

Fisheries and Oceans Canada / Pêches et Océans Canada



Transformation numérique au SHC
Digital Transformation at CHS

*Paper charts automatically derived from ENCs...
Where does Canada stand with this initiative?*

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Hello everyone, my name is Julie Larrivée and I'm Manager of Products and Services for the Canadian Hydrographic Service.

I'd like to give you an update on the progress of PC2.0 project, as we call it in Canada. Essentially, this project automatically derives paper charts from ENCs.

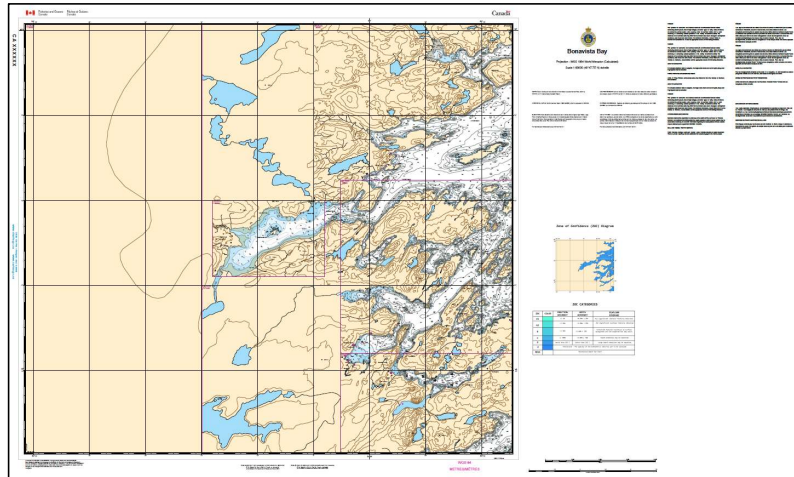
So, I'd like to explain where we stand and some challenges we face.



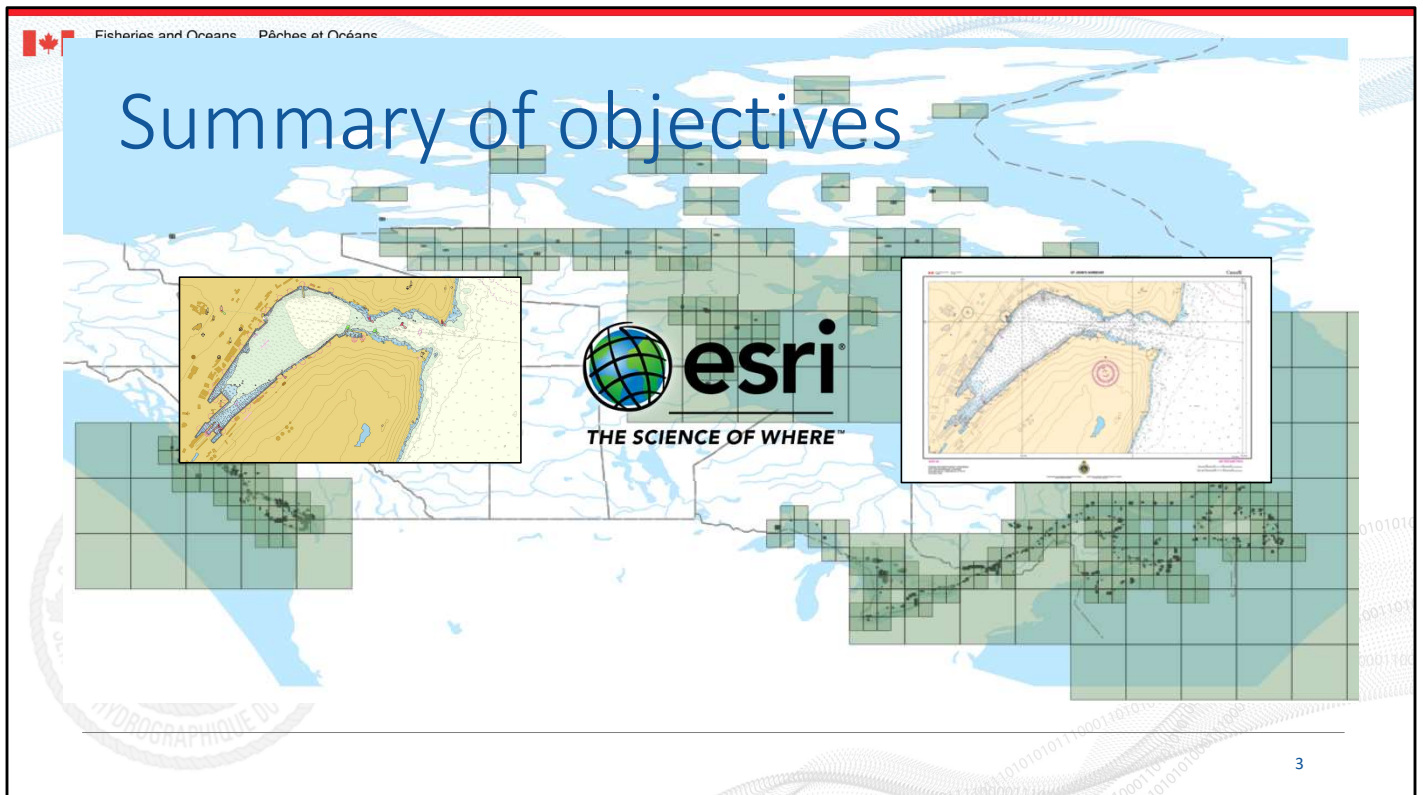
Paper Chart: the next generation...



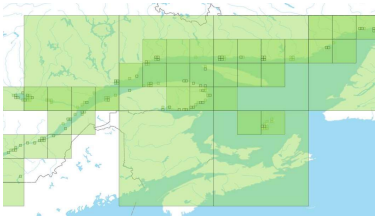
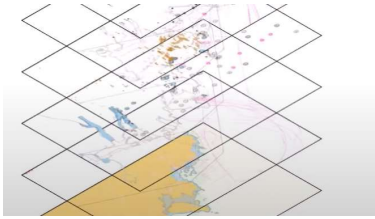
PC 2.0



- Paper Chart 2.0 is a CHS transformation project that aims to create the next generation and will replace the traditional paper chart.
- This will enable CHS to rationalize its vast catalog of PC production in order to reallocate resources to the production and updating of ENCs and other national priorities and international initiatives as we are moving to the S-100 Standards.



- Paper Chart 2.0 develops the new generation of CHS paper charts, automatically generated from ENCs.
- It is using ESRI's marine chart services, hosted on the Canadian government's eGIS platform. Templates have been created and CHS-specific chart features (such as: color, logo, marginalia, etc.) have been implemented. PC2.0 samples are generated for each new version of the ENC and/or at the request of production managers.



**internationales (INT)
et
specifications de l'OHI
pour les cartes marines**




Edition 4.9.0 – mars 2021
(Date de publication: octobre 2021)

Meeting international standards...

4

- As CHS will use its portfolio of ENC's to automatically generate paper charts; standards and international regulations must be respected.
- CHS recognizes that official paper charts should, wherever possible, conform to the IHO S4 standard.
- To this end, CHS relay to an INDEPENDENT study from IIC Technologies to analyze chart samples and highlight where paper chart 2.0 does not meet the S4 standard, and to identify gaps and recommend strategies to ensure overall harmonization between paper chart 2.0 and the S4 standard.
- The CHS project team is currently studying the results of this study and working with ESRI to address them.

Analysis of results...

MAJOR	
Foul ground not S-4 representation	
Submerged dangers not labelled	
Unrecognized features	
Source info/diagram missing	

 **IIC TECHNOLOGIES**
Automated Paper Chart Output Review
Against IHO S-4


 Major
items




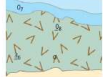


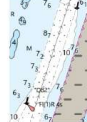
5

- IIC identified and categorized items into major, medium and minor significance.
- The findings were consistent throughout all six charts chosen for the study.
- The few major items identified do not deem the chart deficient or unusable but are factors which should be addressed in the short term.
- The items found to be categorized medium and minor can generally be cleared or adjusted by editing mapping rules.



Medium items



MEDIUM	
Symbols not mapped (ie. ?)	
Linear scales not INT2	
Bridge clearance and symbolization not matching S-4	
Rocky foreshore not S-4	
Numerous features overlapping	
Power lines missing vertical safe clearance symbol and transmission type	
Dredged areas not labelled and incorrectly represented	

Here are the medium items... for example,

1. Some Symbols are not charted (that means not recognized by the application)
2. Scalebars are not INT2
3. The symbolization of vertical clearances does not match.
4. The rocky areas don't match.
5. Cluttering (due to the scale at which the elements were compiled, are not adapted).
6. The overhead cable clearance symbols and the overhead cable transmission type are missing.
7. Dredge areas or maintained by dredging have no labels and are incorrectly represented.



Minor items

MINOR	
Scale not including space and latitude not properly formatted	Projection Information WGS 1984 World Mercator (Calculated) SCALE 1:40000 at Lat. 46°34' 01" GCS WGS 1984
Line weights the same between features	
Upright vs italic text for land and water features	
Tanks, fortified structure and domes not matching S-4	
Small tank symbols not represented with hatched fill	
Soundings not sloped with unique font	
Mixed BCs represented with a comma rather than period	
Text for lights on buoys includes all information	
Anchorage and cable areas not S-4	

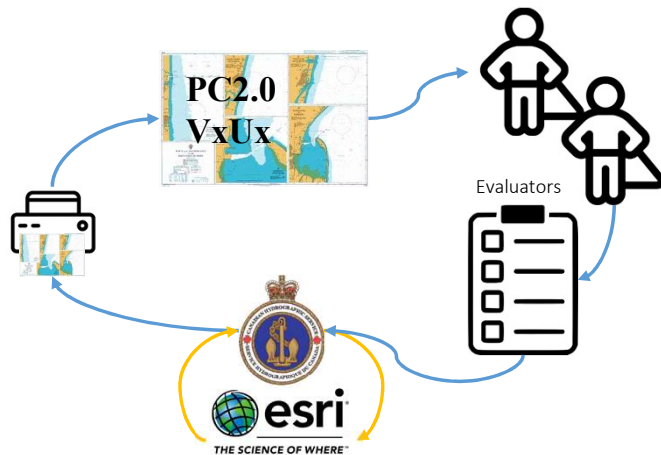
The minor items are here also...

In conclusion,

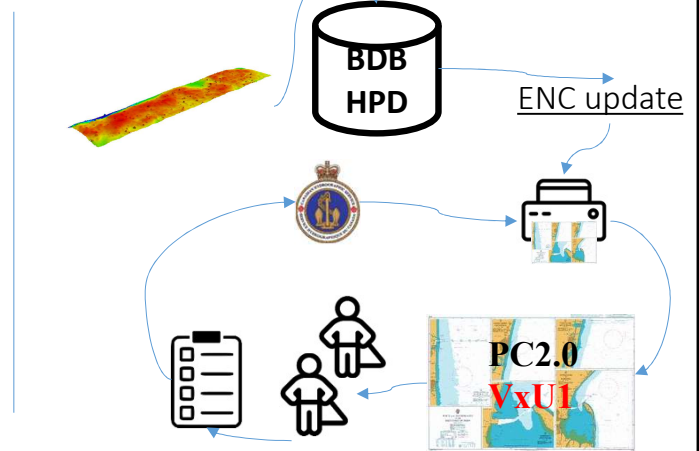
Overall, the resulting Paper Chart 2.0 product requires some minor modifications in the short term, and further improvements in the longer term. Our team is currently evaluating it.

Approach: Iteration loop for PC2.0 evaluation

Step 1: Acceptance of PC2.0



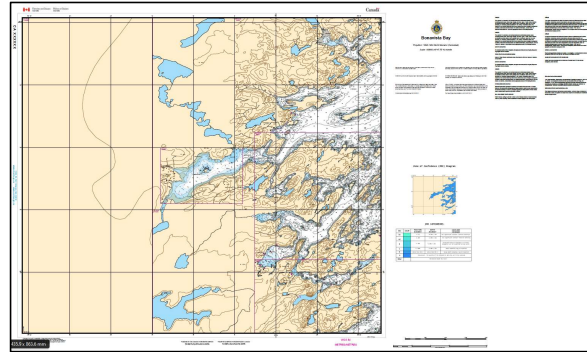
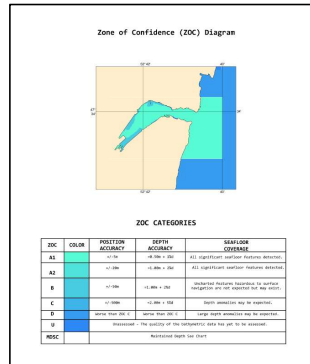
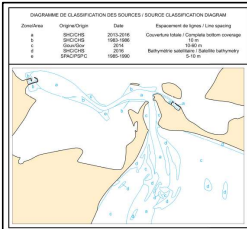
Step 2: Update PC2.0



8

- We are working with our communications consultant to produce a guidance document for PC2.0 evaluators (internal and external) to gather structured feedback that will continue to guide the development of the new product. As we speak, we don't yet have this feedback loop in place. We're working on it.

Where are we now?



Transformation numérique au SHC
Digital Transformation at CHS



Where are we now with the project?

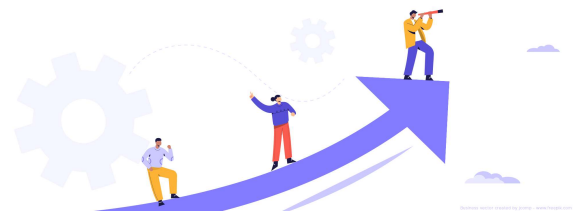
- We've implemented the use of CATZOC diagrams (which will replace traditional source classification diagrams) and we've implemented a unified notes database as well as other improvements to Marginalia such as annexing notes on the same page instead of separate pages.
- In the light of the analysis and the study, we continue to address the modifications to be made with ESRI to obtain a more satisfactory result. We are continuing our exchanges to identify the modifications we can make "in house" versus the modifications we need to ask ESRI to make in order to apply them to the ESRI application as well.
- Paper chart 2.0 must progress faster than other aspects of CHS transformation. A comprehensive communications plan is needed to inform mariners of this change, and to reassure the public and staff that the PC2.0 chart will be a safe method of navigation, and that it will continue to meet mariners' needs.

What's next?

- Improve charts templates
- Support NCWG's unified symbology initiative
- Transitory use of the traditional NTM method
- Develop graphical NTM —————> Subscription service
- Support international NTM standard developments

9/25/2023

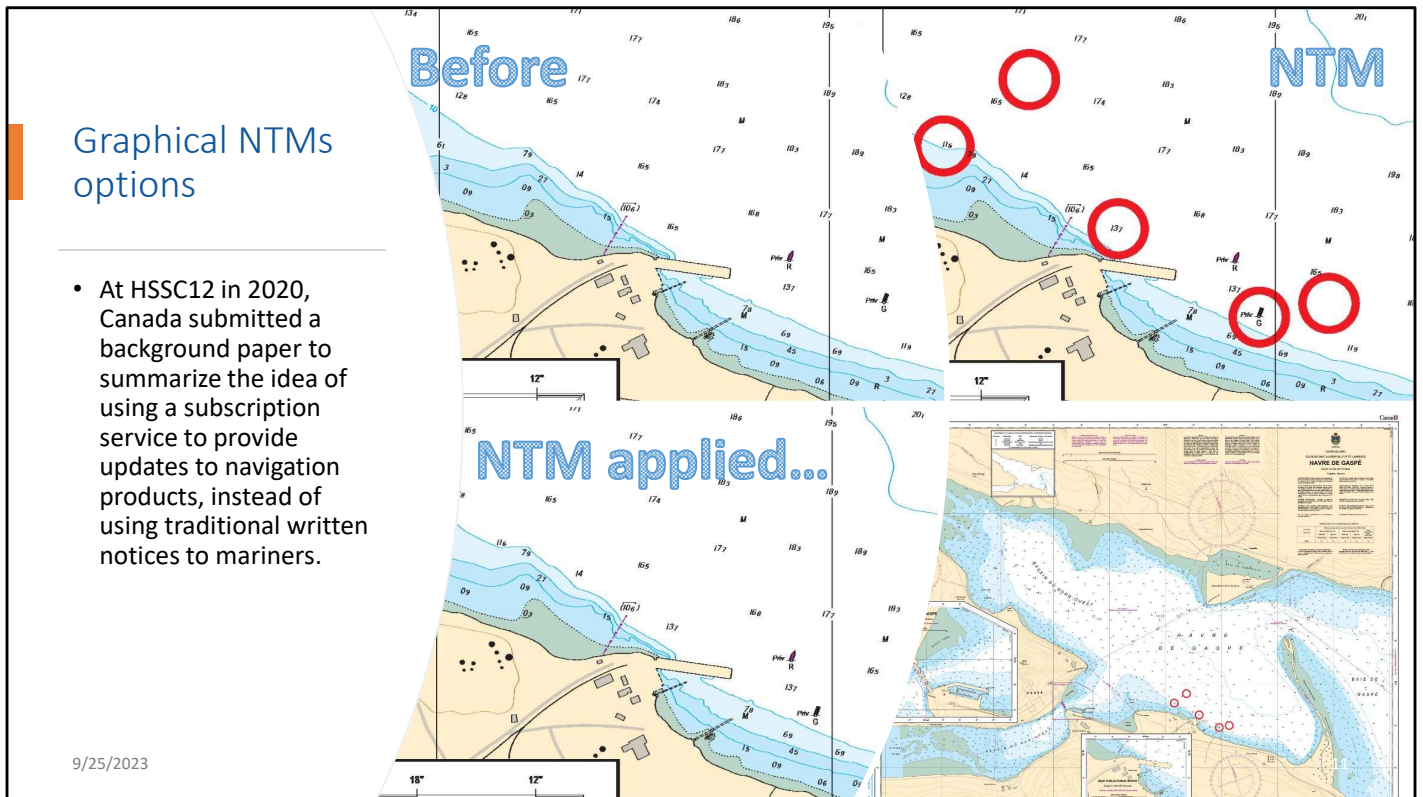
10



- The next steps for us will be to improve the chart templates and marginalia to ensure that mariners get used to them, and to gather their feedback.
- Continue to support the unified symbology initiative of the NCWG.
- To move forward, we'll probably have to use the traditional NTM method on a transitory basis, applying it to PC2.0. This option is obviously not desired, as we want to move away from it.
- Afterward, we will have to develop graphical NTMs as an additional option... And....Finally, until our subscription service is deployed.

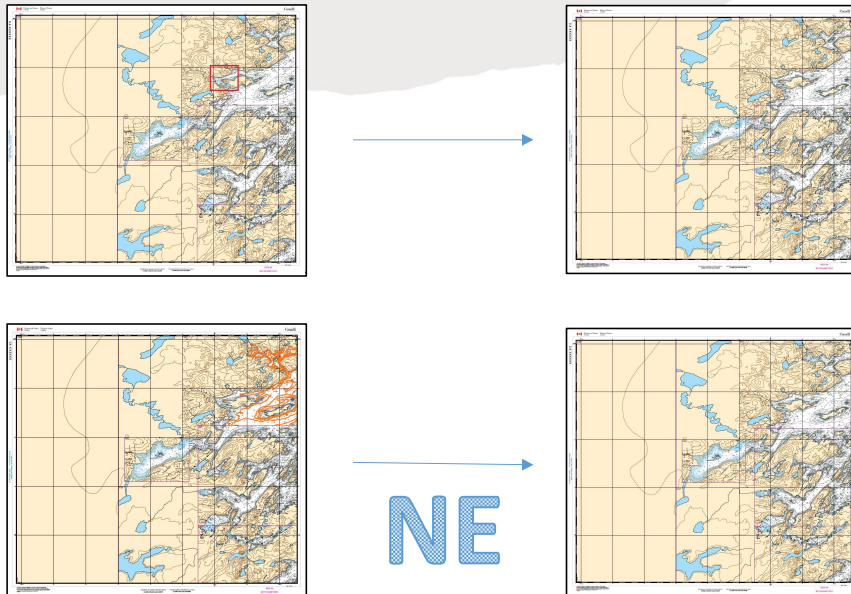
Graphical NTMs options

- At HSSC12 in 2020, Canada submitted a background paper to summarize the idea of using a subscription service to provide updates to navigation products, instead of using traditional written notices to mariners.



- At HSSC12 in 2020, Canada submitted an information paper to summarize the idea of using a subscription service to provide updates to navigation products, instead of using traditional written notices to mariners.
- That was an option proposed. We are still looking at other options and how we can meanwhile move forward.

Graphical NTMs options



9/27/2023

12

Graphical NTMs is an option:

- A marked copy with a box highlighting the area of the changes, would be provide
- A second copy would be supplied at the same time, including and applying the changes
- This option could be used when the changes are too important or complicated to publish as a written NTM or because this is not punctual features only that have change. (which is mostly the cases for us as we are applying continuous maintenance of our sources to ENC's).
- A certain number of changes or a maximum area involved could be considered, and use that method, otherwise a periodic new edition would simply be more appropriate.

OR as we are applying continuous maintenance:

- We do not go into traditional NTMs at all and we provide New Editions Periodically. This option will need to adapt our business plan to mitigate the effects on the mariners.



Ideally, Canada doesn't want to do this alone. We need this concept to be accepted both nationally and internationally. Canada supports the continued development of standards for this initiative and for acceptance to be achieved as soon as possible. Canada supports also all kind of Project teams, Sub-Groups, workshops that will be initiated about this topic internationally. Canada also understands and respects our international obligation to strive to conform to the IHO's S4 guidelines and we are confident that it is the case.

PC2.0 is a real success so far for Canada.

We are very close to release our fist paper charts with that technology which is

-very efficient,

-less time consuming for our cartographer,

-aim us to be more synchronized with our sources dataflow and will aim the objective to synchronize our S-101 and S-102.

-enable us to focus all our cartographer knowledge to the next generation of S-101 ENC's and focus on the compilation and effective updating of our ENC's.

-finally aim us to be safer with all of those reasons...

Thank you very much for your attention and I've brought with me some samples that I can show you after the meeting.