



ALC group

# Alpha Hydraulic Engineering Consultants Co., Ltd.

The earth has water to cultivate all lives including human beings. Rain drops on its surface will permeate into the ground to be groundwater, or they will flow through the forest, farmland and city down to the river and ocean, to bring enormous benefits to lives on the earth. To protect the water cycle for its eternal utilization, AHEC provides excellent consulting services in the hydraulic engineering. Toward “harmony with the environment”, “symbiosis with nature” and “sustainability”, AHEC will create a prosperous future for the next generation. We will continue our efforts as a leading consultant with expertise in the hydraulic engineering.

## Corporate Profile

Company Name	Alpha Hydraulic Engineering Consultants Co., Ltd
Established	Oct. 1986
Number of Employees	134 (as of Aug 2022)
Hokkaido Head Office	516-336 14-Chome, 9-Jou, Hassamu, Nishi-Ku Sapporo, Hokkaido 063-0829 Tel +81 11 662 3331 Fax +81 11 666 8049
Tokyo Office	9-9 3-Chome, Tsukiji, Chuo-Ku, Tokyo 104-0045 Tel +81 3 6264 7741 Fax +81 3 6264 7742
Sales Branches	Aomori, Morioka, Akita, Sendai, Chiba, Okayama, Nagasaki
QMS	ISO 9001:2015
EMS	ISO 14001:2015

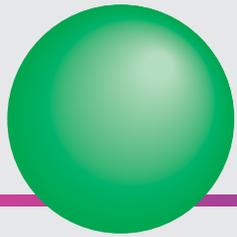


## Management Team

Representative Director	Takehito Horie (Ph.D. Professional Engineer)
Tokyo Office President	Koji Hashimoto (Ph.D. Professional Engineer)

## Qualified Personnel

Ph.D.	: 11
Professional Engineer	: 52
APEC Engineer	: 1
RCCM	: 9
Class 1 Architect	: 4
Class 1 Civil Const Management Engineer	: 19
Surveyor	: 10
Certified Harbor Survey Engineer	: 3
Marine & Port Structure Designer	: 1
Marine & Port Structure Maintenance Manager	: 3
Chartered Environmental Surveyor	: 2
Authorized Concrete Diagnosis and Maintenance Engineer	: 1
Applied Information Technology Engineer Examination	: 1
Meteorologist	: 2



# Investigation

The investigation is the first step to the water engineering for Ocean, Coast, River, Pond and Lake. Especially the ocean has innumerable possibility and unknown world to be explored, long-term and cautious investigation with the comprehensive view and consideration is necessary. Even for the complicated issues, the solution will be found out by the records research with strict observation and perspective. Such manner to the investigation has not only been accumulated as our resource but also developed our technological competence, which is effectively utilized in our various projects.

## 調査

Bioassessment



Stream Regime Survey

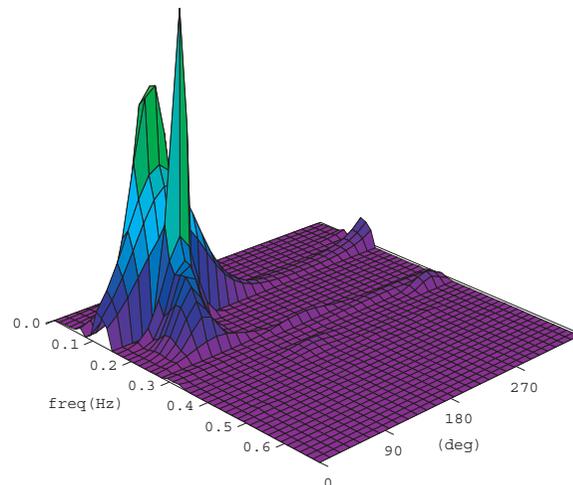


Water Quality Survey

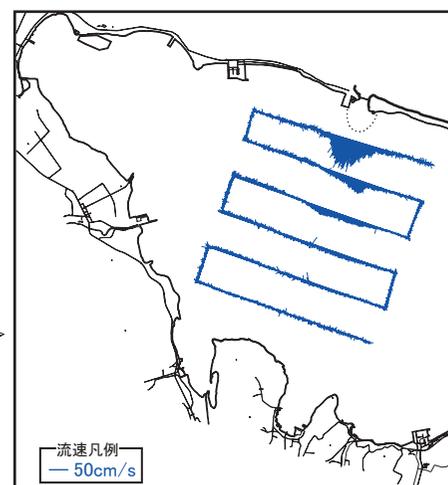


水温塩分計の設置

Direction Spectrum of Wave



Current Analysis with GIS



Environmental Investigation



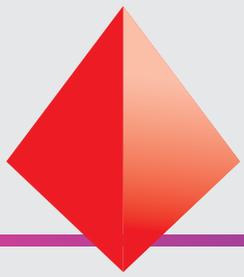
### Core Business

- Investigation of Natural Condition
  - Bathymetry
  - Wave Survey
  - Drift Sand and Beach Transformation Survey
  - Stream Regime Survey
  - Water Quality and Bottom Sediment Survey
  - Weather Observation
  - River Mouth Closure Survey
  - River Bed Transformation Survey
  - Hydrological Survey
  - Stratum Exploration
  - Soil Survey
- Investigation of Natural Environment
  - Bioassessment
  - Inhabitation Investigation
- Natural Disaster Investigation
- Structural Reliability Investigation
- Various Surveys

### ● Available Equipments

- Doppler Current Meter (ADCP) ... 5
- Instantaneous Current Meter ... 1
- Electromagnetic Current Meter ... 13
- Ultrasonic Wave Height Meter ... 6
- Hydraulic Wave Height Meter ... 7
- Memory Turbidimeter ... 1
- Water Temperature and Salt Meter ... 4
- Memory STD ... 2
- Memory DO Meter ... 2
- Light Photon Meter ... 1
- Vane Anemometer ... 1
- Water Level Indicator ... 7
- Precision Echo Sounder ... 2
- Laser Distance Meter ... 1
- Total Station ... 1
- Auto Level ... 1
- RTK-GPS Survey Instrument ... 1
- D-GPS ... 2
- Survey Boat ... 2



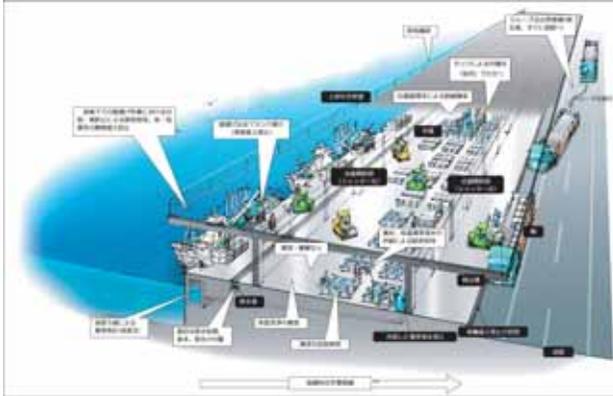


# Project Planning

Various needs such as Harmony with Environment, Recycle Society, Advanced Hygiene Control, IT utilization etc have been generated in terms of the Port and Fishery Port administration. Besides an appearance and harmonization with surroundings to be considered with the view of the disaster measures. In the stage of the project planning, not only reputable expertise, technology and abundant knowledge but also consensus building among stakeholders is required with assessment and process technique. We, AHEC, always make excellent proper consultation to the client how to meet his requirements and show the way of realization

## 計画

Hygienic Admin. Planning



Consensus Formation on Various Plans



Regional Activation Planning



Environment and Landscape Planning



Economic Analysis



屋根付き岸壁利用実態調査

Planning for Community Facility



Facility Planning for interchanging with cities



### Core Business

- Planning for Development and Utilization of Port and Fishing
  - Port Planning
  - Fishing Port Planning
  - Hygienic Control Planning
- Planning for Disaster Prevention
  - Basic Planning for Coastal Protection
  - Planning for Maintenance of Coast
- Planning for Pleasure Boat Facility
  - Environment Planning
- Planning for Fishing Ground and Propagation/ Cultivation of Fishery Resources
  - Landscape Planning
  - Regional Planning
    - Planning for Fishing Village
    - Regional Activation Planning
- Social and Economic Conditions Survey
  - Survey on Distribution, etc...
  - Survey on Utilization of Port and Fishing Port
  - Cost-Benefit Analysis



Investigation



Project Planning



Analysis



Design



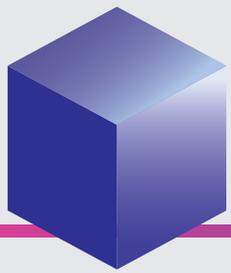
Environment Management



River Environmental Planning



Information Technology

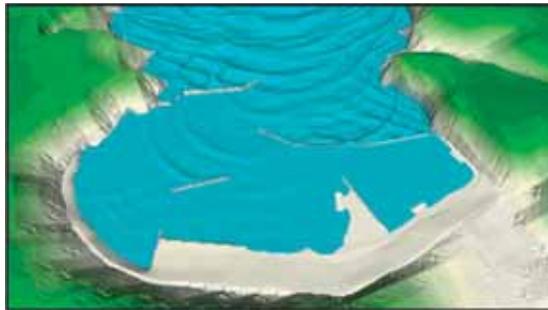


# Analysis

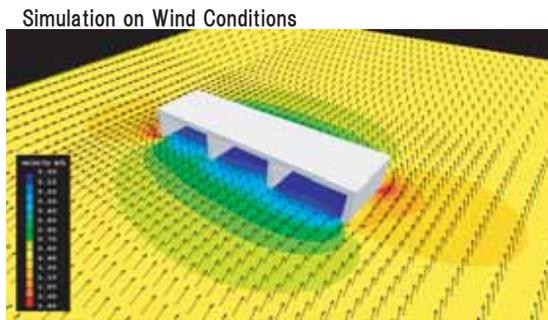
In Ocean, Lake and River, various phenomena are observed in its water. The planned facilities in the water for the development and maintenance to be harmonized with the natural environment, therefore an accurate assessment and evaluation for its effect to be inquired into by the analysis of the present situation, condition and past records. We, AHEC, always pursue the advanced simulation technology so as to analyze the prospective phenomenon and propose the design of the high efficient and economical facilities, which will mitigate environmental load.

## 解析

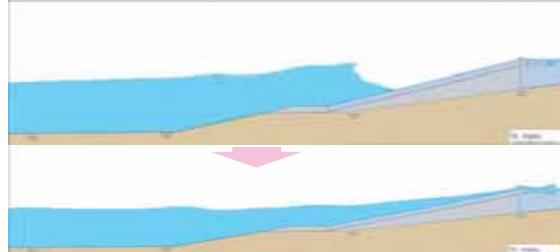
Wave Transformation Simulation



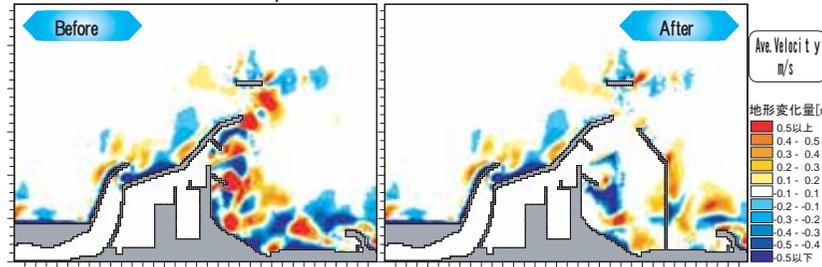
Analysis on Tranquility by Boussinesq Equation Model



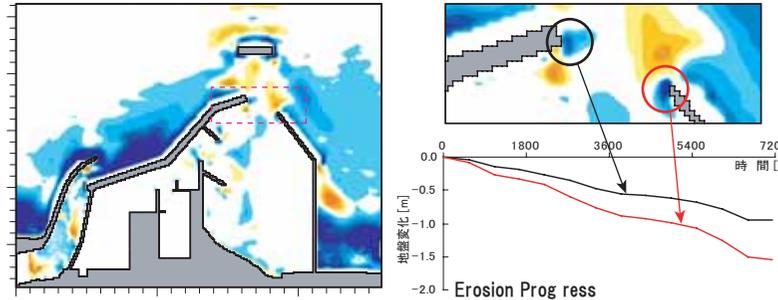
Numerical Wave Analysis Wind Condition Swash & Overtopping



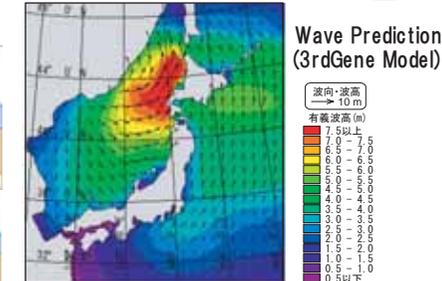
Simulation on draft and suspended sediment



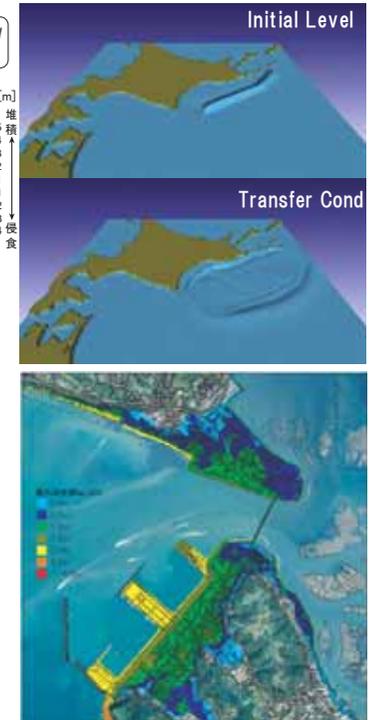
Evaluation Of Erosion



Wave Prediction



Tsunami Simulation



### Core Business

- Computation on shallow-water wave transformation
- Analysis on tranquility in port
- Simulation on draft and swimming sand
  - 3D Beach Deformation Model
  - Long-term Prediction Unsteady Model
  - Saline Mud Transportation, Siltation
- Simulation on Wind Conditions
- Numerical Wave Conduit (Cross-Sectional 2D Wave Motion Model)

- Simulation/Tsunami and Tidal Wave
- Flow Simulation
- Ocean and Tidal Stream Model
- Model of Current due to Wind
- Density Current Model
- 3D Turbulent Model
- Estimation and Prediction on Ocean Wave
- Hydraulic Model Experiment



Investigation



Project Planning



Analysis



Design



Environment Management



River Environmental Planning



Information Technology

# Design

## 設計

Socio economic situation has been considerably changed and matured to the level in the Europe and USA for this half of the century. Consequently, the social demands also have been changed as taking a qualitative value as an environmental view and efficient cost-performance. Therefore, we have to develop comfortable and safer infrastructure with Zero Environmental Load and maintain them as long as possible. However, many undeveloped countries exist in the world and they are fighting with shortage of food and water, and unstable political situation, we also have to contribute to them in the field of the infrastructure stock to prevail their severe social situation. We, AHEC, are continuously making the best endeavor to find the solution for the social stock issue in terms of marine, ocean, lake and river, and to design and manage them by our reputable expertise and technique cultivated in these three decades.

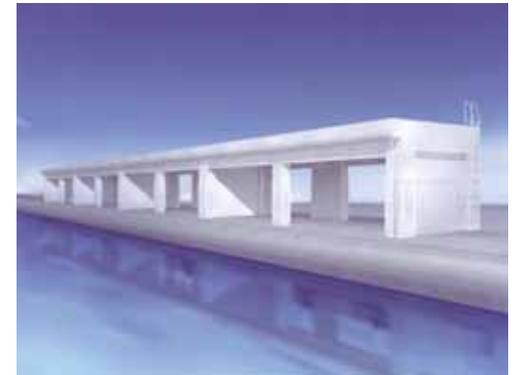
Design for Fishing Port



Environmental Improvement Facility Design



Design for Fisherman's Shed



Design for Hygienic Fishery Facility



Disaster Restoration Design



### Core Business

- Design for Port, Fishery Port, Coast Facility Design
- Seismic Design
- Reliability Design
- Stock Management Planning
- Landscape Design
- Architectural Design
- Quality Examination and Construction Management



Investigation



Project Planning



Analysis



Design



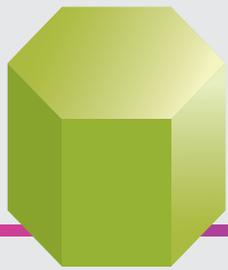
Environment Management



River Environmental Planning



Information Technology

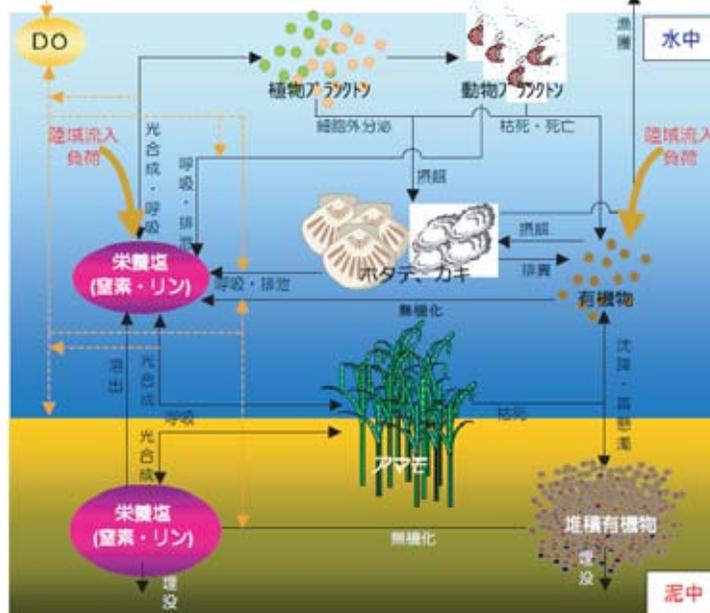


# Environment Management

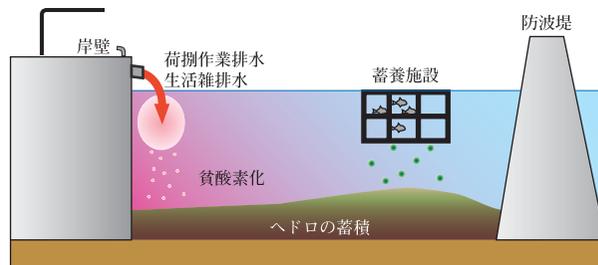
## 環境保全

Not only by a prevention measures for water pollution and waterfront utilization measures but also with careful consideration of ecosystem including plants and animals is definitely important for the formation and sustainable development of the affluent water environment to preserve/recover soundly natural environment. We address the solution to the various environmental issues for the area of an enclosed coastal seas (including anchorage in ports), lakes/dams, tideland and seaweed bed to be figured out, and some measures to be proposed based upon our comprehensive knowledge to the circulation mechanism of the nature.

Analysis on Water Quality in Enclosed Area(Eutrophication Analysis)  
Eutrophication Model for Water Area where Seaweed Bed and Aquaculture Facility are situated

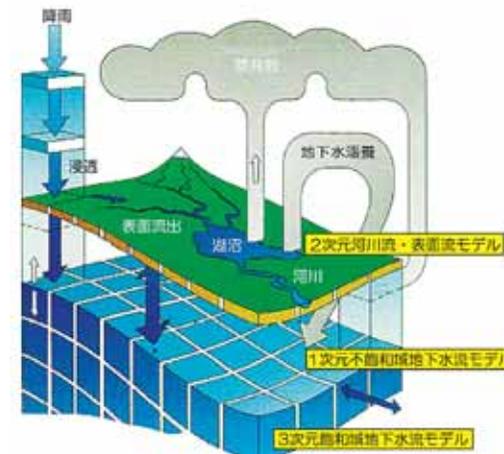
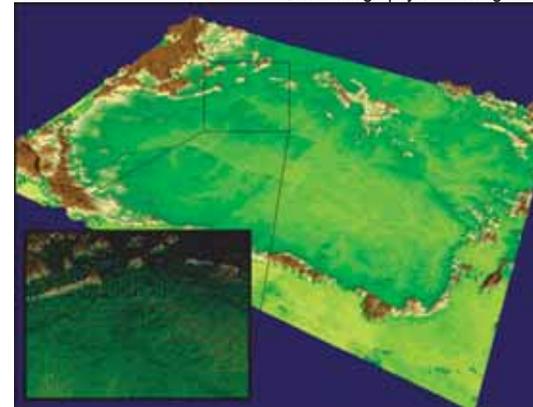


Influence Analysis of Aquaculture Facility



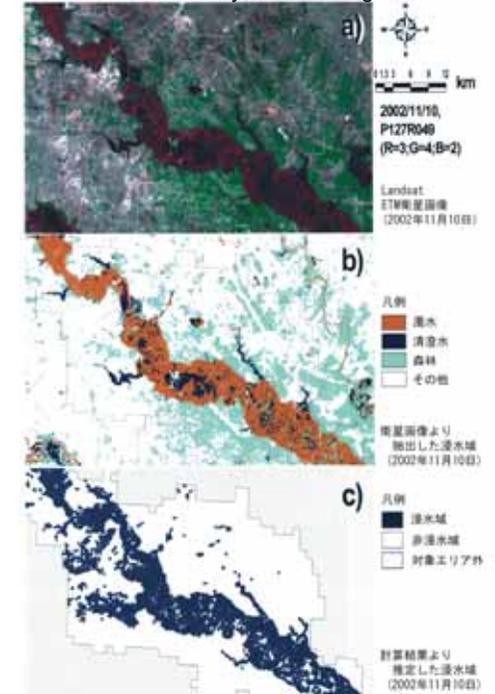
Deterioration of Water in Fishing Port

Comprehensive Water Circulation Analysis  
Basin Geography of Mekong River



Structure of Comprehensive Water Circulation Model

Flood Induction Analysis on Mekong River



### Core Business

- Investigation/Analysis on Enclosed Coastal Seas, Lakes, Dams, Seaweed Bed, Tideland and Natural Park
- Investigation of Natural Conditions
- Natural Environment Investigation
- Environmental Enterprise
- Numerical Analysis
- Simulation on Material Circulation
- Flow Simulation
- Water Circulation Simulation



Investigation



Project Planning



Analysis



Design



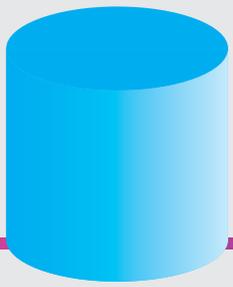
Environment Management



River Environmental Planning



Information Technology



# River Environmental Planning

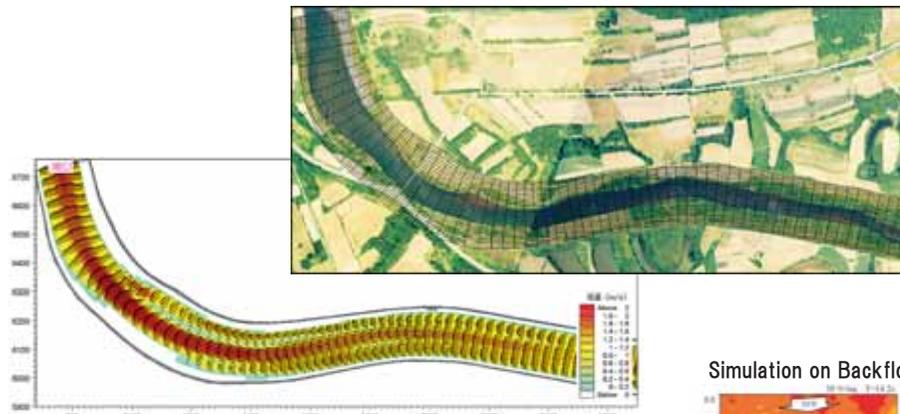
Alpha Hydraulic Engineering Consultants Co., Ltd.

The 21st century will be an era of conflict over water instead of the territory conflicts in 20th, therefore preservation of the favorable aquatic environment is getting very important subject for us. Also, in addition to the frequent occurrence of severe damage by natural disaster such as flood and tidal wave, addressing to the increasing urgency of damage by tsunami has become important issue. Thus, we will propose the river environment management required in the 21st century with respect to "watershed", "running sand system", and "estuarine region" as well as an investigation, an analysis, an evaluation and a project planning for the disaster prevention and an utilities protection in order to provide solutions and contribute to society as much as possible.

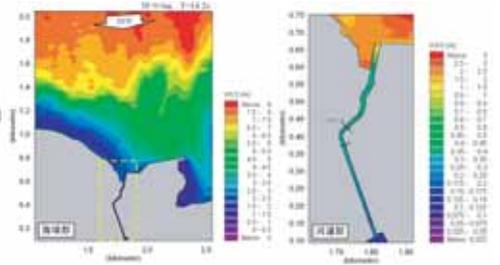
## 河川環境

Simulation on Stream Regime

Vegetation Survey



Simulation on Backflow caused by Ocean Wave



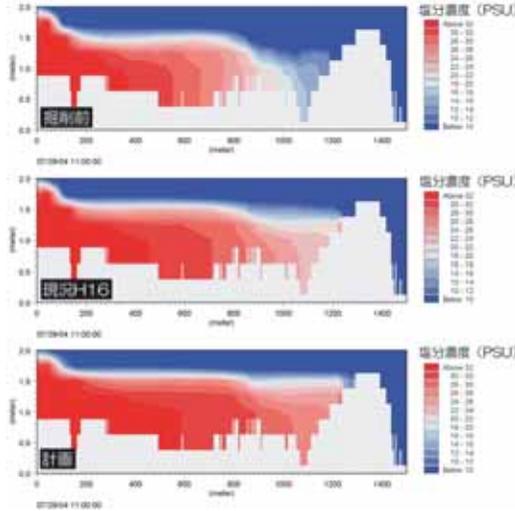
Streamflow Observation



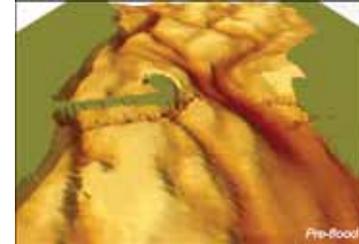
Simulation on River-bed Evolution



Simulation on Backflow caused by Ocean Wave



Bottom Sediment Survey



### Core Business

- Investigation of Natural Conditions
  - Water Quality and Bottom Sediment Survey
  - River Bed Transformation Survey
- Investigation of Natural Environment
  - Bioassessment
  - Inhabitation Investigation
- Numerical Analysis
  - Various Simulation on Phenomenon in River
- River Planning
  - Design for River Training, Structures and Bank



Investigation



Project Planning



Analysis



Design



Environment Management



River Environmental Planning



Information Technology



# Information Technology

Alpha Hydraulic Engineering Consultants Co., Ltd.

With a remarkable development in a field of IT, a new improvement of IT infrastructure has been required as a national strategy in the advanced information society of the 21st century. In this situation, we are facilitating an establishment of information system which makes conventional framework more efficient and sophisticated by using tools such as GIS (Geographical Information System) in various fields such as port, fishing port, coast, river. Also, we can make a proposal regarding utilization method for exchange and distribution of information created by system through networks in order to widely utilize in social life.

## IT 技術



Investigation



Project Planning



Analysis



Design



Environment Management



River Environmental Planning

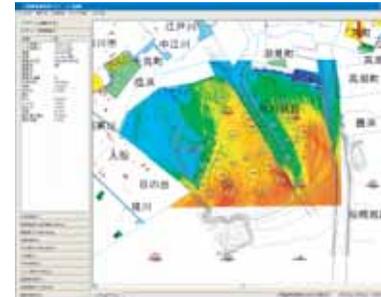


Information Technology

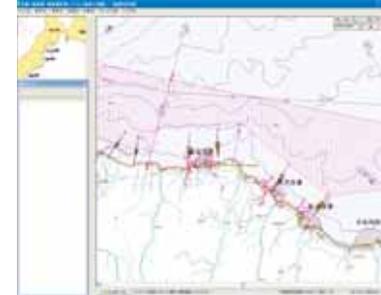
Comprehensive Coastal Management System using GIS



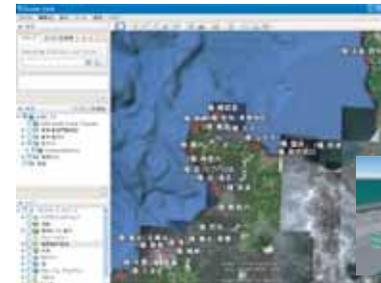
Development of Various Database Systems  
環境データベース



漁場・漁業権データベース



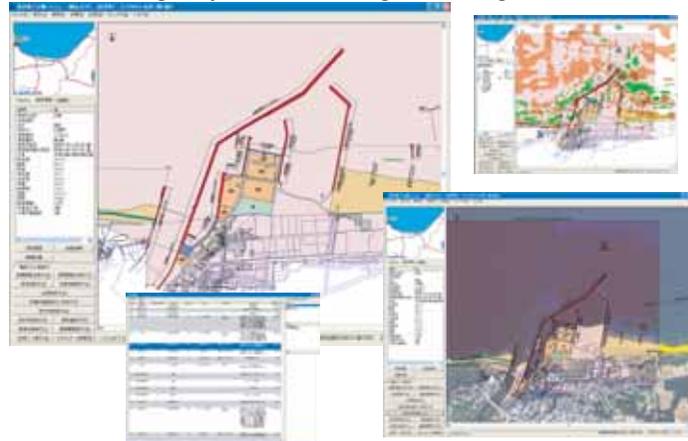
GoogleEarthを利用した漁港データベース



Flood Damage Estimating System using GIS



Electronic Ledger System for Fishing Port using GIS



Facility Diagnosis System for Asset Management



### Core Business

- Development, Introduction, Maintenance of Various ; System Applying GIS Database System Online system
- Introduction Technologies of Various Remote Sensing and GPS
- Digitalization of Various Materials