

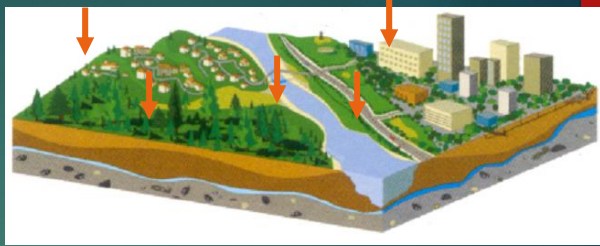
Model Elevasi Digital Permukaan Bumi (DEM)

APLIKASI LANJUT MATERI PEMBUATAN PROFIL DAN KONTOUR

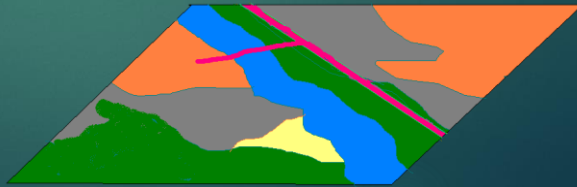
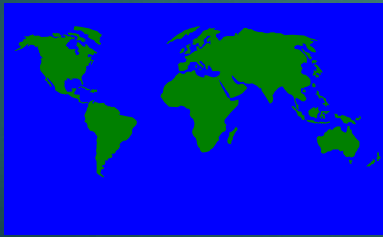


**Lokasi manakah yang masih bisa dikembangkan untuk lokasi permukiman ?
Berapa luas hutan yang masih ada ?**

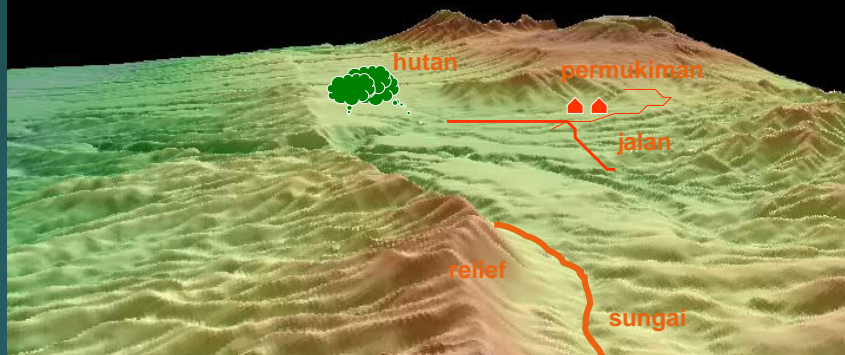
PETA adalah : Gambaran Permukaan Bumi



Yang diproyeksikan ke bidang datar dengan skala tertentu

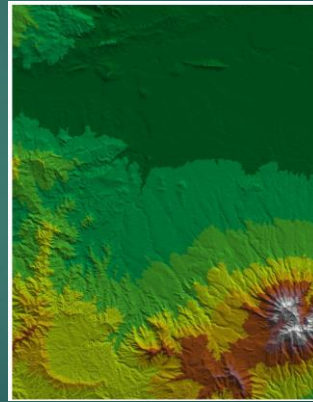
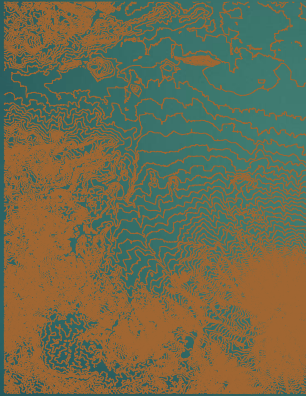


Apa yang dimaksud dengan permukaan bumi ?

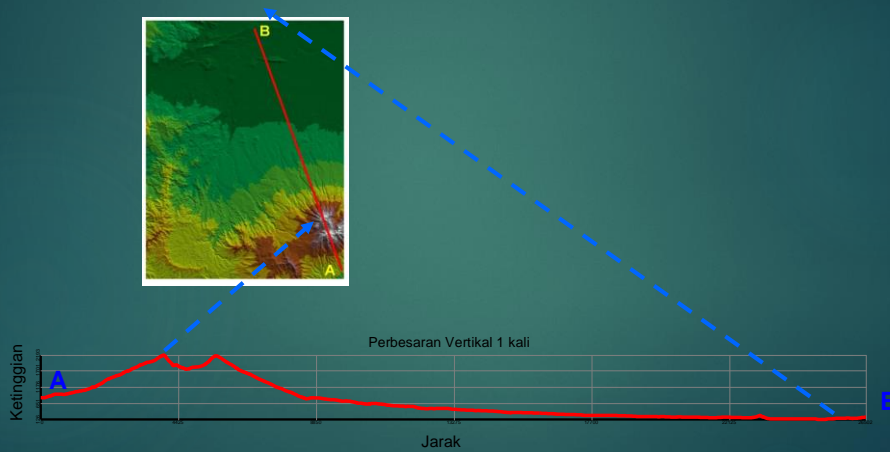




PENYAJIAN DATA KETINGGIAN DALAM BENTUK KONTUR DAN SHADING



ANALISIS PROFIL PENAMPANG MELINTANG

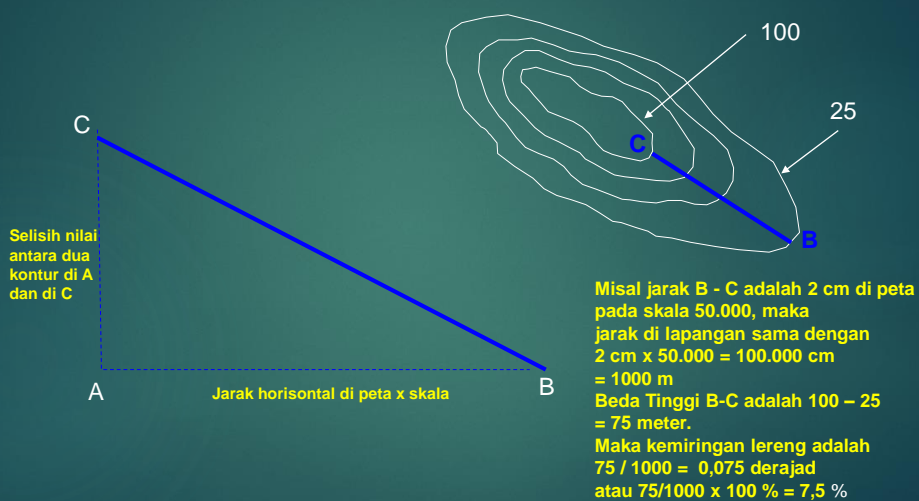


ANALISIS LERENG/GRADIEN

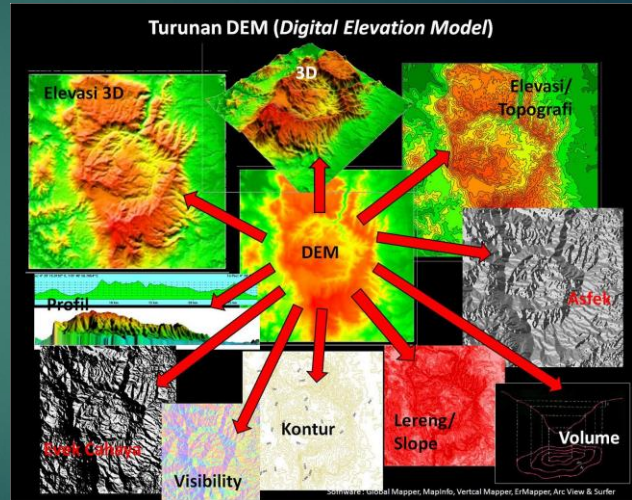
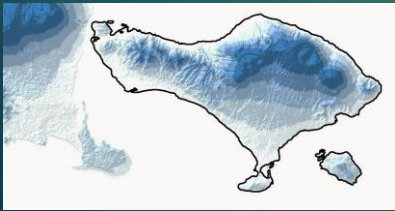
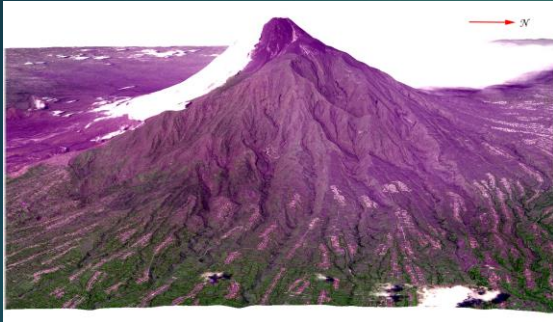
Kemiringan lereng/slope sering
Disebut dengan gradien



MENGHITUNG GRADIEN



Apa itu DEM



Digital Elevation Model: What it looks like

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DEM

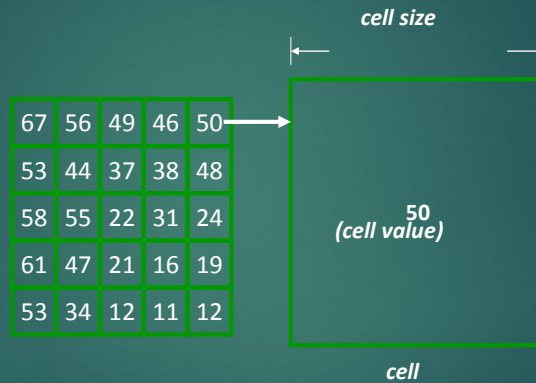
67	56	49	46	50
53	44	37	38	48
58	55	22	31	24
61	47	21	16	19
53	34	12	11	12

Lay a grid over some part of the world and find the average elevation in each cell

Cell Definition

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DEM



The size of a cell is in either: meters, feet, degrees, or arc seconds

DEMs and DTMs

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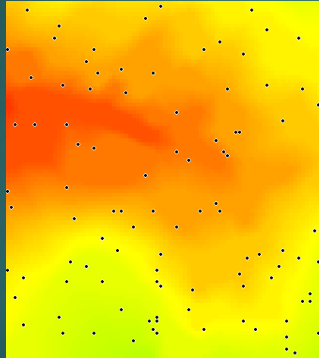
- ▶ Some definitions...
 - ▶ DSM (Digital Surface Model)
 - ▶ Set of regularly or irregularly spaced of surface value
 - ▶ It contains information about trend of surface
 - ▶ DEM (Digital Elevation Model)
 - ▶ set of regularly or irregularly spaced height values
 - ▶ no other information
 - ▶ DTM (Digital Terrain Model)
 - ▶ set of regularly or irregularly spaced height values
 - ▶ but, with other information about terrain surface
 - ▶ ridge lines, spot heights, troughs, coast/shore lines, drainage lines, faults, peaks, pits, passes, etc.

DEMs and TINs

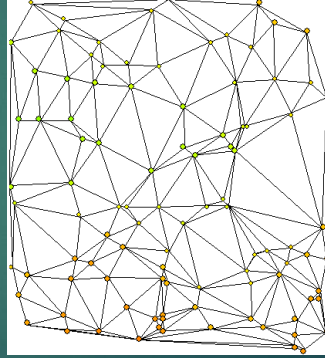
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Physical Environment
Week 19

DEM with sample points



TIN based on same sample points



Advantages/disadvantages

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GEOG2750 – Earth Observation and GIS of the
Physical Environment
Week 19

- ▶ DEMs:
 - ▶ accept data direct from digital altitude matrices
 - ▶ must be resampled if irregular data used
 - ▶ may miss complex topographic features
 - ▶ may include redundant data in low relief areas
 - ▶ less complex and CPU intensive
- ▶ TINs:
 - ▶ accept randomly sampled data without resampling
 - ▶ accept linear features such as contours and breaklines (ridges and troughs)
 - ▶ accept point features (spot heights and peaks)
 - ▶ vary density of sample points according to terrain complexity

Sumber Data DEM

- ▶ Survei Lapangan
- ▶ Data Analisis Penginderaan Jauh
 - ▶ Foto Udara (Stereo) → Photogrammetry
 - ▶ Foto Stereo Citra Satelit → Imagegrammetry (Stereo)
 - ▶ Shuttle Imaging (Stereo) → Imagegrammetry (Stereo) dan Radargrammetry
 - ▶ Radar → Radargrammetry (interferometry – Differential Interferometry) – INSAR / IFSAR, DINSAR
 - ▶ LIDAR → Point Cloud Analysis (advanced)

Sumber lain : DEM Data Sources

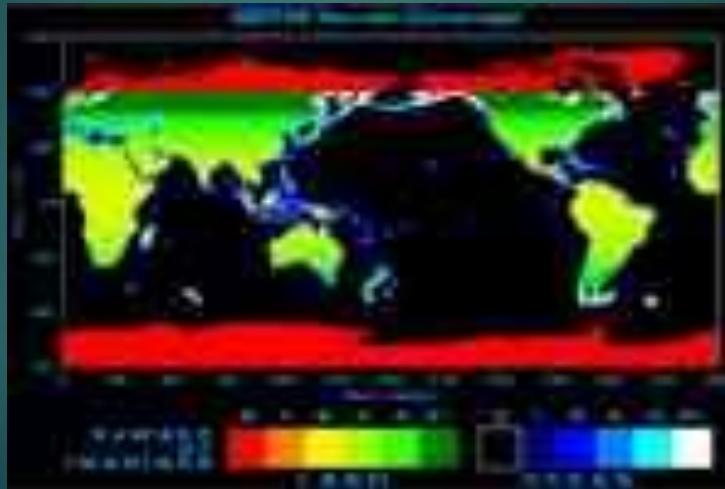
- ▶ Shuttle Radar Topography Mission (**SRTM**)
- ▶ **30m** DEMs from 1:24,000 scale map
- ▶ **1"** National Elevation Dataset
- ▶ **3"** (100m) DEMs from 1:250,000 scale maps
- ▶ **30"** DEM of the earth (**GTOPO30**)

Shuttle Radar Topography Mission (SRTM)

- ▶ 1 arc-second elevation data for the United States, 3 arc-second data for the globe
- ▶ Produced by radar measurements from a Shuttle mission, Feb 11-22, 2000
- ▶ <http://srtm.usgs.gov/data/obtainingdata.html>



SRTM Coverage 56°S to 60°N



30m DEMs

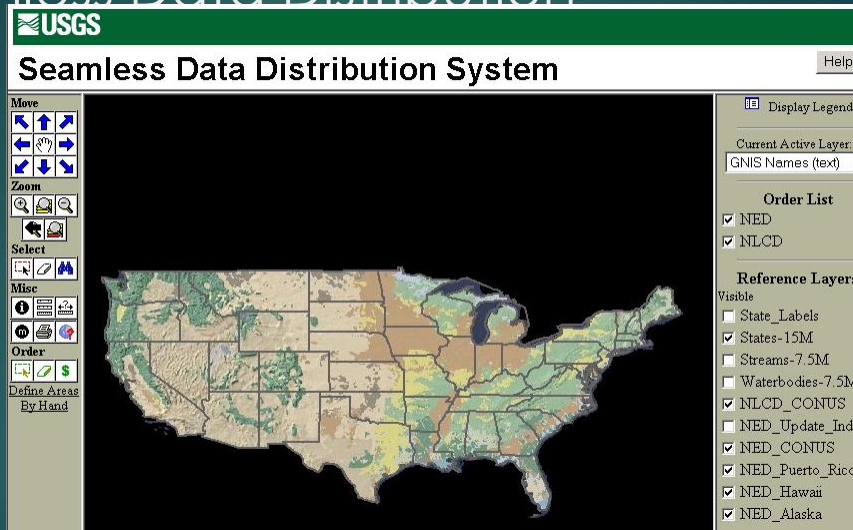
- ▶ **Best resolution** standardized data source available for the US
- ▶ Coverage of the country is **incomplete**
- ▶ Data by 7.5' map sheets in **UTM** projection
- ▶ **Link** for **US**
http://edcwww.cr.usgs.gov/Webglis/glisbin/guide.pl/glis/hyper/guide/usgs_dem
- ▶ **Link** for **Texas**
<http://www.tnris.state.tx.us/DigitalData/DEMs/dems.htm>

National Elevation Dataset

- ▶ **Seamless 1" DEM** for the US in $1^{\circ} \times 1^{\circ}$ blocks
- ▶ Compiled by **synthesizing the 30m DEM's** from 1:24,000 scale maps
- ▶ **Link** to website
<http://edcnts12.cr.usgs.gov/ned/>



Seamless Data Distribution <http://seamless.usgs.gov/>



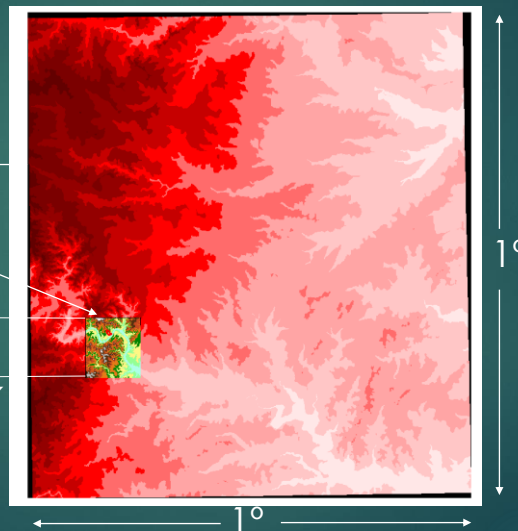
<http://edcnts14.cr.usgs.gov/Website/store/viewer.htm>

Coverage of 30m, 1" and 3" DEMs

1" and
3" DEMs

30m DEM

7.5'
7.5'



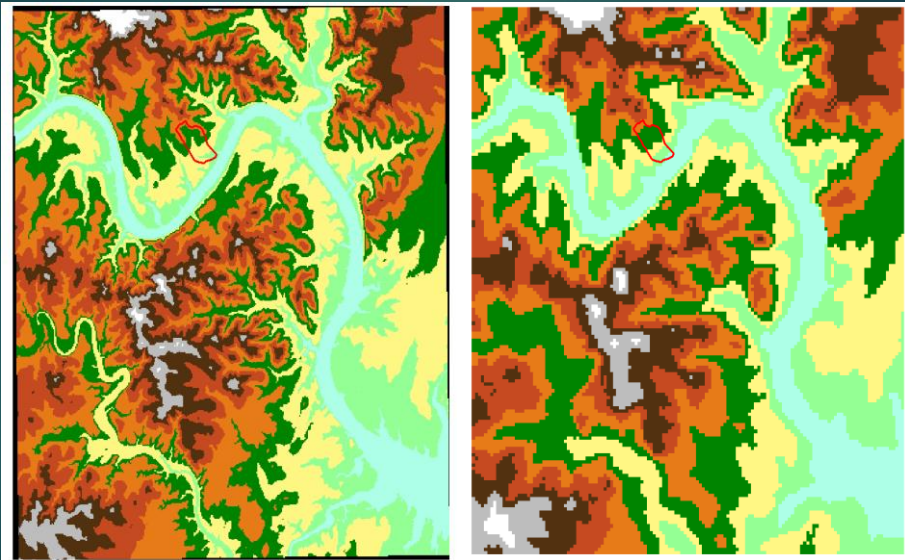
3" DEMs

- ▶ Derived by US Defence Mapping Agency, available from USGS for **the whole US**
- ▶ Data in geographic coordinates by 1:250,000 map sheet names (**1°x 1°**) cells in (1°x 2°) maps
- ▶ Needs to be **projected** to planar coordinates
- ▶ [Link](http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/ndcdb.html) <http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/ndcdb.html>

30m

Cell Size

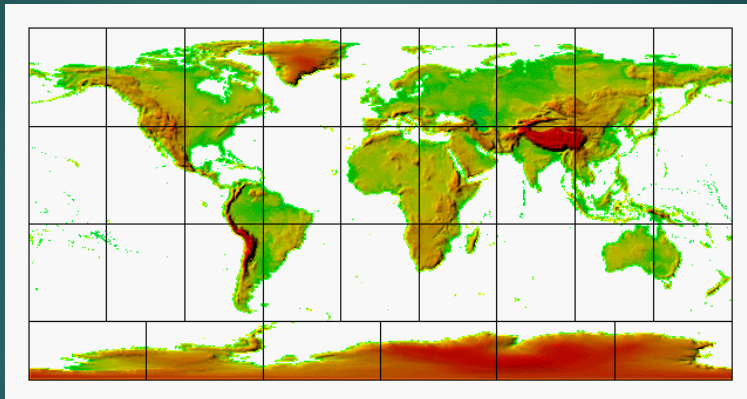
100m



30" DEM GTOPO30

- ▶ Produced by **USGS** from 3" grids and Digital Chart of the World topography
- ▶ Coverage complete for the **earth**
- ▶ Projected cell size is **1km**
- ▶ Data must be **projected** before use
- ▶ [Link](http://edcwww.cr.usgs.gov/landdaac/gtopo30/gtopo30.html) <http://edcwww.cr.usgs.gov/landdaac/gtopo30/gtopo30.html>

GTOPO30



Source: <http://edcwww.cr.usgs.gov/landdaac/gtopo30/gtopo30.html>

GARIS BESAR KEGIATAN SURVEI TANAH

