RS & GIS for city level assessments

- Panaji & Visakhapatnam

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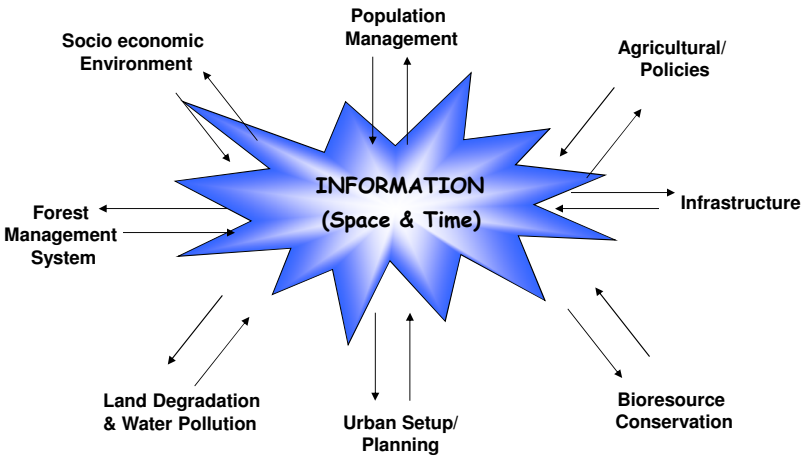
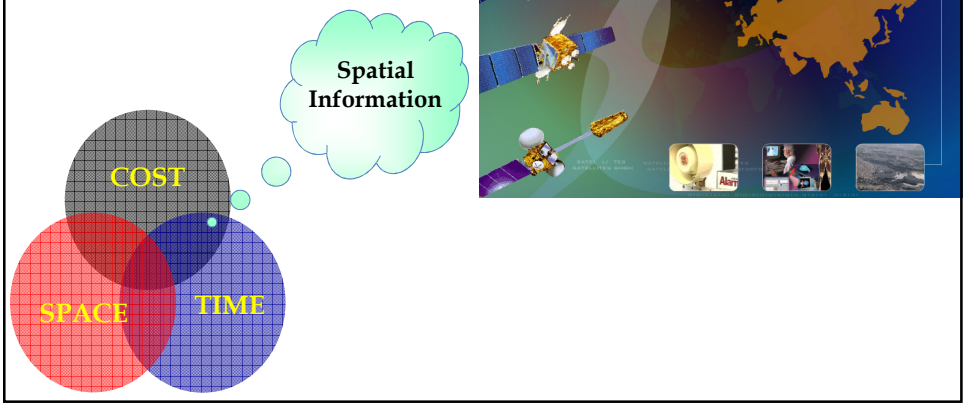
Need?

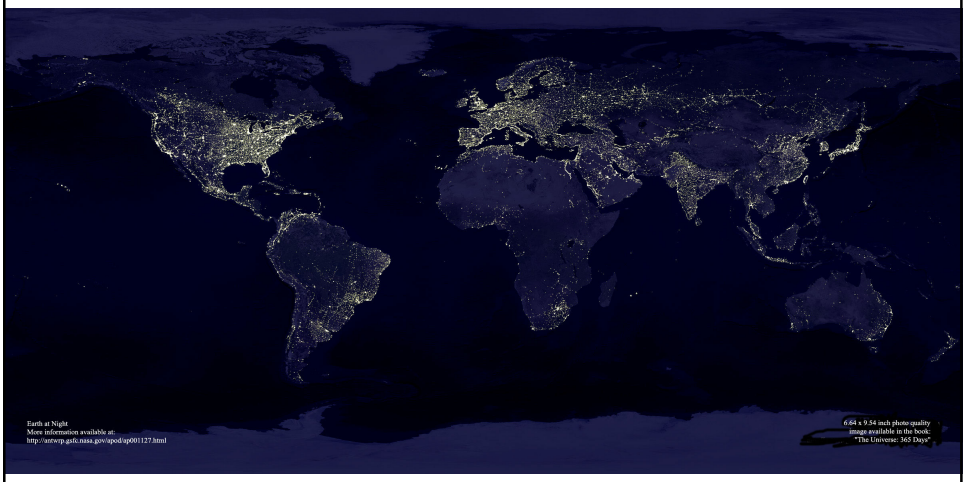


Facts for planning

Remote Sensing, GIS & GNSS



Urban Centers – Around the Globe

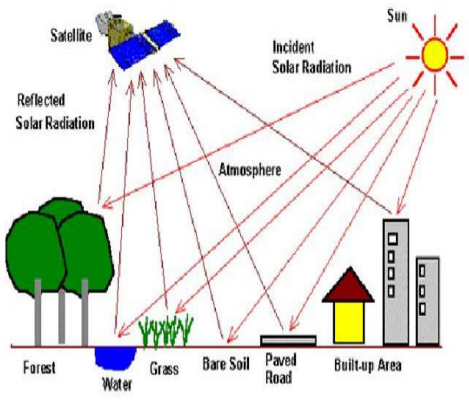


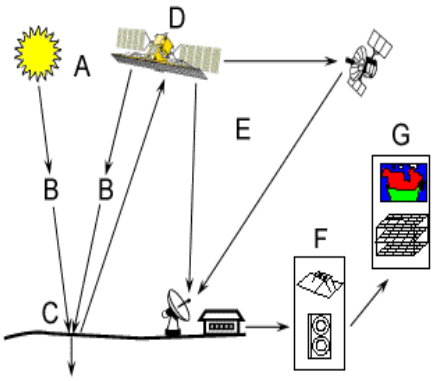
Source: DMSP/OLS NTL

Development of Ur Surrounding

Source: Google Earth

Stages of Remote Sensing



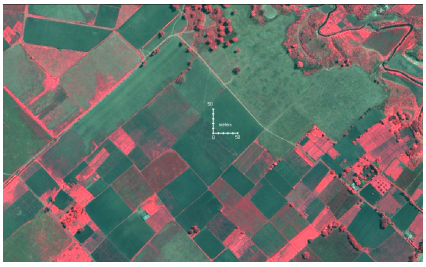


Source: CRISP

High Resolution

Forested Landscape

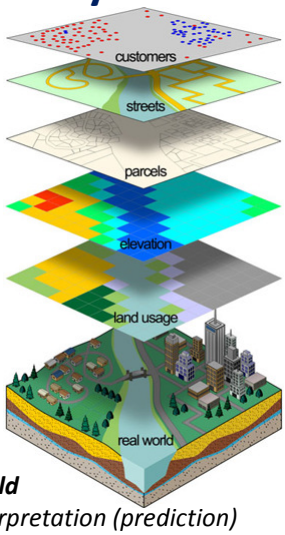
Settlement (Urban)



Agricultural Land

Source: NRSC/ISRO

GIS - Geographical Information System

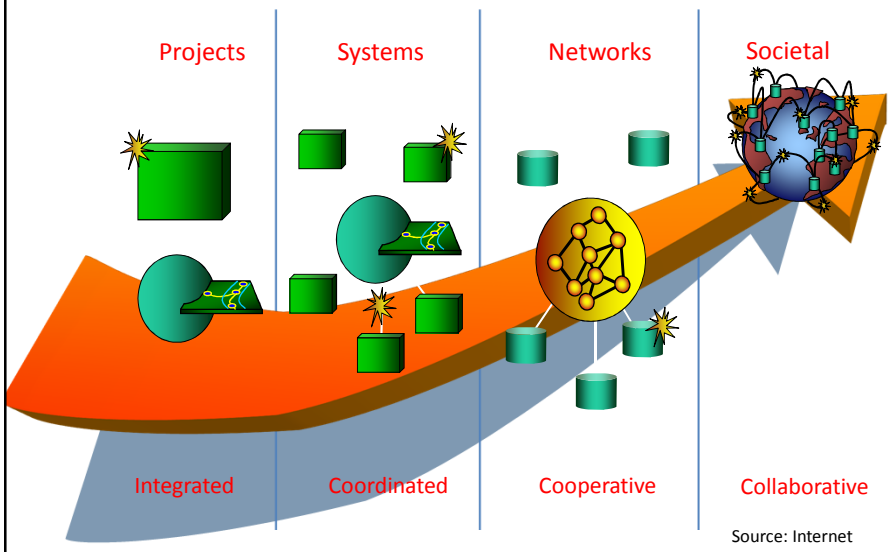


GIS gives map - *the mislabeled child*

Its all about analysis, problem solving, and pattern interpretation (prediction) using database

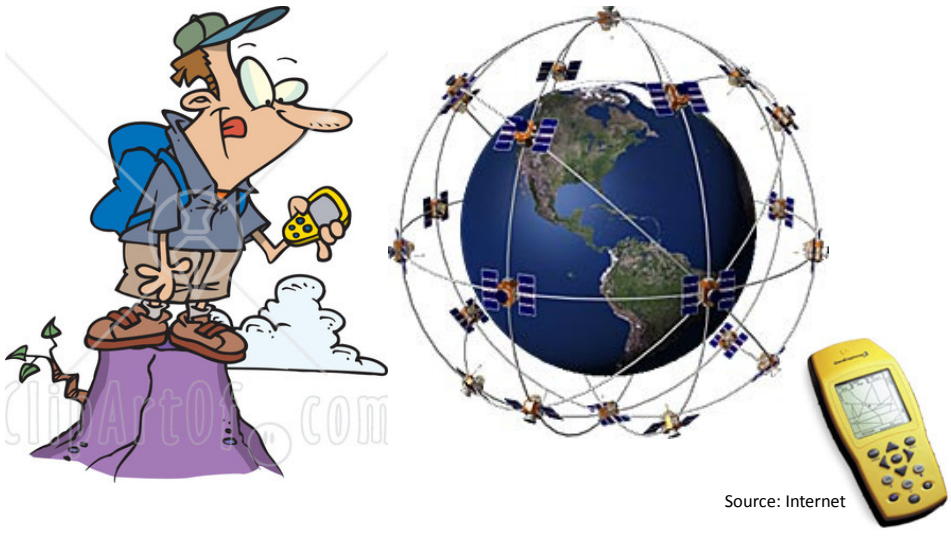
Source: Internet

GIS - rapidly evolving



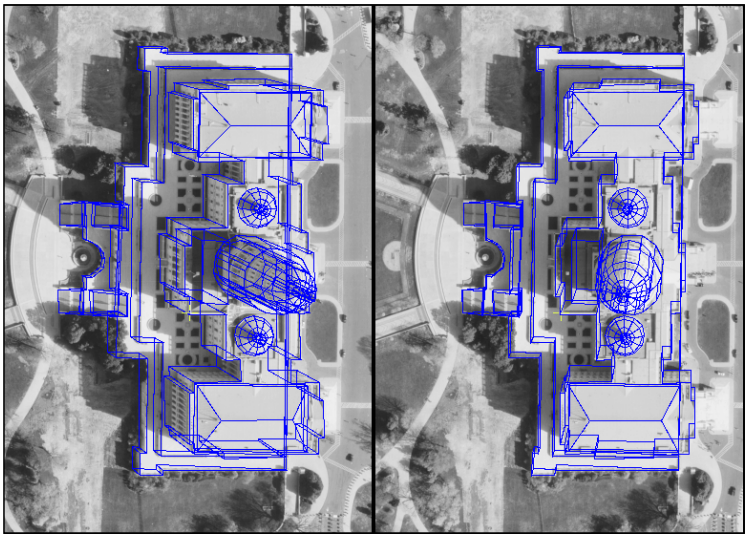
Source: Internet

GNSS



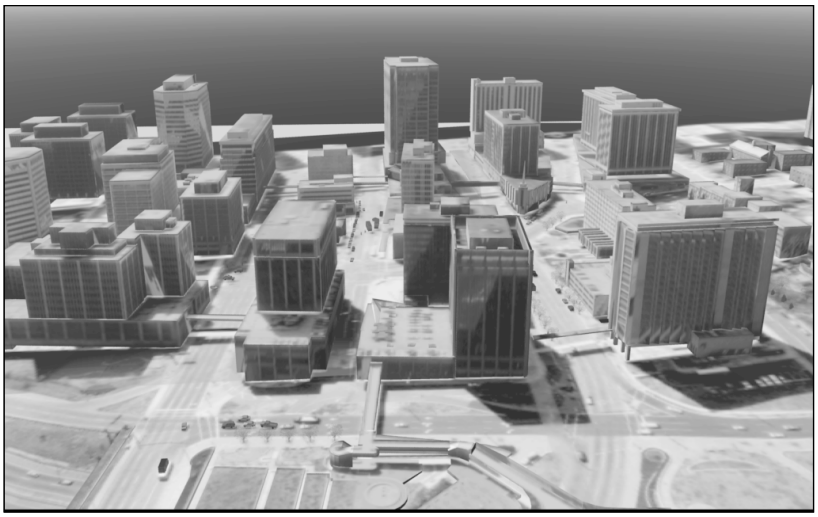
Source: Internet

Building footprint



Source: Jensen (2007)

3-D

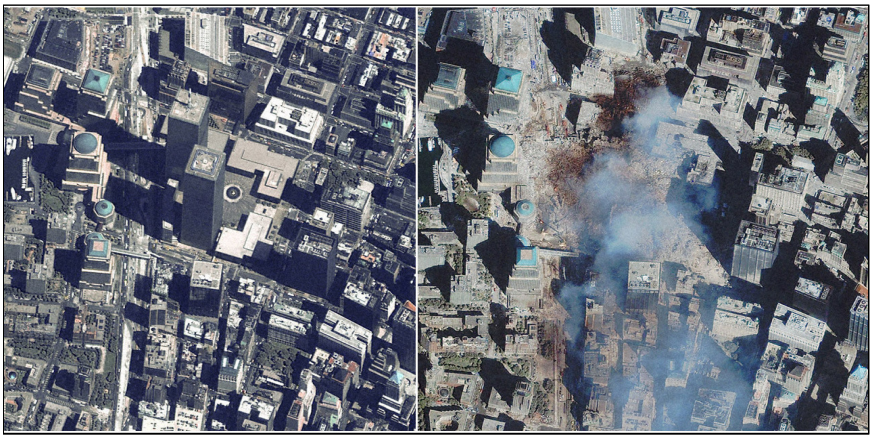


Source: Jensen (2007)

Tornado damage

Source: Internet

World Trade Center



Source: Internet

Tsunami

Source: Internet

Kedarnath

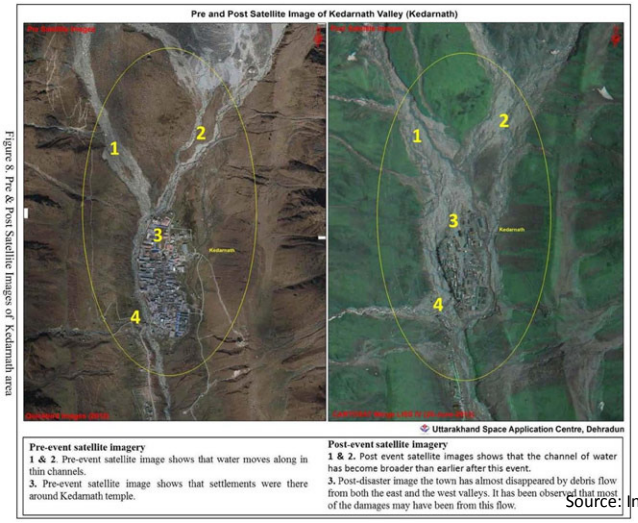
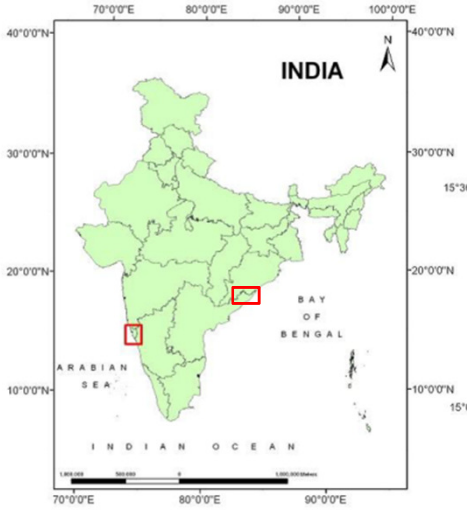


Figure 8. Pre & Post Satellite Images of Kedarnath area

Source: Internet

Locations



Panaji (**Goa**)
Population 114,405
Tourist destination (inter/national)
Mangroves under threat
Infrastructure development

Visakhapatnam (**Andhra Pradesh**)
Population 1,730,320
Industrial hub
Tourist destination

Objectives

1. Understanding impact of sea level rise and vulnerability of the cities to climate change induced events like extreme precipitation, cyclones and storm surges.
2. Identifying hotspots and critical infrastructure and services
3. Identifying actions to address climate criticality and to plan for climate resilience
4. Informing planning decisions at the level of the local government (city government) to achieve the same.

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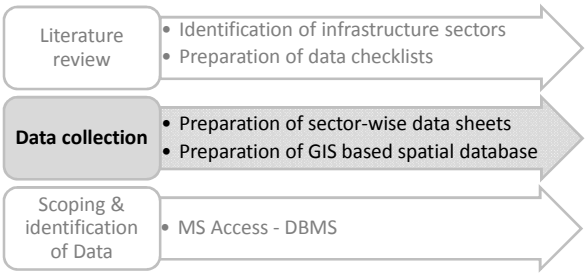
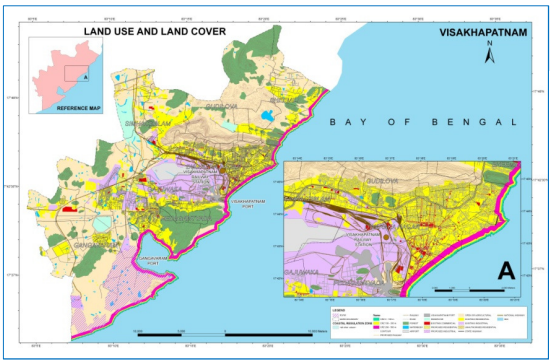
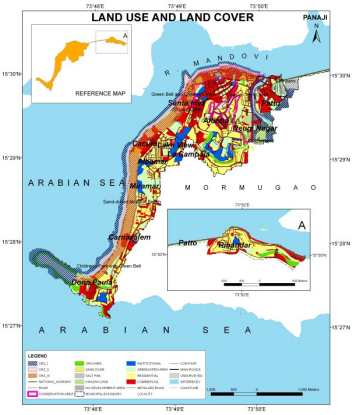
Inventory of Assets

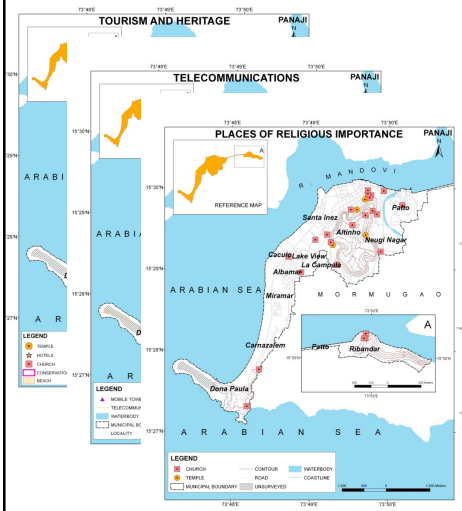


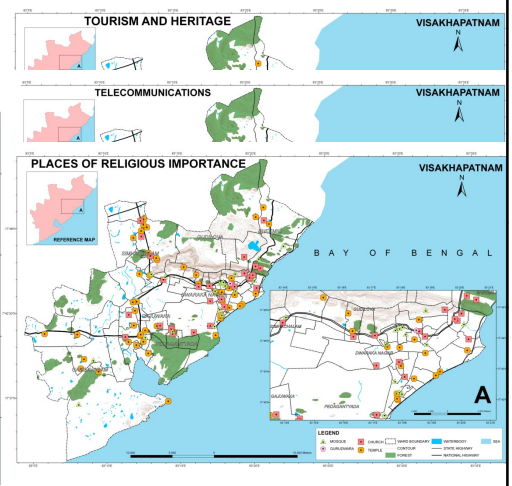
Land Use Land Cover





Database

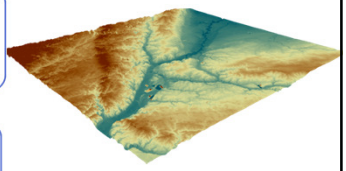




Vulnerability Assessment

DEM
DEM data set was downloaded from open data sources - ASTER Global Digital Elevation Map (2011) at 30m resolution

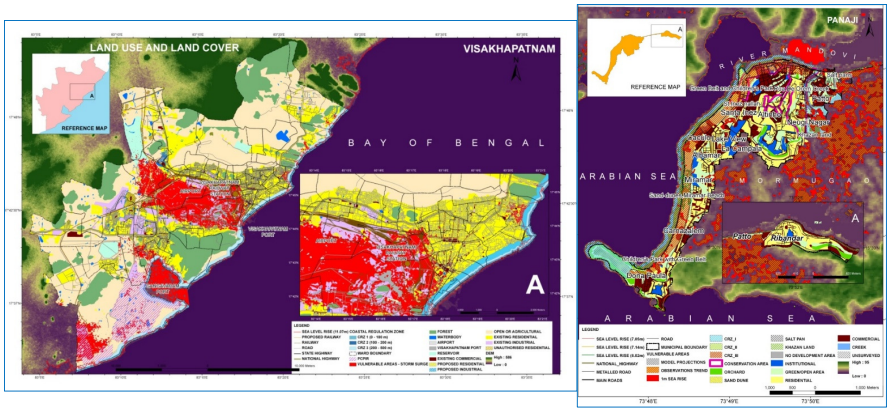
Plotting SLR and storm surge scenarios
- SLR values (in m) from TERI's model projections
- Observed SLR values with GIA correction (in m)
- 1 m SLR (based on literature review)
- 4 m storm surge in case of cyclonic events



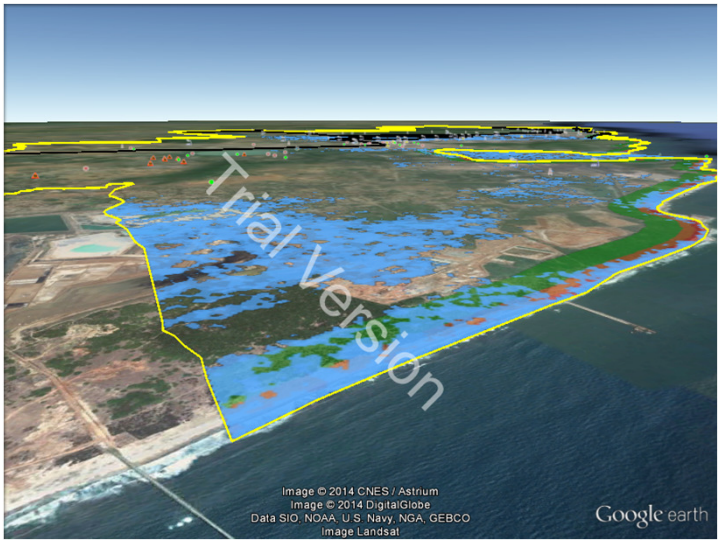
Vulnerability mapping
- Scenarios plotted on DEM were overlayed on thematic maps for the 2 cities
- Areas with elevations lesser than projected SLR/ storm surge were delineated as 'vulnerable' hotspots

Output
- Vulnerability maps for 2 cities
  - Shape files in Arc GIS platform
  - Layouts in .jpeg format

Vulnerability Assessment



Vulnerability Assessment



Conclusions

- Sector specific recommendations
- Cover man-made and natural infrastructure assets
- Provide inputs on Planning/Regulatory requirements/Capacity needs
- Scenarios and location specific vulnerability for both cities

- Strengthening the resilience capacity and reducing the vulnerability of the infrastructure services against climate change
- Developing policy and regulatory instruments for building resilience of our cities and infrastructure

…….we acknowledge

USAID
FROM THE AMERICAN PEOPLE

Contribution(s)

Mr Summit Anand
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Ms Rozita Singh
Ms Raina Singh
Dr Divya Sharma