

3D Space Modeling system for Flood Simulation





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Introduction



■ Indispensability of Flood Simulation System

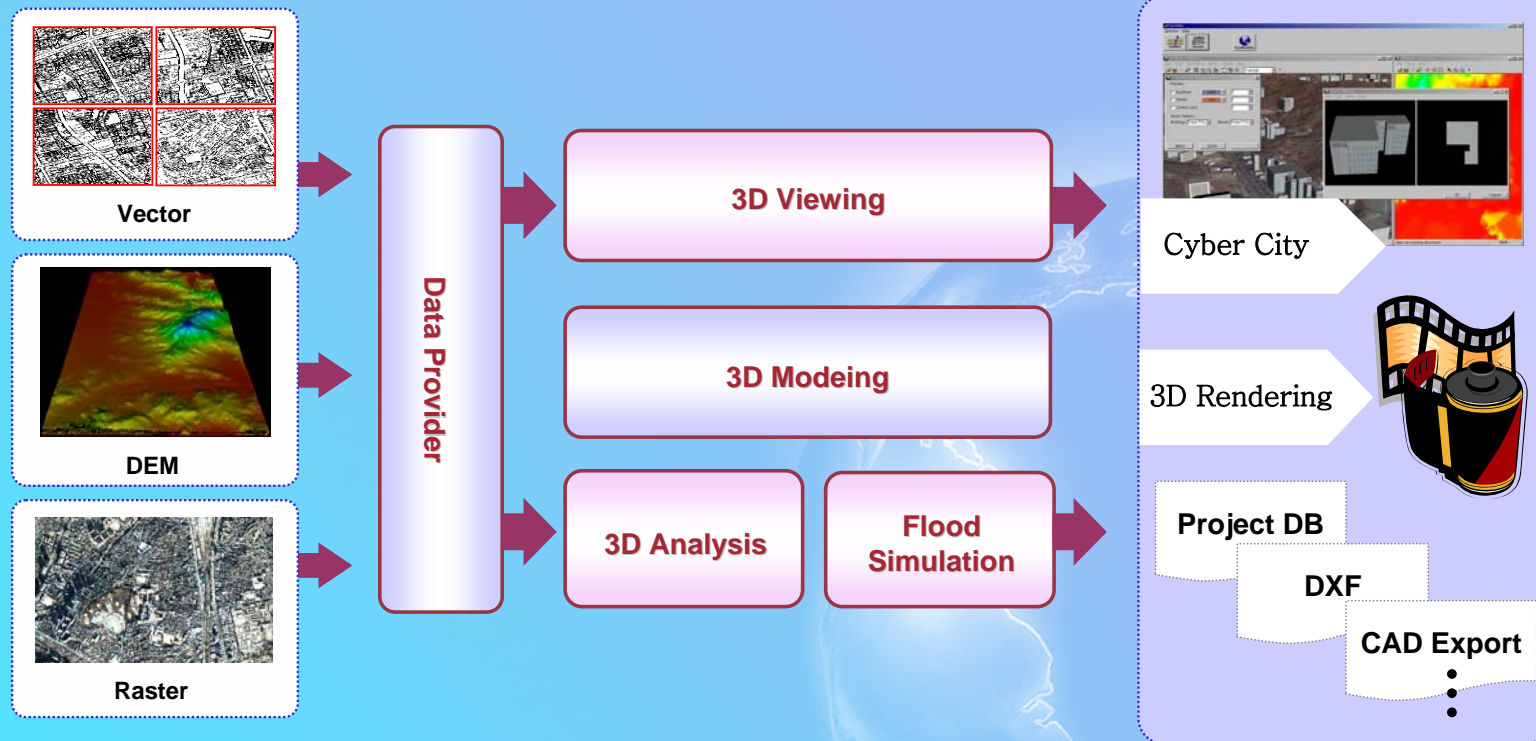
- No flood prediction system related to GIS
- Difficulty in predicting damage by flood
- Need for a mathematical model of flood prediction

■ 3D Modeling system for Flood Simulation

- Reflection of real world
- 3D modeling of real world with spatial datum
- 3D viewing for 3D flood simulation
- Preparation for basic environment for flood simulation



System Architecture





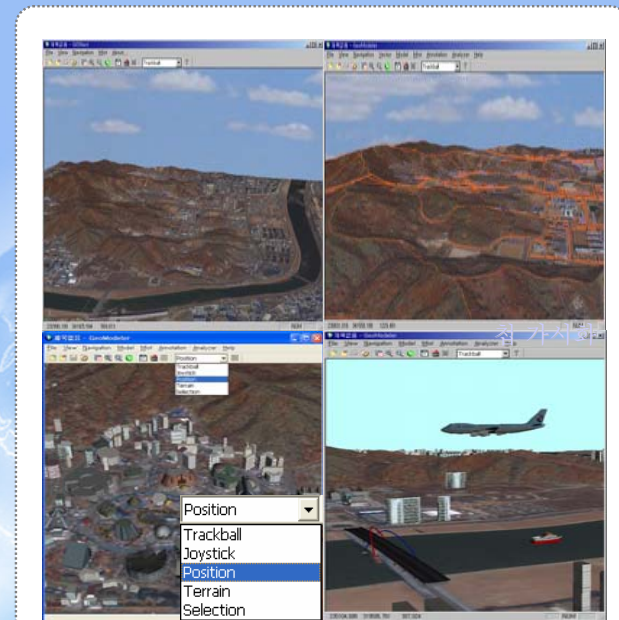
3D Viewing

■ 3D viewing of spatial datum

- 3D Rendering of DEM, Raster, Vector
- Layered viewing

■ 3D Navigation

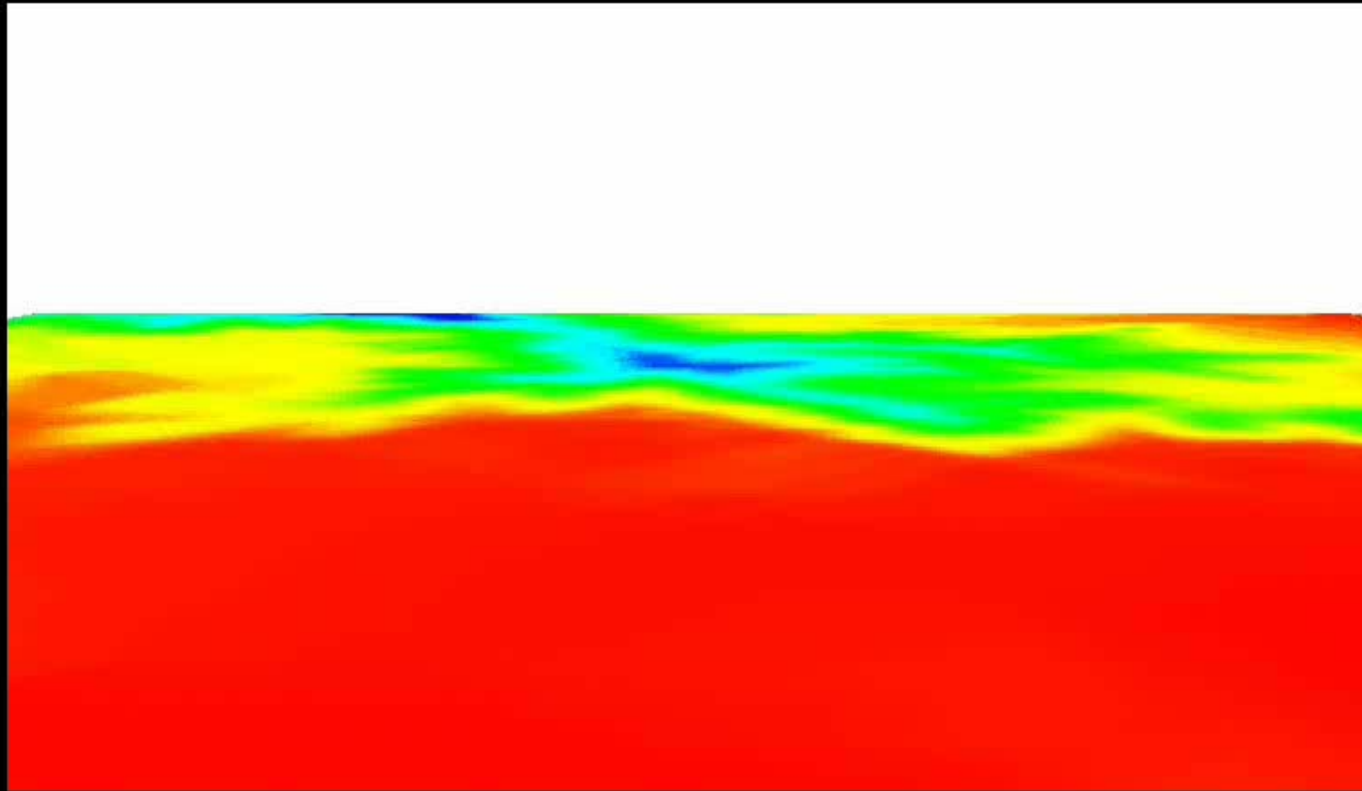
- 3D navigation with mouse operation
- 3D analysis of geographic space
- Trackball, joystic mode navigation
- Terrain mode navigation
- Location based navigation
- Selection mode navigation



3D Viewing



Data Loading & Navigation mode





3D Viewing

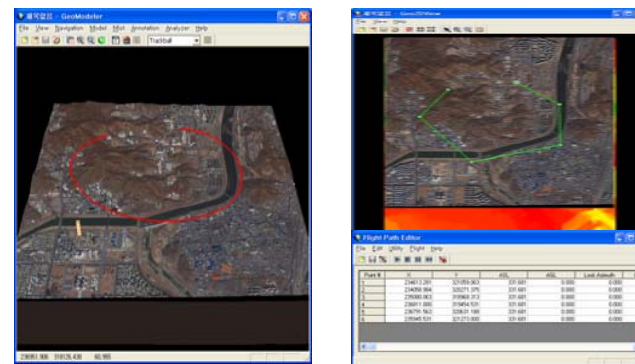
■ Animation of navigation process

- Navigation path edit
- Creation of animation

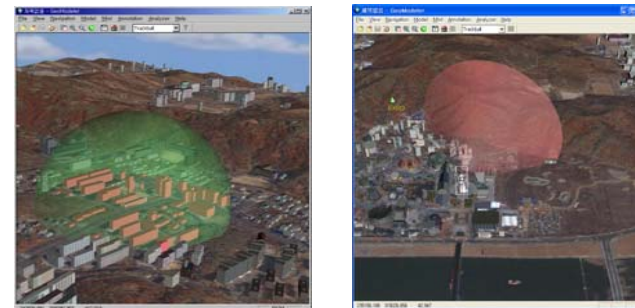
■ Snapshot of 3D Scene

■ 3D Analysis

- 3D Buffering
- Analysis of Viewing region



Navigation Path edit



3D Buffering

Viewing region



Characteristics of 3D Viewing



■ Improvement of User interface

- Mouse operation and Hot key
- Various forms of navigation for user

■ Maximization of veiwing effect of 3D navigation with scene property edit

- Background edit – solid color, texture
- Fog/Mist effect
- Sun positioning

■ Possibility of 3D analysis of 3D space with spatial analysis tools

- Analysis of veiwing region
- 3D buffering



3D Space Modeling

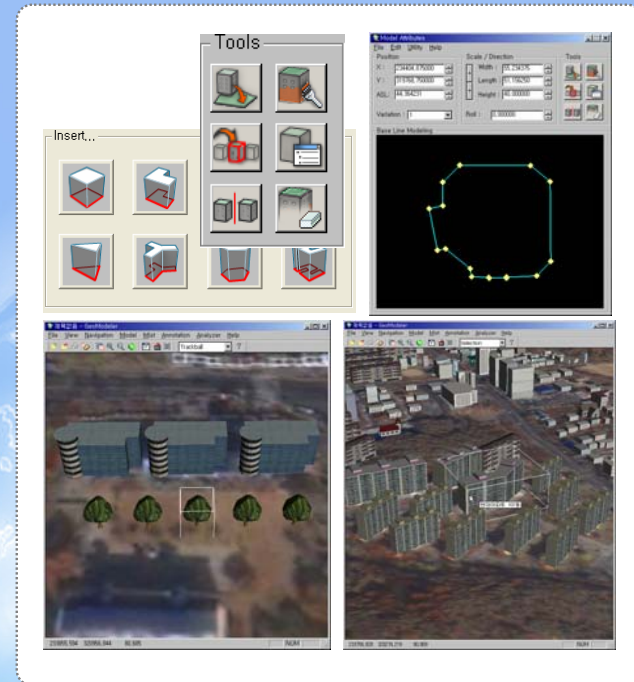


■ Space Modeling for 3D space analysis

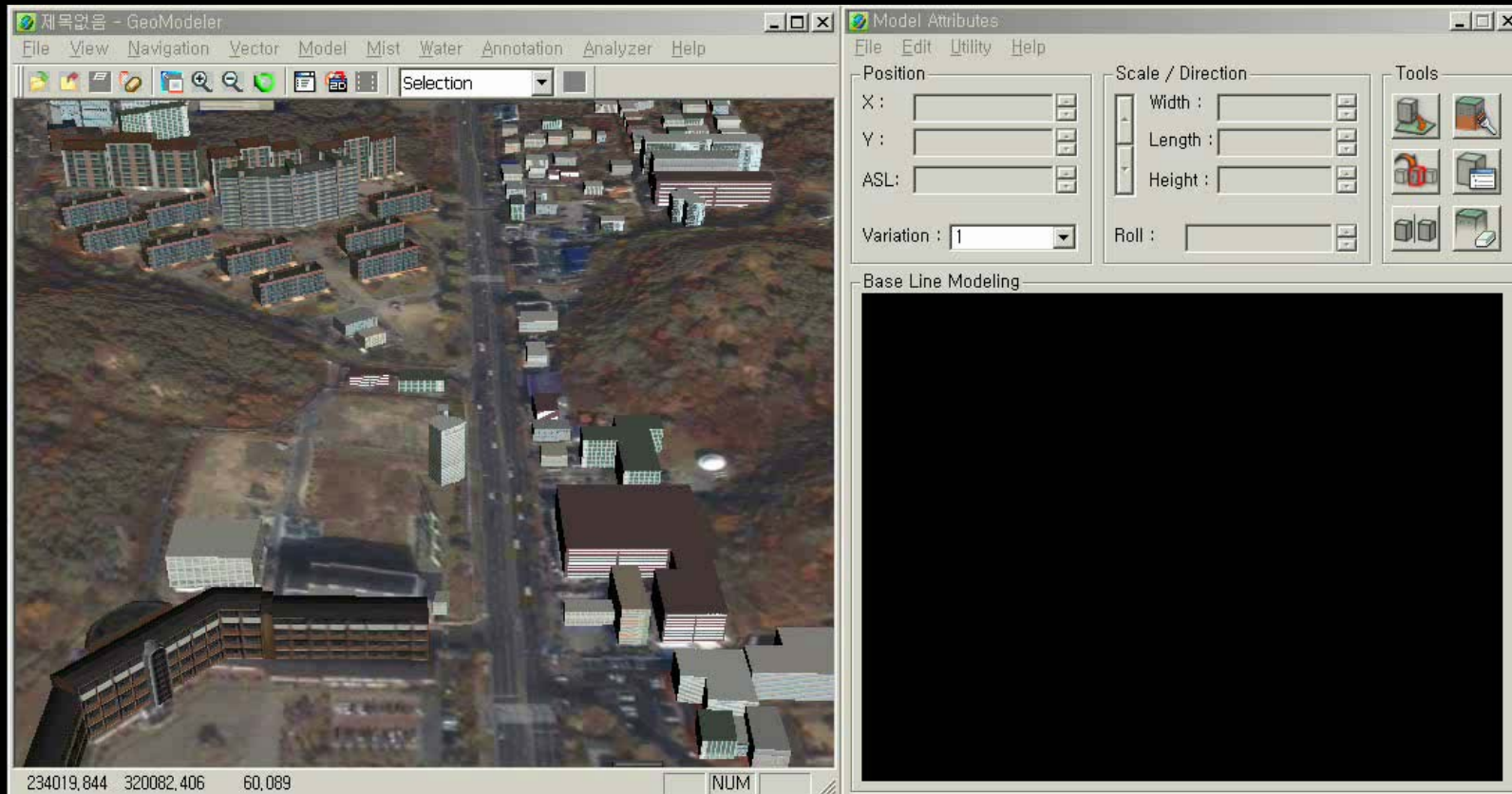
- Construction of 3D cyber space with spatial datum

■ Various types of building modeling

- Automatic reconstruction with vector data
- Building modeling with vector edit
- Building modeling with building templates
- Building modeling with model data import



Building Modeling with template





3D Space Modeling

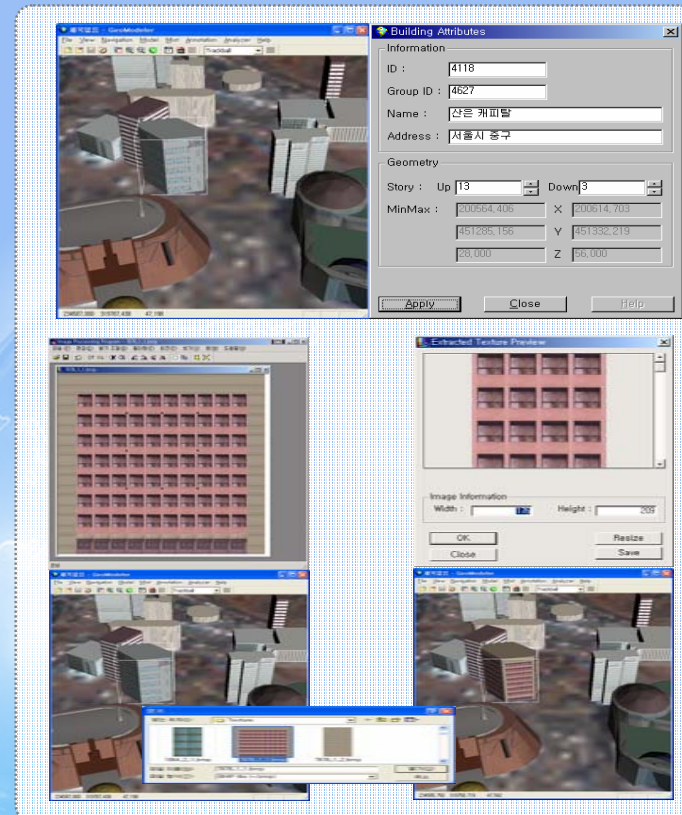


■ Edit of building attribute

- Building name, address, number of stairs, min/max, spatial information

■ Extraction and edit of building texture

- Texture extraction with texture extractor
- Texture edit for improvement of reality





Characteristics of 3D Space Modeling



- Enhancement of convenience of user interface by integration of 3D viewing and 3D modeling
- Enhancement of modeling environment with various modeling methods
 - Various modeling methods
 - Compatible with commercial modeler
 - Superior modeling environment to foreign S/W

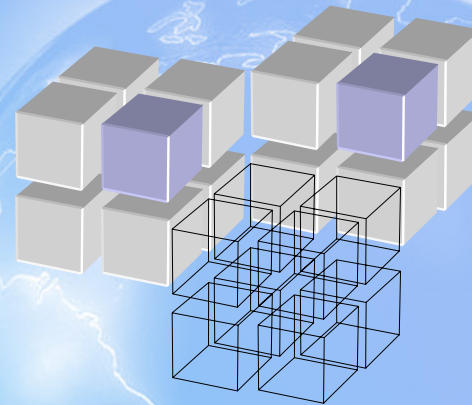
	IRHIS/GeoModeler	A Software	B Software
Vector edit	0	X	0
Model import	0	0	0
Compatibility (MAX, MAYA)	0	X	X
Model template	0	X	X
Texture extraction/edit	0	X	△ (only edit)



Demonstration



- Expo park of Daejeon
- Junggu of Seoul



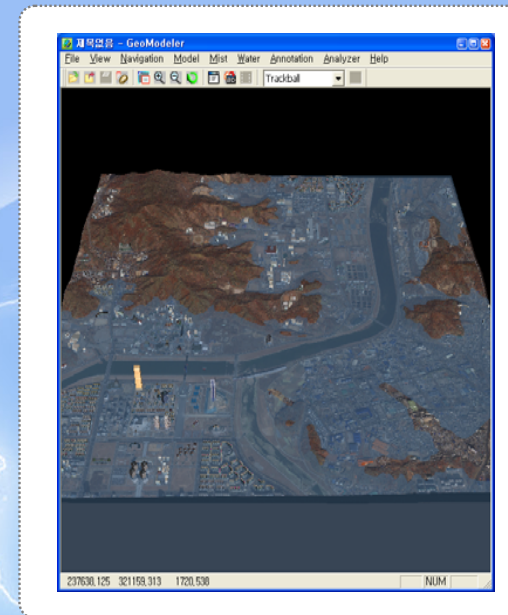
Expo park & Junggu

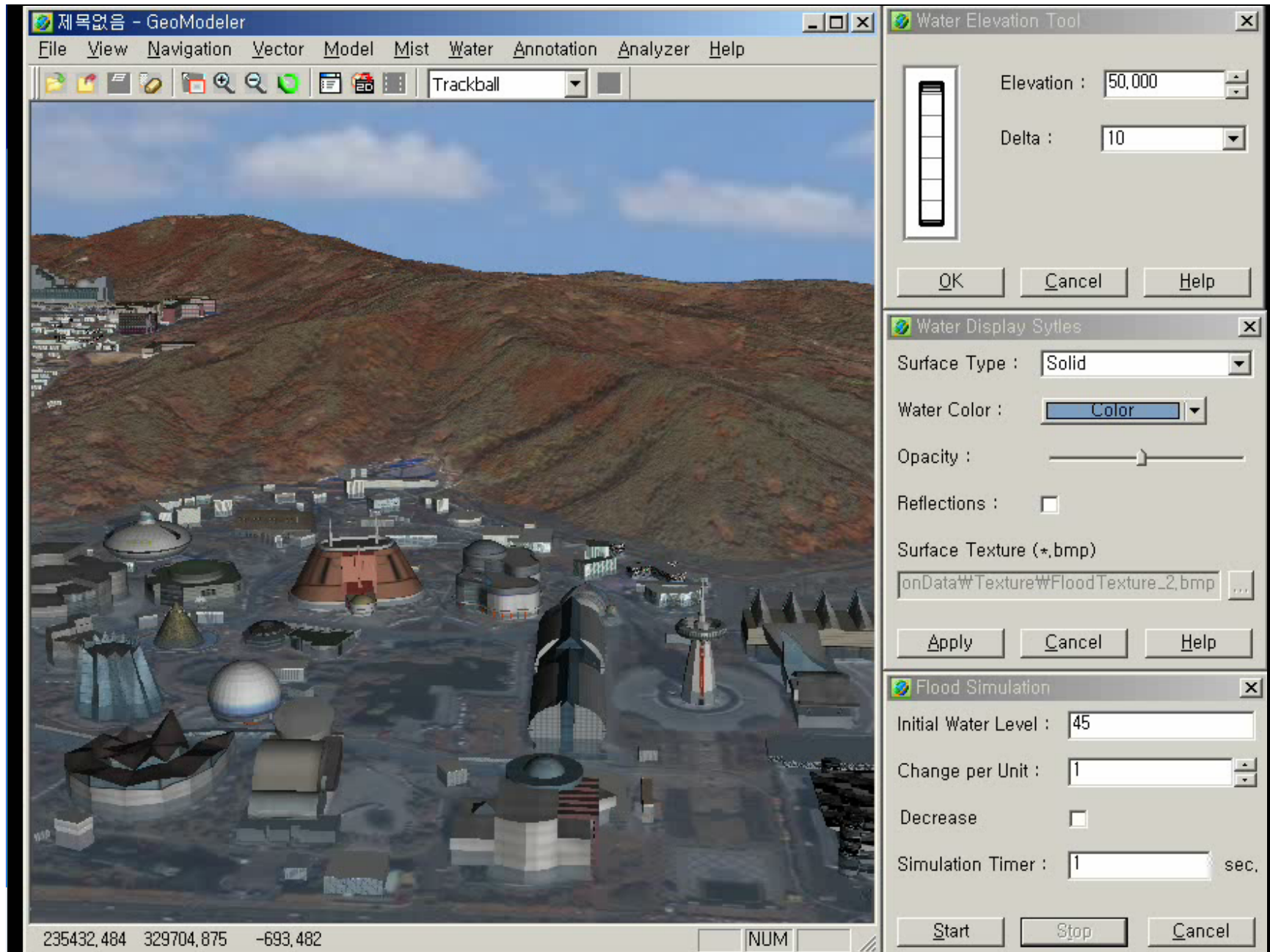




Flood Simulation

- Flood simulation with water elevation tool in the modeled 3D cyber city
- Display of the extent of damage by flood
- Edit of display style of water
- Basic environment for flood simulation







Conclusion



- **Preparation of basic environment for flood simulation**
 - 3D viewing technique
 - 3D modeling technique

- **Application to a system of prevention of flood related to GIS**

- **Need for a rigorous mathematical model of flood prediction for flood simulation provided by the 3D Modeling system**

Thank you!

