

WHERE WATERS AND LAND MEET

Teaching material

Water, Water-Management and Coastal Zone Management
Education in the Context of Regular Primary and Secondary
School Education

Grade 1 to 12



“Children of the world: Holding the line against the pollution from the land”,
one of the prize winning drawings of 2004 school contests, the start of
the CCP 3.1 project in TTHue province, Vietnam.

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**Vietnam–Netherlands Coastal Cooperative Programme
(CCP) - 2005 Task 3.1: Awareness Raising project**

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Water, Water-Management and Coastal Zone Management Education in the
Context of Regular Primary and Secondary School Education

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TABLE OF CONTENTS

Introduction

The purpose of the educational program and this teaching material;
The contents of the teaching material;
How to use the teaching material presented in this book;
Detailed list of lessons and activities regarding subjects and grade level.

Each of the following ten Sections A - J are subdivided into Introductions, Lessons including practical Activities, Worksheets and Discussions, all supported by instructive sketches.

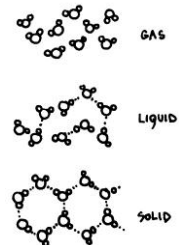
The Introduction, the ten Sections and the Glossary are all free-of-charge downloadable as a PDF file through the blue link on condition of proper CCC citation:

Vahtar, Marta & Misdorp, Robbert: "WHERE WATERS AND LAND MEET - Teaching material" in "Climate of Coastal Cooperation – Internet Publication" (R.Misdorp ed); the Coastal and Marine Union - EUCC, Leiden, the Netherlands;
www.coastalcooperation.net

Part 1: Water, Water Environments and Natural Processes

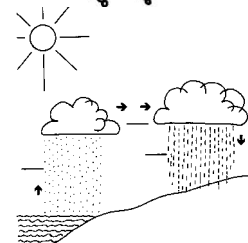
- **Section A: Water – basic characteristics (21 pages):**

The state of water: gas, liquid, ice; water cycle; water is everywhere; dissolvent; seawater and freshwater; buoyancy; surface tension: water as a skin.



- **Section B: The Water Cycle (11 pages):**

The water cycle concept; processes and state of the water; functions of water in natural systems; the role of plants formation of fresh water; water cycle terms.



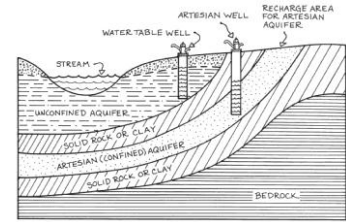
- **Section C: Rivers (21 pages):**

The formation of rivers, freshwater and groundwater as parts of one fresh water system; the creation of river basins; the watershed concept and its characteristics; fresh water as the base for the all forms of life; the water quality in relation to the self purification capacity of rivers; the need for protection of surface water and types measures.



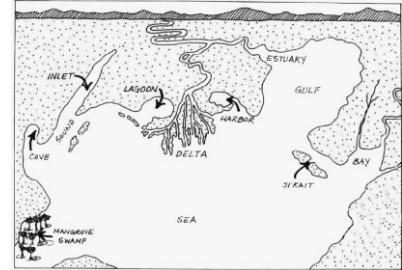
- **Section D: Groundwater**

Different types of groundwater, its movement related to the permeability and porosity of soils and rock materials; groundwater: one of most important resources for drinking water; recharge and discharge of aquifers; karstic aquifers; natural purification capacity; pollution; salt water intrusion in coastal areas; protection of the ground resources.



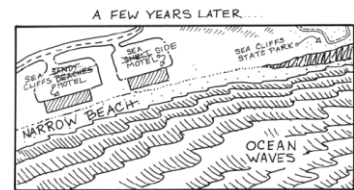
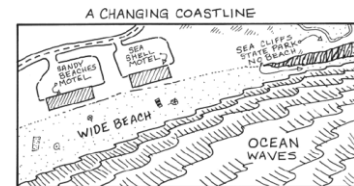
- **Section E: Coastal and Marine Waters**

Types of coastal waters and their characteristics; formation of various coastal landscapes influenced by very dynamic natural processes; the values of coastal wetlands; effects of the climate, the impacts of coastal urbanisation and other uses; the threats of marine life.



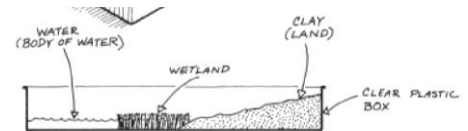
- **Section F: Floods and Erosion**

Dynamic natural coastal processes: excessive precipitation (storms, typhoon etc.) causing floods (river floods, coastal floods) and erosion (soil erosion, coastal erosion); different forms of preventing and adapting to floods and erosion; erosion and floods, natural processes, need space; occupying too much space may lead to large impacts by natural disasters.



- **Section G: Wetlands**

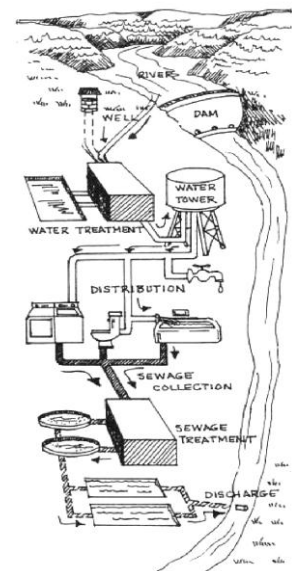
Definition and the importance of wetlands; protecting endangered wetlands = providing safety against flooding and self-purification of the water system and preserving the coastal biodiversity.



Part 2: Social and Economic Elements of Water and Coastal Resources Management

- **Section H: Man-Made Water Cycle (30 pages):**

The water resources and water supply system; man-made water cycle: first half of the cycle: drinking water treatment, second half: the sewage/wastewater system; modern integrated water supply system = protection of water resources, drinking water treatment, water distribution system and the waste water/sewage system with treatment plants and various steps in the purification processes; a non-complete, non-integrated man-made water system causes spreading pollution and diseases, degrading water resources and the environment; practical lessons in water management, conservation and treatment.



- **[Section I: Protection from Natural and Man Initiated Disasters \(19 pages\):](#)**

Natural disasters: flooding by storm surges and typhoons, tsunami, landslides, coastal erosion, droughts; man-initiated disasters: pollution of fresh water aquifers, landslides; measures increasing protection from natural & man-initiated disasters: storm surge early-warning systems to protect lives and property, building a dam, spatial planning maps of communities, soil conservation by terrace farming, 'soft' and 'hard' coastal erosion protection, protection from droughts, and how to produce healthy drinking water for a community; each measure has its own merits: weighing economic and environmental cost & benefit is part of integrated management practices.



- **[Section J: Integrated Coastal Resource Management \(11 pages\):](#)**

Many conflicting uses of resources in the coastal zone need an integrated management approach; definition of integrated resource management; understanding of the complexity of decision making process is base for water and coastal resources management dealing with interactive natural and socio-economic coastal processes; a set of practices help to define how to use those natural resources in a sustainable way; these practices were developed over time and were shaped by various social and cultural values and attitudes.

Glossaries

- **[Glossary: grade 1-2 \(7 pages\)](#)**
- **[Glossary: grade 3-5 \(14 pages\)](#)**
- **[Glossary: grade 6-8 \(18 pages\)](#)**
- **[Glossary: grade 9-12 \(26 pages\)](#)**

References (2 pages)
