Work Item A

B-12 Maintenance

Report to CSBWG Meeting 16 NIWA, Wellington, New Zealand 26 March 2025

Brian Calder CCOM/JHC, University of New Hampshire





Why We Need a Change in B-12 Maintenance Mechanism

International Hydrographic Organization

Technical Concerns

Administrative Concerns



Why We Need a Change in B-12 Maintenance Mechanisms

International
Hydrographic
Organization

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CSB-Guidance_Document-Edition_2.0.2-Clean.docx	Jul 24, 2019 at 2:59 am	5.9 MB	Micros(.docx)
CSB-Guidance_Document-Edition_3.0.pdf	Mar 29, 2023 at 10:13 am	3.5 MB	PDF Document
Document Chapters	Nov 16, 2022 at 4:46 pm		Folder
SourceObjects_Uncertainty	Nov 16, 2022 at 4:46 pm		Folder
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2017-12-12_CSB_uncertainty_comment.xls	Dec 22, 2017 at 7:09 pm	45 KB	Microsok (.xls
2017-12-12_CSB-Guidance_Document-v3.12_with_comments.docx	Dec 22, 2017 at 7:09 pm	6.7 MB	Micros(.docx)
accuracy_vs_precision_556.jpg	Nov 10, 2016 at 4:37 pm	61 KB	JPEG image
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CSB-Guidance_Document-v4_FINAL.docx	Feb 26, 2018 at 8:11 am	5 MB	Micros(.docx)
CSB-guidance-document-v3.1_brc.docx	Nov 15, 2016 at 7:05 pm	5.1 MB	Micros(.docx)
CSB-guidance-document-v3.5.docx	Feb 10, 2017 at 8:35 pm	4.2 MB	Micros(.docx)
CSB-guidance-document-v3.6_with_comments_Uncertainty.docx	Feb 14, 2017 at 12:50 pm	4.5 MB	Micros(.docx)
CSB-guidance-document-v3.10_BRC.docx	Mar 27, 2017 at 11:36 am	4.4 MB	Micros(.docx)
CSB-guidance-document-v3.docx	Nov 10, 2016 at 4:37 pm	420 KB	Micros(.docx)
EnvironmentInformation_Copy.docx	Nov 10, 2016 at 4:37 pm	17 KB	Micros(.docx)
illustration_uncertainties_CSBWG.docx	Nov 10, 2016 at 4:37 pm	1.9 MB	Micros(.docx)
Serge Comments CSB-guidance-document - SG - uncertainty.docx	Nov 10, 2016 at 4:37 pm	413 KB	Micros(.docx)
Table of uncertainty_draft_squat_settlement.docx	Nov 10, 2016 at 4:37 pm	165 KB	Micros(.docx)
Thomas Comments Uncertainty Draft V3.1.docx	Nov 10, 2016 at 4:37 pm	27 KB	Micros(.docx)
uncertainty_definition.docx	Nov 10, 2016 at 4:37 pm	4 KB	Micros(.docx)
UncertaintyAppendixSubjects.docx	Nov 10, 2016 at 4:37 pm	84 KB	Micros(.docx)
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CSBWG Uncertainty Section Dr File Edit View Insert Format Te		В
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1	develop the data from the database into a product. More details on particular uncertainties, and	
	suggestions for best practice, are provided in the sections below focussing on these use cases.	
cument tabs +	Estimation & Expression of Uncertainty	
	The most common method for estimating and expressing uncertainty is through some statement of the statistics associated with a measurement or system. Ideally, this is done by making the	
CSBWG Uncertainty	same observation multiple times, and then assessing the degree to which the measurement	
1. Uncertainty	indicated changes between different observations. For example, imagine the case where an echosounder is mounted in a tank, and constantly measures the depth. Since we do not believe	
Meaning, Sources, and	that the depth of the tank is varying significantly within the duration of the observations (e.g.,	
The Meaning of Unce	due to atmospheric pressure, evaporation, or condensation), or we consider these variations to be insignificant with respect to the scale of the variations being examined, any change in the	
Sources of Uncertainty	indicated depth must be due to uncontrolled variabilities in the echosounder. For example,	
	there could be differences due to acoustic or electrical noise in the returned signal. Taking all of the measurements together, it would be possible to estimate the average depth returned, and	
Estimation & Expressi	therefore the degree of variability of the depths about this average value. If we depth of the tank	
Consequences of Un	was independently measured, for example by draining all of the water and measuring with a laser level, then it would also be possible to estimate any bias between the average acoustic	
Uncertainty for Indivi	depth and the physically measured depth ² . Going further, it might be possible, depending on	
Uncertainty for Trust	the number of observations, to estimate whether the observations are all clustered symmetrically around the average value, or if there is an asymmetry in the observations, with	
Uncertainty for Datab	most likely value being shallow or deeper than the average.	
	This ideal case rarely occurs in practice. In many physical systems it is very difficult to keep	
	conditions sufficiently constant that multiple observations can be made of exactly the same system. For example, imagine that the echosounder is now attached to a dock and observes	
	ostensibly the same patch of seafloor on each measurement cycle. Changes in the water	
	² Note that this is not the "true" depth, since the physical measurement also has uncertainties. It might	
	be, however, significantly lower uncertainty than the acoustic measurement and therefore considered	
	sufficiently "true" for current purposes.	
	properties on the scale of a few measurement cycles can cause sufficient difference to dominate	
	the variability being observedit is even possible for miniscule changes in the configuration of the seafloor to affect the observations.	
	In practice, therefore, many techniques have been developed to attempt to estimate uncertainties using non-ideal data, at least as an approximation. For example, if two different	
	systems observe the same thing simultaneously, any difference in the pair of observations has	
	to be caused by the systems, and not by the thing itself. This is sometimes used to make paired observations where the statistics of the difference between two devices are examined. Effective	
	techniques can vary according to the measurement; more details for suggested methods with	
	respect to crowd-sourced bathymetry are presented in the following sections, and in Appendix X.	
	Data sufficiently rich to be interesting are often the result of a number of different observations,	
	or the combination of core data from multiple different systems. For example, with bathymetric observations, the resulting depth is a function of at least a positioning system and an	



Why We Need a Change in B-12 Maintenance Mechanisms

International Hydrographic Organization

	New Edition	
IHO Programme 2	New Editions of standards introduce significant changes. New Editions enable new concepts, such as the ability to support new functions or applications, or the introduction of new constructs or data types, to be introduced. New Editions are likely to have a significant impact on either existing users or future users of the revised standard. It follows that a full consultative process that provides an opportunity for	2 "Hydrographic Services and Standards" 2.1 - General
3. Procedures 3.1 Standar properly deve remain simple 3.1.1 Changes or <i>clarification</i>	input from as many stakeholders as possible is required for standards listed in Appendix 1, optional for those listed in Appendix 2. Proposed changes to a standard should be evaluated and tested wherever practicable. The approval of Member States is required before any <i>New Edition</i> of a standard can enter into force. All cumulative <i>clarifications</i> and <i>revisions</i> must be included with the release of an approved <i>New Edition</i> of a standard. Revision <i>Revisions</i> are defined as substantive changes to a standard. Typically, <i>revisions</i> change existing specifications to correct factual errors; introduce necessary changes that have become evident as a result of practical experience or changing circumstances; or add new specifications within an existing section. <i>Revisions</i> could have an impact on either existing users or future users of a revised standard.	to IHO standards are se procedures should s: <i>new edition, revision,</i> ral and implementation ne for <i>new editions</i> , to
process differs	The approval of Member States is required before any <i>revisions</i> to a standard can enter into force. All cumulative <i>clarifications</i> must be included with the release of approved corrections revisions. However, there may be instances where more urgent action is required, especially where there are	le for <i>new editions</i> , to
³ See HSSC and	serious implications to safety of navigation. In such cases, a "fast-track" approval by correspondence	
	A revision shall not be classified as a <i>clarification</i> in order to bypass the appropriate consultation processes.	
	Clarification	1
	Clarifications are non-substantive changes to a standard. Typically, clarifications: remove ambiguity; correct grammatical and spelling errors; amend or update cross references; insert improved graphics in spelling, punctuation and grammar. A clarification must not cause any substantive semantic change	
	⁴ *n » is not limited to 9.	
		ds"
		1 1
approval at the to be "significa	2.1 – General	evisions are considered entation.
	to a standard. <i>Clarifications</i> are the responsibility of the relevant subordinate body and may be delegated to the responsible editor.	



IHO Context & History for the Proposal

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tio	 V Discussions Q Actions [] Frigecia Q decomy C magina (p) defunga 			
			Edits to IRCC proposal (Jencks) #9	Edit <> C
Markup language for B.12			11 Open brian-r-calder wants to merge 15 commits into main from dev-ircc-7	
			🗘 Conversation 28 - Commits 15 🖻 Checks 0 🖹 Files changed 2	+242 -17
Q is:open	Sort by: Latest activity - Label - Filter:	: Open - New discussion	brian-r-calder commented on Jan 8	Reviewers
Categories	Discussions		This PR implements issue #8, supporting discussion #7. This adds significant edits to the IRCC proposal document to clarify background and intent, particularly governance and versioning.	🔮 giumas 🕼 selimnairb
Q View all discussions	Thoughts re. suggested edit to Ch 3 of B-12	Q2 0 1	©	 glabmoris matt-the-bass
Announcements	ijencks started 3 weeks ago in <u>General</u>		brian-r-calder added 2 commits 2 months ago	ijencks
💬 General	1 Fhoughts re. updated IRCC proposal	🚱 🖓 🖓 1	Original Calues auded 2 Communics 2 Interfaits augo Setted in proposed modifications to the IRCC proposal document from J.,	Still in progress? Learn about draft PRs
Polls			- 🍪 Synchronizing update to IRCC proposal document. 🚥 1b285b	od Assignees
🙏 Q&A	1 Rew sections proposed jiencks started on Dec 23, 2024 in Ideas	🚱 🖓 8		🍪 brian-r-calder
🙌 Show and tell	Voting protocols for finalised modifications brian-r-calder started on Nov 12, 2024 in Ideas		Signar-r-calder added documentation enhancement labels on Jan 8	Labels
Most helpful	bhan-r-calder started on Nov 12, 2024 in Ideas		O Stran-r-calder requested a review from jjencks 2 months ago	documentation enhancement
Be sure to mark someone's comment as an answer if it helps you resolve your question — they deserve the credit! ♥	(1) Is CC0 1.0 Universal license compatible with current B-12 disclaimer? giumas started on Nov 19, 2024 in <u>General</u>	🥵 🖓 1	R 🎯 brian-r-calder self-assigned this on Jan 8	Projects None yet
F) Community guidelines	Markup language for B.12 brian-r-calder started on Nov 5, 2024 in Ideas	🕵 🖓 1	🍪 📀 brian-r-calder commented on Jan 8 View reviewed changes	Milestone 5 No milestone
🗠 Community insights	(1) Working protocol for modifications to B.12		AuxiliaryDocuments/IRCC-Proposal/CSBWG-B12-Maintenance-Proposal.md (Outdated)	Development
	brian-r-calder started on Nov 12, 2024 in Ideas	<u>م</u>	🍪 📀 brian-r-calder commented on Jan 8 View reviewed changes	Successfully merging this pull request may these issues. None vet
	brian-r-calder announced on Nov 12, 2024 in Announcements	o ټ 🎱	AuxiliaryDocuments/IRCC-Proposal/CS8WG-B12-Maintenance-Proposal.md Outdated	Notifications
	Composition of the Maintenance Group brian-r-calder started on Nov 5, 2024 in Ideas	🎱 🖓 1	brian-r-calder commented on Jan 8 View reviewed changes	& Unsubscribe
			AuxiliaryDocuments/IRCC-Proposal/CSBWG-B12-Maintenance-Proposal.md Outdated + Show resolved	assigned.
🔘 © 2025 GitHub	Inc. Terms Privacy Security Status Docs Contact Manage cockies Do not share my personal information	a		5 participants



IHO Context & History for the Proposal

	III Film	CSBWG-B12 / AuxiliaryDocuments	Edits to IRCC proposal (Jencks)	#9 0/2 files viewed Review in codespace Review changes 👻	Q. Type [] to search 8 - + - O 11 @
iona	• Files		Changes from all commits -	File filter - Conversations - 🕲 -	
aph	₽ 1b285bd - Q	Preview Code Blame 275	Q Filter changed files	✓ ⁺ 412 ■■■ ♦ 12 ■■	ctions 🖽 Projects 🛈 Security 🗠 Insights 🕸 Settings
atio	Q Go to file	Initial version: 2024-11-0	AuxiliaryDocuments/IRCC-Proposal	AuxiliaryDocuments/IRCC-Proposal/CSBWG-B12-Maintenance-Proposal.md	
	 AuxiliaryDocuments/IRCC-Prop 	 This version: 2025-01-08 Reviewed and Approved 1 	CSBWG-B12-Maintenance-P •	The primary benefit of the proposed maintenance protocol is that B-12 will meet its original intent of providing best practices for collecting, contributing, assessing and using crowdsourced bathymetry by recognizing that	ents / IRCC-Proposal / CSBWG-B12-Maintenance-Proposal.md
	CSBWG-B12-Maintenance-Pr	- Reviewed and Approved I	V 🖿 B12-Main	these practices are ever-evolving. Having a more timely and flexible development process for the data/metadata	BWG-B12-Maintenance-Proposal.md 🚥 e353406 · last week 🕚 H
	> B12-Main	Background and Pu	B12-main.adoc	format recommended will break an annual (and often longer) update cycle, allowing for more rapid adaptation as	
		In 2014, the Fifth Extraordinar		requests are made and ensuring that the guidance stays relevant within not only IHO Member States, but the global community.	284 lines (243 loc) · 16.3 KB 🛛 🖉 👻 🖉 👻
	README.md	Regional Coordination Commi			
		prepare and maintain a new II-		A more subtle benefit is that this process will build community and trust. That is, at present it is well known that	
		document would state the IHC		changes to B.12the data/metadata recommendations for CSB data accession to DCDB will take at least a year to	ourced Bathymetry Working Group
		bathymetry. This document w		be approved, and many developers either cannot or will not wait that long. This encourages them to just make	
		guidelines for gathering and a		(non-standard) modifications to data or metadata since they need to move on; the potential for database damage is therefore high. If, however, developers know that they can make suggestions for changes to B.12, and	ion
		would supersede national or in		particularly the data and metadata, using mechanisms that they already understand and use themselves (i.e.,	
		Initial development of B.12. w		issue trackers and GitHub repositories) and, critically, have these requests actioned in a timely manner (e.g.,	
		primarily using general deskto		within a couple of weeks), then there is an impetus to use this mechanism for change. This will more likely keep	:@ccom.unh.edu)
		approval process, CSB data c		changes within the standard-B.12 model, and reduce the probability of incompatible (or unusable) data appearing	(jennifer.jencks@noaa.gov) (CSBWG Chair)
		was provided to the CSBWG.		in the IHO databases.	
		immediately after its initial pul			li (gimas@gst.dk)
		By the time v 3.0.0 was appro		Potential Risks and Mitigations	es@ccom.unh.edu)
		IHO approval timeline, were b		<u>^</u>	.Oias@sjofartsverket.se)
		meant to provide ever-evolvin		Ÿ	11-04
		meeting reports, it could be d		The proposal for use of new tools to maintain the B-12 guidance document changes only the method of	3-06
		changes were or were not agr		implementation for modifications, but not the process for approval or oversight. The tools being proposed for use are commonly recognized and used for many massive open and closed source projects world-wide. This is	ved for submission by IHO CSBWG: 2025-03-25 [update as appropriate]
		These issues, and an annual r		therefore considered very low risk.	
		consistent with the speed at v			Purpose
		bathymetry community. This I		Separately maintaining T the most obvious and significant data/metadata recommendations has the potential risk	
		actual practice in the field, wh		of incompatibility with the proposed maintenance model iscurrent definition in B-12, or that B.12 the	linary International Hydrographic Conference (EIHC-5), by Decision 8, tasked the Inter-
		submitted to the IHO Data Ce		implementation will develop in a direction orthogonal to the IHO's intent without oversight by, or that of the	mmittee (IRCC) with establishing a Crowdsourced Bathymetry Working Group (CSBWG) w IHO publication on policy for crowdsourced bathymetry (Terms of Reference). This
		data formats within the databa		CSBWG, IRCC, or the Member States. With the constraints of a Maintenance Group nominated by CSBWG with the Chair an ex officio member, this risk is relatively low. The Chair always has the ability to remit any	 HO's policy towards, and provide best practices for collecting and contributing,
		value of these potentially very		development item to the CSBWG-entire for review and vote, and has the choice of which type of vote is required.	7. This document was envisioned to provide volunteer data collectors and interested
		During CSBWG14 and CSBW0			gathering, submitting and assessing the quality of CSB data by providing technical
		to address the maintenance is		In addition, the technical mechanisms used to make modifications to the B.12 documentdocuments are	way would supersede national or international laws and regulations.
		that an approach to maintena		intrinsically designed so that each modification is tracked and can be reversed if required: an entire history of theeach document is maintained as a core feature of the tools used. Therefore any changes to B12 that are	2, which began in 2016 and was approved by IHO Member States in 2019, was conduct
		allow a more flexible and time		subsequently considered damaging can always be reversed if required.	sktop and cloud word-processing tools. As the initial version was going through the IHC
		decisions, enable transparenc			ta collection began to expand globally, B-12 was put into practice, and real-world feedb
		It is worth noting that the CSE		The overall risk of adopting the proposed methods is therefore considered very low.	VG. It quickly became apparent that B-12 would require significant updates almost
		groups, particularly the S-102		Requested Actions	I publication.
		switching to these new tools a		requested Activits	proved by IHO Member States in 2022, it became clear that these tools, and the standa
		therefore, highlights the prope and how these tools and prote		1. 	re becoming challenging for the type of incremental maintenance required on a docume
		and now these tools and prote			plving and improving technical guidelines. In addition, without searching into the CSBWG
				The CSBWG, having reviewed and approved these recommendations, request that IRCC:	be difficult to determine the history of the modifications made, or the rationale by which
		0 2025		1. Acknowledge this request for a new maintenance method.	: agreed.
	January	0, 2020		2. Approvea CSBWG to move ahead with maintenance of B.12 under these premises.	ual meeting cycle of the CSBWG, mean that it is difficult to achieve an update cycle for
				 Approve separation of the maintenance of the B-12 guidance document from the data/metadata 	2 (specifically within Chapter 3: Data and Metadata) consistent with the speed at which a practice are occuring within the crowdsourced bathymetry community. This leads to the



Context & History for the Proposal



- The proposal has to address:
 - Tooling to use for discussion, work items, formal review, etc.
 - Governance model for contributions
 - Acceptable IHO process
- The initial proposal had an "all in" strategy for maintenance
 - Significant focus on process, not entirely in line with R-2/2007
 - Probably too detailed!
- Most responses were from technologists, and entirely positive
- BUT not matching R-2/2007 was a big problem for IHO/MS



Context & History for the Proposal

International Hydrographic Organization

The most significant difference in V1 \rightarrow V2:

B-12 shouldn't have detailed requirements on data/metadata formatting to satisfy DCDB needs.

With the obvious corollary:

DCDB should publish their specific requirements for accession to the archive and maintain these separately.



IHO **Context & History for the Proposal**

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↑ Top

Files

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④ ① + ① CSBWG-B12 / B12-Main / B12-main.adoc ↑ Top Preview Code Blame 729 lines (459 loc) · 67.3 KB Raw r□ ± // + := P dev-ircc-7 + + Q Q Go to file 3.3. Metadata and Data Formats AuxiliaryDocuments/IRCC-Prop... The current active definition of the mandatory, recommended, and optional data and metadata described here are managed by the Working Group through a GitHub repository which is publicly available. The definitions here CSBWG-B12-Maintenance-Pr are now outdated by structural changes in the database at DCDB; the current definitions are provided in the B12-Main repository above, and as HTML pages. > 📄 Assets This section provides guidance to data collectors and Trusted Nodes about the standard metadata that is required > Chapters for submitting data to the DCDB. In addition, it provides information about additional metadata that would enhance B12-main.adoc the value of the data for end users. CSB data contributors should collect and forward this information whenever possible. Recognizing that translating metadata fields to files for submission to the DCDB can be complex, Trusted 🗋 B12-main.md Nodes are encouraged to review the CSB Sample Data Contribution Formats Document which can be found on the LICENSE IHO DCDB website, and includes the latest conventions and examples of acceptable data formats. The International README.md System of Units (SI) should be used, with the allowed addition of knots (nautical miles per hour, specified to be exactly 1.852 km/h, or approximately 0.514 m/s). As such, depth and offsets measurements should be in metres. 3.3.1. Mandatory Metadata from Trusted Nodes Trusted Nodes should assign additional metadata to crowdsourced bathymetry before they deliver data to the DCDB. Table 1 lists metadata that Trusted Nodes should provide. Note that the Data Field, "Data License", shall list only the "Creative Commons Zero" universal public domain dedication (CC0 1.0). More information on data licensing can be found in Section 5. Table 1. Trusted Node Metadata Data Field Description Example Drovider Contact The Trusted Node's name, in free-text format Example Cruises Inc. Point Organization Name Provider A free-text field for the Trusted Node's email address, so that data support@example.com Email users can contact the Trusted Node with questions about the data Generated by the Trusted Node, this number identifies the Trusted Node and uniquely identifies the contributing vessel. The characters preceding the hyphen (-) identify the Trusted Node, followed by a hyphen (-), and then the vessel's unique identifier. The UUID Unique assigned by the Trusted Node is consistent for each contributing EXAMPLE-UUID Vessel ID vessel, throughout the life of service of the vessel. However, if the vessel chooses to remain anonymous to data users, the Trusted Node does not need to publish the vessel name in association with the UUID. This field describes the format and version for the data and metadata, such as GeoJSON, CSV, or XYZT. Reference the version of GeoJSON CSB 3.0 Convention SB 2.0 CSB 3.0) where possible **Proposed B-12/3.1.0** pmain dedication under which the ata to the DCDB. Additional CC0 1 0 und in Section 5

aithub.com



Implications of the Proposal

- International Hydrographic Organization
- IRCC:
 - Accept proposal to use GitHub tooling for maintenance.
 - Accept proposed B-12/3.1.0 with adjusted Section 3.3.
 - [MS would also have to vote on IRCC decision]
- CSBWG:
 - Provide modified B-12/3.1.0. [done]
 - Formalize structure of GitHub repository for B-12. [copy demo repo]
 - Nominate a Maintenance Group for GitHub repository.
 - Redevelop B-12/3.1.0-3.3 \rightarrow B-12/4.0.0 by 2026 IRCC.
- DCDB (with CSBWG help):
 - Establish GitHub repository for data/metadata definition. [CSBSchema?]
 - Publish documentation of current schema, ideally automatically. [done?]
 - Work with CSBWG for maintenance/development.



Hydrographic Organization Request of Work Item A to the Working Group

Debate the current IRCC Proposal document as circulated and presented.

Approve WG Chair to take the proposal to the next IRCC meeting as our request.





Big

Smaller Details

- Do we agree Section 3.3 (as is) is correctly a DCDB thing?
- Does this proposal meet the requirements for oversight?
- Are we happy with tooling suggested?
- What formatting do we want (e.g., AsciiDoc or MetaNorma)?
- What should the Maintenance Group look like?
- How do we feel about electronic voting for approvals?
- Do we need documents (e.g., PDF) for review, or is online OK?