	**n/a**
Copyright note for CHS produced ENCs containing US areas		CHS	M_NPUB Polygon of entire ENC	**TXTDSC (external text file – use standard file naming convention for CHS files e.g. CAEN0123.TXT)**
		CHS	M_NPUB Polygon of entire ENC	**NTXTDC (external text file – use standard file naming convention for CHS files e.g. CAFN0123.TXT)**
Chart Datum **In the case of mixed US and Canadian ENCs sounding and vertical datum: Set for entire ENC**	Sounding datum = 12 (Mean lower low water)	NOAA	DSPM	**SDAT =12**
	Vertical datum = 16 (Mean high water)	NOAA	DSPM	**VDAT=16**
	Sounding datum = 27 (Lower Low Water Large Tides) • Create polygon in layer 401	CHS	DSPM	**SDAT=27**
	Vertical datum = 28 (Higher High Water Large Tides) • Create polygon in layer 401	CHS	DSPM	**VDAT=28**
Sounding Datum **Set for selected areas only:**	Use Meta object to cover entire Canadian territory.	NOAA	M_SDAT	**VERDAT=27**
	Use Meta object to cover entire US territory.	CHS	M_SDAT	**VERDAT=12**

<u>Vertical Datum</u> **Set for selected areas only:**	Use Meta object to cover entire Canadian territory.	NOAA	M_VDAT	**VERDAT=28**
	Use Meta object to cover entire US territory.	CHS	M_VDAT	**VERDAT=16**
ENCs that contain disputed areas **Boundary note 2: To be shown in the nautical publications note file.** **(for applicable ENCs only)**		CHS NOAA	M_NPUB Polygon of entire ENC	**TXTDSC** **(external text file – use standard file naming convention for each agency)**
		CHS	M_NPUB Polygon of entire ENC	**NTXTDS** **(external text file – use standard file naming convention for each agency)**
Standard and Cautionary notes: **For NOAA ENCs containing Canadian territory**	NOAA to include their standard and cautionary notes CHS to add French standard and cautionary notes as per equivalent CHS chart notes	CHS NOAA	M_NPUB	**TXTDSC** **NTXTDS**
Coding for official Pan-Canadian bilingual geographic names	**Objects in Canadian territory on US ENCs which require Pan-Canadian names should be coded in the appropriate name object for each feature** **Note Only Vancouver Island / Île de Vancouver is required for affected ENCs** **CHS to add to NOAA file**	**CHS**	**Feature object (e.g. LNDARE)**	**NOBJNM**

ANNEX E — OFFICIAL NOTES FOR THE ENC TRANSBOUNDARY PROJECT

Since Canada and the United States have different rules and regulations regarding copyright and intellectual property, USCHC determined that specific notes needed to be developed for ENCs that are in this region. In addition, since the cuts were determined in the interest of the mariner, rather than based on geo-political boundaries, the United States and Canada agreed on a common note that will inform the mariner that they may be traveling in a region that contains a disputed boundary.

Description		Agency
Copyright note for NOAA-produced ENCs containing Canadian areas	No copyright is claimed by the United States Government under Title 17 U.S.C. Therefore, no license is required from the U.S. Office of Coast Survey to reproduce or distribute U.S. data shown on this product. However, this product contains Canadian Hydrographic Service copyrighted works, and is published with the authorization of the Canadian Hydrographic Service. A license is required from the Canadian Hydrographic Service (www.charts.gc.ca) to reproduce or distribute Canadian copyrighted works incorporated into this product.	**NOAA**
	En vertu du *Title 17 U.S.C.*, aucune redevance de droit d'auteur n'est perçue par le gouvernement des États-Unis d'Amérique. Par conséquent, aucune permission n'est requise de l'*U.S. Office of Coast Survey* pour la reproduction et la distribution des données incorporées dans ce produit qui proviennent des États-Unis d'Amérique. Toutefois, le Service hydrographique du Canada possède des droits d'auteur sur certaines œuvres contenues dans ce produit, qui est publié avec l'autorisation du Service hydrographique du Canada. La reproduction et la distribution des oeuvres canadiennes incorporées dans ce produit sont sujettes à l'obtention d'une licence octroyée par le Service hydrographique du Canada (www.charts.gc.ca)	
Standard copyright note	©Fisheries and Oceans Canada 200X / Pêches et Océans Canada 200X. Published by the Canadian Hydrographic Service / Publié par le Service hydrographique du Canada. A licence is required from the Canadian Hydrographic Service (www.charts.gc.ca) to reproduce or distribute this work. La reproduction et la distribution de ce produit sont sujettes à l'obtention d'un permis octroyé par le Service hydrographique du Canada (www.charts.gc.ca).	**CHS**

Copyright note for CHS-produced ENCs containing US areas	©Fisheries and Oceans Canada 200X / Pêches et Océans Canada 200X. Published by the Canadian Hydrographic Service / Publié par le Service hydrographique du Canada. A licence is required from the Canadian Hydrographic Service (www.charts.gc.ca) to reproduce or distribute this work. In addition, this product contains U.S. Government works or data, and is published with the authorization of the Office of Coast Survey. No copyright is claimed by the United States Government under Title 17 U.S.C. with regard to their works or data contained in this product. Therefore, no license is required from the U.S. Office of Coast Survey to reproduce or distribute U.S. data shown on this product.	**CHS**
	©Pêches et Océans Canada 200X/Fisheries and Oceans Canada 200X. Publié par le Service hydrographique du Canada/Published by the Canadian Hydrographic Service. La reproduction et la distribution de ce produit sont sujettes à l'obtention d'un permis octroyé par le Service hydrographique du Canada (www.charts.gc.ca). De plus, ce produit a un contenu ou des données provenant du gouvernement des États-Unis d'Amérique et est publié avec l'autorisation de l'*U.S. Office of Coast Survey*. En vertu du *Title 17 U.S.C.*, le gouvernement des États-Unis d'Amérique ne perçoit aucun droit d'auteur sur le contenu ou les données de ce produit qui proviennent des États-Unis d'Amérique. Par conséquent, aucune permission n'est requise de l'*U.S. Office of Coast Survey* pour reproduire et distribuer les données contenues dans ce produit qui proviennent des États-Unis d'Amérique.	**CHS**
Actual Disputed Area Caution Note	"This area is disputed by United States and Canada." Cette zone est l'objet d'un désaccord entre les États-Unis et le Canada.	**CHS** **NOAA**
ENCs that contain disputed areas **Boundary note 2: To be shown in the nautical publications note file. (for applicable ENCs only)**	"Any international maritime boundary shown in the disputed area is without prejudice to the legal position of the United States or Canada" L'indication de toute frontière maritime internationale dans la zone contestée est sans préjudice à la position juridique des États-Unis ou du Canada.	**CHS** **NOAA**

ANNEX F — PACIFIC REGION COMMUNICATIONS FRAMEWORK

The Office of Coast Survey (OCS) and the Canadian Hydrographic Service (CHS) have harmonized the Pacific Electronic Navigational Charts (ENCs), in the transboundary waters between Canada and United States to comply with the worldwide ENC Database (WEND) principles of the International Hydrographic Organization. They are ready for release to the public.

ENC USERS

There is no "typical" ENC user who will be affected by the change. Since the users differ in their reliance on the ENCs, in their methods for acquiring ENCs, and in their sources of ENC information, OCS and CHS will coordinate distinct communication efforts targeted to specific users groups.

The user groups include:

- Recreational boaters
- Commercial mariners and pilots
- Shipping agents
- Commercial fishermen
- UNOLS research vessels
- ENC distributors, Canadian Digital Dealers and Value Added Resellers
- U.S. Coast Guard, Canadian Coast Guard
- U.S. and Canadian Navy
- End users of ENC and BSB registered with CHS
- BC pilots
- BC ferry pilots

MATERIAL PRODUCTION

The technical experts will provide draft copy of the technical explanations of what is changing, and what charts will be available from which country. They will additionally format the explanation to be suitable for use in the Notice to Mariners publications.

A communications team from Coast Survey and CHS will use that information to produce the following materials for the user groups:

1. Website announcements
2. Press releases geared to specific target audiences, as outlined below
3. Blog posts (U.S.)
4. Personalized letters and email notes
5. PowerPoint presentations (for face-to-face meetings and a webinar)
6. Fact sheets

COMMON INFORMATION SOURCES
Common government communication vehicles include:

- United States Coast Guard's Local Notice to Mariners
- Canadian Coast Guard's Local Notice to Mariners
- National Geospatial-Intelligence Agency's (NGA) Weekly Notice to Mariners. (NGA is the U.S. official distribution agency for deep draft chart corrections.)
- Canadian Notice to Mariners

The notices will be made public 90 days before the release of the ENCs. The notices will run every other week for the first month, then each week until the product release.

Websites:

The notice will be posted on the Office of Coast Survey homepage (nauticalcharts.noaa.gov) under "Latest News" and on the CHS website (chs-shc.gc.ca/pub/) under "Important Messages."

These notices will remain visible on the website for a minimum of 60 days before the release of the ENCs. Coast Survey's and CHC's intent is to publish information on our sites as soon as possible once the transboundary ENC plan is approved.

CHS is able to reach any Canadian ENC and BSB Registered Users via e-mails, and will provide 60-90 days notices

RECREATIONAL BOATERS
This group may be the most difficult to reach, since they may not belong to a trade association or professional group that can transmit the information. They may also be unfamiliar with the IMO/IHO efforts to harmonize charts, so will need additional explanations beyond what we provide to commercial, academic, or military entities.

Potential press release, with graphic, to:

- Northwest Yachting Magazine
- Boating Magazine
- BoatU.S. Magazine
- Sailing World
- Powerboat Magazine
- US Power Boat Squadron Magazine: The Ensign
- Canadian Power & Sail Squadrons
- Northwest Boating Network
- SailingScuttlebutt
- Pacific Northwest Yachting Association
- Northwest Marine Trade Association
- 48 deg North – Sailing Magazine

- Pacific Yachting Magazine
- Sea Magazine
- Nor'westing Magazine
- Boating Business
- Council of BC Yacht Clubs
- CMMA

U.S. blog post to:

- Northwest Boating Network
- SailingScuttlebutt

U.S. letter, and U.S. offer to make a presentation, to:

- Pacific Northwest Yachting Association

Boat shows, in preparation for the 2012 boating season:

- Seattle and Vancouver Boat Shows

COMMERCIAL MARINERS/PILOTS
Press release, with graphic, to the following potential list:

- American Shipper
- Boating Industry Canada
- MarineLink
- Marine Log
- Maritime Executive
- Pacific Maritime Magazine
- Seafarers' International Union of Canada
- World Maritime News
- Magazine Maritime
- Canadian Sailings
- Canadian Merchant Service Officers Guild
- Seaspan Coastal Intermodal
- British Columbia Ferry Services
- Black Ball ferry Line
- Washington State Department of Transportation
- Cruising Magazine
- Hydro International
- Western Mariner
- Sea Technology

- BC Shipping News Magazine
- BC Coast Pilots
- BC Harbour Authority Association
- Cruise BC
- CHA Lighthouse Magazine
- BC Marine Trades Association
- Company of Master Mariners of Canada
- Ocean Industries BC

U.S. blog post to:

- gCaptain

Personal meetings (U.S.):

Meet with stakeholders at Harbor Safety Meetings in Portland, Seattle, Alaska, and British Columbia. OCS navigation managers can organize meetings in U.S. ports.

COMMERCIAL FISHERMEN (U.S)
Press release, with graphic, to:

- Pacific Fishing
- Commercial Fishing
- Pacific Coast Federation of Fishermen's Associations
- Commercial Fishing Links – Associations in NA

Blog post to:

- Commercial Fishing

Letter, and offer to make a presentation, to:

- Pacific Coast Federation of Fishermen's Associations

Fact sheet:

Coast Survey will request that NOAA's National Marine Fisheries Service distribute fact sheet to their mailing list of fishermen.

UNOLS RESEARCH VESSELS (U.S.)
Send announcement to:

- UNOLS

Email explanation, with graphics, to:

- UNOLS Research Vessel Operators Committee members
- University of Alaska, Seward Marine Center
- Oregon State University, College of Oceanic and Atmospheric Sciences
- University of Washington, School of Oceanography

U.S. DISTRIBUTORS, CANADIAN DIGITAL DEALERS AND VALUE ADDED RESELLERS
These important groups include Certified NOAA ENC Distributors, Certified NOAA ENC Value Added Distributors, CHS Digital Dealers, CHS Super Dealers, and CHS Value Added Resellers.

OCS and CHS will provide these groups of users, who will be directly interacting with ENC consumers, a high level of attention. A letter of explanation, with graphics, could potentially be accompanied by an invitation to a webinar where OCS and CHS experts will be available to answer questions.

At the webinar, in addition to explaining the changes and answering questions, OCS and CHS should offer to provide the distributors with additional materials or information for their communications with customers.

- UKHO - Lindley Robert [Robert.Lindley@UKHO.gov.uk]
- C-MAP/Jeppesen – enc [enc@jeppesen.com
- Primar – Lynn Kolbeinson [Lynn.Kolbeinson@statkart.no]
- NEW – Chartworld - Juergen Kuternoga [jak@chartworld.com]
- Canadian BC pilots
- Canadian BC ferries

U.S. COAST GUARD/ CANADIAN COAST GUARD
In addition to notification through the Notice to Mariners process, we should reach out to auxiliary members of the USCG.

Blog post or letter to:

- USCG Auxiliary Pacific Northwest
- Canadian Auxiliary Coast Guard

U.S. AND CANADIAN NAVY

PUBLIC WORKS CANADA

INDUSTRY CANADA:

- http://www.ic.gu.ca/eic/site/sim-cnmi.nsf/eng/uv00033.html

US and CANADA BORDER SERVICES

- http://www.cbp.gov/
- http://www.cbsa-asfc.gc.ca/menu-eng.html

THIRD PARTY DEVELOPERS AND SOFTWARE SUPPLIERS

- IIC
- Caris
- ESRI
- EIS

OTHER

OCS and CHS may add additional stakeholders. They will use the most cost effective approach to reach a maximum number of stakeholders.

Captain John E. Lowell, JR.
Director and U.S. National Hydrographer
Office of Coast Survey
National Ocean Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

date of signature: 4/25/11

Dr. Savithri Narayanan
Dominion Hydrographer
Canadian Hydrographic Service
Ocean and Science Sector
Department of Fisheries and Oceans

date of signature: 25 Apr 2011