Natural Disasters: 2007-2017

$1.6 Trillion in damage
700,000 people killed
1/3 of Earth’s population affected

... how can we use technology to reduce this?
Tropical Storms in the Caribbean Basin – 1842 - 2010

About 42,000 storms has formed
Natural Disaster Scenario – Current Problem

Not having clear understanding of:
• Potential damage and disruption
• Actual damage, loss and disruption after the event
• Insurance claim/Reconstruction cost

SpatialEdge provides:

Data, technology and platform for comprehensive Disaster Risk Information and analysis
SpatialEdge User Interface

- Clear and intuitive
- Easy to navigate
- Do analysis when required
- Easy reporting tool
- Big data search tool
- Download report and data
Intuitive User Interface

SpatialEdge showing susceptible flood area (in light blue) and rooftop in green outline. The application allows to filter out buildings with flood hazards, among others.
CDEMA has been using SpatialEdge platform to dynamically pull tropical storm hazard data from National Hurricane Center.

While there are a few applications that provides the visualization of this type, we are further upping the ante to use these dynamic data in evaluating impact on population and exposure, at real time.

As hurricane change its course, the analysis results are reflected at the dashboard in real time.
Hurricane Maria: Sep 18, 2017, 5 AM EST
Hurricane Maria: Sep 18, 2017, Cat 5, 8 PM EST,
Probable Windspeed
Analysis Result – Dominica Population

Data on School, Bridge and Hospital not yet uploaded in the application

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<th>S.N.</th>
<th>Name</th>
<th>Total Area (SqKM)</th>
<th>Area Affected (SqKM)</th>
<th>Total Population</th>
<th>Affected Population</th>
<th>School Affected</th>
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<th>Road Affected (KM)</th>
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Mapping assets and vulnerability

SpatialEdge helps to map the assets and derive vulnerability

The mobile app, called MapWoW!, uses the smartphone platform to automatically map the assets from a moving vehicle (car, boat or a small aircraft)
MapWoW! is mobile data collection solution for SpatialEdge that can help to collect georeferenced photos of the assets.
Haiti - Road Asset Vulnerability Monitoring for Climate Resilience
SpatialEdge for Data Collection
Extracting data using machine learning using TensorFlow

Deep learning module build in Python using TensorFlow

Application built in Java Spring MVC

Database with postGIS
SpatialEdge for Data Collection

- State of the art model which can classify imagery automatically recognizing the known pattern (houses)
Disaster Risk Score of assets

Proprietary algorithm to assign unique disaster risk score to all assets

Integration of live and static hazard data

Hurricane
Earthquake
Flood
Tornado
Drought
Wildfire
Landslide/Mudslide

Big data analytics

Run time analytics of likely damage
The World Bank

Damage and loss assessment aftermath Hurricane Matthew, 2016
Damage and loss are increasing in the Caribbean as frequency and magnitude of weather events are increasing.

High concentration of economic activities in the coastal area
Our Clients

Institutional Clients
- The World Bank
- Asian Development Bank
- Caribbean Disaster Management Agency
- Rocky Mountain Institute
- Inter-American Development Bank
- Private businesses
Bishwa Pandey
More than 20 years working in managing natural disasters
bishwa@nepcol.com

Team of 25 developers, data scientists and product manager

Offices in:
Washington DC Metro Area
Bogota, Colombia
Kathmandu, Nepal