

# Environmental Technologies

3D Computational Fluid Dynamics (CFD) Analysis  
for Atmospheric Environment  
Survey & Analysis of Water Quality & Soil  
Contamination

Natural Environment Analysis

Modeling Habitat Suitability

Conserving Rare Plants

Determining Urban Biodiversity

Tracking Endangered Species Habitats by GPS &  
CCTV

**R&D Center**

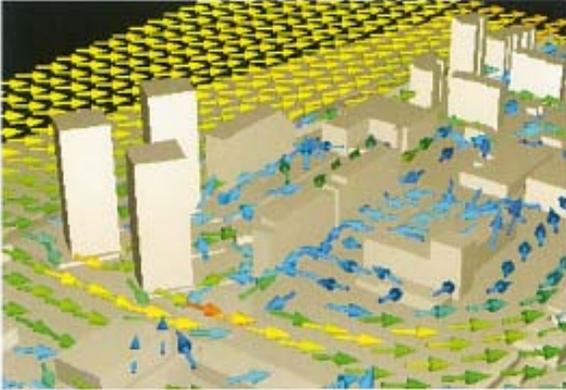
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## 3D Computational Fluid Dynamics (CFD) Analysis for Atmospheric Environment



Wind simulation around tall buildings

- Land modifications and construction works often cause adverse effects on atmospheric environment such as windblast, air pollution and cold air drainage.
- To provide the physically sound and cost effective countermeasures, we use three dimensional Computer Fluid Dynamics (CFD) analysis.

# Survey & Analysis of Water Quality & Soil Contamination



Chemical laboratory

There has recently been a large increase in awareness of soil and groundwater contamination with toxic substances.

The need to survey and possible contamination is increasing in real-state transaction and land redevelopment.

We provide field surveys for soil and groundwater contamination, analyzing for heavy or metals and other chemical compounds harmful to human health.

- Our lab is well equipped; instruments include:
  - Atomic absorption photometer
  - ICP chemiluminescent and spectroscopic analyzer
  - Liquid chromatograph
  - Gas chromatograph
  - Gas chromatograph mass spectrometer
  - Spectrophotometer
  - Spectrofluorometer



Soil gas survey

- We undertake water and soil surveys and performs soil and water sample analysis.
- We also perform investigation, evaluation, analysis, and examination in collaboration with our consulting divisions.



← Sampling  
Water quality test



On-site groundwater Survey

Country	Project
Japan	Environmental impact assessment for waste disposal center
Japan	Investigation of groundwater contamination for old factory sites
Japan	Groundwater monitoring of existing final waste disposal sites

# Natural Environmental Analysis



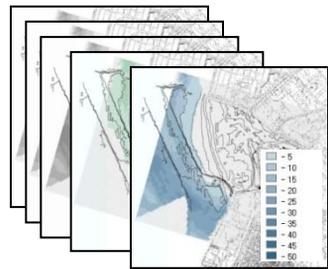
Field investigation of a rare fish using an elastomer tag

Biodiversity on the earth has been in great crisis since the 20th century.

To conserve biodiversity, we are researching on planning and evaluation methods such as modeling habitat suitability and field investigation methods using new devices such as an elastomer tag, GPS and CCTV.

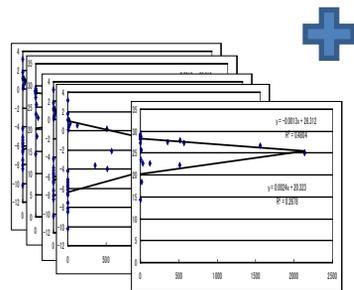
## Modeling Habitat Suitability

Through modeling appropriate environment for each animal and plant, we can predict the impacts of port projects and road projects on the animals and plants.

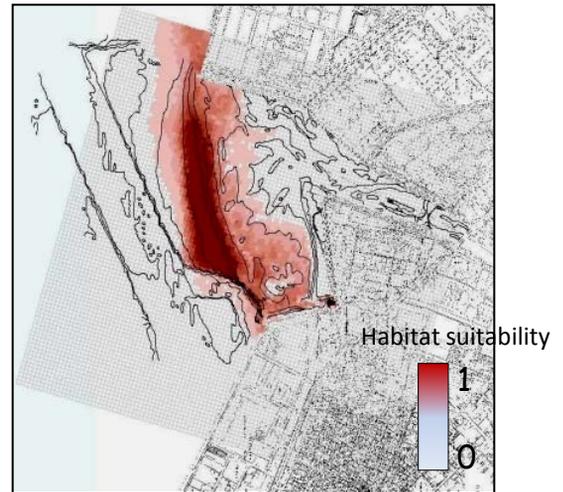


Preparing GIS database of habitat environment

- water depth
- salt content
- grain size distribution
- ocean waves, etc.



Modeling habitat appropriateness for each physical environmental factor



Appropriate habitat of clams, reproduced by the model

## Conserving Rare Plants

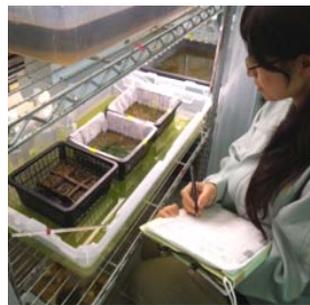
For conservation of rare plants in the construction sites (road, dam, etc.), we preserve and propagate rare plants in our R&D Center.



Glass house



Hygrophyte field



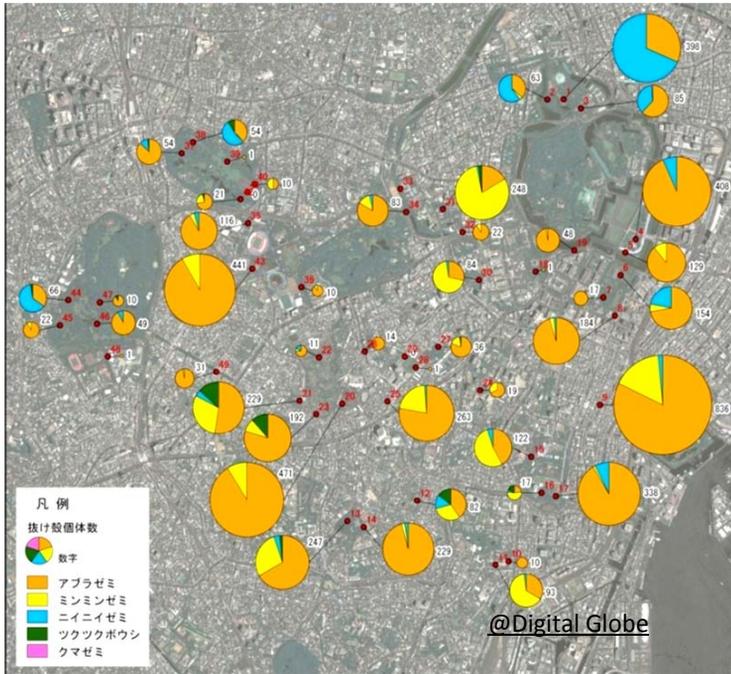
In-room glass house



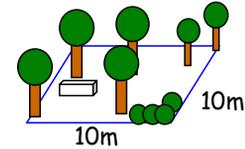
# Determining Urban Biodiversity



Counting cast-off skins of cicada is effective methods to know the biodiversity of the forest, Hence we clarify cicada distribution in urban areas and the environmental factors that affect its population and distribution.



Cicada distribution



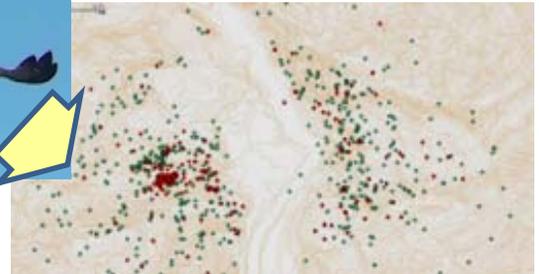
# Tracking Endangered Species Habits by GPS & CCTV

Attaching a GPS device



Tracking GPS information from a satellite

Documenting activity range



Installing an artificial nest



Collecting video record of nursing conditions by a CCTV camera

