



B-12 Guidance on Crowdsourced Bathymetry *Data and Metadata*

Discussion Topics



IHO

Discussion Topic #1: Reordering of topics

From: 3.3 Metadata and Data Formats

International
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Organization

Suggestion 1: 3.1 Data Vs. Metadata (added to rev_6 doc)

- 3.2 The Importance of Metadata
- 3.3 Metadata and Data Formats
 - 3.3.1 Mandatory Metadata from Trusted Nodes
 - 3.3.2 Mandatory Data
 - 3.3.3 Recommended Metadata - Vessel Information and Sensor Configuration
 - 3.3.4 Recommended Metadata - Data Processing

Points for discussion:

- Georgie Zelenak (GZ): The proposed addition of a Data Processing subsection increases the length of the chapter and adds more technical details. Restructuring the section to emphasize mandatory data up front would allow less technical users of the document to more easily access the critical information for their purposes.
- Jenn Jencks (JJ): No issue with suggested change.



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Discussion Topic #1: Reordering of topics

From: 3.3 Metadata and Data Formats

Reordering of subsections

Additional input:

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Decisions/Next Steps

Agreement, proceed with Suggestion 1



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Discussion Topic #2: Depth Sensor vs. Sounder

From: 3.1 Data Vs. Metadata, 3.3.2 Mandatory Data

Edition 2.0.3: Primarily uses “sounder”, with additional references to “echo-sounder”

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Suggestion 1: (added to rev_6 doc)

- “Depth sensor” would be the most generic and would require the least maintenance as changes are made in the future

Suggestion 2:

- “Echo Sounder” would be in agreement with S-32 IHO Dictionary

Suggestion 3:

- “Sounder” is frequently used by manufacturers

Points for discussion:

- Decision should be consistent across the document and should be as instrument agnostic as possible
- JJ: “Depth sensor” gets my vote for the reason given. However, I would be fine with any of the terminology listed as long as we are consistent.



IHO

Discussion Topic #2: Depth Sensor vs. Sounder

From: 3.1 Data Vs. Metadata, 3.3.2 Mandatory Data

Edition 2.0.3: Primarily uses “sounder”, with additional references to “echo-sounder”

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Additional input:

- BC: Happy with any option. “Depth sensor” is most generic. Sounder does not necessarily mean acoustic.
- FF: Remove “sounder” from consideration due to reason above
- JD: “Depth sensor”, agreement needed with other sections

Decisions/Next Steps

- Proceed with Suggestion 1 - “Depth Sensor”. Ask for agreement with other sections.



IHO

Discussion Topic #3: CRS of navigation data, vertical reference of depth, and vessel position reference point

From: 3.3.1 Mandatory Metadata from Trusted nodes

Edition 2.0.3: CRS not listed as a metadata field. Vertical Reference of Depth is in optional metadata as “Reference Point for Depth”

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Suggestion 1: (added to rev_6 doc)

- Incorporate these fields into Table 1. Trusted Node Metadata

Suggestion 2:

- Incorporate these fields into Table 2. Mandatory Information

Suggestion 3:

- Incorporate these fields into Table 3. Recommended Metadata - Vessel Information and Sensor Configuration

Points for discussion:

- This information is important for end users and could therefore be considered “Mandatory Information” appropriate for table 1 or 2.
- However, this could add an additional barrier to entry for some potential contributors
- These fields are specific to the file rather than the data point, and therefore may not be appropriate for the “Mandatory Information” table that is currently specific to point data.
- JJ: I vote for #3. I don't see how this information can be required for ALL trusted nodes. Customers would have to input this information.



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Additional input:

- BC: Point about table 2 is well made. Table 2 would mean it must be in every feature object in geojson. Table 2 (suggestion 2) should be removed from consideration. Suggestion 1 (trusted node table) should be appropriate, should be known by each trusted node or data should not be taken. Should be fine to have in trusted node metadata (suggestion 1)
- JJ: In case of Rosepoint (very hands off with hundreds of contributors) how would it work?
- BC: Collecting from NMEA strings, so know CRS. Recording out of strings so know CRS. May choose other methods pending confidence, but they should know.
- JD: Agree with Brian, Suggestion 1 is appropriate. End information users will want to have. In most cases will be WGS84. Unfortunate if people did not submit data because of this though.
- BC: think about value of the data. If the data does not say reference system, even if unknown, data will likely not be used. Could be collecting data with no practical use.
- GZ: Include “unknown” as an option in documentation if mandatory, or highly preferred if in documentation if optional
- BC: Including “unknown” in text could be an option, but may be challenging for vertical
- IHO: CRS mandatory, VR optional?
- BC: Would be an acceptable compromise, however VR should not be optional. Should be mandatory but make it explicit that it can be unknown
- IHO supports that this information is key for end user
- BC: “unknown” should not be an option for horizontal (likely WGS84). Given option, people will likely default to “unknown” instead of specifying
- May have additional TNs if it is not mandatory, but these few extras would not be valuable and likely would not be used.



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Discussion Topic #3: CRS of navigation data, vertical reference of depth, and vessel position reference point

From: 3.3.1 Mandatory Metadata from Trusted nodes

Edition 2.0.3: CRS not listed as a metadata field. Vertical Reference of Depth is in optional metadata as “Reference Point for Depth”

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Decisions/Next Steps

- CRS, VR of depth, and vessel position should all be in mandatory table (suggestion 1)
- Modify suggestion 1 language to include that “unknown” is an option for vertical portion. Do not provide “unknown” option for horizontal option.



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Discussion Topic #4: Specify vessel's PRP longitudinal and latitudinal geographic coordinates

From: 3.3.2 Mandatory Data

Edition 2.0.3: "The vessel's longitudinal geographic position" and "The vessel's latitudinal geographic position"

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Suggestion 1: (added to rev_6 doc)

- "The vessel's PRP (Position Reference Point) longitudinal geographic coordinate"
- "The vessel's PRP (Position Reference Point) latitudinal geographic coordinate"
- Addition of Vessel Position Reference Point in Section 3.3.1 (see discussion topic #3)

Points for discussion:

- IHPT: Sometimes too much precision in the language makes the idea less objective.



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Discussion Topic #4: Specify vessel's PRP longitudinal and latitudinal geographic coordinates

From: 3.3.2 Mandatory Data

Edition 2.0.3: "The vessel's longitudinal geographic position" and "The vessel's latitudinal geographic position"

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Additional input:

- IHPT: "latitudinal" may not translate to other languages although it is correct in English
- BC: could simplify to "vessel's PRP longitude" and "vessel's PRP latitude"

Decisions/Next Steps

- Modify language to "The vessel's PRP longitude" and "The vessel's PRP latitude"



IHO

Discussion Topic #5: Creation of generic “sensor description” composite metadata field

From: 3.3.3 Recommended Metadata

Edition 2.0.3: Numerous fields for sensor information including Sensor Type Sounder, Sounder Make, Sounder Model, Sounder Frequency, Sounder Draft, Uncertainty of Draft, and equivalent fields for GNSS. IMU not included.

Suggestion 1: (added to rev_6 doc)

- Create a single “Sensor Description” composite field that contains type, make, model, and position for the sensor.
- Additional optional information would vary based on sensor and could be outlined in a note beneath Table 3. See example of this in Brian Calder’s sample file.

Points for discussion:

- Recommend removing multiple sensor-related fields in favour of a consolidated “sensor” element (one per sensor in an array), and a uniform positioning vector within that sensor element
- Healy data from Brian Calder includes IMU information as well as GNSS and sounder. Continuing to add additional fields for all possible sensors would lengthen and complicate the guidance document. The proposed “sensor description” composite field could be adapted for a wide range of sensors.



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Discussion Topic #5: Creation of generic “sensor description” com metadata field

From: 3.3.3 Recommended Metadata

Edition 2.0.3: Numerous fields for sensor information including Sensor Type Sounder, Sounder Make, Sounder Model, Sounder Frequency, Sounder Draft, Uncertainty of Draft, and equivalent fields for GNSS. IMU not included.

Additional input:

- Needs to be supported by robust example file, which has been done with BC’s sample
- BC: Should standardize information for sensor type. Read first element of array, know it’s a sounder, and then know what to expect in remaining elements.
- FF: Agree with suggestion
- JJ: agree

Decisions/Next Steps

- Proceed with Suggestion 1



IHO

Discussion Topic #6: Level of Processing

From: 3.3.3 Recommended Metadata

Edition 2.0.3: Not included

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Suggestion 1: (added to rev_6 doc)

- Add “Data Processed” field to Table 3. Recommended Metadata - Vessel Information and Sensor Configuration. Anticipate true/false response. If true, optional fields in section 3.3.4 should be reviewed. If false, information in 3.3.4 is not needed.

Points for discussion:

- Inclusion of language related to grids should be deferred for future discussion.
- JJ: I like this suggestion a lot. And agree that discussion of gridded products should be deferred to future meetings and future B-12 updates. Definitely outside of scope for this edition.



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Discussion Topic #6: Level of Processing

From: 3.3.3 Recommended Metadata

Edition 2.0.3: Not included

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Additional input:

- JJ: likes suggestion. Shows how initiative has grown in ways we did not initially anticipate. We initially just anticipated raw data, but now most trusted nodes talk about this. Most want to contribute some level of processed data. Right now we have no way to capture that information. Can still send unprocessed data, but this is a clean solution for processed data.
- BC: Concur. Programmatically, this is a clean way to say “do I need to look for further metadata”. If true, know to look for more. If false, don’t look for anything more.]
- Contributor comments - example comment has US-style date.

Decisions/Next Steps

- Proceed with Suggestion 1
- Review data in contributor comments - make ISO-standard instead of US-style date



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Discussion Topic #7: Additional Metadata Table for Processing

From: 3.3.4 Recommended Metadata - Data Processing

Edition 2.0.3: Metadata regarding data processing is not incorporated, or is insufficiently captured in Optional Metadata

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Suggestion 1: (added to rev_6 doc)

- Addition of new section 3.3.4 Recommended Metadata - Data Processing. Corresponding Table 4. Recommended Metadata for Processed Data proposed.

Points for discussion:

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Discussion Topic #7: Additional Metadata Table for Processing

From: 3.3.4 Recommended Metadata - Data Processing

Edition 2.0.3: Metadata regarding data processing is not incorporated, or is insufficiently captured in Optional Metadata

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Additional input:

- BC: If allow processed data the data will be suspicious without additional information. If something has been done to the data we need to know what has been done. Gives you the option to not use data or proceed with using data.
- JJ: fully support recommendation
- GZ: separate table makes process easier for TNs submitting raw data, will be clear that this information is not required.

Decisions/Next Steps

- Proceed with suggestion 1



IHO

Discussion Topic #8: Reference Point for Time

From: 3.3.4 Recommended Metadata - Data Processing

Edition 2.0.3: Not included

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Suggestion 1: (added to rev_6 doc)

- Incorporate as a field in the new Table 4: Recommended Metadata for Processed Data
- Propose calling field “Time Stamp Interpolation”

Points for discussion:

- Data collector should be required to indicate what method they use for assigning time to depth.



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Discussion Topic #8: Reference Point for Time

From: 3.3.4 Recommended Metadata - Data Processing

Edition 2.0.3: Not included

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Additional input:

- BC: The point here is that whatever sort of data we collect (NMEA 183 or NMEA 2000) the depth data is asynchronous. Must assign a time stamp to the depth. TeamSurv only records NMEA string, no timestamp included. Other loggers will record higher resolution time. Accuracy is very different so usability is very different. Should be able to record this.

Decisions/Next Steps

- Proceed with Suggestion 1



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Discussion Topic #9: Sound Velocity Value

From: 3.3.3 and 3.3.4

Edition 2.0.3: Not included

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Suggestion 1: (added to rev_6 doc)

- Maintain “Sound Speed Applied” field in the Optional Metadata table, with anticipated true/false response
- If true, specify that providers should review additional metadata fields in the Recommended Metadata - Data Processing table, where the Sound Speed Correction field has been added.

Points for discussion:

- Question as to whether Sound Velocity Value should be added to the Optional Metadata table
- Noted that we should be careful to use sound speed rather than sound velocity as it doesn't have a direction
- Brian Calder (BC) queried whether it is actually necessary on the basis that very few collectors would actually record sound speed.



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Discussion Topic #9: Sound Velocity Value

From: 3.3.3 and 3.3.4

Edition 2.0.3: Not included

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Additional input:

- GZ: programmatically simplifies looking for additional metadata, does not add major barrier for TNs as it can be a simple “false”

Decisions/Next Steps

- Proceed with suggestion 1



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Discussion Topic #10: Specification of SI units

From: 3.3, 3.3.3, and 3.3.4

Edition 2.0.3: Some metadata fields (such as depth) specify units should be in meters, but there is no blanket statement

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Suggestion 1: (added to rev_6 doc)

- Add the following to the beginning of 3.3. Metadata and Data Formats:
 - In the metadata description, the International 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)

Points for discussion:

- Current sample 2.0 convention in appendices shows additional metadata fields for units that are not listed in Section 3. This has caused confusion, with some trusted nodes submitting initial test files in “feet”
- Submissions should be standardized to SI units, with all metadata fields and sample files in agreement.
- Julien Desrochers (JD): Should it be specified that this translates to depth and offset measurements in meters?
- BC: Are other nautical-specific units required?
- IHPT: Only in the description of the metadata or also in the acquisition of the data?



IHO

Discussion Topic #10: Specification of SI units

From: 3.3, 3.3.3, and 3.3.4

Edition 2.0.3: Some metadata fields (such as depth) specify units should be in meters, but there is no blanket statement

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Additional input:

- JJ: As such, depth and offsets measurements should be in meters.
- IHPT: This standardization to SI units should be specified in other portions of B-12 as well.
- BC: not a massive lift to require that submitted files are in meters. Can't require manufacturers to change their systems, but it is easier
- GZ: pointed out that we specify it in some metadata fields already, would simplify onboarding
- Annie Ji (AJ), JJ agree

Decisions/Next Steps

- Proceed with Suggestion 1



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Discussion Topic #11: New version 3.0 convention needed, potential addition of xyz example

From: 3.3.1, annex

Edition 2.0.3: References convention 2.0, example of this convention is in an annex

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Suggestion 1:

- Reference convention 3.0 in “convention” field of 3.3.1 Mandatory Metadata from Trusted Nodes
- Use Brian Calder’s sample file as a starting point for a new convention 3.0 geojson example in the annex
- Create additional annex demonstrating only mandatory fields in geojson format
- Create additional annex demonstrating xyz format

Points for discussion:

- The changes proposed in Section 3 necessitate the creation of a new convention and sample file as many fields have been changed from the current convention 2.0 provided as an annex. New trusted nodes regularly reference the sample file in the annex rather than reading Section 3 in depth.
- Additional sample files demonstrating minimal fields and the xyz format would be useful to Trusted Nodes in addition to the current geojson example.
- How stable will the data formats be? If stable, they could be added as annexes. Else would they be better suited to an outside resource on the DCDB and IHO resources?



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Discussion Topic #11: New version 3.0 convention needed, potential addition of xyz example

From: 3.3.1, annex

Edition 2.0.3: References convention 2.0, example of this convention is in an annex

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Additional input:

- BC: makes sense to have minimal viable xyz and geojson. Could be more useful to have digitally readable file rather than encoded into word document. Could make sense to have separate resource with machine readable version
- JD: Agree to have simplified versions of geojson and xyz
- GZ: asked about barriers to external reference if we remove this from B-12
- IHO: Discussion came up in previous meeting. Don't see any barriers. Don't know exactly what it could look like, but could see it being on CSBWG website with links
- JJ: could host on DCDB website
- BC: consider versioning. Make a repository on github, B-12 could reference repository (that would show history), CSBWG could maintain repository
- JJ: Supports Brian's suggestion

Decisions/Next Steps

- **ACTION:** Discuss what links on CSBWG could like, would apply to other sections as well. Follow up on github proposal
- Include minimal viable versions of xyz and geojson as well as thorough xyz and geojson examples. Stand up outside of B-12 on DCDB website, CSBWG website, and/or github



IHO

Discussion Topic #12: Inclusion of Encoding Information

From: 3.3 Metadata and Data Formats

Edition 2.0.3: Not included

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Suggestion 1:

- Defer discussion, provide complete example of 3.0 and add references to the annex in Section 3 text
- Consider the creation of a companion document outside B-12

Suggestion 2:

- Expand scope of current edits to incorporate encoding information within Section 3 of B-12

Points for discussion:

- (BC to lead)
- JJ: Information on the data formats (geojson, xyz) should be added to Section 3. Alternatively at least link to the annex showing the geojson format



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Discussion Topic #12: Inclusion of Encoding Information

From: 3.3 Metadata and Data Formats

Edition 2.0.3: Not included

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Additional input:

- BC: became clear as modifying the document. We are not a standards document, we do not want to be a standards document. But in practice we are. We are establishing a standard for the encoding we are requiring from users. This is not good news for us. Suggestion 1 is probably the best we can do right now. Else we would be adding a lot of detail to B-12. Should have a companion document to B-12. If we added to section 3 it would not be done this year.
- IHO: Agree with suggestion 1, especially deferring the discussion. Would need to think about where such a guide would live in amongst the broader family of similar documents within the broader suite of IHO documents. There may be a logical home within other standards documents that could provide efficiency in developing the material. Support deferring discussion, not including in this round of edits
- BC: Choosing suggestion 1 does not mean “do nothing about it”. Could say that how you go from metadata to example could be complex, review example
- JJ, FF: likes suggestion

Decisions/Next Steps

- Suggestion 1 accepted, add statement about reviewing example as BC suggests



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Discussion Topic #13: Controlled Vocabulary

From: 3.3 Metadata and Data Formats

Edition 2.0.3: Not included

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Suggestion 1: (added to rev_6 doc)

- Create a companion document outside of B-12. Potentially this could be part of an external “trusted node guide” that incorporates encoding and controlled vocabulary?

Suggestion 2:

- Create annotated version of 3.0 convention that includes detailed comments alongside the sample data and metadata

Points for discussion:

- We need to be very clear on what controlled vocabulary terms mean. If we accept the proposed changes to the section we need to clearly define “ellipsoid”, etc.



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Discussion Topic #13: Controlled Vocabulary

From: 3.3, 3.3.3, and 3.3.4

Edition 2.0.3: Some metadata fields (such as depth) specify units should be in meters, but there is no blanket statement

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Additional input:

- BC: Context - this is a consequence of discussion topic 12. If we make an encoding guide, various things in here will need to have a known vocabulary. Else will have many variations that will make things difficult. If build encoding guide, include a controlled vocabulary that makes clear what we mean by terms. Have seen real-world impacts on other projects.
- BC: Discussion topic 12 was deferred from this update. So we are obligated here to defer suggestion 1 until we do an “encoding guide”.
- JD, JJ agree with deferral

Decisions/Next Steps

- Defer creation of “encoding guide” that would capture discussion topics 12 and 13



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Discussion Topic #14: Data license

International
Hydrographic
Organization

Edition 2.0.3: Not currently included

Suggestion 1:

- The data license under which the Trusted Node is providing CSB data to the IHO DCDB should be captured in the metadata. Suggest adding “Data License” field to Table 1. Trusted Node Metadata
 - Description: The Creative Commons public domain dedication under which the Trusted Node is providing CSB data to the IHO DCDB
 - Example: CCO
- Add the following to Section 3.3.1 text:
 - Note that the Data Field, “Data License”, shall list only the Creative Commons 1.0 Universal public domain dedication (CC0). More information on data licensing can be found in the Additional Considerations section

Points for discussion:

- JJ: Once the CC license has been agreed upon, it will actually be mandatory and unable to be changed. Need to consider how to capture this.



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Discussion Topic #14: Data license

International
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Edition 2.0.3: Not currently included

Additional input:

- JJ: Raised by Giuseppe during greater meeting. Should discuss what data license is within the data package. The question here is not “what should the license be” (that will be in another section’s discussion). NOAA lawyers proposed having this as a metadata field. So for this group, what is the best way to have that captured?
- BC: Do not disagree that it should be a part of the metadata. If specify it is part of the metadata, think should have a URL pointing to the licensing information.
- JJ: <https://creativecommons.org/publicdomain/zero/1.0/>
- BC: Could this be a barrier to entry?
- JJ: Data could not be made discoverable without this license. In the case of not having a CRS, the data could still be made available and be a pat on the back for company, maybe GEBCO could use it. So “unknown” for the CRS mandatory field could still have some use, even if not for Brian. But if the license is not correct it could not even be discoverable.
- BC: So say data cc’ed by attribution. Would mean data could not be used for many things. But why couldn’t make it discoverable?
- JJ: Getting into discussion for other section. DCDB does not want to play police by doing licensing
- BC: already being police by filtering data. Fine with saying this is how things should be because it makes things simple. Can say it must be CC0 or we’re not taking it. But make it clear that our intention here is to be keeping things simple. Need to be consistent with previous suggestions
- JJ: recognize importance of consistency.
- BC: “as policy decision, will not make data publicly available unless it’s CC0”. Be clear on that instead of round-about argument for debate. Be clear it’s a policy decision and make it clear, make it so Georgie does not have to defend decision with every new TNs
- JJ: so say “use CC0 or don’t send data”. IHO feedback?



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Discussion Topic #14: Data license

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Edition 2.0.3: Not currently included

Additional input:

- IHO: straying into conversation for tomorrow. Nervous that conversation here will need to be replayed tomorrow. Need to table it here. Perfectly acceptable to say it is a policy decision as long as appropriately made. What will burden be of managing this in the future? If volume grows, what does that mean for policing the licensing issue and protecting data contributors/TNs? Last thing we need is a complex issue. Totally reasonable to make a policy decision as long as clear about rational behind it. But by going down this route, what is barrier to contributing? Far more subjective discussion.
- GZ: so what do we need to include in this section?
- JJ: Text needs to be drafted and included here, short statement that this is a policy decision.
- BC: Ok to make a policy decision, but make it clear that this is the decision.
- BC: Modification - instead of having description and example, instead just have a license field in table 1 with a URL in example field. Entry in text may depend on discussion tomorrow



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Discussion Topic #14: Data license

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Edition 2.0.3: Not currently included

Decisions/Next Steps

- Add a link to the URL pointing to licensing information (<https://creativecommons.org/publicdomain/zero/1.0/>)
- Accept adding this to mandatory TN metadata
- Language will need to be refined pending conversation in additional considerations section. Likely a statement about “policy decision”