



Grid Analysis of Landslide Hazards Impacting Transportation Systems

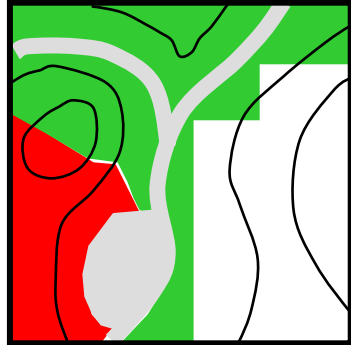
Presented by
Sean Davies
sean.davies@intergraph.com

Intergraph Corporation
Mapping and GeoSpatial Solutions

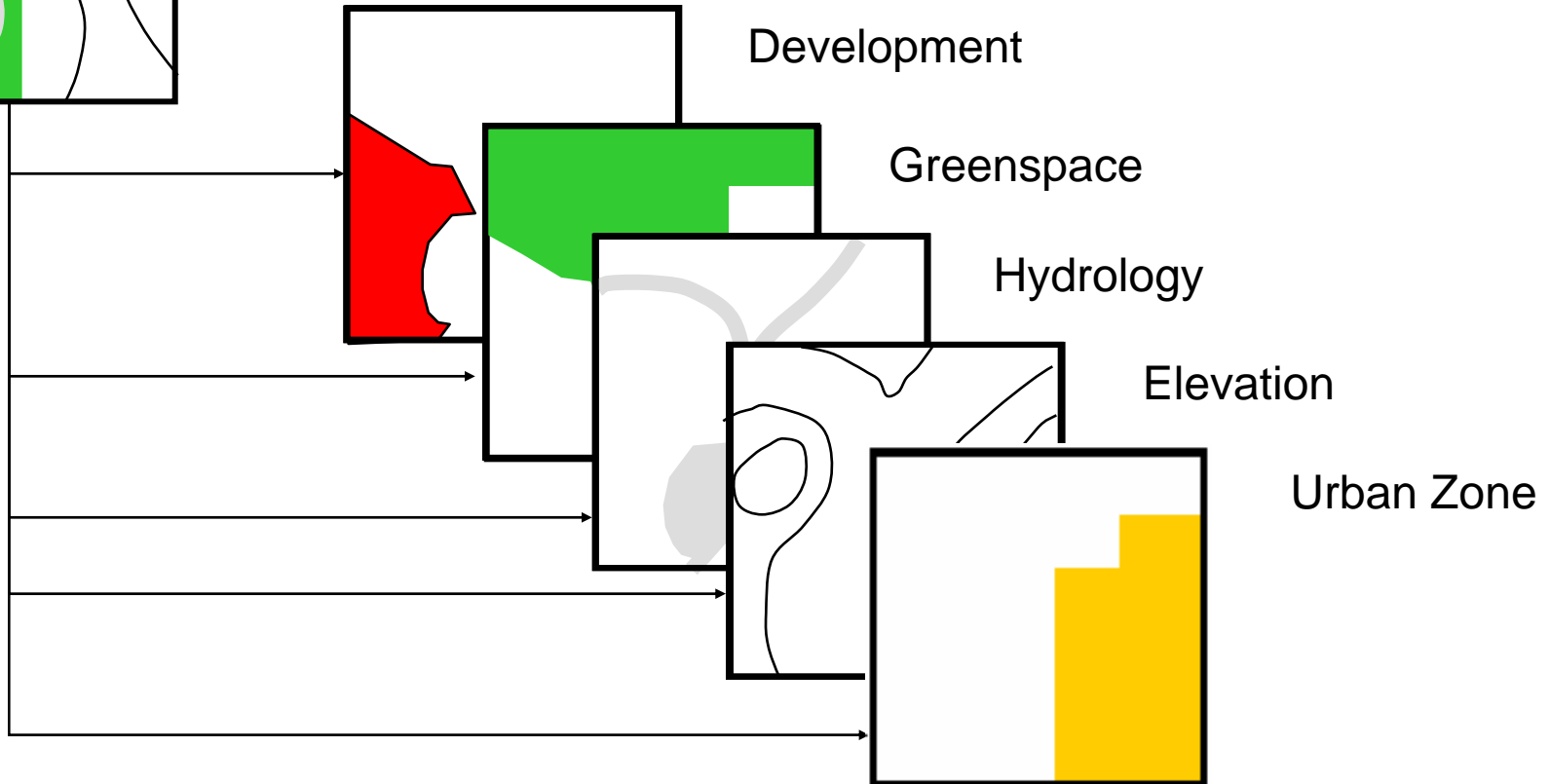
Grid Analysis Capabilities

- **Hot Spot Analysis**
- **Least-Cost Corridor Analysis**
- **Downhill Flow Path Determination**
- **Viewshed Analysis**
- **Spatial Statistical Analysis (water quality, etc.)**
- **Continuous Surface Interpretation**

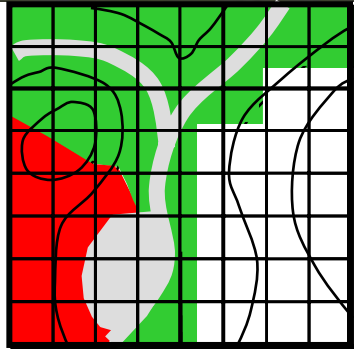
Vector Model



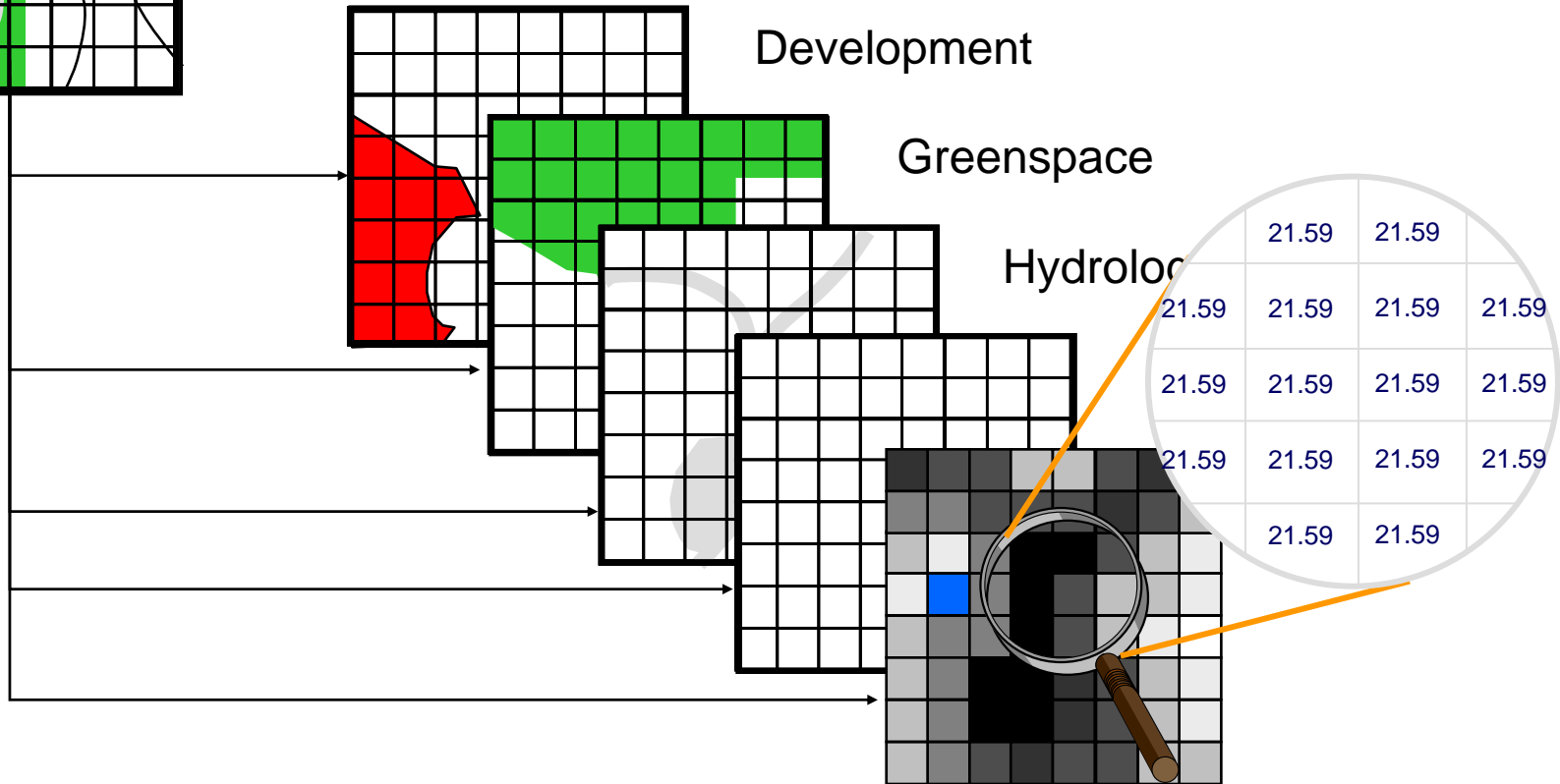
Vector based systems show data by means of a series of **points**, **lines**, and **polygons**. Each layer contains information about one theme or topic.



GRID Model



Grid based systems show data by means of a series of **gridded cells**. Each layer contains information about one theme or topic.



Vector and Grid

Vector

Employs points, lines, and polygons to represent data.

Reliance on databases for data storage and retrieval.

Compares layers of information based on database queries.

Strong query tools.

Grid

Employs cells or images to represent data.

The maps themselves contain the data. (can be tied to a database)

Compares layers of information based on cell-by-cell comparisons.

Strong analytical tools.

Grid Layers

In a grid layer, geographic space is divided into a grid of square cells in which each cell represents a square parcel of land.

Each cell has a **location, value, resolution, and **appearance.****

These can be combined into **zones of similar cells.**

A grid layer legend in the edit window provides information about the layer.

Using this concept, multiple layers can be used to describe or analyze different features of the same geographic space.

Cell Value

Cell Value

- Imported grid layers have values that are attributes, such as elevation, temperature, electromagnetic reflectance, or population,
- Nominal values indicating a quality or category, such as soil type, highway designation, tree species, or political district are also possibilities.

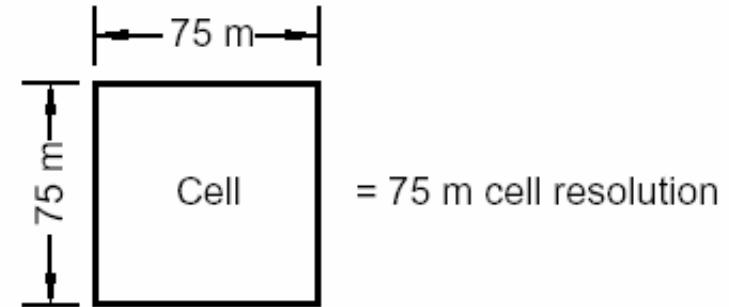
| | | | |
|----|----|----|----|
| 12 | 4 | 5 | 5 |
| 3 | 22 | 22 | 23 |
| 3 | 22 | 22 | 23 |
| 12 | 12 | 12 | 22 |

A single cell
with a value
of 22

Cell Resolution

Cell Resolution

- The cells making up a grid layer all have the same cell resolution.



- Cell resolution is the length of one side of the “real world” square represented by the cell.
- Grid layers that are used together in grid analysis must all have the same cell resolution.

Areas Prone to Mudslides

Huntsville, AL Input Criteria

- **Distance from Streets**
- **Aspect**
- **Slope**
- **Soil Type**
- **Known Slides**