Urban Water Metabolism for Indian Cities

Case Study for Delhi

Advisor: Professor Anu Ramaswami

Student: Roshan Shankar, G1, CEE

Connecting multiple sectors...

Water | Greenery | Transportation | Food | Energy | Waste | Buildings

...across spatial scales with multiple societal outcomes

Environment | Health | Wellbeing | Equity | Livability

Example: Water and Delhi

Remote Sensing

- River Network
- Watershed Boundaries
- Water Reservoirs
- Elevation
- Rainfall
- Soil Moisture
- Surface Water Storage
- Surface Water Flows
- Evapotranspiration

Physical Sensing

- Water Quantity
- Water Quality
- STP
- WWTP
- WTP
- SPS
- BPS
- UGR
- Groundwater Levels
- Domestic Water Demand
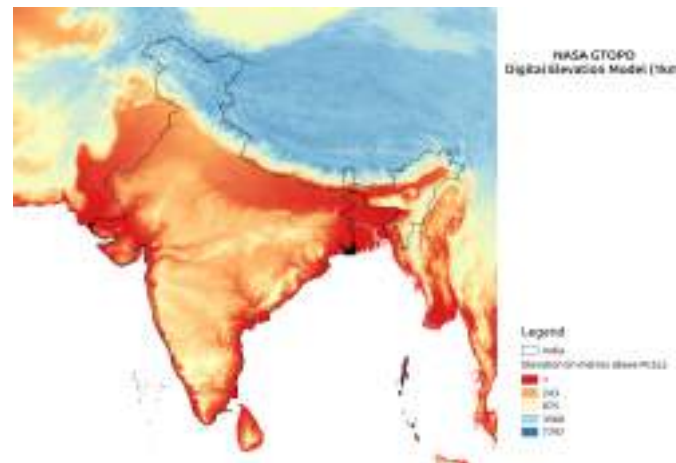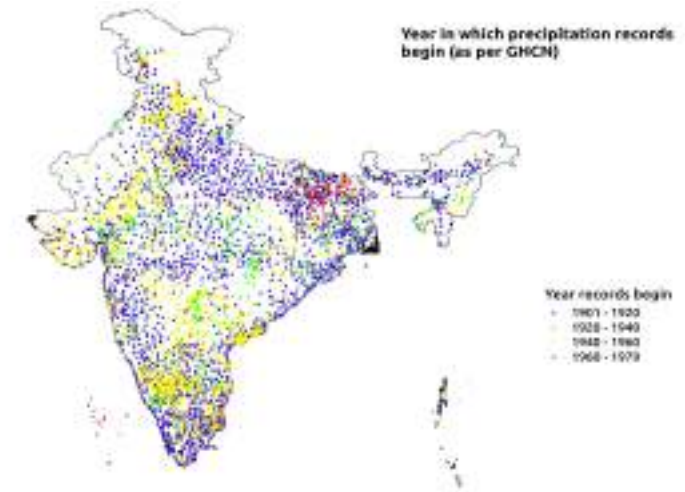- Industrial Water Allocation

Social Sensing

- Water Survey
- Operations
- Maintenance
- Cost/Price structure
- Tankers and borewells
- Grievances
- Formal/informal

Strategic Open Data (Remote Sensing)

State (Open Data)

- Data Segmentation

- Data Demand

- APIs

- Trusted Intermediaries

- Example
  - International agencies
  - National governments
  - Space companies (near future)

Strategic Open Data (Physical Sensing)
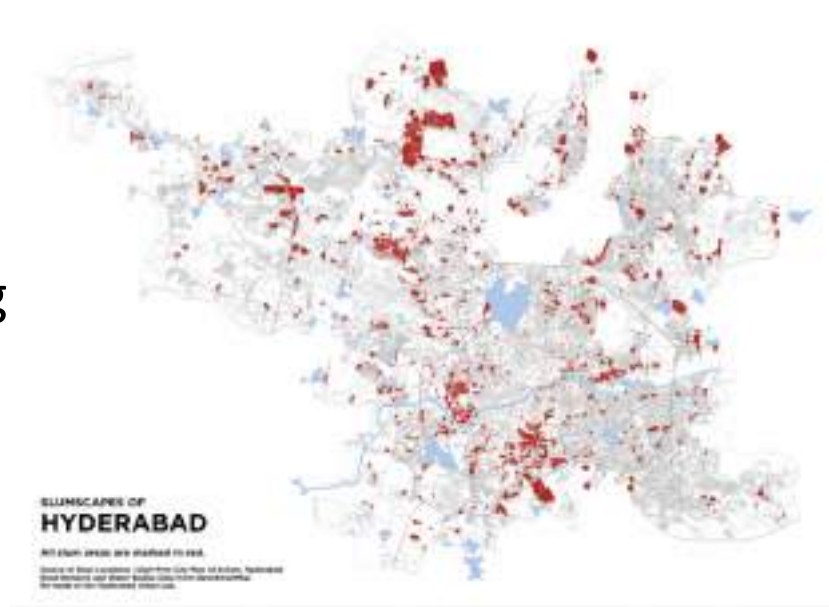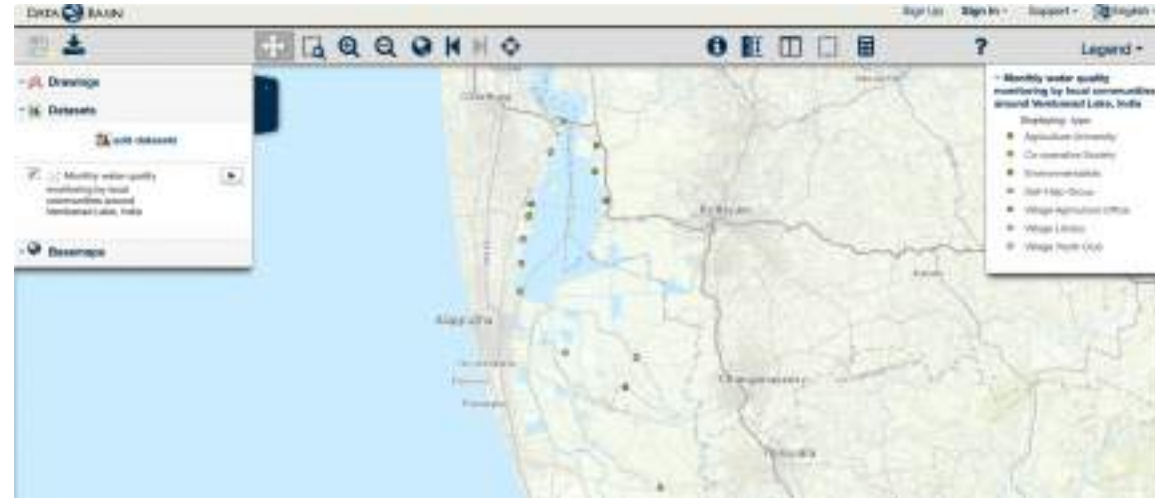
Market (Smart City)

- Data Collaborative

- Data Stewardship

- Prizes and Challenges

- Corporate Social Responsibility

- Example
  - City governments
  - Water companies working with states
  - Non-profits and multi-lateral agencies

Strategic Open Data (Social Sensing)

Society (Hackable City)

- Data Cooperatives

- Research Partnerships

- Communities and Movements

- Example
  - Open Street Mapping
  - Community Water Mapping
  - Academic and research collaboratives

Thank You!

PRINCETON UNIVERSITY

Connecting multiple sectors...

Water	Greenery	Transportation	Food	Energy	Waste	Buildings

...across spatial scales with multiple societal outcomes

Environment	Health	Wellbeing	Equity	Livability