



2021 United Nations Decade  
2030 of Ocean Science  
for Sustainable Development

# PICES Training Session #2 “International Data Management”



## Data Management in the Republic of Korea

Kyungpook National University

Seung-Tae Yoon

# Contents

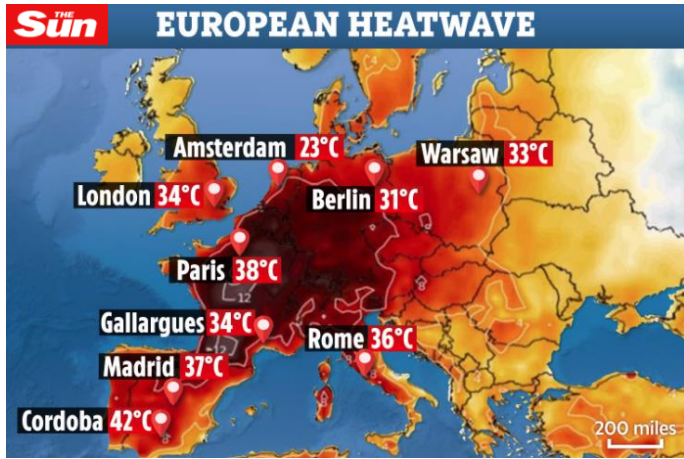
- 1. Importance of Ocean Data**
- 2. Various Practices of Data Management in the ROK**
- 3. Challenges of Data Management in the ROK**
- 4. Suggestion on Successful Data Management**

# 1. Importance of Ocean Data

“Recent climate changes have had widespread impacts on human and natural systems.”

“Recent changes in the climate are widespread, rapid, and intensifying, and unprecedented in thousands of years”

[IPCC AR5 & AR6, 2014 & 2022]

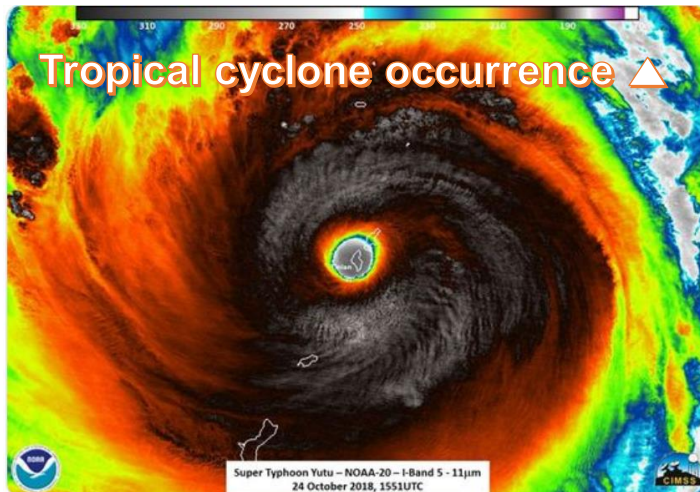


South Korea battles deadly floods and landslides

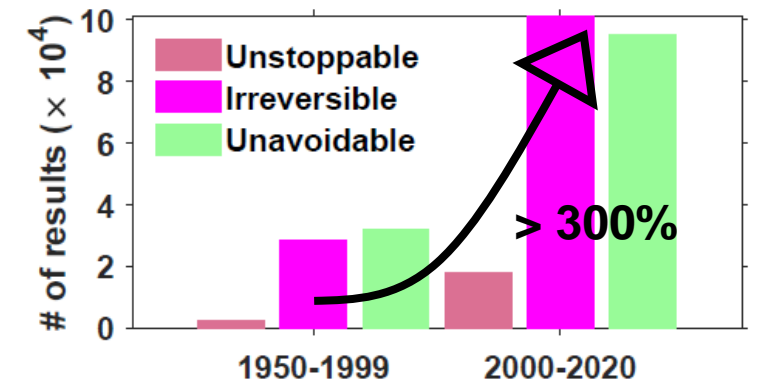


**'Climate emergency' is Oxford Dictionaries' 2019 word of the year**

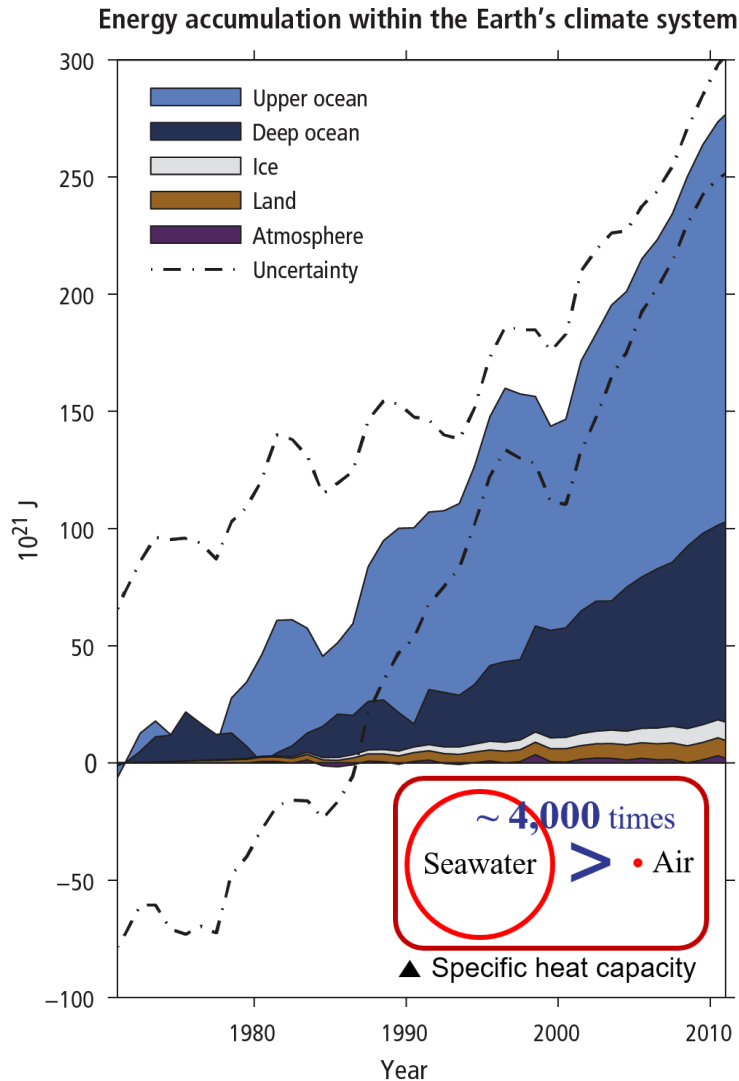
Usage of the term is up 10,789 percent over the previous year, according to the dictionary's data.



Google Scholar search results ▼ for 'Unstoppable climate change', 'Irreversible climate change', and 'Unavoidable climate change'



# “The ocean and cryosphere regulate the climate and weather on Earth” [SROCC, 2019]

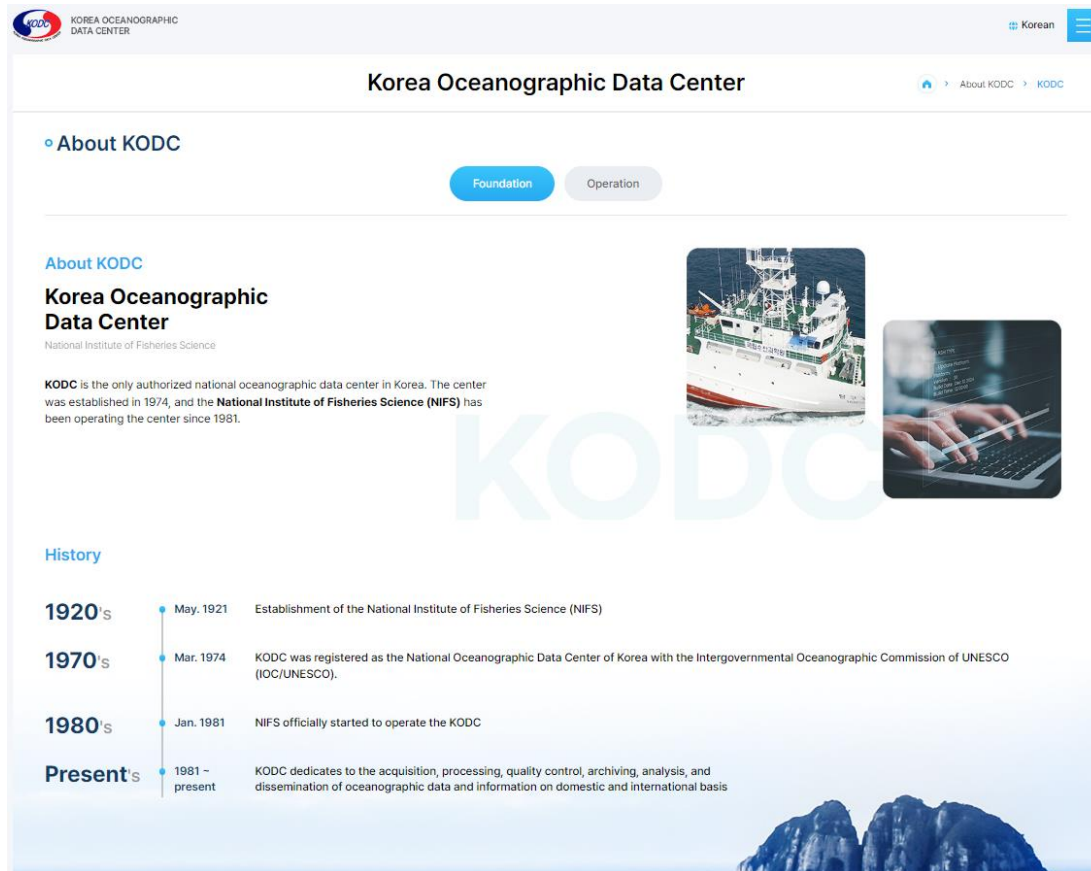


- It is crucial to investigate ocean responses to climate change in recent times using in-situ observational data.

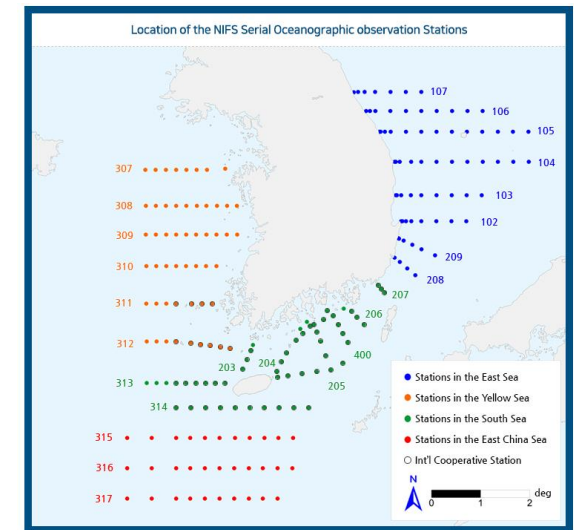
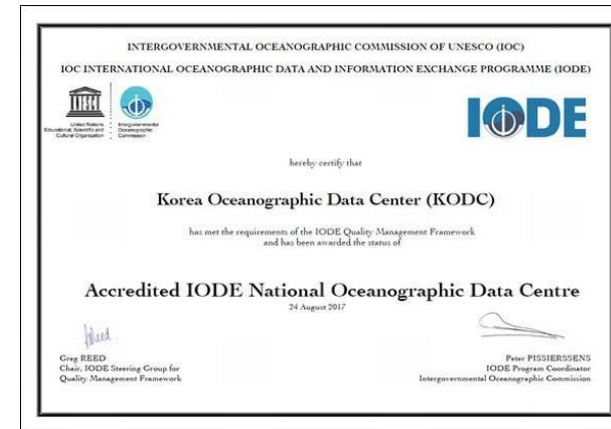


# 2. Various Practices of Data Management in the ROK

## 1) KODC (Korea Oceanographic Data Center; <https://www.nifs.go.kr/kodc/index.kodc>)



- World's 5<sup>th</sup> National Ocean Data Center accredited by the IOC (Intergovernmental Oceanographic Commission of UNESCO)



- NIFS (National Institute of Fisheries Science) conducts observations every two months (Feb., Apr., Jun., Aug., Oct., Dec.) in the Korean Marginal Sea.

*Created by NIFS (National Institute of Fisheries Science)*

KODC KOREA OCEANOGRAPHIC DATA CENTER

NIFS Serial Oceanographic Observation

Data search

Waters: All | Water Level: All | Line: All | Station: All

Data period: 20240923 ~ 20240923 | 1Week | 1Month | 6 Month

Sort: Name of Coastal station | Ascending

Search

Total 0

Text Save | Excel Save

Area	Line	Station	Date(YYYY-MM-DD)	Latitude	Longitude	Vertical change chart	Depth(m)	Water Temperature(°C)	T QC flag	Salinity(psu)	S QC flag	DO(ml/L)
------	------	---------	------------------	----------	-----------	-----------------------	----------	-----------------------	-----------	---------------	-----------	----------

- You are free to download the data obtained from 1968 to 2023.

- Data are only available at 15 standard depths (0, 10, 20, 30, 50, 75, 100, 125, 150, 200, 250, 300, 400, 500 m) below 500 m.

- Data are quality-controlled according to the standard data processing methods and are provided with QC flags.

- To provide high-quality data, data management efforts continue by the *‘Advancement of ocean observation, Diagnosis, and forecasting system customized for consumers’* research project (P.I. JJ Park (KNU)).

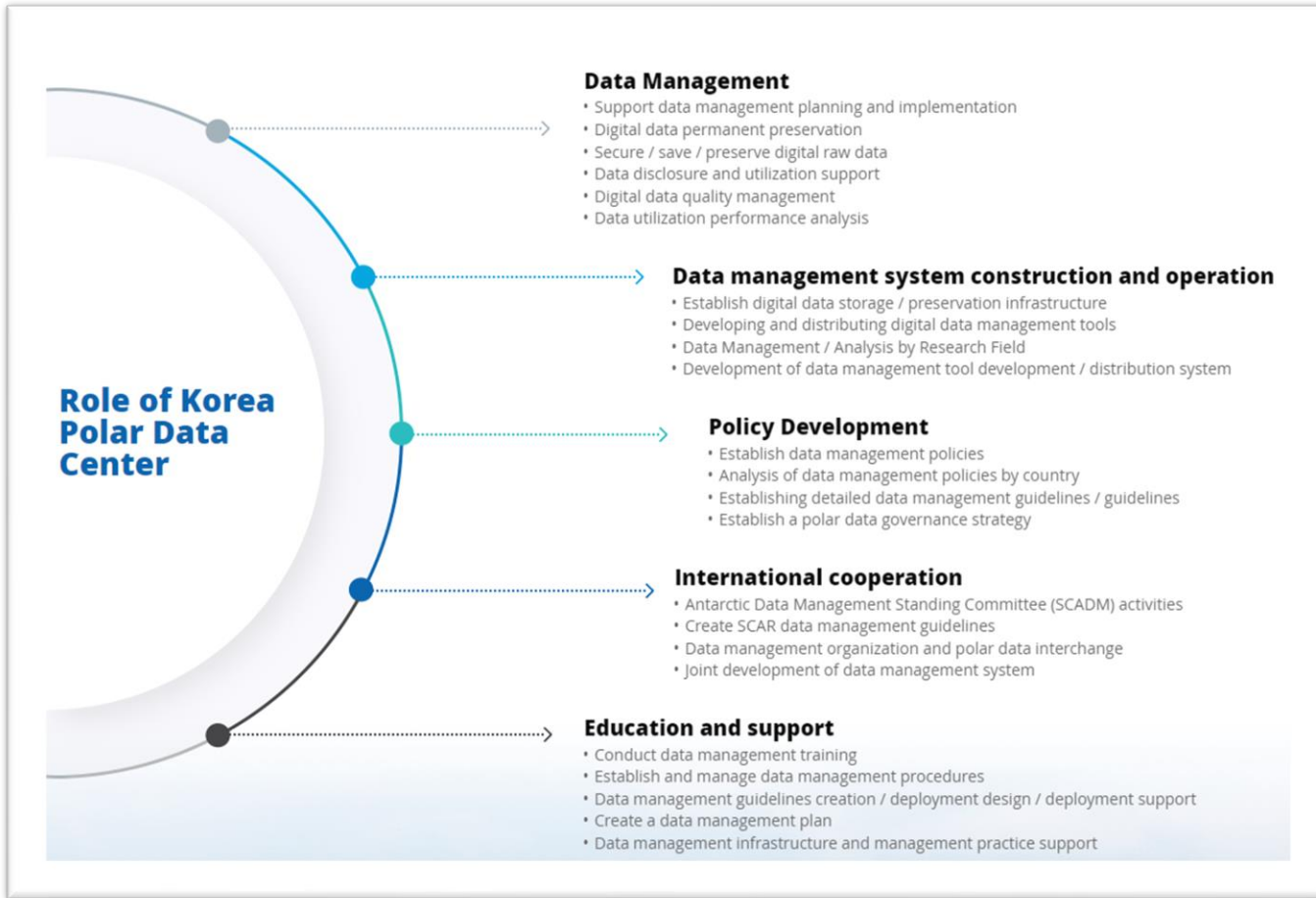
QC information

QC flag information

KODC assigns QC flags to the observation data based on UNESCO/IOC's recommended ocean data standards.

QC Flag	Meaning	Definition
1	Good	Passed documented required QC tests
2	Not evaluated, not available or unknown	Used for data when no QC test performed or the information on quality is not available
3	Questionable/suspect	Failed non-critical documented metric or subjective test(s)
4	Bad	Failed critical documented QC test(s) or as assigned by the data provider
9	Missing data	Used as place holder when data are missing

## 2) KPDC (Korea Polar Data Center; <https://kpdc.kopri.re.kr>)



- KOPRI (Korea Polar Research Institute) research team Upload metadata after obtaining data in Antarctica or Arctic (ex) through an Antarctic survey).

**ANA14B CTD/LADCP data in Amundsen Sea**

To investigate ocean-induced melting processes and the influence of glacier and sea-ice meltwater on marine environments, CTD/LADCP observations were conducted in the ocean near Thwaites Glacier and Dotsen ice shelves in the Amundsen Sea during the ANA14B ARAON cruise in Jan 2024. A total of 111 CTD/LADCP vertical profiles were obtained at 107 sites in the Thwaites (78 sites) and the Dotson Ice Shelf region (29 sites).

☆ Register favorites + Add

🗨 Disclosure Request + Add

100 Views

📘 🐦

• <b>Entry ID</b>	KOPRI-KPDC-00002478
• <b>DOI</b>	<a href="https://dx.doi.org/doi:10.22663/KOPRI-KPDC-00002478.2">https://dx.doi.org/doi:10.22663/KOPRI-KPDC-00002478.2</a>
• <b>Copyright</b>	
• <b>Science Keyword</b>	EARTH SCIENCE > OCEANS > SALINITY/DENSITY EARTH SCIENCE > OCEANS > OCEAN CIRCULATION > OCEAN CURRENTS
• <b>ISO Topic</b>	Oceans Environment
• <b>Platforms</b>	In Situ Ocean-based Platforms > R/V ARAON
• <b>Instruments</b>	Conductivity, Temperature, Depth (CTD)

- Raw data are only provided upon request.

• **Raw Data** File Size 193.34 Mb for 2 Items

Category	File Name	Description	Size	Status
Rawdata	ANA14B_CTD_data.zip		92.97 Mb	Request required
Rawdata	ANA14B LADCP Data.zip		100.37 Mb	Request required

# 3. Challenges of Data Management in the ROK

## 1) KODC

- The Korean Marginal Sea is where military and political interests are intertwined.
- Data were collected with 24 Hz CTD (Conductivity-Temperature-Depth) sensors, but these high-resolution profiles could be used for military purposes.
  - ▶ Difficult to manage the raw data or high-resolution data
- Frequent change of person in charge (observation & data management) because the NIFS is a public institute (continuity).

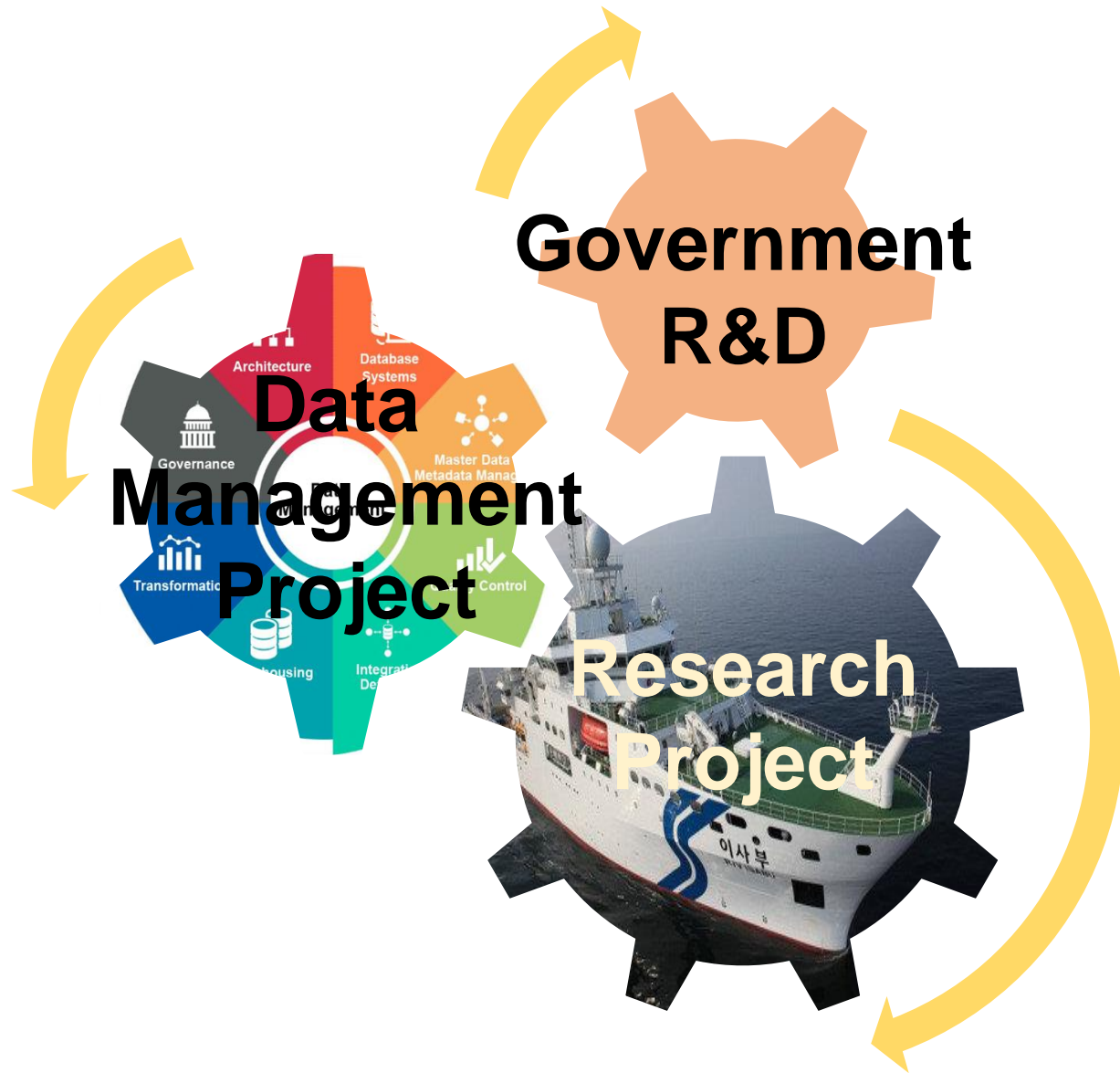


## 2) KPDC

- Each data set was obtained through an individual research project, so the data should be used to produce project results (ex) publication
  - ▶ Conservative for data sharing; Difficult to manage the raw data (there is no obligation to open the raw data...)
- There are various types of data (ocean, land, atmosphere), and the same kind of data was not quality-controlled in the same way.



## 4. Suggestion on Successful Data Management



### ● *Research Project*

- Data acquisition
- Share Metadata
- Research

### ● *Data Management Project*

- A pair with the research project
- The research project's members should participate in this project
- Data QC following the standard methods
- Final output: Raw data with QC flags
- Upload the output to domestic (or global) data storage & submit it to data journals (DOIs)
- Update the metadata with the DOIs

Thank you for your attention :)

UTOIMAGE



[styoon@knu.ac.kr](mailto:styoon@knu.ac.kr)