

# Centralized Data Archiving and Integration System

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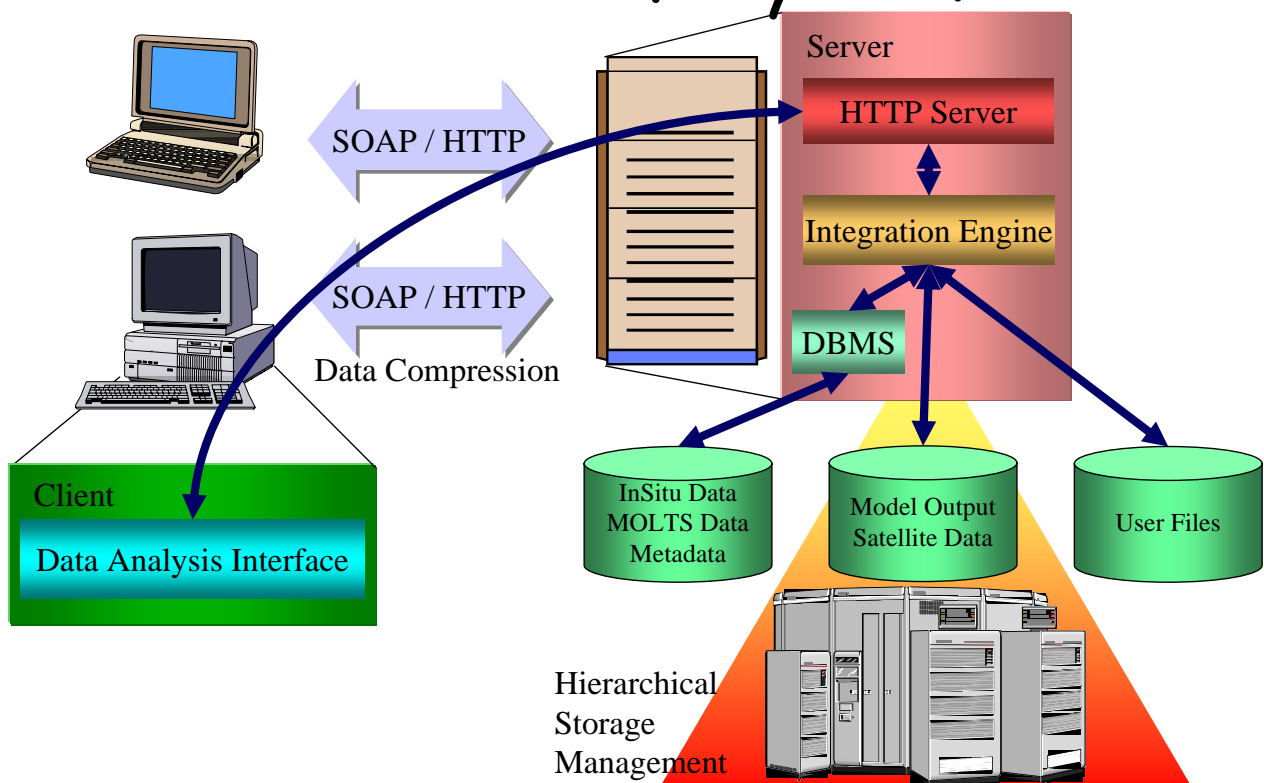
## Activities of Information Systems at University of Tokyo

- Centralized Data Archiving and Integration System
- Quality Control System
- Data Mining System
- 3D Visualization System

# Centralized Archiving and Integration System

- Archive all CEOP data
  - In-Situ Data
  - Model Output
  - Satellite Data
  - Metadata
- Provide data and analysis environment
  - Data Server
  - User Interface

## Architecture of System



# System Characteristics

- Data server
  - Metadata, In-situ data, MOLTS  
⇒ DBMS
  - Satellite data, Model output  
⇒ External Files
- Client
  - Written in JAVA
- Data transfer
  - SOAP (Simple Object Access Protocol)/HTTP
  - Compression

# Data Characteristics

Type of data		Spatial Dim.	Resolution (Spatial/Temporal)	Data size	Format
In-Situ data	Reference site	0 (~1)	— 30min ~ 1hour	~1MB/year	ASCII
Model output	Reference site (MOLTS)	0 ~ 1	— 1 ~ 3hour	~10TB/year	Depends on center (NetCDF, ASCII, Binary)
	Global	2 ~ 3	0.5 ~ 1degree 3 ~ 12hour		Grib
Satellite data	Reference site	2 (~3)	250m ~ Several time/day	~100TB/year	Depends on provider (HDF, Binary)
	Monsoon region		250m ~ 0.25degree Daily/Monthly		
	Global		250m ~ 0.25degree Daily/Monthly		

# Internal Data Representation

DataInfo = {Type, Unit, ...}

Cells[T][Z][Y][X] = {{{  
     {Value<sub>1,1,1,1</sub>, QualityFlag<sub>1,1,1,1</sub>}, ...  
 }}}}

AxisInfo<sub>t</sub> = {Type, Unit, ...}

AxisInfo<sub>x</sub> = {Type, Unit, ...}

AxisInfo<sub>y</sub> = {Type, Unit, ...}

AxisInfo<sub>z</sub> = {Type, Unit, ...}

Axis<sub>t</sub>[T] = {{Value<sub>t1</sub>, Thickness<sub>t1</sub>}, ...}

Axis<sub>x</sub>[X] = {{Value<sub>x1</sub>, Thickness<sub>x1</sub>}, ...}

Axis<sub>y</sub>[Y] = {{Value<sub>y1</sub>, Thickness<sub>y1</sub>}, ...}

Axis<sub>z</sub>[Z] = {{Value<sub>z1</sub>, Thickness<sub>z1</sub>}, ...}

## Functions

- Data retrieval
- Format conversion
- Alignment and adjustment of temporal/spatial axes
- Aggregation
  - Averaging, Maximizing, Minimizing, Variance, Summation...
- Calculation
  - Difference, Correlation, Regression...
- Visualization
  - Chart, Image...

# Archived In-Situ Data

Platform Name	Level	ID	Product	Description	Sensor Data		Status	
					Available	Not Available	Available	Not Available
AMAR	Level 1B	SEVIRI	High-resolution temperature					
		MODIS	SeaWiFS water color					
	Level 2	SEVIRI	SeaWiFS water temperature					
		SEVIRI	SeaWiFS chlorophyll-a					
	Level 3	SEVIRI	SeaWiFS water temperature					
		SEVIRI	SeaWiFS chlorophyll-a					
		SEVIRI	SeaWiFS water vapor					
		SEVIRI	SeaWiFS cloud cover					
		SEVIRI	SeaWiFS cloud top height					
		SEVIRI	SeaWiFS cloud optical depth					
CAL	Level 1B	SEVIRI	High-resolution temperature					
		MODIS	SeaWiFS water color					
	Level 2	SEVIRI	SeaWiFS water temperature					
		SEVIRI	SeaWiFS chlorophyll-a					
	Level 3	SEVIRI	SeaWiFS water temperature					
		SEVIRI	SeaWiFS chlorophyll-a					
		SEVIRI	SeaWiFS water vapor					
		SEVIRI	SeaWiFS cloud cover					
		SEVIRI	SeaWiFS cloud top height					
		SEVIRI	SeaWiFS cloud optical depth					
SeaWiFS	Level 1B	SEVIRI	High-resolution temperature					
		MODIS	SeaWiFS water color					
	Level 2	SEVIRI	SeaWiFS water temperature					
		SEVIRI	SeaWiFS chlorophyll-a					
	Level 3	SEVIRI	SeaWiFS water temperature					
		SEVIRI	SeaWiFS chlorophyll-a					
		SEVIRI	SeaWiFS water vapor					
		SEVIRI	SeaWiFS cloud cover					
		SEVIRI	SeaWiFS cloud top height					
		SEVIRI	SeaWiFS cloud optical depth					

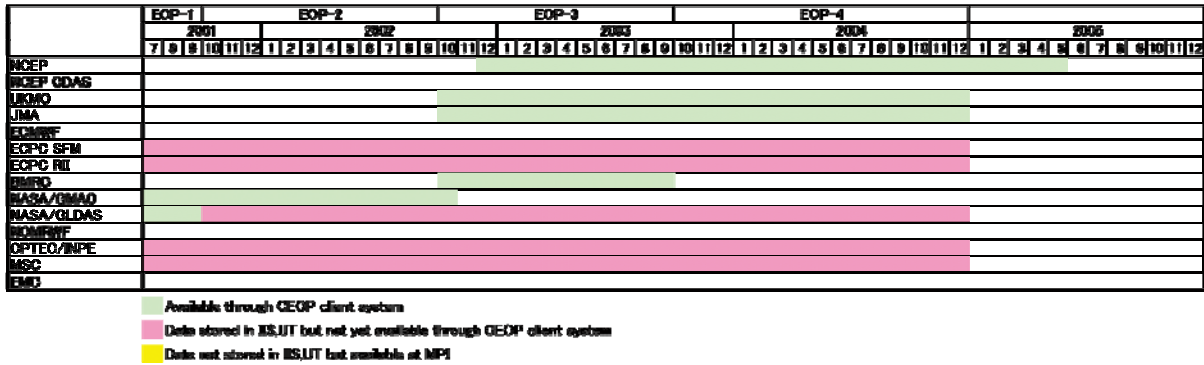
Available through CEOP alert system  
 Data stored in SELECT but not yet available through CEOP alert system  
 Not covered

# Archived Satellite Data

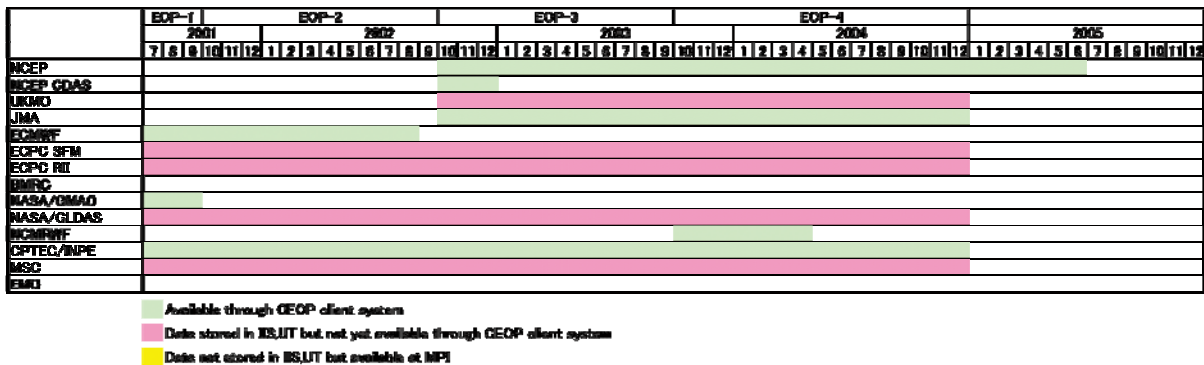
Platform Name	Level	ID	Product	Description	Reference Link	Minimum Value	Maximum Value
AMAR	Level 1B	SEVIRI	High-resolution temperature				
		MODIS	SeaWiFS water color				
	Level 2	SEVIRI	SeaWiFS water temperature				
		SEVIRI	SeaWiFS chlorophyll-a				
	Level 3	SEVIRI	SeaWiFS water temperature				
		SEVIRI	SeaWiFS chlorophyll-a				
		SEVIRI	SeaWiFS water vapor				
		SEVIRI	SeaWiFS cloud cover				
		SEVIRI	SeaWiFS cloud top height				
		SEVIRI	SeaWiFS cloud optical depth				
CAL	Level 1B	SEVIRI	High-resolution temperature				
		MODIS	SeaWiFS water color				
	Level 2	SEVIRI	SeaWiFS water temperature				
		SEVIRI	SeaWiFS chlorophyll-a				
	Level 3	SEVIRI	SeaWiFS water temperature				
		SEVIRI	SeaWiFS chlorophyll-a				
		SEVIRI	SeaWiFS water vapor				
		SEVIRI	SeaWiFS cloud cover				
		SEVIRI	SeaWiFS cloud top height				
		SEVIRI	SeaWiFS cloud optical depth				
SeaWiFS	Level 1B	SEVIRI	High-resolution temperature				
		MODIS	SeaWiFS water color				
	Level 2	SEVIRI	SeaWiFS water temperature				
		SEVIRI	SeaWiFS chlorophyll-a				
	Level 3	SEVIRI	SeaWiFS water temperature				
		SEVIRI	SeaWiFS chlorophyll-a				
		SEVIRI	SeaWiFS water vapor				
		SEVIRI	SeaWiFS cloud cover				
		SEVIRI	SeaWiFS cloud top height				
		SEVIRI	SeaWiFS cloud optical depth				
AMAR-1B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-2B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-3B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-4B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-5B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-6B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-7B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-8B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-9B	Level 1B	SEVIRI	High-resolution temperature				
AMAR-10B	Level 1B	SEVIRI	High-resolution temperature				

Available through CEOP alert system  
 Data stored in SELECT but not yet available through CEOP alert system

# Archived MOLTTS Data



# Archived Model Output



# Demonstration

# Conclusion

- Current status of Centralized Data Archiving and Integration System is introduced.
  - Most available data have been stored.
  - Basic functions have already been implemented.