



INTERNATIONAL SCHOOL FOR GEOSCIENCE RESOURCES (IS-Geo)
KOREA INSTITUTE OF GEOSCIENCE AND MINERAL RESOURCES (KIGAM)

REGULAR TRAINING COURSE ON
Coastal Geology and Geohazards
(GeoCoast)

The International School for Geoscience Resources of KIGAM presents an intensive training course on ***Coastal Geology and Geohazards (GeoCoast)***. The course will take place at the Ara room of the International School for Geoscience Resources of KIGAM in Daejeon (Korea) **from Sep. 15 to 30, 2014** and will include the following modules:

Title	Date	Instructor
Module 1. Wave-dominated Coasts and Coastal Geohazards	Sep. 15-17.	Prof. Andrew Short (University of Sydney, Australia)
Field trip to Eastern Korean Coast (Wave-dominated)	Sep. 18-20.	Prof. Andrew Short & Dr. Sung Pil Kim (KIGAM)
Module 2. Tide-dominated Coasts and Human Impacts	Sep. 22-23.	Prof. Burg W. Flemming (Senckenberg Institute, Germany)
Field trip to Western Korean Coast (Tide-dominated)	Sep. 24-26.	Prof. Flemming & Dr. Tae Soo Chang (KIGAM)
Country Report Workshop	Sep. 29.	IS-Geo
Discussion meeting with GECC	Sep. 30.	GECC

Module 1 - Wave-dominated Coasts and Coastal Geohazards

Summary of course content and learning objectives

The coastal zone represents the main buffer between waves and coastal populations/infrastructure. It is also an area of high economic, environmental, tourist and recreational value. The first module focuses on wave-dominated coastlines. It begins with a global overview then covers the basics of waves and related coastal processes followed by an examination of the various types of wave-dominated coastlines found throughout the world. These include beaches, dunes, estuaries and barrier systems. A number of case studies are presented as well as the latest research in this area.

Wave-dominated coastlines are the most dynamic major landform on the earth's surface, with processes occurring across a wide range of spatial and temporal scales. Understanding how this zone operates is essential for coastal managers to effectively plan for the future and minimize the risk of coastal hazards. This is usually achieved through a combination of Quaternary studies that investigate the evolution of the coast, programs that monitor the present coast, as well as numerical simulations (modelling) to predict the future coast. This module explains the different ways of investigating, monitoring and modelling the coastal zone, from traditional methods to the latest state-of-the-art technology. It finishes with an overview of how coasts should be managed.

Content of Module 1

Day 1. Wave-dominated coasts and coastal geohazards

- 10:00 – 11:00: Global coastal systems
- 11:10 – 12:10: Coastal processes 1
- 12:10 – 13:10: *Lunch break*
- 13:10 – 14:00: Coastal processes 2
- 14:10 – 15:00: Beach systems: wave-dominated
- 15:10 – 16:00: Beach systems: tide-modified beaches
- 16:10 – 17:00: Embayed & structurally controlled beaches

Day 2. Wave-dominated coasts and coastal geohazards

- 10:00 – 11:00: Coastal dunes
- 11:10 – 12:10: Estuarine systems
- 12:10 – 13:10: *Lunch break*
- 13:10 – 14:00: Coastal barrier systems
- 14:10 – 15:00: Coastal sediment cells and transport
- 15:10 – 16:00: Investigating & monitoring coastal systems
- 16:10 – 17:00: Coastal Geo-hazards

Day 3. Wave-dominated coasts and coastal geohazards

- 10:00 – 11:00: Human impacts in the coastal zone
- 11:00 – 12:00: Case Studies: human-coast interactions
- 12:00 – 13:10: *Lunch break*
- 13:10 – 14:00: Climate change impacts on the coast
- 14:10 – 15:00: Remote sensing coastal systems
- 15:10 – 16:00: Coastal modelling
- 16:10 – 17:00: Managing coastal systems

Day 4-6. Field to Eastern Korean Coast (Wave-dominated)

- Field trip to Korean east coast
- 08:00 18th (Thu.) September: Departure from IS-Geo of KIGAM
- 18:00 20th (Sat.) September: Return to IS-Geo of KIGAM

Module 2 - Tide-dominated Coasts and Human Impacts

Summary of course content and learning objectives

This module gives an introduction to tide-dominated coasts and human impacts on the meso- to macrotidal Wadden Sea depositional system located along the southwest coast of the North Sea in Europe. On day one, the first lecture aims at refreshing basic knowledge of tidal processes and their sedimentological effects. The second lecture deals with the geological evolution of the North Sea with special emphasis of the Wadden Sea depositional system and how this has been affected by human interventions in historical times. The third lecture focuses on the morphology and sedimentology of the East Frisian Wadden Sea at tidal basin scale. The fourth lecture tackles the issue of global warming and what implications an accelerating rise in sea level will have on the Wadden Sea.

On day two, the first lecture aims at refreshing basic knowledge of tide-dominated coastal processes, in particular morphodynamics, hydrodynamics, meteorology, scale effects, and single events. The second lecture introduces sophisticated modern remote sensing tools for data acquisition and monitoring, in particular the integrated use of multibeam echosounders, digital side-scan sonars, parametric subbottom profilers, ADCPs, and in situ particle size analyzers such as LISST, both within the context of basic science and national/international monitoring programs, e.g. the EU Water Frame Directive. The third lecture focuses on the protection of diked coasts, in particular against storm surges and associated coastal erosion. Finally, the fourth lecture discusses the impacts of major coastal constructions along tidal coasts, especially the construction of a gas pipeline through the Wadden Sea (the EUROPIPE project) and of new deep-water ports in Wilhelmshaven and Bremerhaven (Germany), and how integrated coastal zone management concepts can contribute to the mitigation of harmful effects.

Content of Module 2

Day 1. Tide-dominated Coasts and Human Impacts

- 10:00 – 11:00: Tidal processes and products
- 11:00 – 12:00: Evolution of the North Sea and the Wadden Sea coast

International School for Geoscience Resources (IS-Geo)
Korea Institute of Geoscience and Mineral Resources (KIGAM),
124 Gwahang-no, Yuseong-gu, Daejeon 305-350, Korea. URL: <http://isgeo.kigam.re.kr>
TEL : +82-42-868-3718, 3816 FAX: +82-42-868-3432



- 12:00 – 13:30: *Lunch break*
- 13:30 – 15:15: The mesotidal East Frisian barrier-island depositional systems:
morphological and sedimentological characteristics
- 15:15 – 17:00: Impacts of global warming on the Wadden Sea

Day 2. Tide-dominated Coasts and Human Impacts

- 10:00 – 11:00: Processes and dynamics along tide-dominated coasts
- 11:00 – 12:00: Modern tools for coastal data acquisition and monitoring
- 12:00 – 13:30: *Lunch break*
- 13:30 – 15:15: Coastal protection – past, present, future
- 15:15 – 17:00: Constructional impacts

Day 3-5. Field trip to Western Korean Coast (Tide-dominated)

- Field trip to the Dasari coastal dune, Saemangeum estuary, Byunsan
macrotidal beach, and Gomso Bay tidal flat (Korean west coast)
- 08:00 24th (Wed.) September: Departure from IS-Geo of KIGAM
- 18:00 26th (Fri.) September: Return to IS-Geo of KIGAM

Country Report Workshop (9.29)

Discussion meeting with GECC (9.30)

- Global Energy Cooperation Center in Seoul

About the presenter – Prof. Dr. Andrew Short



Andrew Short is a marine scientist specializing in coastal processes and beach dynamics. He has degrees from the University of Sydney, University of Hawaii and Louisiana State University and has worked on the coasts of North and South America, including north Alaska and Hawaii, Europe, New Zealand and the entire Australian coast. He is presently Honorary Professor in the School of Geosciences,

University of Sydney; Honorary Professor in the School of Earth and Environmental Sciences, University of Wollongong; Adjunct Professor in the Griffith (University) Centre for Coastal Management; Visiting Scientist at the Universidade Federal de Santa Catarina (Brazil); Senior Coastal Scientist (part-time) with CoastalCOMS.com; Scientific Adviser to Surf Life Saving Australia; Chair of National Surfing Reserves (Australia); and on the Advisory Board of World Surfing Reserves. He has published more than 200 scientific articles and 12 books including “Beach and Shoreface Morphodynamics” (1999) and “The Coast of Australia” (2009). He is presently writing and editing a book on “Brazilian Beach Systems”.

About the presenter – Prof. Dr. Burghard W. Flemming



Prof. Dr. Burghard W. Flemming, born in 1944, began his academic education at the University of Kiel (Germany) where he graduated in 1972 (MSc equivalent), majoring in marine geology and sedimentology. While in Kiel, he qualified himself as a scientific diver, his master's thesis having essentially been an underwater project on wave abrasion and deposition in the western Baltic Sea. Early in 1973, a foreign student exchange scholarship took him to the University of

Cape Town (South Africa) where he engaged in a PhD project on depositional processes in Saldanha Bay and Langebaan Lagoon located along the west coast of South Africa. He was awarded his PhD degree in 1977. Already in 1975 he had become a member of the newly created National Research Institute for Oceanology (CSIR) where he assisted in building up a marine geoscience division, which he took over as Divisional Head in 1980. During this time his research focused on regional current-generated bedforms and sediment dispersal along the southeast African continental margin driven by the Agulhas Current. In October 1984, he



followed in the footsteps of Hans-Erich Reineck as Head of the Senckenberg Marine Research Station in Wilhelmshaven (Germany), being mainly engaged in the investigation of tidal depositional processes. At the same time he gave undergraduate courses in sedimentology at the University of Bremen, Germany, being honoured for his teaching engagement with an extramural professorship in 1998. Burg Flemming retired in 2009 at the age of 65, having to date published over 180 papers in scientific journals and books.



GENERAL INFORMATION

• STARTING/END DATE AND LOCATION

- ✓ **September 15 through 30 (3 weeks) at KIGAM in Daejeon, Korea.**

• LANGUAGE OF STUDY

- ✓ The language of instruction is English and the courseware is in English.

• ASSESSMENT AND CERTIFICATION

- ✓ A participant will receive the certificate upon completion of the course.

• REGISTRATION

- ✓ **Deadline – By August 14 for a nominee**
Before 7 days in starting date of each module for someone else except for a nominee
- ✓ **How to Register**
 - Complete and return the attached form, “Nomination form” for a nominee and “Registration form” for someone else except for a nominee to Mr. Seung-Ryeol Hwang (hwang3816@kigam.re.kr) by email
 - Visit at <http://isgeo.kigam.re.kr>, IS-Geo URL. You can learn more about all training courses in IS-Geo website.

• COURSE FEE

- ✓ The fee for each module contains the access to electronic course notes, the certificate of attendance and the Pre-Course e-Learning.
- ✓ **The fee for a nominee is free.**
The fee to someone else except for a nominee in each module is 300 US dollars /300,000 KRW per module (100 US dollars/100,000 KRW per module for only students).

• CONTACT

- ✓ For more inquiries about training courses of IS-Geo, please contact at any time
- ✓ **Mr. Seung-Ryeol Hwang**, Assistant Coordinator by phone at +82-42-868-3816 or by email at Hwang3816@kigam.re.kr