

```
          00 000000
0000110101000100
01110111011001100000
010011111100100 111010100000 0
001 00111110101010110001001000 0 000
00010100001000001010011011010 0000 0010
00111011010 1010101001001010 0110100010 0
00 01000 010010 0100 1010110 111000 0101000
00 00110000101100 011 01011 11000 0001100 000
0000110 001011100 1 1011111100 000110 000000
0001 1 00001110001 11011 101000011 000 010 0
0001 0000111 10 1111 1101100 00010 100100 0
00 000011000100 001 10 1110 00 010 10 00 0000
011 00110 1 010 11 11010101000 0010
01100 11 11110 11010 10 10100
0000000 100 1111 1110 000110 001 00
000 10000000111 1101011000
01110010 110
11110
11010
1101
1000
11010
01101110110
011100000111001101110000100 00
```

COASTPILOT

DATASTRUCTURE

Thinking Differently

briana Sullivan - UNH
7/2/15

Hello, I am Briana Sullivan from the University of New Hampshire. I work for the Center for Coastal and Ocean Mapping/Joint Hydrographic Center in the Data Visualization Lab. As Tom Loeper mentioned at the end of his presentation,

I'd like to discuss the Coast Pilot data structure as it is today and some insights on where I think it should be and some ideas on how to make it happen.

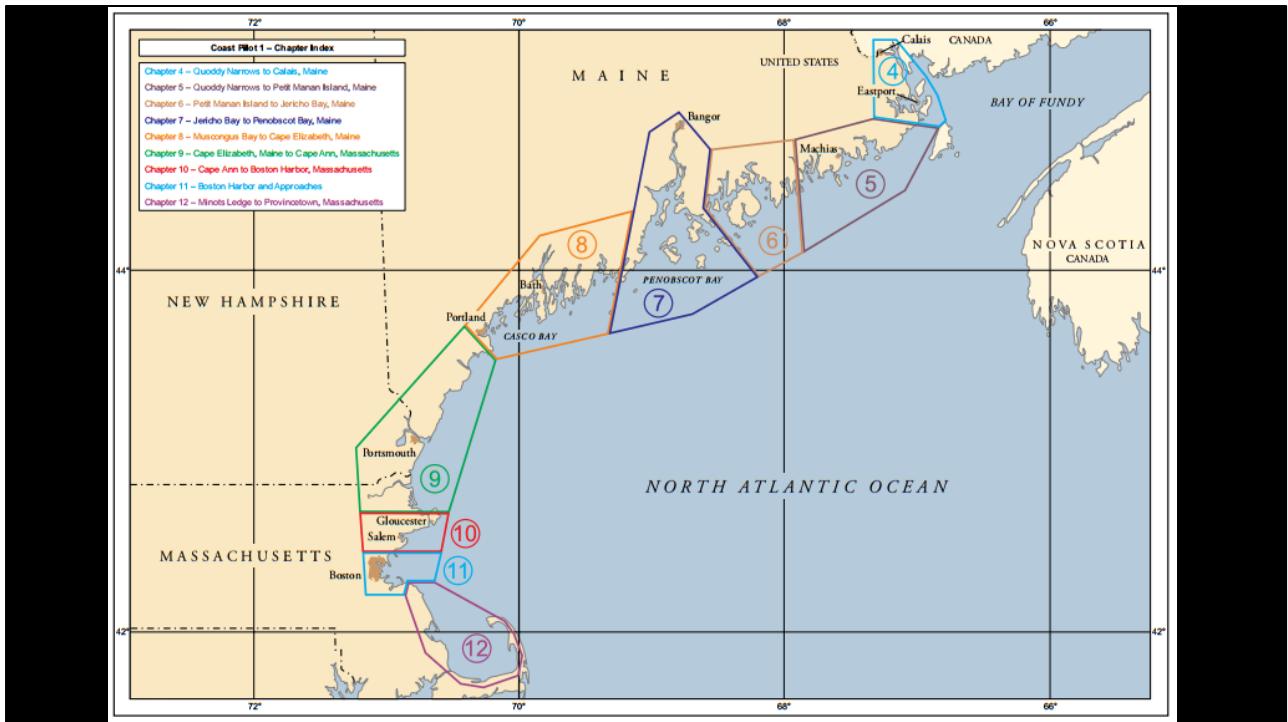
Currently:

**based on the
publication**

let me first explain, visually, how the data structure is based on the publication...



The Coast Pilot is set up via Books. Books subdivide the working area into maintainable sections. So, to get local information you need to know the Book as the root element



The chapters unique to each book, subdivide the area represented by the book into manageable parts. NOTE: each chapter contains one or more nautical chart within it's limits (and due to this some information repeats where charts/chapters/books share a border/overlap)

a variety of information important to navigators of coastal and Intracoastal waters and the Great Lakes. Issued in nine volumes, they contain supplemental information that is difficult to portray on a nautical chart.

Logos and Trademarks

Problems viewing the files? Download the latest [Adobe Reader](#).

Note: Do not bookmark downloads from this page. Download links change every week. To download the latest Coast Pilot information, please bookmark this page instead.

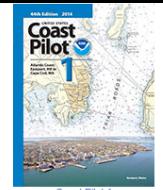
Please Note: There is a known issue when using the Chrome browser to download a PDF. To avoid this, download a volume of the Coast Pilot by right clicking on the link and selecting *Save link as*. Additionally, try using a different browser.

Coast Pilot 1 - 45th Edition, 2015
covers the coasts of Maine, New Hampshire, and part of Massachusetts, from Eastport, ME to Provincetown, MA.

This publication has been updated through: 05-APRIL-2015

[Coast Pilot 1 complete \[pdf\]](#)

[Coast Pilot 1 \(complete .pdf\) \[zip\]](#)



Coast Pilot 1

Chapter	Description	Alternate Downloads (Beta)*
Front	Title page, Preface and Table of Contents	[XML] [HTML]
Chapter 1	General Information	[XML] [HTML]
Chapter 2	Navigation Regulations	[XML] [HTML]
Chapter 3	Eastport to Cape Cod	[XML] [HTML]
Chapter 4	Quoddy Narrows to Calais, Maine	[XML] [HTML]
Chapter 5	Quoddy Narrows to Petit Manan Island, Maine	[XML] [HTML]
Chapter 6	Petit Manan Island to Jericho Bay, Maine	[XML] [HTML]
Chapter 7	Jericho Bay to Penobscot Bay, Maine	[XML] [HTML]
Chapter 8	Muscongus Bay to Cape Elizabeth, Maine	[XML] [HTML]
Chapter 9	Cape Elizabeth, Maine to Cape Ann, Massachusetts	[XML] [HTML]
Chapter 10	Cape Ann to Boston Harbor, Massachusetts	[XML] [HTML]
Chapter 11	Boston Harbor and Approaches	[XML] [HTML]
Chapter 12	Minots Ledge to Provincetown, Massachusetts	[XML] [HTML]
Appendix A	Appendix A	[XML] [HTML]
Appendix B	Appendix B	[XML] [HTML]
Weekly Record of Updates	Weekly Record of Updates	[XML] [HTML]
Index	Index	[XML] [HTML]

*Not for Navigation

Within each book are various chapters, some with data common to the entire book, most chapters are for specific areas delineated by a specific boundary.

Clearly there are some chapters that don't follow the same type of formatting...these will be researched and dealt with at a later time.

Notice this disclaimer on the left that this is "...information that is difficult to display on a nautical chart." ...I'll talk about this a bit later.

Quoddy Narrows to Calais, Maine

(1) This chapter describes the Maine and New Brunswick coasts from Quoddy Narrows through Lubec Channel, Friar Roads, Western Passage, and the St. Croix River to the head of navigation at Calais. Included in the text are discussions of the Maine ports of Lubec, Eastport, and Calais; the Canadian ports of St. Stephen and St. Andrews; several small harbors on Campobello Island; and Head Harbour Passage.

(2) COLREGS Demarcation Lines

(3) The lines established for this part of the coast are described in **80.105** chapter 2.

(4) Charts 13394, 13396, 13398

(5) The approaches to St. Croix River include Quoddy Narrows, Lubec Channel, Friar Roads, Head Harbour Passage, Western Passage, and Passamaquoddy Bay. The principal entrance is around the northern end of Campobello Island through Head Harbour Passage. This passage is deep and generally clear of dangers. The channel through Lubec Narrows is also used, especially at high water. The tidal currents are strong in both passages.

(6) **West Quoddy Head**, the easternmost point of the United States, is bold and wooded. **West Quoddy Head Light** ($44^{\circ}48'54"N$, $66^{\circ}57'02"W$), 83 feet above the water, is shown from a 49-foot red and white horizontally banded tower on the eastern edge of the headland. A sound signal is at the light. The abandoned Coast Guard lookout tower near the summit of the ridge westward of the light is the most conspicuous landmark in the approach to Quoddy Narrows from seaward.

(7) Between West Quoddy Head and Calais, fluorescent red pyramidal markers define straight line segments and turning points of the United States-Canada boundary.

(8) **Quoddy Narrows (Quoddy Roads)** between West Quoddy Head and Canada's Campobello Island, is the usual anchorage for vessels seeking shelter or waiting for a favorable tide to pass through Lubec Narrows. The entrance, between West Quoddy Head and The Boring Stone, is about 0.8 mile wide and has a depth of 28 feet near the middle. Winds from east to south generate rough seas in the entrance.

(9) The anchorage affords shelter from northerly and westerly winds in depths of 12 to 25 feet, but is open to winds from the east and south, and protection from northeast gales is reported poor. The northern and western parts of Quoddy Narrows between West Quoddy Head and Lubec are full of shoals which partly uncover.



U.S. Coast Pilot®

Color Legend

- Chart
- Geotag
- Code of Federal Regulations
- Updated Paragraph

Chapter Elements

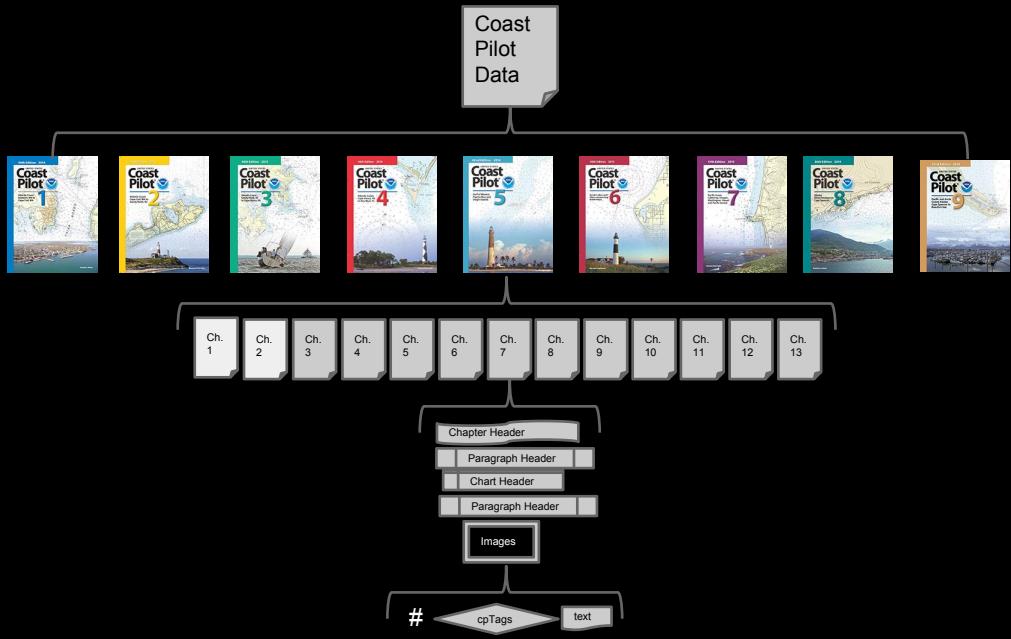
1. **Chapter Header**
2. **Chart Header**
3. **Paragraph Header**
4. **Paragraph -> CP_Tags**
5. **Images**

Within each chapter are “elements”. Each element is represented as a paragraph within the chapter and is numbered. But the elements have types associated with them such as:

1. Chapter Header (Orange)
2. Chart Header (Yellow)
3. Paragraph Header (Aqua)
4. Paragraph -> CP_Tags (Blue)
5. Image (Pink)

These items are typically described in geographic order. On the East Coast of the US, for example, it is from North to South.

So far, the data structure is something like this:



This is a hierachal data structurejust like a tree, where the whole CP is the tree, each book is a branch, each chapter are leaves on the branch, etc.

example of xml for this section

```
<!-- symbol definitions -->
<Book Number="1" BookID="327" Edition="45" ChapterNo="4" Title="Coast Pilot 1" Year="2015" Type="Chapter">
  <Chapters>
    <Chap>
      <Image_detail IS_NW="0" ImageTag="ch4" DisplayFile="images/CPChapter4.eps" ImgLocation="FullPage" href="file:///images/blank.jpg" Para_No="0" ID="258862" OriginalFile="6c25df20-b515-40b5-03a1-8ba411cb518.jpg"/>
      <chapterTitle>Quoddy Narrows to Calais, Maine</chapterTitle>
      <paraText>
        <Spacer></Spacer>
        This chapter describes the Maine and New Brunswick coasts from Quoddy Narrows through Lubec Channel, Friar Roads, Western Passage, and the St. Croix River to the head of navigation at Calais. Included in the text are discussions of the Maine ports of Lubec, Eastport, and Calais; the Canadian ports of St. Stephen and St. Andrews; several small harbors on Campobello Island; and Head Harbour Passage.
      </paraText>
      <paraText>
        <Spacer></Spacer>
        The lines established for this part of the coast are described in
        <CP INDEX ID="105,</CP>
        chapter 2.
      </paraText>
      <paraText>
        <Spacer></Spacer>
        Charts 13394, 13396, 13398
      </paraText>
      <paraText>
        <Spacer></Spacer>
        The approaches to St. Croix River include Quoddy Narrows, Lubec Channel, Friar Roads, Head Harbour Passage, Western Passage, and Passamaquoddy Bay. The principal entrance is around the northern end of Campobello Island through Head Harbour Passage. This passage is deep and generally clear of dangers. The channel through Lubec Narrows is also used, especially at high water. The tidal currents are strong in both passages.
      </paraText>
      <paraText>
        <Spacer></Spacer>
        <CP_GEO_LOC Lat_Dec="-44.8131" Long_Dec="-66.9628" Elev_In_M="45" Source="GNIS" Source_ID="578209" Source_Date="9/30/1980" Feature_Name="West Quoddy Head" Feature_Class="Cape" State_Alpha="ME" State_Numeric="23" County_Name="29" County_Numeric="Washington" Map_Name="Lubec">
          <CP_INDEX TEXT="West Quoddy Head 13394, 13396">
            West
            <CP_B>Quoddy Head</CP_B>
          </CP_INDEX>
        </CP_GEO_LOC>
      </paraText>
    </Chap>
  </Chapters>
</Book>
```

should separate formatting from data

Notice all the *attributes* for the Book, image_detail, and CP_GEO_LOC tags

This is what the “tree” looks like when represented with XML. You can see the tags are exactly as you’d expect the layout of the book!

It's probably better not to think of Google Maps as a thing like a paper map. Geographic information systems represent a jump from paper maps like the abacus to the computer. "I honestly think we're seeing a more profound change, for map-making, than the switch from manuscript to print in the Renaissance," University of London cartographic historian Jerry Brotton told the [Sydney Morning Herald](#). "That was huge. But this is bigger."

thinking differently

"There are a couple of steps (to make a Google Map). You acquire data through partners. **You do a bunch of engineering on that data** to get it **into the right format** and conflate it with other sources of data, and then you do a bunch of operations, to hand massage the data. And out the other end pops something **that is higher quality than the sum of its parts.**" - former NASA engineer Michael Weiss-Malik

With the S-100 standard in the works, technology use common place, and a need for more useable and accessible data it's "time to think differently".

I found this quote talking about Google Maps that I feel can also be said about nautical charts/publications...(read quote at top of slide).

A former NASA engineer working at Google lays out the steps to the success of Google Maps...(read quote at bottom of slide)

Isn't that the holy grail? Getting something out of this that is "higher quality than the sum of its parts"?

source: <http://www.theatlantic.com/technology/archive/2012/09/how-google-builds-its-maps-and-what-it-means-for-the-future-of-everything/261913/>

Ideally:

based on the
data

We can accomplish this if we can move from a publication-centric data format to a data-centric one. What do I mean by this?

“(Coast Pilots) contain supplemental information that is difficult to portray on a nautical chart.”

rewrite:

Coast Pilots describe the features found along the coast and how to get to/access/use/avoid them.

It brings me back to that disclaimer I mentioned earlier...(read slide).

We have seen from Tom's presentation that NOAA's Office of Coast Survey (OCS) is starting the process of thinking differently

From the OCS website...

The Coast Pilot project needs increased data management capability to
share its information with other sources and
offer a **customizable product**.

This degree of customization requires **more control** than a traditional
Desktop Publisher (DTP) can provide...the Extensible Markup Language (XML)
and associated tools have that capability.

...I recently found this on their web page...(read slide)

But remember...just tagging something with XML doesn't mean it will allow the kind of control mentioned here. Thought and foresight needs to come into play to make sure the mark-up is being used to maximize data use.

source: <http://www.nauticalcharts.noaa.gov/nsd/RD-cpdb.html>

Metadata relating to book details

Coast Pilot 1 - Chapter 4 - Edition 45, 2015

Quoddy Narrows to Calais, Maine

(1) This chapter describes the Maine and New Brunswick coasts from Quoddy Narrows through Lubec Channel, Friar Roads, Western Passage, and the St. Croix River to the head of navigation at Calais. Included in the text are discussions of the Maine ports of Lubec, Eastport, and Calais; the Canadian ports of St. Stephen and St. Andrews; several small harbors on Campobello Island; and Head Harbour Passage.

(2) COLREGS Demarcation Lines

(3) The lines established for this part of the coast are described in **80.105** chapter 2.

4) Charts 13394, 13396, 13398

(5) The approaches to St. Croix River include Quoddy Narrows, Lubec Channel, Friar Roads, Head Harbour Passage, Western Passage, and Passamaquoddy Bay. The principal entrance is around the northern end of Campobello Island through Head Harbour Passage. This passage is deep and generally clear of dangers. The channel through Lubec Narrows is also used, especially at high water. The tidal currents are strong in both passages.



(104) **St. Croix River** extends north-northwestward for 8 miles from the southern part of Passamaquoddy Bay, then turns westward between **Devils Head** and **Todds Point**. The channel is deep and comparatively clear as far as the turn, then is narrow and winding, and has a controlling depth of about 16 feet for some 3 miles to Hills Point ($45^{\circ}09'53''N$, $67^{\circ}01'33''W$).

(105) A dredged channel leads from above Hills Point to Calais. In 1977, the midchannel controlling depth was 7 feet to Todd Point, about 4.2 miles above the mouth, thence 5 feet to Calais and St. Stephen on the Canadian side of the border, except for shoaling to 3 feet about 90 feet below the International Bridge at Calais. The channel is marked by lights and buoys, but is not maintained. The two buoys on the north side of the channel at **The Narrows** opposite **Whitlocks Mill Light** 25 tow under during the strength of the tide. Local knowledge is necessary for the river above Whitlocks Mill.

(106) Small craft up to 40 feet in length can anchor in 14 feet on the west side of the channel just above Whitlocks Mill Light, but larger craft should anchor off Devils Head.

(107) The scattered remains of an old breakwater, which uncover 12 feet in spots, extend southeastward across the mudflats on the south side of St. Croix River for about 300 yards from near channel Buoy 19. The mudflats, which uncover 11 feet, are opposite **The Ledge** a village on the north side of the river about 9.7 miles above the mouth; caution is advised in this area.

108) Ice

(109) St. Croix River above Robbinston is reported to be closed by ice for about one or two weeks in February. The channel to the oil wharf in Calais is usually kept open by the tug and barge bound there. Quoddy Narrows and

```
<feature name="St. Croix River">
  <extents>
    <direction>north-northwestward</direction>
    <dist unit="miles">8</dist>
    <from>the southern part of <place>Passamaquoddy Bay</place></from>
    <to>then turns westward between <place>Devils Head</place> and <place>Todds Point</place></to>
  </extents>
  <characteristics>
    <characteristic>narrow</characteristic>
    <characteristic>windy</characteristic>
  </characteristics>
  <channelDepth>deep</channelDepth>
  <controllingDepth units="feet">16</controllingDepth>
  <controllingLength units="miles">3</controllingLength>
  <approaches>
    <approach>Quoddy Narrows</approach>
    <approach entrance="secondary">Lubec Narrows</approach>
    <approach entrance="principal">Friar Roads</approach>
    <approach entrance="principal">Head Harbour Passage</approach>
    <approach>Western Passage</approach>
    <approach>Passamaquoddy Bay</approach>
  </approaches>
  <ice>
    <closurePlace>Robbinston</closurePlace>
    <closureDuration>one or two weeks</closureDuration>
    <closureMonth>February</closureMonth>
  </ice>
</feature>
```

So to demonstrate how “Thinking Differently” could work to maximize the data...here’s an example paragraph.

The XML colored in black is directly from paragraph 5 (the green highlight). Basically, I read the paragraph and attempted to take everything I could and “tag” and organize it. But, since I’m focused on the feature, I’m stopping at the first one I see, “St. Croix River”. Then I search the rest of the chapter for “St. Croix River”. My goal is to find and group all info about the “St. Croix River” that I can. The orange text is just that...info from the rest of the chapter about the St. Croix River. Wow, how great is it to be able to find out all about this river in one location!

Doing this exercise brought up quite a few other questions in quality control (as Jens mentioned on Monday) with consistency, formatting, and organization. Like: 1) Why isn’t the first instance of “St. Croix River” (5) in bold? Instead it is bold in (104). 2) Principal entrance is listed in (5) as “Head Harbour Passage”, yet elsewhere in the chapter “Friar Roads” is also a principal entrance 3) what is the determining factor to having the geo-referenced links?

On the left is the exact XML from the OCS website representing the section of the Coast Pilot from the previous slide... On the right is a demonstration on how to minimize the "attributes" of the book tag... which is a W3C (world wide web consortium) recommendation for ease of maintenance and extendibility.

```

<symbol definitions="1" Book Number="1" BookId="327" Edition="45" ChapterNo="4" Title="Coast Pilot">
  <Chapter>
    <image_detail IS_NMR="0" ImageTag="ch4" DisplayFile="images/CP1Chapter93a1-6b4e411cb518.jpg"/>
    <chapterTitle>Quoddy Narrows to Calais, Maine</chapterTitle>
    <paragraph>
      <paraIndex>(1)</paraIndex>
      <paraText>
        <Spacer>
          This chapter describes the Maine and New Brunswick coasts from Quo Calis. Included in the text are discussions of the Maine ports of Island; and Head Harbour Passage.
        </paraText>
      </paraIndex>
    </paragraphHeader>
    <paraIndex>(2)</paraIndex>
    COLREGS Decartion Lines
    </paragraphHeader>
    <paragraph>
      <paraIndex>(3)</paraIndex>
      <paraText>
        <Spacer>
          The lines established for this part of the coast are described in <CP_B>80,105,</CP_B>
          chapter 2.
        </paraText>
      </paraIndex>
    </chartHeader>
    <paraIndex>(4)</paraIndex>
    Charts 13394, 13396, 13398
    </chartHeader>
    <paraIndex>(5)</paraIndex>
    <paraText>
      <Spacer>
        The approaches to St. Croix River include Quoddy Narrows, Lubec Ch northern end of Campobello Island through Head Harbour Passage. Th water. The tidal currents are strong in both passages.
      </paraText>
    </paraIndex>
    <paraText>
      <Spacer>
        <><CP_GEO_LOC Lat_Dec="44.8131" Long_Dec="-66.9628" Elev_In_M="45" S State_Alpha="ME" State_Numeric="23" County_Name="29" County_Numeric ><CP_INDEX TEXT="West Quoddy Head 13394, 13396">
        West
        <CP_B>Quoddy Head</CP_B>
        ,
      </CP_INDEX>
    </CP_GEO_LOC>
  </Book>

```

<CoastPilot xmlns:gml="http://www.opengis.net/gml/3.2" gml:xmlns="">
 <isoCountryCode>USA</isoCountryCode>
 <source>NOAA</source>
 <Book id="327">
 <bookNum>1</bookNum>
 <edition>44</edition>
 <editionYear>2014</editionYear>
 <bookTitle>Coast Pilot 1</bookTitle>
 <bookDesc>
 This book covers the coasts of Maine, New Hampshire, and part of Massachusetts.
 </bookDesc>
 <BookBoundaries>
 <BookBoundary>
 <boundaryDesc>Atlantic Coast: Eastport, ME to Cape Cod, MA</boundaryDesc>
 <gml:Polygon>
 <gml:exterior>
 <gml:LinearRing>
 <gml:posList>
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 </gml:posList>
 </gml:LinearRing>
 </gml:exterior>
 </gml:Polygon>
 </BookBoundary>
 </BookBoundaries>
 </Book>

So, now a side-by-side comparison in how the mark-up could change from "publication-centric" to "data-centric".

On the left is the exact XML from the OCS website representing the section of the Coast Pilot from the previous slide...

On the right is a demonstration on how to minimize the "attributes" of the book tag... which is a W3C (world wide web consortium) recommendation for ease of maintenance and extendibility.

Instead of all these attributes another XML file could be referenced that contains all the data about the books. It could have even more data as well, this bounding information is from the Coast Pilot online web interface and is coded in the S-100 GML standard encoding.

Side Note: I also set this up as a sample web-service to give a full listing of all the books available.

```

<!-- symbol definitions -->
<Book Number="1" BookId="327" Edition="45" ChapterNo="4" Title="Coast Pilot 1" Year="2015" Type="Chapter">
  <Chapter>
    <image_detail IS_NMR="0" ImageTag="ch4" DisplayFile="images/CP1Chapter4.eps" ImageLocation="FullPage" href="file:/93a1-6b4e411cb518.jpg"/>
    <chapterTitle>Quoddy Narrows to Calais, Maine</chapterTitle>
  <paragraph>
    <paraIndex>(1)</paraIndex>
  <paraText>
    <Spacer></Spacer>
    This chapter describes the Maine and New Brunswick coasts from Quoddy Narrows through Lubec Channel, Friar Roads, Calais. Included in the text are discussions of the Maine ports of Lubec, Eastport, and Calais; the Canadian port of Island, and Head Harbour Passage.
  </paraText>
  </paragraph>
  <paragraphHeader>
    <paraIndex>(2)</paraIndex>
    COLREGS Decimation Lines
  </paragraphHeader>
  <paragraph>
    <paraIndex>(3)</paraIndex>
  <paraText>
    <Spacer></Spacer>
    The lines established for this part of the coast are described in
    <CP_B>80,105,</CP_B>
    chapter 2.
  </paraText>
  </paragraph>
  <chartHeader>
    <paraIndex>(4)</paraIndex>
    Charts 13394, 13396, 13398
  </chartHeader>
  <paragraph>
    <paraIndex>(5)</paraIndex>
  <paraText>
    <Spacer></Spacer>
    The approaches to St. Croix River include Quoddy Narrows, Lubec Channel, Friar Roads, Head Harbour Passage, West northern end of Campobello Island through Head Harbour Passage. This passage is deep and generally clear of dangerous water. The tidal currents are strong in both passages.
  </paraText>
  </paragraph>
  <paragraph>
    <paraIndex>(6)</paraIndex>
  <paraText>
    <Spacer></Spacer>
    <CP_GEO_LOC Lat_Deg="44.8131" Long_Deg="-66.9628" Elev_In_M="45" Source="GNIS" Source_ID="578209" Source_Date="State_Alpha="ME" State_Numeric="23" County_Name="29" County_Numeric="Washington" Map_Name="Lubec">
      <CP_INDEX TEXT="West Quoddy Head 13394, 13396">
        West
        <CP_B>Quoddy Head</CP_B>
      ,
    </CP_INDEX>
  </CP_GEO_LOC>

```

```

<feature name="St. Croix River">
  <extent>
    <direction>north-northwestward</direction>
    <dist unit="miles">8</dist>
    <from>the southern part of <place>Passamaquoddy Bay</place></from>
    <to>then turns westward between <place>Devils Head</place> and <place>Todds Point</place></to>
  </extent>
  <characteristics>
    <characteristic>narrow</characteristic>
    <characteristic>windy</characteristic>
  </characteristics>
  <channelDepth>deep</channelDepth>
  <controllingDepth units="feet">16</controllingDepth>
  <controllingLength units="miles">3</controllingLength>
  <approaches>
    <approach>Quoddy Narrows</approach>
    <approach entrance="secondary">Lubec Narrows</approach>
    <approach entrance="principal">Friar Roads</approach>
    <approach entrance="principal">Head Harbour Passage</approach>
    <approach>Western Passage</approach>
    <approach>Passamaquoddy Bay</approach>
  </approaches>
  <ice>
    <closurePlace>Robbinston</closurePlace>
    <closureDuration>one or two weeks</closureDuration>
    <closureMonth>February</closureMonth>
  </ice>
</feature>

```

Again on the left...the current XML (publication-centric) mark-up...comparing this time against the data-centric mark-up example on the right.

Note: the St. Croix River (the red box) is inside the `<paraText>` tag hidden amongst a narrative string of words. Not easy to quickly find or extract.

Granted...it's a LOT of work! But the uses for how the data is marked up on the right is many times more useful than the original.

Coast Pilot Data - 2015

Paragraph Number:

5

Paragraph Text:

The approaches to St. Croix River include Quoddy Narrows, Lubec Channel, Friar Roads, Head Harbour Passage, Western Passage, and Passamaquoddy Bay. The principal entrance is around the northern end of Campobello Island through Head Harbour Passage. This passage is deep and generally clear of dangers. The channel through Lubec Narrows is also used, especially at high water. The tidal currents are strong in both passages.

Coast Pilot Data - the future

Feature

St. Croix River ▾

Characteristics

description

long ▾

description

windy ▾

description

select... ▾

Extent

Distance (miles)

8

Bounding Box

lat/lng polygon

Orientation/Direction

North-northwest ▾

Approaches

Principal Entrance

Friar Roads ▾

Secondary Entrance

Lubec Narrows ▾

Approach

Western Passage ▾

Ice

Closure Location

Robinson ▾

Closure Duration (max weeks)

2

Closure Month

February ▾

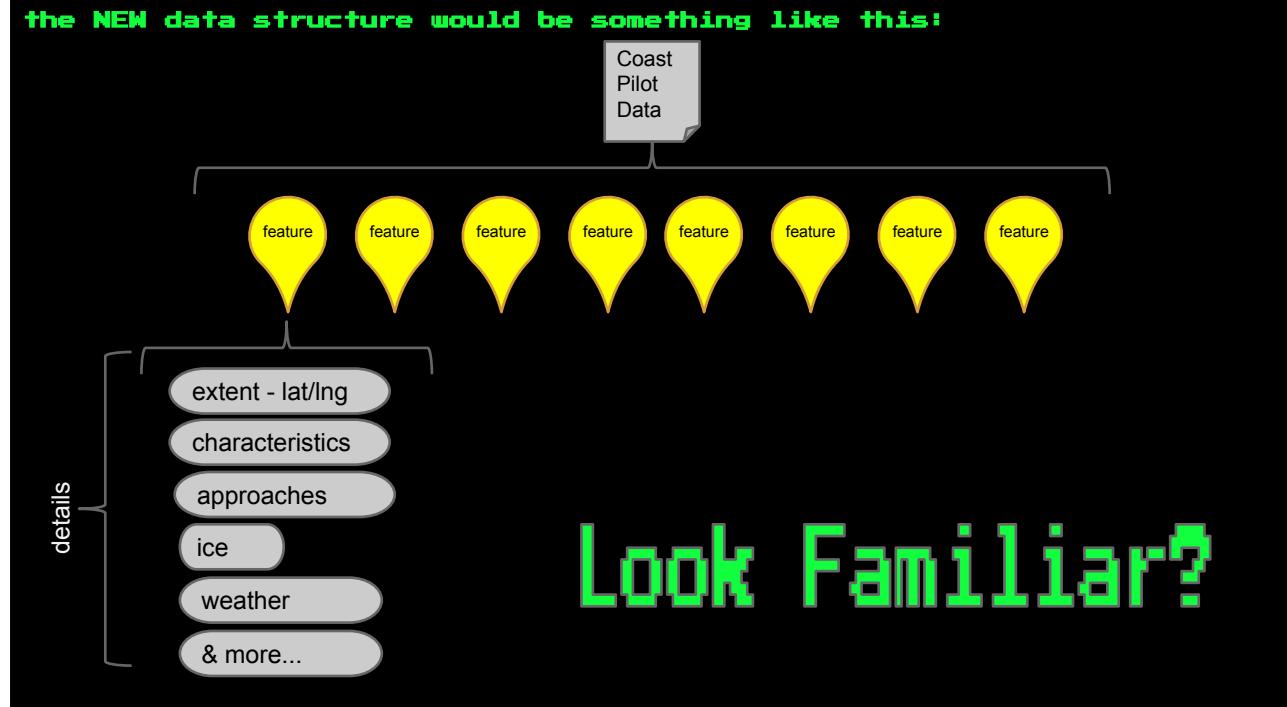
For those of you who don't like to look at code, another way to view and understand this would be like filling out a form online...

The example on the left allows for a narrative - a rich textual description. Easy for input purposes, but just not easy to process, discover and use on the output.

The example on the right, sure it's more complicated to set up, it takes longer to fill out...BUT, it forces the input to be formatted, tagged, organized, and verified on submit, which means there is no more/very little work to do on the output...

This is a great example of how to standardize the data content.

the NEW data structure would be something like this:



Yet another way to view this data structure (for those of you that like pictures!)

This is the direction of the S-100...Feature-based data...

it can work for the Coast Pilot/Sailing Directions too...in fact it should work in conjunction with S-101 (the ENC) data.

Everything related to a specific physical feature (S-126 - the physical environment) should be able to reference the S-101 ENC utilizing the overlap and simply linking the features together. Remember the goal to reduce redundant work and work towards "harmonization" with other related specifications.

(Although some, Edward Hosken, might differ in opinion) For the most part the S-126 is basically describing the S-101 feature....the textual description of the physical feature as it relates to navigation.

Why? -end result

1. A mariner of a small private vessel wants to get rid of all text relating to pilots and large ships. (and vice-versa)
2. Correlating the weather data in the text with historical, current and predictions of the same area.
3. Filter out anchorages along a coastline to help a mariner decide which to head for. (using S101 feature catalogue rules of anchorage types relevant to her - code 8: small craft mooring area).
4. A researcher wants to test AUV in a specific area and wants a quick way to search for all rivers that have a “windy” characteristic.
5. Get drawbridge information for a route quickly...all in one place.
6. Text reader for a audio description of area

Remember, we need to keep in mind the end result, how will the data be used? It is (or should) be there to serve us...not us be slave to it.

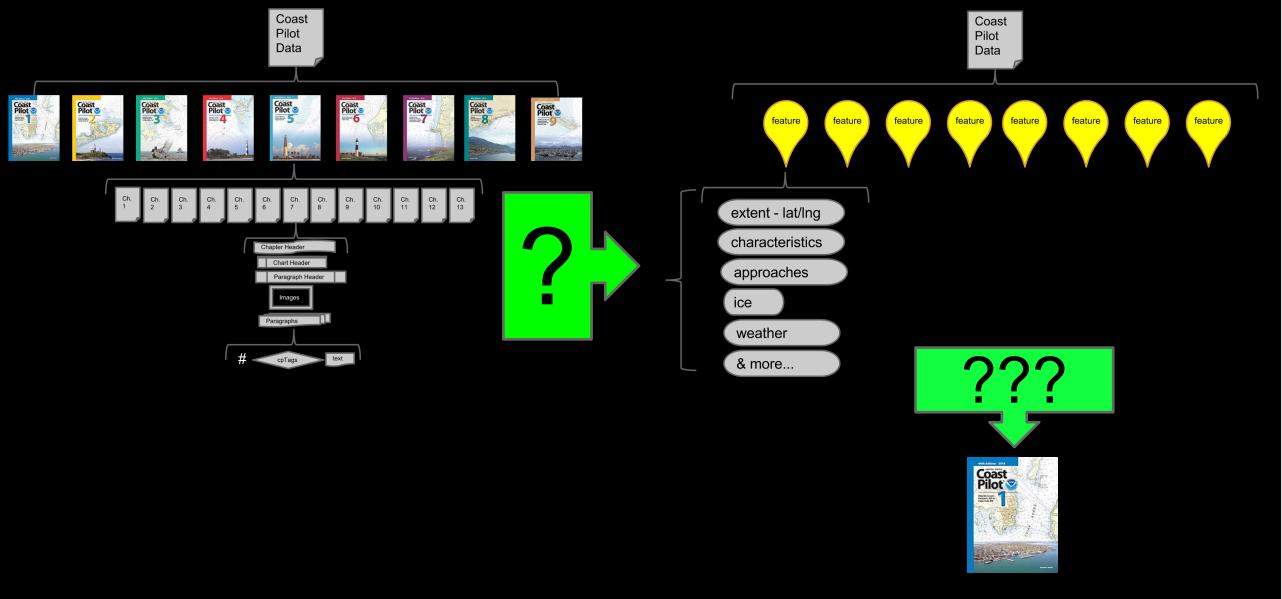
- 1.
- 2.
3. (or better would be “winding” since “windy” in the dictionary is “wind swept” not “twisty”...but that’s another presentation!)
- 4.

problem: implementation

Of course, the biggest problem in this whole story is HOW do you get from the current situation to the dream?

Or even something on the way to the dream? I don't think the presentation should end here (even though you may want it to!)...

how?



....So, how to make it happen? How do you turn a tree into lots of little seeds (for lack of better analogy)?

And the million dollar question how do you take the seeds and get the tree you are used to?

Intermediate steps

1. Normalize/clean the database
 - a. Get unique list of all paragraph headers - *standardize*
2. Geo-reference data (use GML)
 - a. algorithms using GNIS data
3. Add Chart numbers to all elements (for backward compatibility)
4. Better Tags:
 - a. Replace cp_index tags to ref/extend feature tags - *standardize*
 - b. Replace “formatting” tags (cp_bold, cp_italic) with feature tags
5. Recode tags with fewer attributes
6. Use modern technologies to present the data better online.

1. Process of reducing redundancy in the DB.
 - a. Use query string to find distinct Paragraph Header type of elements, then clean the list manually
 - i. Get rid of tags, duplicates, make things generic (get rid of state and regional specific locations in text) - this could be a starter list for common headers in all of the world's sailing directions -- This is part of the STANDARDIZATION process! (example: Pilotage for Coast of New Hampshire, just Pilotage since it's already in the section about New Hampshire)
 1. duplicates in the database reduce headers by 318 entries (from 2258 to 1940),
 - ii. This is a great exercise to see how consistent the document is written, how terms/phrases/headers are similar but not the same.(i.e. using MA vs. Mass, VA vs. Va., NY vs. N.Y., under way vs. underway, use of caps, use of spaces/punctuation, plural vs. singular, cross current vs. crosscurrent, small craft vs. small-craft vs. small-boat)
 - b. Get rid of added tags and attach as a new field “type” or “paragraph header type” (Appendix, CFR, sect, CP_INDEX, CP_BOLD, etc.)
 - C. Punctuation within tags isn't necessary.
 2. Geo-reference data - how is Tom's group doing it (regexp automation to start)
According to publication “Fulltext Geocoding Versus Spatial Metadata for

1. Large Text Archives: Towards a Geographically Enriched Wikipedia”
 - a. Checking for potential matches: find all possible matches (either use the xml version of each document or make new version from DB) - “feature catalogue”
 - b. match with GNIS table
2. Isolate the chart numbers using regexp, set up parent/child relationships via query and create new table of chart numbers to elements.
This set will give everything an associated area even if it doesn't have a geo-reference.
3. Compare against the ENC feature catalogue so the tagging can be synced up/reused
4. recode without attributes

★ Map

Coast Pilot Data

44ed 2014

44ed 2015

47ed 2014

46ed 2014

42ed 2014

44ed 2014

46ed 2014

36ed 2014

32ed 2014

CP1

Cape Cod, MA to Provincetown, MA.

CP2

Cape Cod, MA to Sandy Hook, NJ, including the coasts of Rhode Island, Connecticut, and New York.

CP3

Sandy Hook, NJ to Cape Henry, VA, including Delaware Bay and Chesapeake Bay.

CP4

Cape Henry, VA to Key West, FL.

CP5

Key West, FL to the Rio Grande, including Puerto Rico and the Virgin Islands.

CP6

Great Lakes system, including Lakes Ontario, Erie, Huron, Michigan, and Superior, their connecting waters, and the St. Lawrence River.

CP7

coasts of California, Oregon and Washington, and includes Hawaii and other United States territories in the South Pacific.

CP8

panhandle section of Alaska between the south boundary and Cape Spencer.

CP9

Cape Spencer to the Beaufort Sea.

About

Using JQuery Mobile and HTML5 data-base or web-service-based data can be displayed in a fluid layout, hiding what you don't need and...

The screenshot shows a mobile application interface titled "Coast Pilot Data". At the top, there are three buttons: a star icon labeled "Map", the title "Coast Pilot Data", and a gear icon. Below this is a list of seven items, each consisting of a small thumbnail image of a "Coast Pilot" book cover followed by the book's title, edition year, and a brief description. Each item has a right-pointing arrow icon at the end of its row.

Thumbnail	Title	Edition Year	Description
	CP1	44ed 2014	Eastport, ME to Provincetow...
	CP2	44ed 2015	Cape Cod, MA to Sandy Ho...
	CP3	47ed 2014	Sandy Hook, NJ to Cape He...
	CP4	46ed 2014	Cape Henry, VA to Key Wes...
	CP5	42ed 2014	Key West, FL to the Rio Gra...
	CP6	44ed 2014	Great Lakes system, includin...
	CP7	46ed 2014	coasts Of California, Oregon ...

Updating the format based on the screen size of the device in use...all with the same piece of code.

[Front - Title page, Preface and Table of Contents](#)

[Chapter 1 - General Information](#)

[Chapter 2 - Navigation Regulations](#)

Chapter 3 - Eastport to Cape Cod

[Chapter 4 - Quoddy Narrows to Calais, Maine](#)

[Chapter 5 - Quoddy Narrows to Petit Manan Island, Maine](#)

[Chapter 6 - Petit Manan Island to Jericho Bay, Maine](#)

[Chapter 7 - Jericho Bay to Penobscot Bay, Maine](#)

[Chapter 8 - Muscongus Bay to Cape Elizabeth, Maine](#)

[Chapter 9 - Cape Elizabeth, Maine to Cape Ann, Massachusetts](#)

[Chapter 10 - Cape Ann to Boston Harbor, Massachusetts](#)

[Chapter 11 - Boston Harbor and Approaches](#)

[Chapter 12 - Minots Ledge to Provincetown, Massachusetts](#)

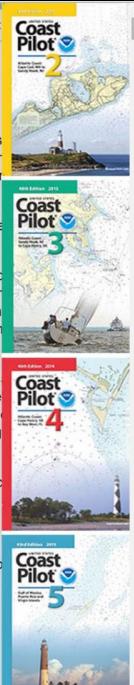
[Appendix A - Appendix A](#)

[Appendix B - Appendix B](#)

[Back - Back Pages](#)

Coast Pilot Book 1

default



2

most of Massachusetts lie between West Quoddy Head in Maine and Provincetown in Massachusetts. Most of the Maine coast is broken by numerous bays and inlets, many of which are excellent harbors. The bays and inlets are often sheltered from the open sea by rocky headlands and islands. Many of the bays and inlets are sheltered from the open sea by rocky headlands and islands. The bays and inlets are often sheltered from the open sea by rocky headlands and islands.

The coast between the Canadian Province of Nova Scotia on the northeast and Massachusetts on the southwest. It includes the Bay of Fundy and the Gulf of Maine. Because of its changeable weather, frequent fogs, and strong tidal currents, this area has a bad reputation among mariners.

The coast is mostly rocky and is indented by numerous large bays and excellent harbors. Among the many islands along this coast are numerous small islets and rocks. The bays and inlets are often sheltered from the open sea by rocky headlands and islands. In many cases they rise abruptly from deep water and soundings do not generally indicate their proximity until it is too late to avoid them. The range of tide is greater than normal range of tide and that at high water a vessel may sometimes pass over places on which she would otherwise run aground.

The coast is rocky and broken by numerous bays and rivers, many of which are excellent harbors. In Muscongus and Casco Bays there are many narrow channels and passages that are used by the smaller class of vessels passing along the coast. Extreme caution should be exercised when passing through these channels because of the strong tidal currents. Particular caution is necessary for small craft crossing Penobscot Bay and the mouths of the rivers flowing into it. The wind is contrary to the current because heavy tide rips are encountered. Great caution is also necessary when standing along the shore of the bay, as the water is shallow and dangerous.

There are fewer harbors and marked indentations. The shore is more thickly settled than farther eastward, and several of the beach towns are marked and fewer in number.

The northern shore of Cape Ann is high and rocky, with few indentations. The southern shore is mostly sandy, with a few outcropping ledges and outlying dangers, but the northern shore of Cape Ann is high and rocky.

The coast is mostly rocky and bold, and has numerous islands, dry rocks, boulders, and covered ledges near the shore, with deep channels between them. There are extensive sand shoals extending out well from the shore in many places. Boulders also occur in places in Cape Cod Bay.

The coast from Little River to Portland is mostly rocky and broken by numerous bays and inlets. The shore is mostly rocky, with few indentations. The northern shore of Cape Ann is high and rocky, with few indentations. The southern shore is mostly sandy, with a few outcropping ledges and outlying dangers, but the northern shore of Cape Ann is high and rocky.

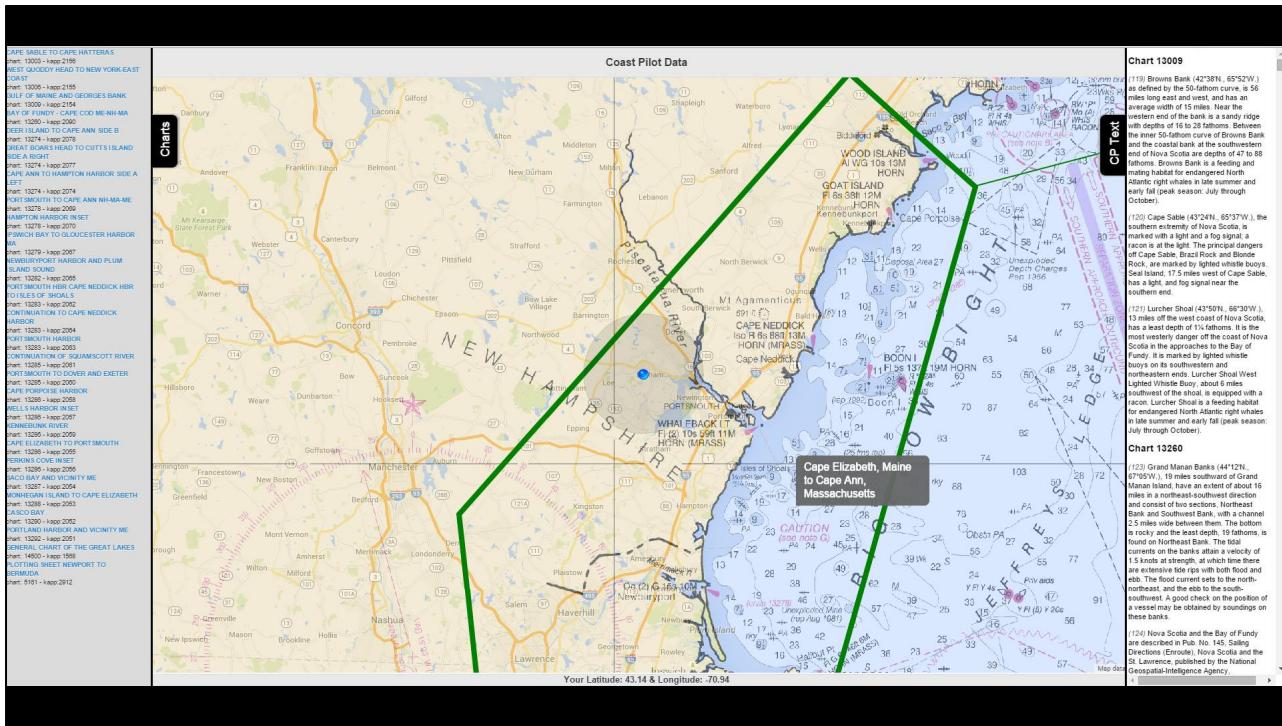
By doing just a few of the intermediate steps to my copy of the Coast Pilot DB, I was able to create a prototype to illustrate the benefits to some small changes.

Example: Simple

Organizing the data in a better way allows for new ways to view the data, for a simple example

...easier navigation between books and chapters

And with topic categories based on the paragraph headers these paragraphs could be set up to group data accordingly, hiding and showing only the topics desired. (Sorry,, I don't have a slide for this because I failed to take a screenshot while it was working and I haven't fixed what I broke yet!)



Also, by associating a chart to every paragraph in the Coast Pilot, I can now show text that is only related to the charts that are within the viewport of the map (a Google map).

As I zoom in on the chart, the list of charts on the left is shortened and subsequently the text displaying on the right is reduced.

To explain the rest of the interface:

- Both the chart and text tabs retract when not needed.
- The blue dot in the middle is the location of the user (using web geo-location) which is the default location when the web page is opened.
- The green outline is the extent of the chapter and the grey box displays the chapter title (the extent of the box)
- There are options (not visible in this screen shot) to toggle the outlines of chapter bounds as well as chart bounds and to track the user's position.

As I move forward with the intermediate steps outlined earlier, the way the text is presented here will change dramatically and have more options for customization.

Wrapping up

The term Spatial Data Infrastructure (SDI) -

“embraces the structure of working practices and relationships among data producers and users that **facilitates data sharing and use**. It covers the set of actions and *new ways of accessing, sharing and using geographic data* that enable far more comprehensive analysis at all levels of government, the commercial and not-for-profit sectors and academia”

What are the challenges an HO may face when participating in an SDI?

“Challenging the way things are currently done to ensure they are undertaken *more efficiently* in the future.”

Again, this isn't a purely simple or easy task, but it's also not impossible!

We like to say at CCOM/JHC “Map Once, Use Many Times”....we can change that to say “Enter Data (correctly) Once, Use Many Times, Many Ways”

source: Spatial Data Infrastructures “The Marine Dimension”
Guidance for Hydrographic Offices IHO Publication C-17 - Edition 1.1.0 February 2011

SDI - http://www.ihodata.int/ihodata_pubs/CB/C-17_e1.1.0_2011_EN.pdf

other challenges in SDI:

- A lack of funding to progress their involvement in SDI.
- Persuading decision makers and budget managers to support SDI activities.
- Gaining the trust of other stakeholders.
- Ensuring the HO has the knowledge, training and skills for involvement in SDI.

thank you...



GAME
OVER

NOT