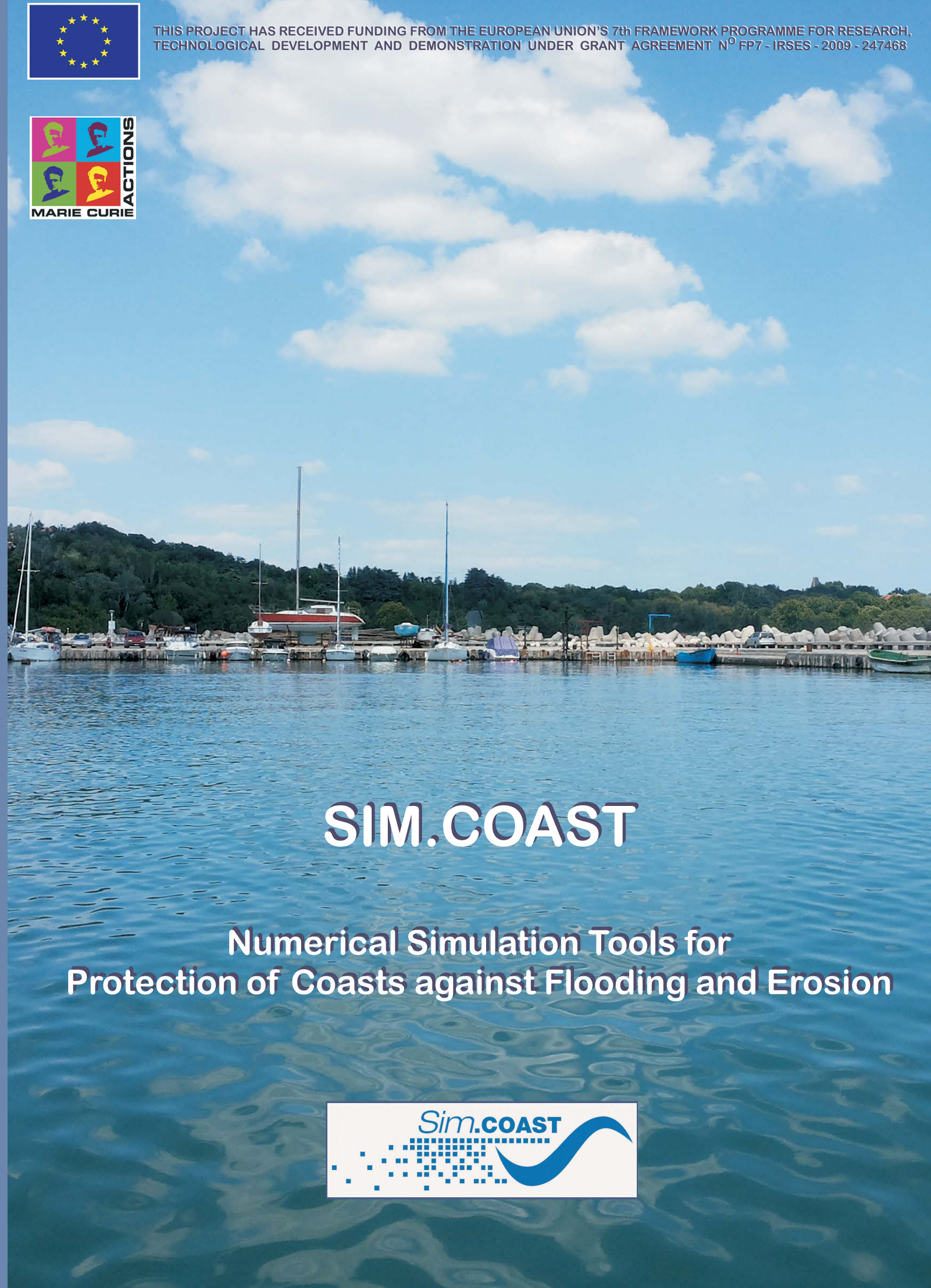


SIM.COAST

Numerical Simulation Tools
for Protection of Coasts
against Flooding and Erosion



THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S 7th FRAMEWORK PROGRAMME FOR RESEARCH, TECHNOLOGICAL DEVELOPMENT AND DEMONSTRATION UNDER GRANT AGREEMENT N° FP7 - IRSES - 2009 - 247468



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A joint FP7 research cooperation project, programme PEOPLE,
Marie Curie action, FP7-IRSES-2009-247468, carried out by partners:



Technical University of Hamburg - Harburg
GERMANY (Coordinator)



Black Sea - Danube Coastal Research Association
BULGARIA



HoHai University
CHINA



Nanjing Hydraulic Research Institute
CHINA



University of Roma Tre
ITALY



THE PROJECT

Sim.COAST is an FP7 EU-funded project under the People Programme Marie Curie Actions, FP7-PEOPLE-2009-IRSES, Grant Agreement n° 247468. The Project involves 5 partners from the EU and China:

- Hamburg University of Technology, TUHH, River and Coastal Engineering Institute, Hamburg, Germany (*Coordinator*)
- Black Sea-Danube Costal Research Association, BDCA, Varna, Bulgaria
- Hohai University, HHU, Nanjing, China
- Nanjing Hydraulic Research Institute, NHRI, Nanjing, China
- University of Roma Tre, Department of Civil Engineering, UR3, Italy

Sim.COAST aims to provide improved process understanding, new knowledge, methods, new and improved numerical tools, through extensive exchange of knowledge and experience, and implementation of a joint research & training program of partners.

Sim.Coast continues existing cooperation of German researchers from TUHH in a DAAD Summer School on “Coastal Protection” at the Hohai University (China), and a real and long-lasting cooperation between Chinese researchers (NHRI) with Bulgarian researchers (BDCA and BSHC)

Sim.Coast brings the personal exchange during daily work in order to exchange scientific knowledge and practical experience, and moreover - to bridge the gap in cultural values and traditions, to establish sustainable cooperation and long-lasting friendship.

OBJECTIVES:

Sim.Coast aims to provide improved process understanding, knowledge, methods, as well as new and improved numerical simulation models and data handling tools, aiming to:

- support decision-making at protection of coasts against flooding and erosion
- improve reliability of coastal protection structures, correspondingly to the global climate change
- introduce an advanced environmentally friendly approach in coastal protection

Sim.Coast develops a long-lasting cooperation, by reinforcing an existing collaboration between EU and Chinese researchers (dated from 1989), and by exploiting complementary expertise of the Partners in the project area; creates synergies between them, and brings additional benefits in terms of transfer of scientific knowledge and know-how in the area of coastal protection.



Kick-off meeting, Hamburg, April 2010



Exchange visit of experienced researchers (Nanjing, 2011)

Sim.Coast provides new scientific knowledge (particularly focused on Climate Change effects) on:

- Coastal flooding process understanding;
- Erosion/Sedimentation, Ecology of Floodplains;
- Extreme waves and tsunamis approaching coasts;
- Coastal dynamics due to extreme events

Sim.Coast improves existing and develop new methods and numerical tools to simulate and forecast the above processes.

Simcoast aims to facilitate developing of Coastal Protection Decision Support Systems (DSS) to assess environmental risk, including flood mapping; long-term coastal erosion mapping; coastal structure overtopping/damage assessment; environmental impact assessment.

WORK PACKAGES

The following work-packages integrate core project activities in the field of numerical modeling related to coastal protection against flooding and erosion;

WP 1. Coastal Erosion: Develop/Improve Existing Numerical Simulation Models on Coastal Morphology. Long-term and Short-term erosion forecast. Links to coastal monitoring / field survey, GIS approach.

WP 2. Coastal Flooding: Study Coastal Flooding phenomena. Develop/ Improve Existing Numerical Simulation Models. Flood Risk Analysis.

WP 3. Climate Change, Extreme events: Study / Evaluate Effect of Climate Change (sea level rise, changes in frequency, duration and intensity of storms). Study Extreme Events (Storm surges, Tsunamis). Process Understanding and Better Use of Existing Hydrodynamic Numerical Models.

WP 4. Wave-Structure Interaction: Develop/Improve Advanced Numerical Simulation (VOF) Models. Recommend Improved Environmentally Friendly Coastal Protection (artificial reefs, beach nourishment, permeable barriers, resistant vegetations).

WP 5. GIS Based Approach: Develop GIS Based Approach to provide/handle digitized data for the above numerical models (links to WP1, WP2, WP3 and WP4).

WP 6. Coastal Protection Decision support system (DSS): Develop DSS on protection against flooding and erosion, based on integration of the above models. Environmental risk assessment. Guidelines for application.

EXCHANGE OF RESEARCHERS

Sim.Coast provides exchange visits of more than 20 Experienced and Early stage researchers, from EU to China, and vice versa. Exchange of researchers aims to develop a long-lasting cooperation by exploiting complementary expertise of the Partners in the area of coastal protection and numerical modeling of coastal processes; to create synergies between them, and bring additional benefits in terms of transfer of scientific knowledge and know-how.



Sim.Coast Research Seminar meeting, Rome, Italy, May 2012



Exchange visit of young researchers, 2013

PROJECT RESULTS

More than 20 Experienced and Early stage researchers from Bulgaria, China, Germany and Italy have benefitted from the research exchange of the project. All early stage researchers have carried out Individual Research Projects, within the Sim.Coast work activity plan. Special technical reports have been developed to summarise joint research works for the implementation of the project work packages.

Five project workshop meetings have been carried out to check project progress and , as well as 4 research Seminars (Shanghai July 2010, Rome May 2011, Varna June 2012 and Nanjing September 2013. The last project event is the Closing Conference in Hamburg, March 2014.

Four joint EU-China scientific papers have been already published, on various topics within the project area. Two more papers are underway, to be published by the end of 2014.

Project results should finally serve decision makers in:

- strengthening emergency planning arrangements
- improving co-ordination of coastal erosion and flood risk
- managing the investment of significant levels of public funding
- helping coastal communities adapt to climate change