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Canadian Hydrographic Service / Service hydrographique du Canada

United States-Canada Hydrographic Commission
45th Meeting

Hydrographer of the Future Project

Name:

IHO International Hydrographic Organization

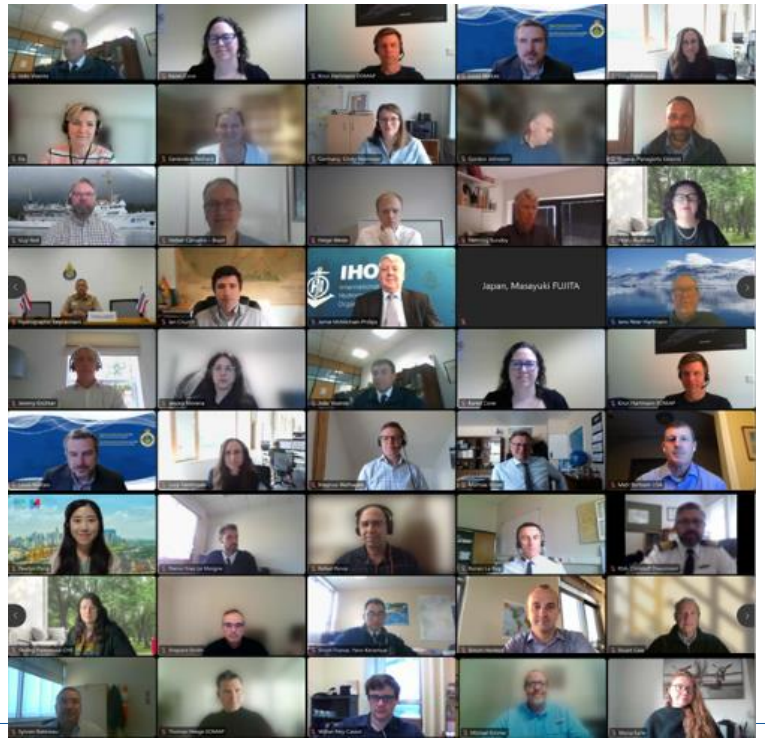
9-10 June 2022 Ottawa CA

Canada

Introducing the Hydrographer of the Future Project

- Canadian Hydrographic Service (CHS) is trying to envisage the skillset that its staff will require as it evolves into a totally digital work environment
- CHS convened an advisory group and organized a 4 hour virtual “Hydrographer of the Future” workshop April 21
- Aim of exploring and defining the employee profile of the Hydrographer of the Future using a collaborative approach with the international hydrographic community
- Report has been sent to participants for feedback and will be shared with hydrographic community and CHS staff

86 particapants from 26 countries



Workshop Topic	Chair	Rapporteur
1a. How will technology enable hydrographers to solve a problem in the future?	Rafael Ponce	Doug Brunt
1b. How will technology enable hydrographers to solve a problem in the future?	Louis Maltais	Scott Ryan
2. What is in the toolbox of the hydrographer of the future?	York Friesen	Shelley Parkhouse
3. Do you think that digital transformation will increase the need for specialization or generalization?	Karen Cove	Sonja Bhatia
4. How do you see the composition of your workforce changing into the future?	Denis Hains	Sarah Rahr
5. What are the evolving hydrographer's skills to work effectively in the Blue Economy?	Chris Hemmingway	David Bradley
6. How will future larger hydrographic datasets impact changes in data management?	Chris Marshall	Jessica Morena

Technology: Hydrographic Offices are Evolving in an Increasingly Digital World

- Digitalization is acting as a driver for change.
- Hydrographic offices vary in the direction they are moving. Some becoming more specialized and others becoming more generalized. Some needing a mix of generalists with hydrography background, with specialists in more technical fields
- See an evolving role for hydrographic offices within the context of the Blue Economy and a changing and expanding user base.

Technology: Technical Needs, IT, Vessels

- Technology can help fill the ‘gaps’ in data collection in areas that are challenging to survey. Need to keep up with state of the art when it comes to new vessel acquisition – UAVs
- A focus on automated or Artificial Intelligence (AI) data analysis techniques and of the vessel itself
- Data storage at large volumes can be costly and complicated. Need underlying systems to be properly designed and maintained to support large datasets-allocate financial and human resources
- Contracting out for specialized data services will play a larger role
- Define authoritative source when there are large volumes of data being collected and made available

Technology: Data Management

- When data are stored on the cloud, it then becomes increasingly important to curate those data, provide metadata, versioning, etc. If this is not done, the cloud becomes a “dump” and highly disorganized.
- Important to understand strengths/weaknesses of automated QC processes and validate data accordingly before dissemination to clients.
- Data ethics/cybersecurity
- Efficiency from digitalization offset by volume.

People and Culture: The role of humans in an increasingly technology-driven environment

- Data managers and organizers (‘cloud engineers’; ‘curators of data’)
- Manage large datasets
- Project management
- Data validation
- Partnership building
- Procurement

People and Culture: Education & Training

- There is no single profile for a Hydrographer; there is a base layer of knowledge (education) that is needed that allows for adaptability
- Some prioritizing CAT-A CAT-B certified hydrographers; but many are hiring staff with educational backgrounds in physical sciences, data science, IT and programming knowledge and GIS.
- Education vs Training – education is the core; training builds the skills and helps the hydrographer keep up with rapid advances; need to apply training in 'real world environment'.
- Dynamic tech training always reactive to technology most of the time – how can we be proactive (stay on top of change)
- Training in Change Management
- Balance new competencies with older traditional training

People and Culture: The Ideal Hydrographer

- Broad set of skills
- Team oriented
- No concept of the perfect hydrographer—no one hydrographer can do it all
- Mix of technical and soft skills
- Problem solver
- Agile and adaptable
- Innovative
- Mix of specialists and generalists

People and Culture: General and Specialized Skills

- Some hydrographic offices still need hydrographers to be a jack of all trades – not specialized in tasks – 'doing it all'; Some seeing a need to split the 'hydrographer' into several specialties: acquisition, processing, databases, cartography, etc.
- Hydrographers are increasingly becoming data managers. Hydrographers need to be knowledgeable on how to incorporate real-time data into their processes. 'Managing data at the speed of knowledge'
- Hydrographers need to have the skills and expertise required to ensure that the data collected are "good"; cannot be push- button

People and Culture: Recruitment, Retention and Knowledge Transfer

- Seems to be competition for new hydrographers and their skill sets.
- Work to increase knowledge of hydrography as a field in the broader population through outreach to educational institutions, show cool technology—also to build diversity in the industry.
- May have to plan for possibly more dynamic workforce. Retaining staff is critical - exchanges and secondments agreement between HOs and Private Sector is an important possibility to exploit further.
- Employers need to be agile.

Future of Hydrography: Partnerships

•Technology can help process, sort, and manage this volume of data. The one question is where does the hydrographer ‘hand off’ this information/data.

•Develop relationship with manufacturers to ensure that hydrographic staff can access and interact with data acquisition devices in the field rather than relying entirely on manufacturer.

Future of Hydrography: Expanding uses of hydrographic data – Blue Economy

- Some of information collected in the hydrographic survey process were seen as toss-offs can be valuable information for others. Backscatter, sound velocity profiles, etc. can now be of use in other fields
- Interoperability and standardizing data sets considering not only the S-100 standards but other standards
- Marine Spatial Data – should hydrographers be specialists for these environments?
- Seeing a need to shift to a focus on user needs

Next Steps

- Incorporate input from participants
- Share final report with broader hydrographic community
- Host workshops in fall with CHS staff

Thank you