DHI MARKET AREA: CLIMATE CHANGE

MARINE WATER AND CLIMATE CHANGE

Adapting to greater storm surges, coastal erosion and flooding due to climate change

Both developed and developing countries face serious challenges in coastal areas. Coastal erosion and flooding can lead to dramatic damages and losses. These challenges are exacerbated by the intense developmental pressure, which is set to escalate in the future with rapid global population growth. Moreover, these coastal challenges will be worsened by climate change impacts.

In most coastal areas worldwide, climate change will bring extremes – ranging from higher and more frequent storm surges to more recurrent intense storms. As a consequence, there will be an increase in the frequency and intensity of flooding and coastal erosion. Low lying coastal mega towns and low atoll islands will be affected first. Global sea level rise is difficult to accurately forecast, due to the inherent uncertainties – in future CO_2 emissions as well as in climate model projections. This means that climate change impact assessments will continue to remain uncertain. As such, measures have to be robust and flexible to adapt to these uncertainties.

THE CHALLENGES

- Adapting to the high degree of uncertainty related to climate change projections
- Deciding on common predictions for sea level rise
- Maintaining good beach quality for all beach-related activities
- Protecting mega coastal cities and low lying islands from the increased risk of coastal flooding
- Ensuring that industrial facilities relying on access to sea water are adapted to the changing climate
- Ensuring that port facilities are adapted to climate change

OUR APPROACH

At DHI, we adopt a holistic approach towards climate change adaptations, since this involves multiple disciplines – especially close to the coast, where many interests potentially conflict with each other. When discussing adaptations of ecosystems and eco-engineering projects, we opt for ethical decisions, keeping your needs in mind and balancing them with environmental sustainability. In order to help you adapt to the impacts of climate change better, we've also outlined a set of effective guidelines based on the Intergovernmental Panel on Climate Change (IPCC) reports.

OUR SOLUTIONS

- Downscaling of climate change projections from General and Regional Climate Models
- Hydrodynamic simulations to obtain future parameters for planning, design and impact assessment
- Introduction of climate change projections in shoreline management planning, design of coastal projects and impact assessment
- Development of adaptation schemes for climate impacts related to coastal erosion and flooding

THE ULTIMATE GOAL

EFFECTIVE ADAPTATION TO CLIMATE CHANGE IMPACTS ON COASTAL & MARINE AREAS

Over the last century, the global sea level has risen by about 10 to 25 cm, much of it most likely related to the concurrent rise in global temperature

GRID-Arendal, United Nations Environment Programme (UNEP) collaborating centre

OUR TOOLS AND SERVICES

We offer a comprehensive range of tools and services to help our clients adapt to the wide ranging impacts of climate change on coastal and marine areas. These include:

- development of an advanced run-up short wave simulation tool for the simulation of run-up and overtopping of dikes
- development of an advanced numerical simulation tool for dike and dune breaching
- development of coastal flooding models in the time domain in order to prepare more accurate flood forecasts
- establishing breaching and coastal flooding forecasting
- estimation of future design water levels and wave conditions, including effects of climate changes
- Climate Adaptation Guidelines for Sea and Coast
- MIKE Powered by DHI software tools
- capacity building and training by THE ACADEMY by DHI

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