



United Nations
Educational, Scientific and
Cultural Organization



International Centre
for Water Resources and Global Change
under the auspices of UNESCO



GTN-H report to TOPC-21

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TOPC-21, Marrakech, Mar 22 2019



GTN-H: major activities in 2019

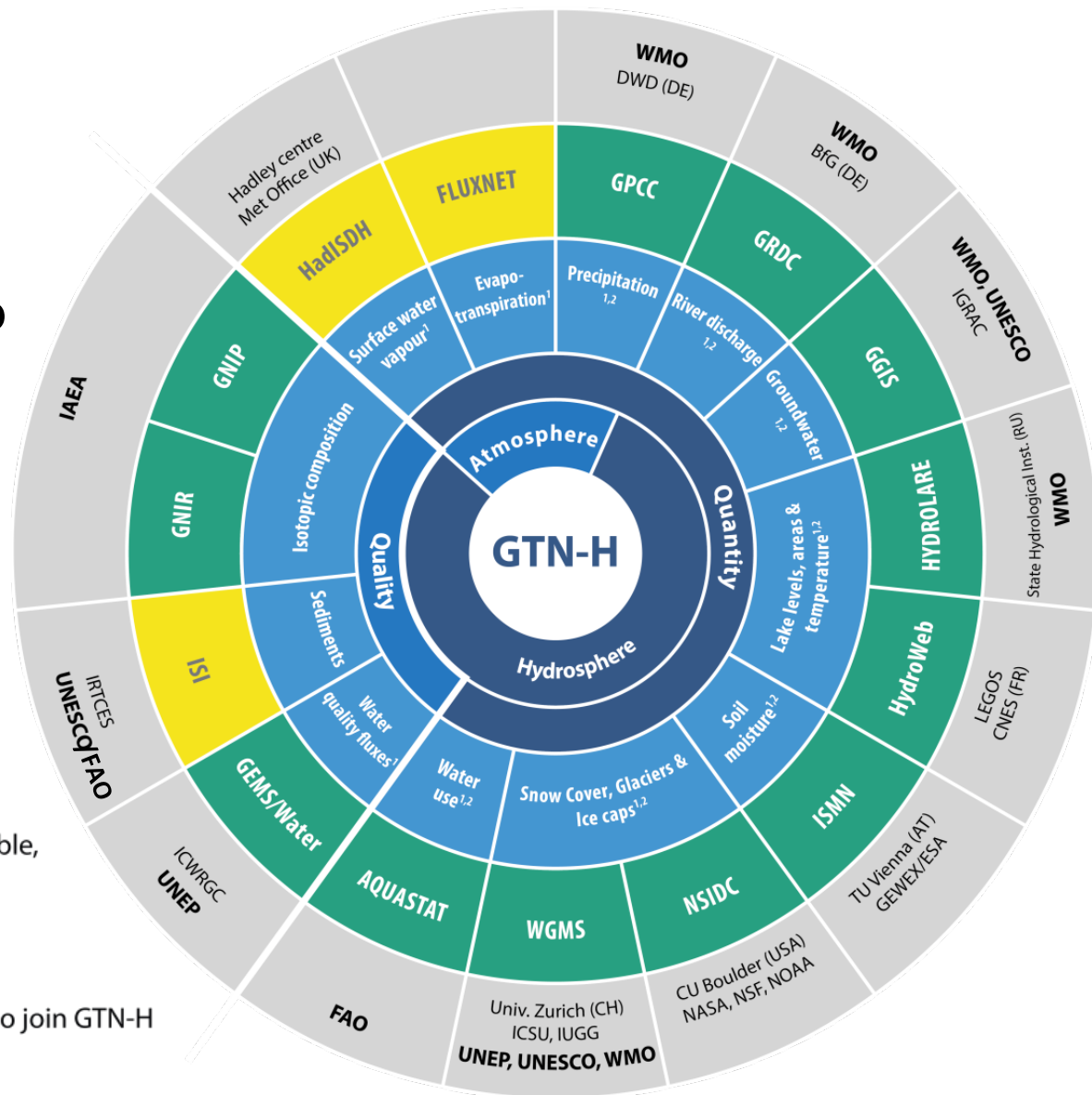
- **10th GTN-H-Panel Meeting** St Petersburg (8-9 (?) October 2019).
- **GCOS JPM and TOPC (2019, Marrakesh)**
- ***Essential Climate Variables*** (GCOS ECVs) and ***Essential Water Variables*** (GEO EWVs) for the hydrosphere and **GCOS IP 2022**.
- Contributions to **GEO Workplan 2020-22** in particular IN-SITU-WATER.
- Development of a GTN-H-Community-Portals **geoportal.org** (to be linked with WHOS).
- Joint Development of **integrated data products** of GTN-H member data centers.
- Negotiations for taking over the **operational part of the ISMN**





The existing operational global water data centers (mostly in situ)

Do you agree with new cycle?



- Variable, ¹GCOS Essential Climate Variable, ²GEO Essential Water Variable
- GTN-H member network
- Global network/identified/suggested to join GTN-H



Development Plans / integrative data products

Schedule (GRDC, GEMS, GPCC):

- Agreement: Draft of 1st Pilot end of 2018
- Pilot studies with master thesis

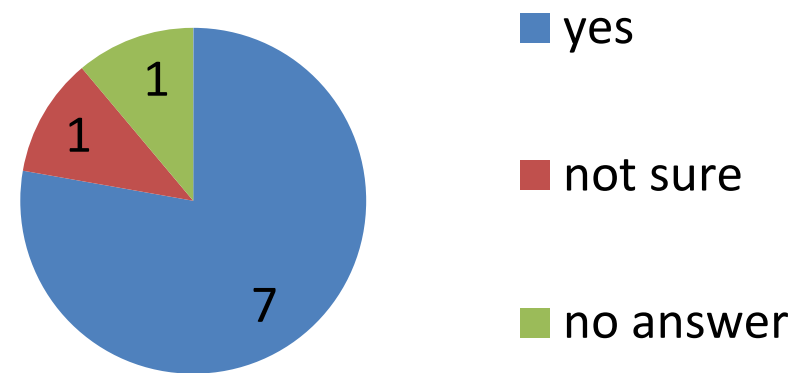
challenges

- Temporal / spatial overlaps
- Scaling to global products

Interest of further GTN-H member networks

- ?

Should we provide data products (e.g. integrative data products of joint analysis of different networks) on the GTN-H...





Development Plans / integrative data products

– GPCC – GRDC

Analysis of relationship between precipitation and runoff (to start in June 2019)

– GEMStat – GRDC

load calculation (Pilot study ongoing)

– GPCC – GRDC – GEMStat

Relationship between drought and water quality (Pilot study from Nov 2019 on)

Additional support by an additional position in cooperation with BfG: joint permanent position for GRDC and GTN-H



Master thesis: Blanca Torres Vara
 „Estimation of Nutrient Load in South Africa” (Oktober 2018 – März 2019)

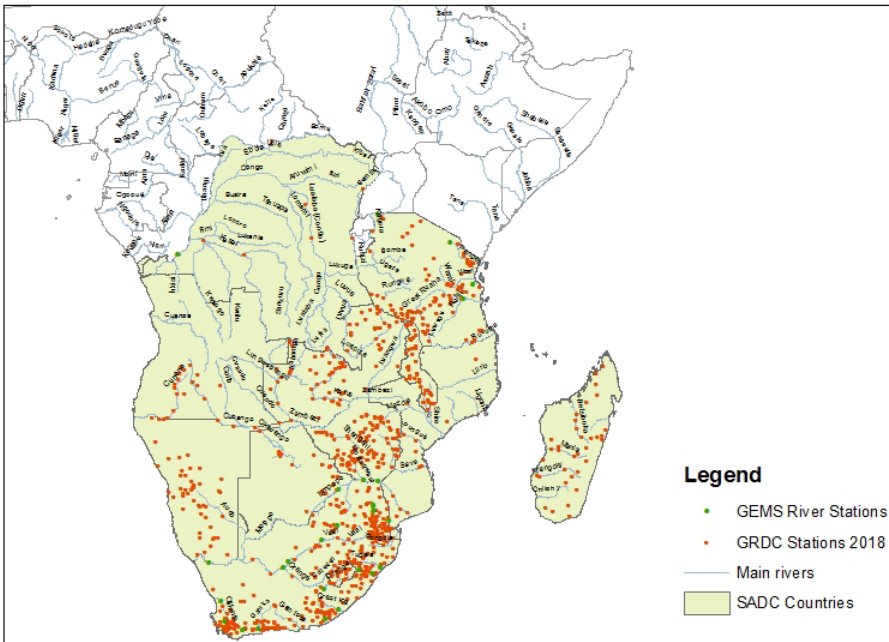


Fig. 1 Distribution of GRDC and GEMStat stations

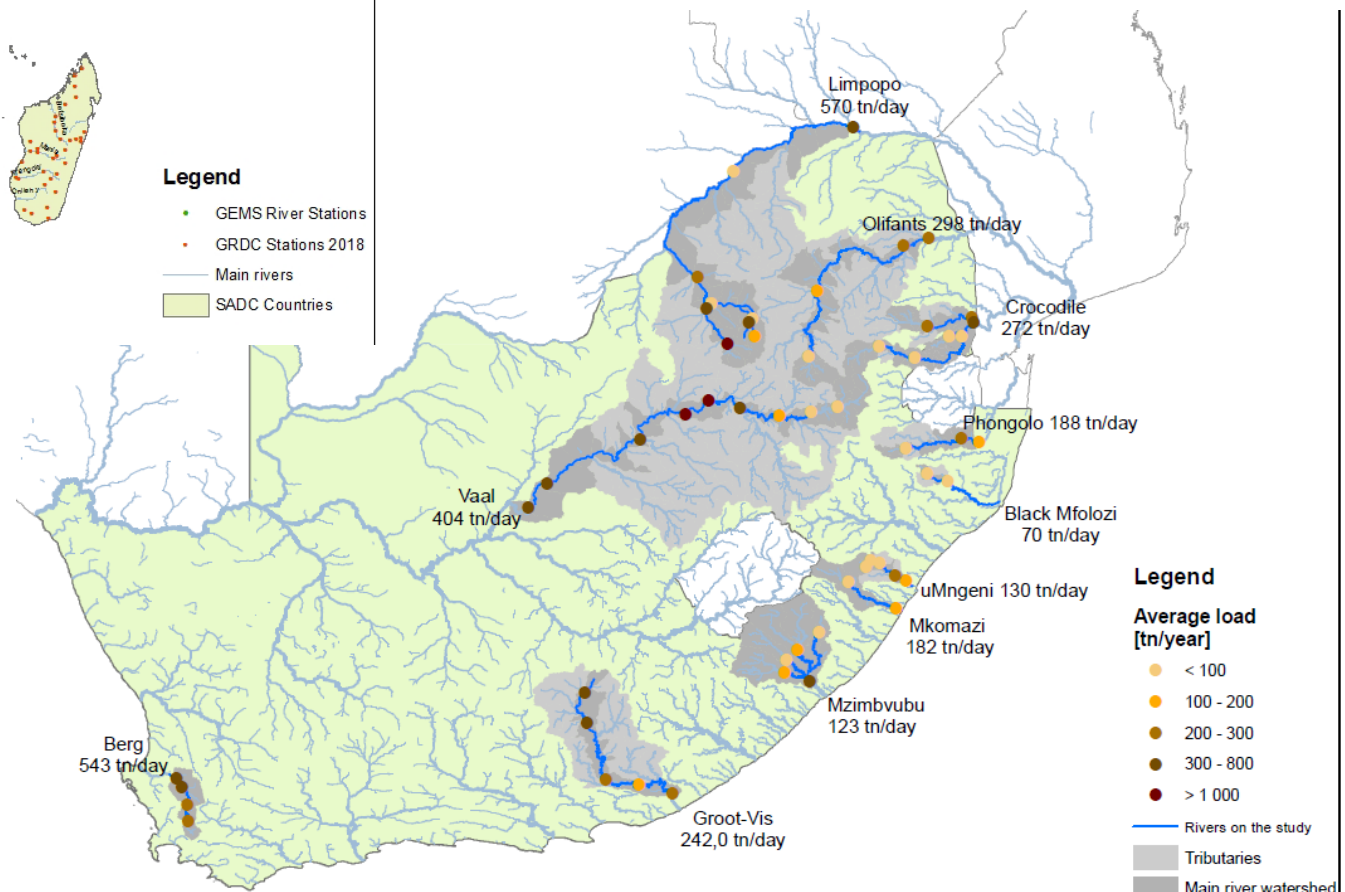


Fig. 2 Average dissolved nitrate and nitrogen loads (tn/yr) to identify the priority regions.

Development Plans / GTN-H community portal



The screenshot displays the GTN-H community portal interface. At the top, there is a search bar with the text "Enter search words ..." and a search icon. Below the search bar, there are several filter options:

- Full and Open Dataset
- Essential Climate Variable (dropdown menu)
- Focus Area (dropdown menu)
- Enter a location (text input field)

A search dropdown menu is open, showing a list of categories and sub-categories:

- HYDROSPHERE
 - Precipitation (GPCC)
 - River Discharge (GRDC)
 - Lake levels (HYDROLARE, LEGOS)
 - Water Use (FAO)
 - Glaciers (NSIDC, WGMS)
 - Soil moisture (ISMN)
 - Groundwater (IGRAC)

Below the search dropdown, there are radio button options for relationship types and time periods:

- contains
- overlaps
- disjoint
- Last week
- Last month
- Last year

The background of the interface is a world map. On the right side of the map, there are several navigation icons: a magnifying glass, a search icon, a plus sign, a square, a house, and a book. At the bottom right of the map, there are links for "Send Feedback" and "Terms & Conditions".

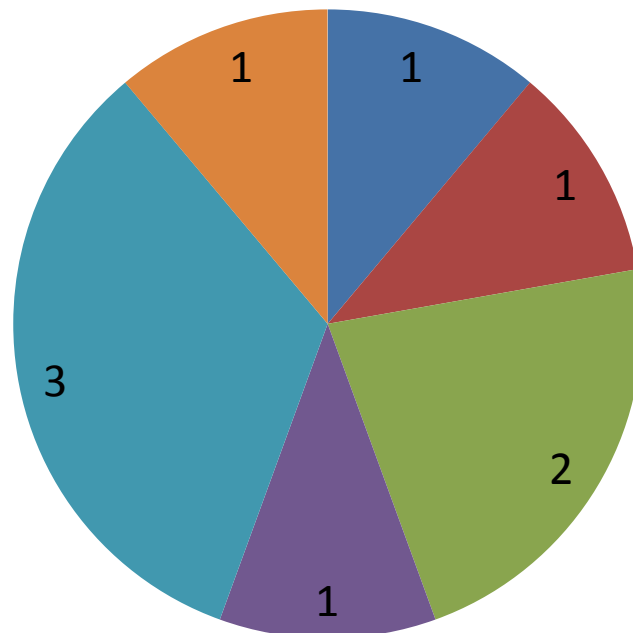


Increasing discoverability



The reality

Do you follow an international standard for metadata description?



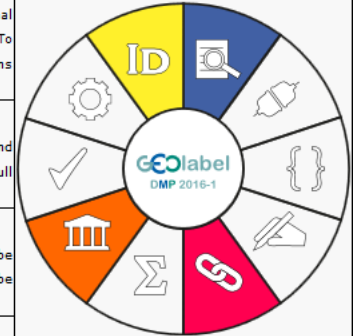
- CF
- SDMX
- ISO19115/19139
- ICSU-WDS
- not yet
- no/no need

GEO data management principles

DMP label			
	Discoverable	1	D
	Accessible	2	A
	Standard encoding using	3	Usability
	Well documented metadata	4	
	Traceable	5	
	Quality documented	6	
	Preserved	7	Preservation
	Periodically verified	8	
	Reviewed and refreshed	9	Curation
	Tagged with permanent ID	10	

Please indicate which principles you are conformant with:

	<input checked="" type="checkbox"/> DMP-1: Metadata for Discovery Data and all associated metadata will be discoverable, through catalogues and search engines, and data access and use conditions, including licenses, will be clearly indicated.
	<input type="checkbox"/> DMP-2: Online Access Data will be accessible via online services, including, at a minimum, direct download but preferably user-customizable services for access, visualization and analysis.
	<input type="checkbox"/> DMP-3: Data Encoding Data should be structured using encodings that are widely accepted in the target user community and aligned with organizational needs and observing methods, with preference given to non-proprietary international standards.
	<input type="checkbox"/> DMP-4: Data Documentation Data will be comprehensively documented, including all elements necessary to access, use, understand, and process, preferably via formal structured metadata based on international or community-approved standards. To the possible extent, data will be described in peer-reviewed publications referenced in metadata records.
	<input checked="" type="checkbox"/> DMP-5: Data Traceability Data will include provenance metadata indicating the origin and processing history of raw observations and derived products, to ensure full traceability of the product chain.
	<input type="checkbox"/> DMP-6: Data Quality-Control Data will be quality-controlled and the results of quality control shall be indicated in metadata; data made available in advance of quality control will be flagged in metadata as unchecked.
	<input checked="" type="checkbox"/> DMP-7: Data Preservation Data will be protected from loss and preserved for future use; preservation planning will be for the long term and include guidelines for loss prevention, retention schedules, and disposal or transfer procedures.
	<input type="checkbox"/> DMP-8: Data and Metadata Verification Data and associated metadata held in data management systems will be periodically verified to ensure integrity, authenticity and readability.
	<input type="checkbox"/> DMP-9: Data Review and Reprocessing Data will be managed to perform corrections and updates in accordance with reviews, and to enable reprocessing as appropriate; where applicable this shall follow established and agreed procedures.
	<input checked="" type="checkbox"/> DMP-10: Persistent and Resolvable Identifiers Data will be assigned appropriate persistent, unique and resolvable identifiers to enable documents to cite the data on which they are based and to enable data providers to receive acknowledgement for use of their data.



http://geolabel.info/DMP_generation.htm



Development Plans / new staff members

- Successful fundraising for additional team members
 - **Joint permanent position for GRDC und GTN-H**
 - **Development of (integrative) data products for GRDC and GTN-H**
 - **Support of GTN-H coordination**
 - R&D position (three years, starting in July 2019)
 - Quantification and Assessment of global sediment, pollution and nutrient loads using GEMStat and GRDC data
 - Upscaling uncertainties of field measurements to global data bases , e.g. GEMStat.
- Continuation of development of pilot studies with Master students



List of Actions / Preparation for Panel meeting 2019 and GTN-H Implementation Plan 2020-21

- **Continuation of started objectives**
 - Strengthening discoverability of GTN-H data (meta information)
 - Pilot via GEOSS community portal
 - Work on sharing data, increase support of WATER-ML2
 - Potential future use for GTN-H networks, especially for complementary use of in-situ and EO data
 - Pilots with IHP-HWRP research communities (FRIEND-water, ERB, etc) and others (potentially NextGEOSS)
 - Development of integrative data products
 - Sharing information between centres but also GCOS, WMO, UNESCO, GEO initiatives (GEOGLOWS, IGWCO CoP)
 - Alignment of ECV and GEO EWV
- **Recommendations by TOPC:**
 - ...



International Centre for Water Resources and Global Change Koblenz

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www.waterandchange.org



List of Actions / Work plan of GTN-H 2017-2019

No.	Action	Who	State	
8	Visualization of meta-data	All GTN-H partners	Exchanging ideas and know-how to visualize meta-data: Informally ongoing, prepare an action plan	
18	Documentation of best practices and quality management tools and approaches	All GTN-H partners	Preparation of a template of a best practice document: In progress, not yet completed Partners to contribute overview papers; partially reflected in status presentations of data centers in 8th GTN-H Panel session	
19	Registration of data in the GEO Portal	All network partners, GEO	Provide clarification of the registration process of data in the GEO Portal: Done for GRDC. Other GTN-H partners to provide status information	



List of Actions / Work plan of GTN-H 2017-2019

No.	Action	Who	State	
21	Interact more closely with WIGOS, WIS and the development of WHOS	GTN-H and GRDC in cooperation with WMO	Develop and circulate a concept note on this issue: In progress, interaction is working	
22	Registration of GTN-H datasets with WIGOS	CHy and GTN-H	In progress through federated data centers; request status of registration progress	
25	Addressing GEOSS Water Strategy Recommendations	GEO-Sec in cooperation with GTN-H	Action document endorsed by GTN-H session, starting up activities in accordance to the document: slow development, resource issues at GTN-H; see status below	



List of Actions / Work plan of GTN-H 2017-2019

No.	Action	Who	State	
26	Develop strategy paper addressing upcoming challenges and opportunities for GTN-H	GTN-H in cooperation with network partners and governing bodies	Re-start as a result of 8th GTN-H Panel Session	
28	Develop a network of support partners to cooperate on the development of integrated data products	All GTN-H partners	Identify opportunities for and existing potential network partners: slow start, needs to be further discussed and acted upon	



List of Actions / Work plan of GTN-H 2017-2019

No.	Action	Who	State	
35	Define relationship between GTN-H and WIGOS /WIS	WMO, GTN-H	Enhance contacts; all data centers potentially become a DCPC platform in WIGOS/WIS: Needs to be discussed further (HYDROLARE, IGRAC)	
36	Cooperate with GCOS, WMO and GEO in the Rolling Review of Requirements	GTN-H, GCOS, WMO, GEO (GEOGLOWS, IGWCO, GEO-Sec)	Prepare overview of current state of RRR for related WMO variables, ECVs and EWVs prepare concept not with a proposed action plan to harmonize RRR where appropriate	
37	Cooperate with GEO to define further actions related to the coordination of terrestrial observations	GTN-H, IGWCO, GEOGLOWS, GEO-Sec	Clarify roles of organizations/programs; develop strategy document with expected outcomes and based on common agreement, an action plan	

major links between GTN-H and IGWCO has been GTN-H's engagement in implementing the GEOSS Water Strategy

GEO Water Strategy: Action list for GTN-H

– Enhancing User Engagement

- (A.2) GEO Water should develop and launch a continuous process to identify, articulate, and further refine user needs in the various water communities from the local scale to the global scale.
- (A.4) Inventory of current data services supporting GEO Water should be developed
- (A.5) Evaluation of the data holdings of global data centres

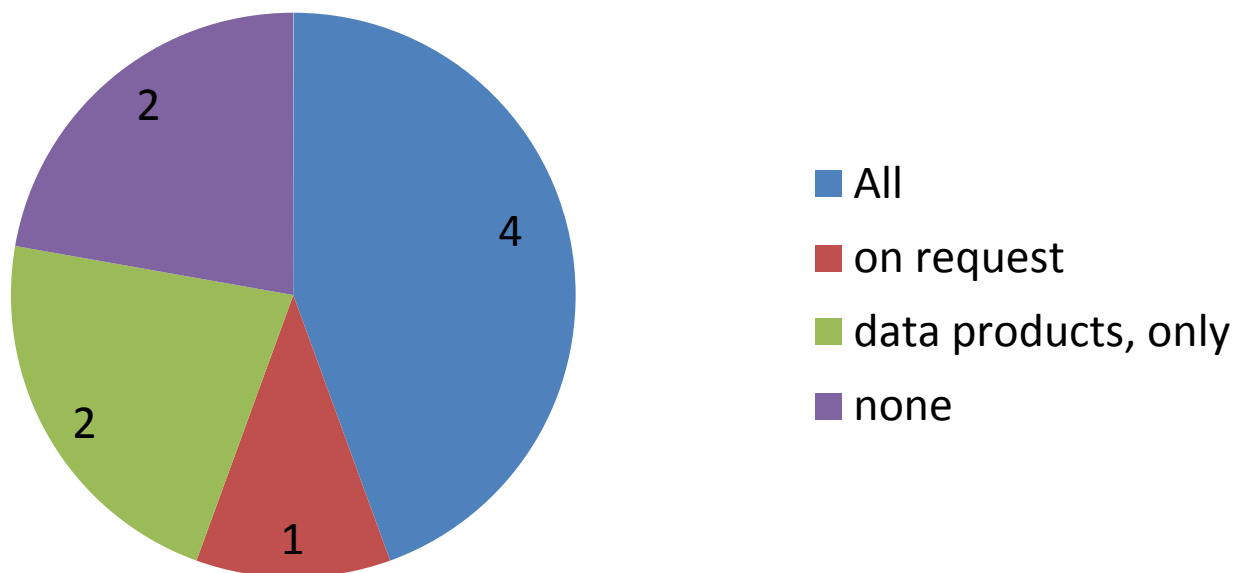
– Strengthening in-situ data acquisition

- (D.1) GEO, IGWCO COP, WMO and GTN-H could launch a study of the potential of observations from volunteers, education systems, and local governments (Synthesis Paper)

– Facilitating data sharing and common standards

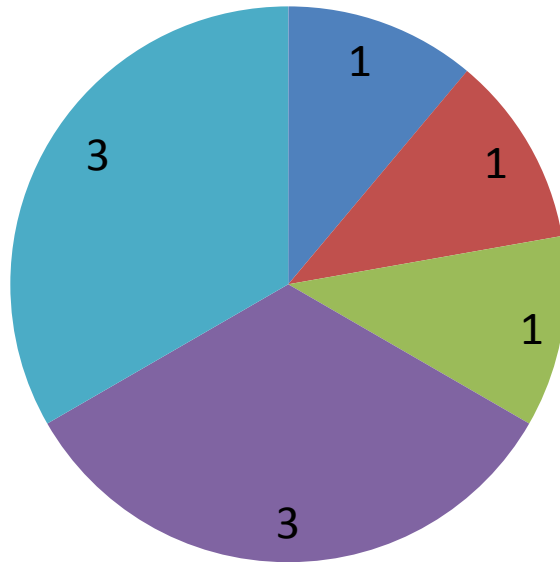
- (F.1) Institutions maintaining archives of water cycle variables should apply modern standards of open data stewardship
GTN-H could review the procedures of its centres to ensure that modern data capabilities are available

Which products and datasets are offered as open data?





Do you follow an international standard for data exchange?



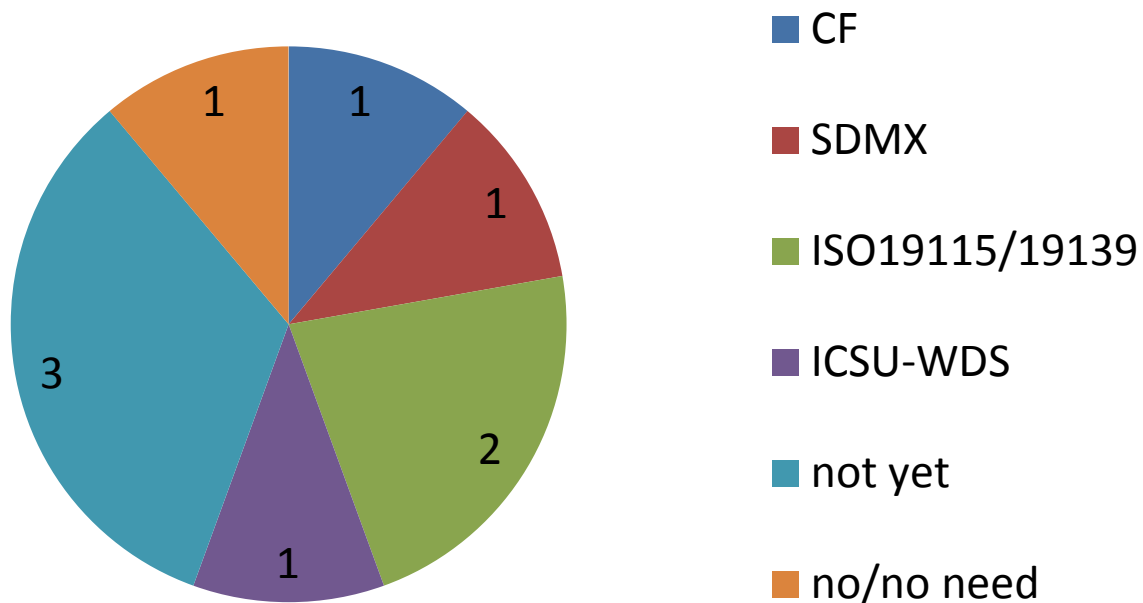
- CF
- SOS
- OGC WMS
- not yet
- no/no need

CF netCDF_4.0

OGC WMS

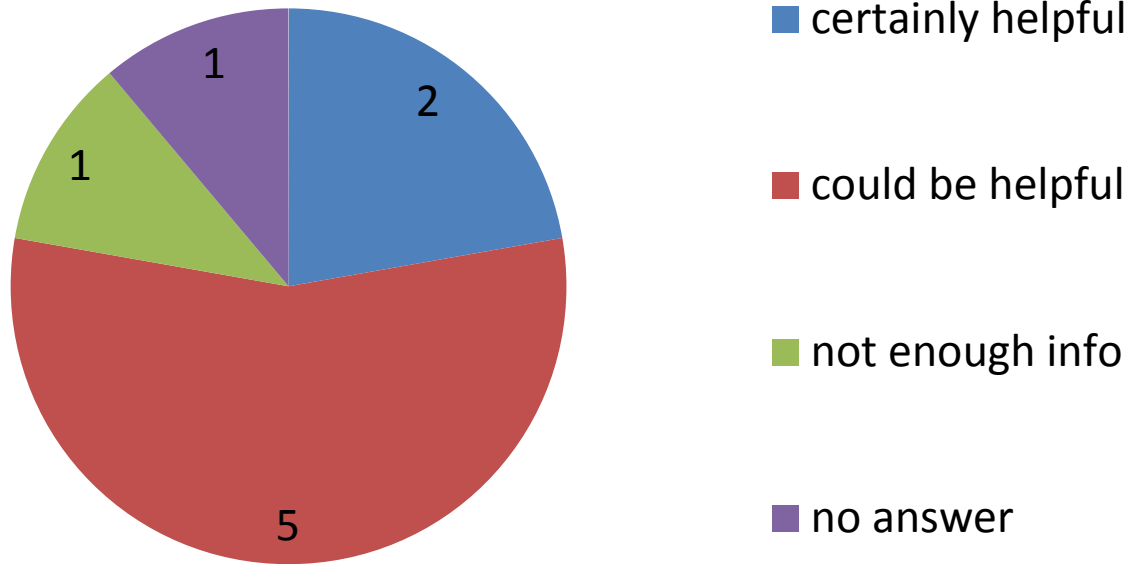
WaterML2.0 part 1 Time series with SOS2 hydrology profile

Do you follow an international standard for metadata description?

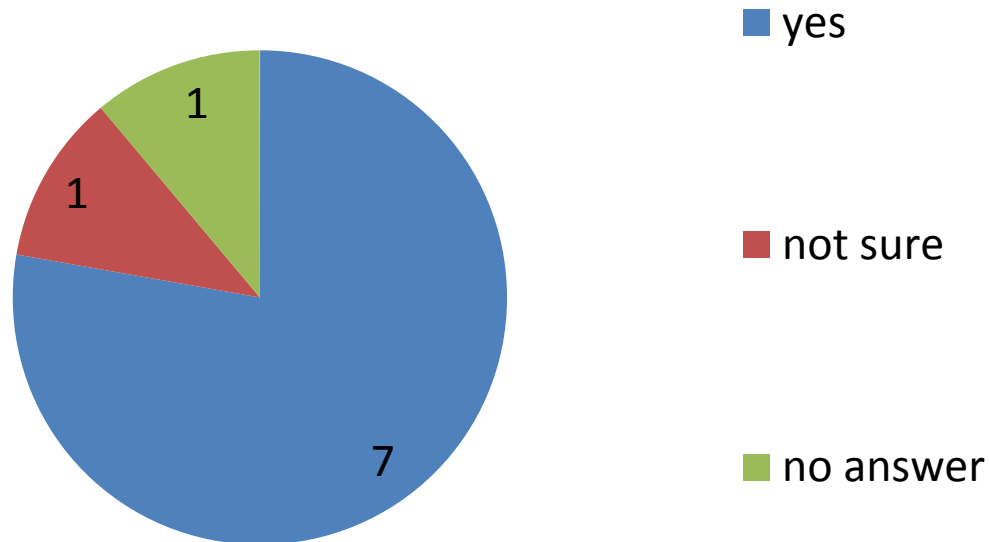




What do you think about a GTN-H community mirror at geoportal.org?



Should we provide data products (e.g. integrative data products of joint analysis of different networks) on the GTN-H website?

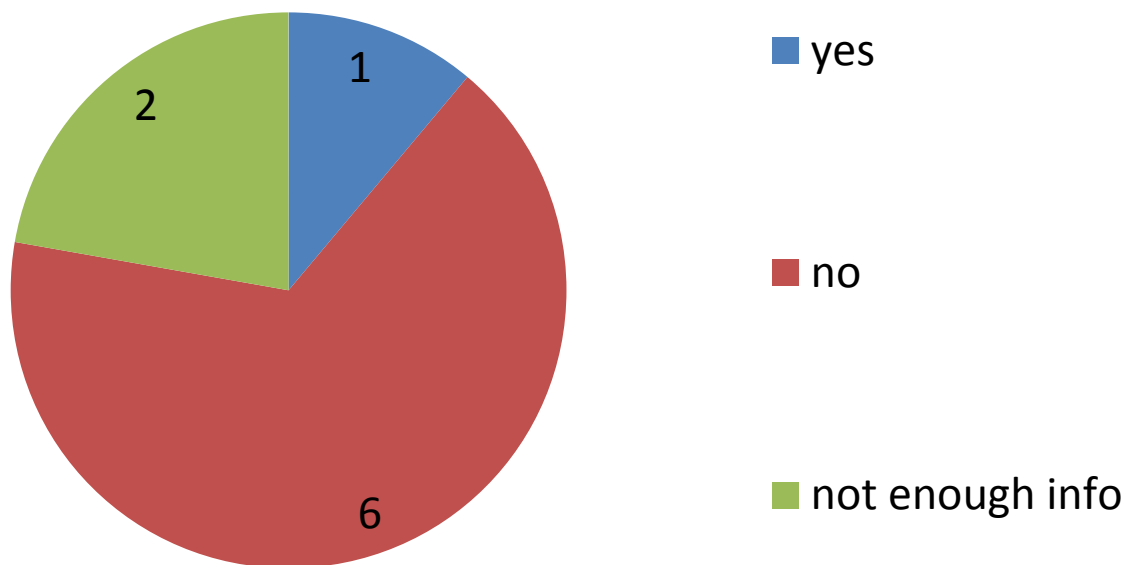




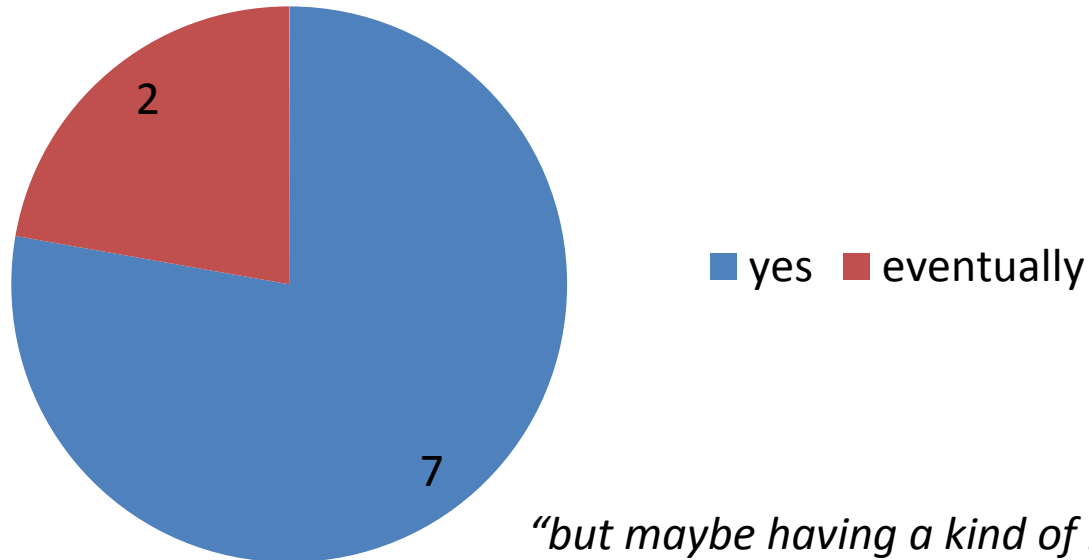
News / Questionnaire - coordination

- collaboration between data centers should be strengthened
 - develop new ideas together
 - Information exchange amongst affiliated data centres and initiatives e.g. GCOS, GEO, etc.
 - Coordination of entries in the different (meta)data portals (GEOSS etc.)
- Development of data/product requirements
 - liaise with custodian agencies (WMO, UNESCO, UNEP) on data/product integration in upstream information systems

Should the GTN-H re-evaluate its organizational form?



Should we meet more often than the biennial meetings?



“but maybe having a kind of newsletter with important deadlines and outcomes, or when some important news needs to be released to other center, this could be nice. “