



GLOBAL
CCS
INSTITUTE



NORWEGIAN MINISTRY
OF FOREIGN AFFAIRS



KIGAM
Korea Institute of Geoscience
and Mineral Resources

CCOP CO₂ Storage Mapping Program (CCS-M)

CCS-M Training Course 5 (T5): Introduction to Geographic Information System (GIS) – Applications in mapping for geological storage of CO₂ 5-8 August 2014, Daejeon, Korea

A. Background and Objectives:

The CCOP Technical Secretariat in cooperation with the Global CCS Institute (GCCSI), Norwegian Ministry of Foreign Affairs, Korea Institute of Geoscience and Mineral Resources (KIGAM) and Geological Survey of Japan (GSJ), will be conducting the subject CCS-M T5 in Daejeon, Korea.

The goals of CCS-M are to enable the government organizations in the CCOP Member Countries responsible for mapping the geological storage of CO₂ to:

- Provide a high level overview of the potential for large-scale CO₂ storage,
- Enhance the member countries capacity and capability in the assessment of geological sites for the safe and long-term storage of CO₂, and
- Increase their understanding of the potential of CO₂ for enhanced oil and gas recovery.

GIS is emerging as a useful tool to foster collaboration among CCOP member countries - for comparative and statistical analysis of resources. The development of a GIS-based CO₂ sources and geological storage database in the CCOP region will help attain the goals of CCS-M.

The objectives of T5 are to enhance the capacities of the member countries on GIS and its applications as an interactive tool to analyse data and provide information of CO₂ stationary sources, potential geologic CO₂ storage formations, storage capacity estimations, potential use of CO₂ for EOR, infrastructure, etc. The agenda will include hands-on exercises to be led by resource persons from GSJ, KIGAM and other member countries.

B. Participants and Resource persons:

1. Representatives from oil and gas regulatory and supervisory agencies, research organizations, national oil and gas companies, geological agencies, environmental agencies, and academic institutions of CCOP member countries and ASCOPE members.
2. Resource persons mainly from Japan, Korea and other CCOP member countries.

C. **Date & venue:** 5-7 August 2014 at KIGAM's IS-Geo (Daejeon) and field trip on 8 Aug 2014 (*Field trip*).

D. Implementing / coordinating organizations

1. CCOP Technical Secretariat
2. Global CCS Institute
3. Norwegian Ministry of Foreign Affairs
4. Korea Institute of Geoscience and Mineral Resources
5. Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology (AIST)

E. Draft Program:

The training module is designed for people with less experience/knowledge about Web-GIS and GIS. However, it could help if trainees have experience in handling spatial data using conventional GIS software. **The trainees should bring their own computer with Windows OS and web browser (preferably Firefox) installed.** The resource persons will prepare spatial data that will be used for the training. However, it will be good for the trainees to experience processing many kinds of data. **All trainees are encouraged to bring their own data (vector or raster).**

#	Time	Item	Person/Organization
1	4 Aug	Arrival of participants/resource persons	CCOP TS/KIGAM
Day 1: 5 Aug 2014			
2	0830	Registration	CCOP TS/KIGAM
3	0900	Opening Ceremony 1. Welcoming Remarks a. CCOP Technical Secretariat	Dr. Adichat Surinkum <i>Director</i> <i>CCOP Technical Secretariat</i>

		<p>b. Permanent Representative of Korea to CCOP</p> <p>2. Opening Remarks</p> <p>a. Royal Norwegian Embassy – Seoul</p> <p>Exchange of Tokens</p>	<p>Dr. Kyu Han Kim President, KIGAM and Permanent Representative of Korea to CCOP</p> <p>Mme Marianne Damhaug <i>Chargè d’Affaires</i> <i>Royal Norwegian Embassy – Seoul</i></p> <p>CCOP TS</p>
4	0930	<p>Keynote Address:</p> <p><i>GIS – a tool for cross-border collaboration in CCOP</i></p>	<p>Dr. Yasukuni Okubo <i>Senior Officer for Collaboration</i> <i>Geological Survey of Japan</i> <i>National Institute of Advanced Industrial Science and Technology (AIST)</i></p>
	1000	Group Photo / Coffee - Tea	CCOP TS
5	1030	Introduction, Background and Update of CCS-M	Mr. Simplicio P. Caluyong <i>CCS-M Coordinator</i> <i>CCOP Technical Secretariat</i>
6	1050	<p>Introduction to WEB-GIS</p> <ul style="list-style-type: none"> ✓ Major Components of WebGIS ✓ Free and Open Source Software (FOSS) and Open Geospatial Consortium (OGC) Standards ✓ OGC based Web Services ✓ Web Service based Information Sharing <p>Demonstration of GIS Applications (WMS Clients and AIST's Current FOSS based WebGIS)</p> <ul style="list-style-type: none"> ✓ Seamless Geology ✓ Groundwater ✓ Mineral Resources ✓ Earthquake and Volcanic Hazards 	Dr. Joel Bandibas <i>Researcher</i> <i>Geological Survey of Japan</i> <i>AIST</i>
	1200	Lunch	
7	1330	<p>Introduction to GIS and GCI (Geospatial Corrective Integration)</p> <ul style="list-style-type: none"> - Introduction of GIS and GCI - Application of GIS and GCI 	Dr. Sa Ro Lee <i>Principal Researcher</i> <i>Geological Research Division</i>

		- Introduction of Geospatial Models	<i>KIGAM</i>
	1430	Coffee / tea break	
8	1500	Demonstration of GIS/GCI Application Geological Hazard (Landslide, Ground Subsidence and Flood) <ul style="list-style-type: none"> - Geological Resources (Mineral and Groundwater) - Ecology (Microbenthos, Mammals and Fishes) 	Dr. Saro Lee <i>KIGAM</i>
9	1630	Summary for Day 1	Chair
	1830	Welcome dinner <i>Attire: Smart Casual</i> <i>Venue: TBC</i>	Host: Korea (to be confirmed - TBC)
Day 2: 6 Aug 2014			
10	0830	Overview of Day 1 and Order of the Day	Chair: Sim Caluyong
11	0840	Development of Basic WebGIS System Review of Major WebGIS Components (Database, Web Services, WebGIS Portal) Database Creation <ul style="list-style-type: none"> ✓ Web Based Spatial Database Creation ✓ Populating the database (Data Entry) 	Dr. Joel Bandibas <i>Geological Survey of Japan</i>
	1000	Coffee/ tea break	
12	1030	Web Services Formulation <ul style="list-style-type: none"> ✓ Web Map Service (WMS) formulation ✓ WMS formulation for seamless geology ✓ WMS formulation for minerals ✓ WMS formulation using other data ✓ Spatial Database Query ✓ Basic Sequential Query Language (SQL) Formulation 	Dr. Joel Bandibas <i>Geological Survey of Japan</i>
	1200	Lunch	
13	1330	WebGIS (Client/Portal) <ul style="list-style-type: none"> ✓ WebGIS Client/Portal Development 	Dr. Joel Bandibas <i>Geological Survey of Japan</i>

		<ul style="list-style-type: none"> ✓ Basic HTML page ✓ Accessing OpenLayers API ✓ Accessing Google Maps API ✓ Integration of the 3 WebGIS Components 	
	1500	Coffee/ tea break	
14	1530	<i>...continue with WebGIS (Client/Portal) demonstration</i>	Dr. Joel Bandibas <i>Geological Survey of Japan</i>
15	1630	Summaries for Day 2	
		Day 3: 7 Aug 2014	
16	0830	Order of the Day	Chairperson
17	0840	Remote Sensing Analysis <ul style="list-style-type: none"> ✓ Satellite images ✓ Exercise 	Dr Takumi Onuma <i>Chief Geologist/Deputy GM Sumiko Resources Exploration & Development Co., Ltd, Japan</i>
	1000	Coffee/ tea break	
	1030	<i>..continue with Remote Sensing Analysis exercises</i>	GSI & All participants
	1200	Lunch	
18	1330	CCOP version WebGIS <ul style="list-style-type: none"> • Group discussions • Plans on the way forward with WebGIS applications in CCS-M • General Summary of CCS-M T5 	Resource persons and participants
	1530	Coffee/ tea break	
19	1600	Briefing on the Field trip (tbc)	KIGAM
20	1615	Evaluation / Feedback Awarding of Certifications Closing Ceremony	CCOP TS and GSI
	1700	End of CCS-M T5	
21	1830	Farewell dinner Attire: Smart Casual Venue: tbc	Host: CCOP TS
22	0800- 1600	Day 4: 8 Aug - Field Trip (tbc)	CCOP TS/KIGAM