# Research Group for the Design of Future Earth and Society

Project level

3. Social Implementation

1. Conception, research

Demonstration experiment

Collaborators

- Data science

- Data service

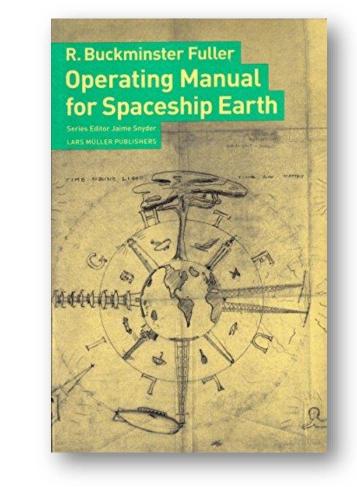
- Other projects

## Background



Buckminster Fuller (1895-1983)

- Emphasized the importance of interdisciplinary approach
- Specialized areas create potentially unifiable technological and economic benefits





### Al Gore (1948 - )

Japan-Thailand Clean Air Partnership

and Measures Development Project

**Emission** 

Inventory

Data Base

By JGSEE

**Particulate Matters Reduction Strategy** 

Sources and Critical Areas

oint source and area source/ critical area in Thailand

**Monitoring &** 

Composition

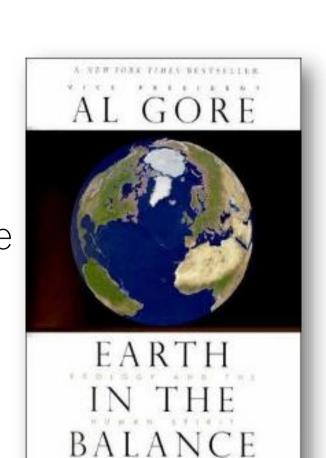
**Analysis** 

pollution source control

OC, EC, ...

Vice President Gore's 1998 vision to create a "Digital Earth" will enable people to explore our planet in its infinite variety

Al Gore Launches Digital Earth Initiative



### Competitive research funding Sponsors Group 2. Global Grid

Fuller suggested to create a peaceful world without worry of resource energy in the construction of the electricity transmission network of the world.

**Stakeholders** 

inside and outside Japan

(policy makers and users etc)

engineering Global grid rescue base

Researchers in each area

**Digital Earth** 

Data analysts

Global

"Combination"

Global grid

engineering

Data providers

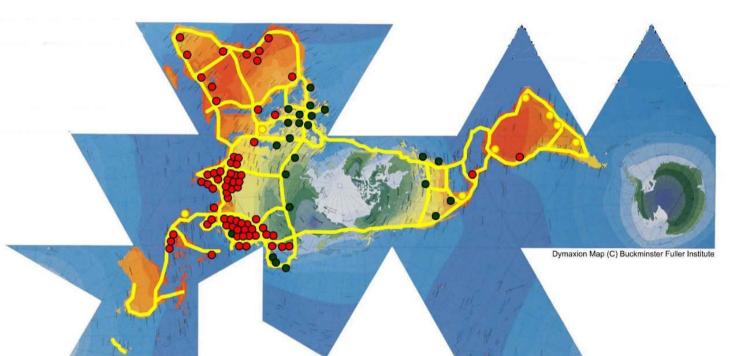
Global

rescue base

Two technologies have potential to achieve it.

### (A) Superconductivity

Chubu university is actively developing superconducting direct current power transmission system which would contribute to realize more sustainable society



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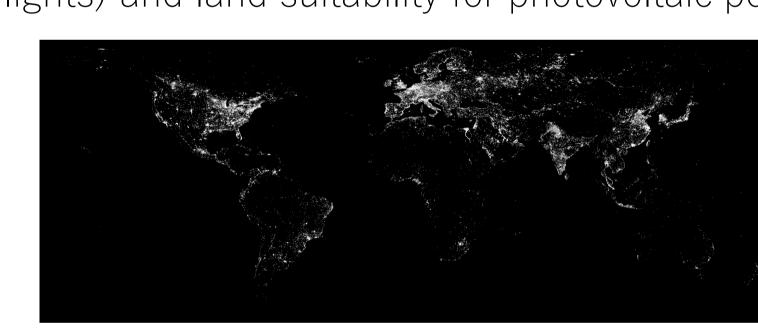


Laboratory of superconductivity

### Altitude UAS (UAV and Operation System) Development by Chubu University Venture, Tera Labo. Consumer aircraft (10m, 80kg) (drone) Payload: 2000m (4m, 40kg) Payload: 1000m 10kg (4m, 40kg) 500m Ground support system Payload: (1.6m, 15.5kg) 150m Payload: 21kg

## (B) Geoinformatics

Geoinformatics techniques enable to estimate the global distribution of energy use (e.g., night lights) and land suitability for photovoltaic power plants etc.



DMSP (distribution of night lights)

Solar radiation energy 5534 - 6376  $(WH/m^2)$  in August, 6377 - 7241 Japan 7242 - 7875 7876 – 15294

## Group 3. Global Rescue Base against Disasters

Framework of the study

Social

vehicle)

Model & → Policy

pollution prediction

Early warning systems

Simulation

1000km

Implementation

for PM2.5 manag.

**Geo-Engineering** 

**UAV** operation

(Unmanned aerial

**Development** 

(A) Large area disaster prediction technology for inundation situation and flood simulation

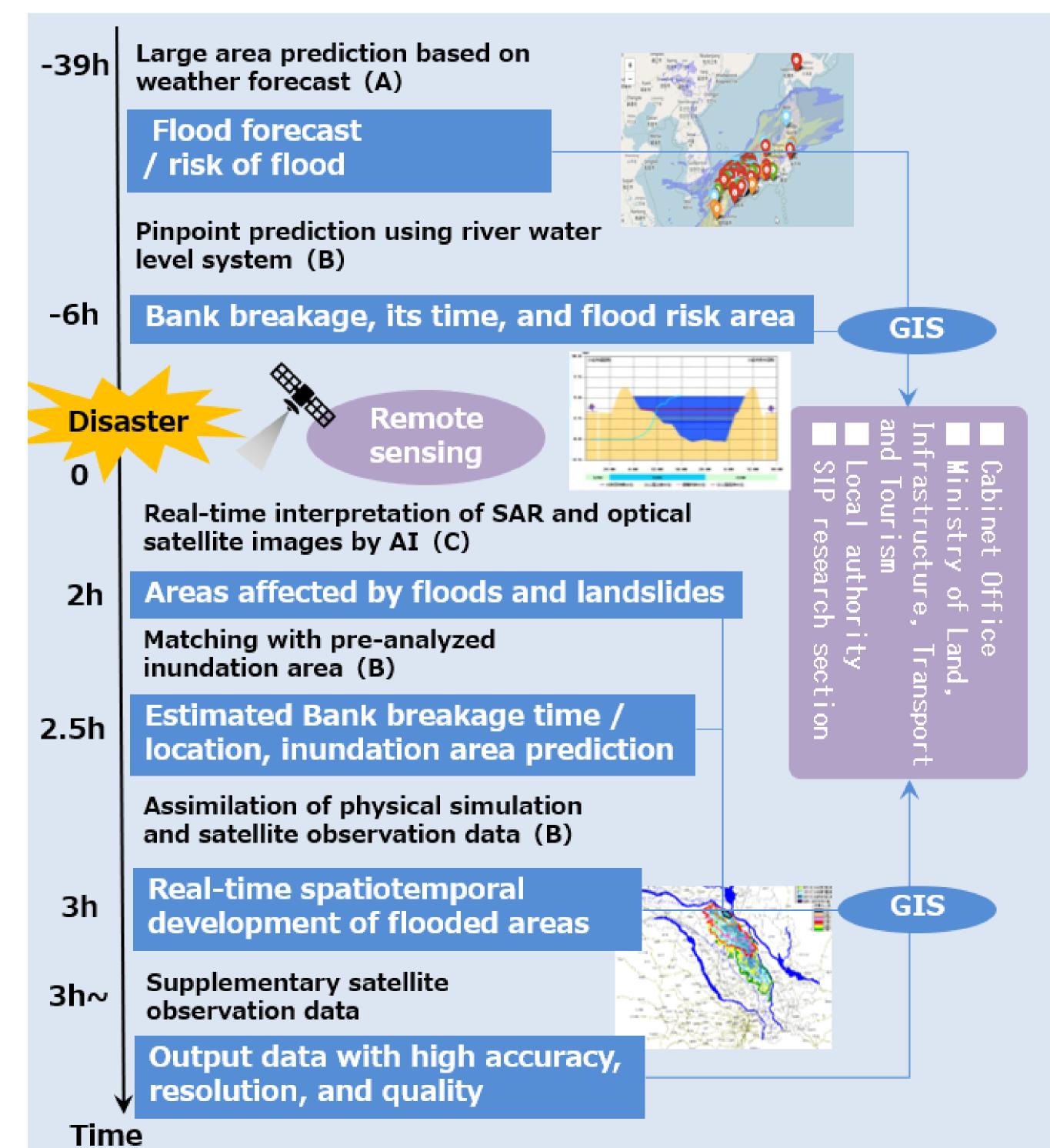
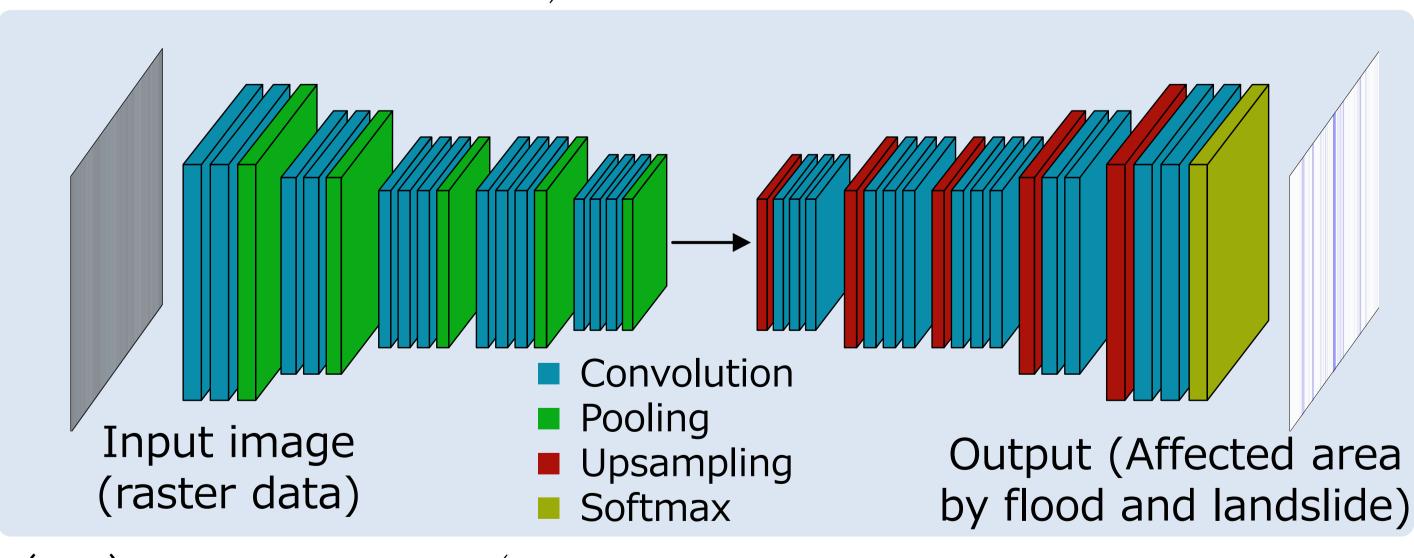


Image recognition using remotely sensed data through deep learning (B-1) Semantic segmentation (i.e., recognition technique to identify the situation of each raster cell)



(B-2) Change detection (i.e., comparing two images before and after the disaster to identify the affected area)

