

Belize - Costa Rica – El Salvador – Guatemala – Honduras – Nicaragua

CAPRA



Central America
Probabilistic Risk Assessment
A regional SDI for disaster risk reduction

Dr. Stuart Gill LCSUW, World Bank



CAPRA – CENTRAL AMERICAN PROBABILISTIC RISK ASSESSMENT
EVALUACIÓN PROBABILISTA DE RIESGOS PARA CENTRO AMÉRICA

Comprehensive Approach to Probabilistic Risk Assessment



Bolivia – Colombia – Ecuador – Mexico – Panama

Belize – Costa Rica – El Salvador – Guatemala – Honduras – Nicaragua

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What is CAPRA?



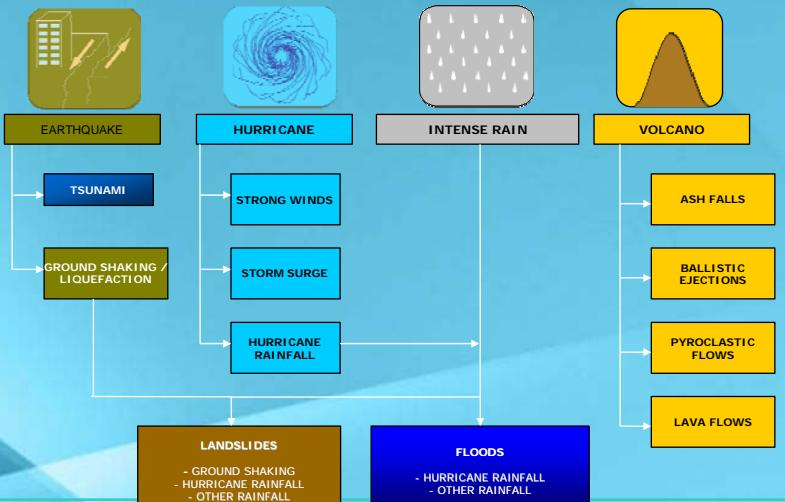
CAPRA is an ongoing initiative to develop and enhance a set of GIS-based tools to **understand, communicate** and **support decisions** related to disaster risk at the local, national and regional levels in Central America.

Primary Products



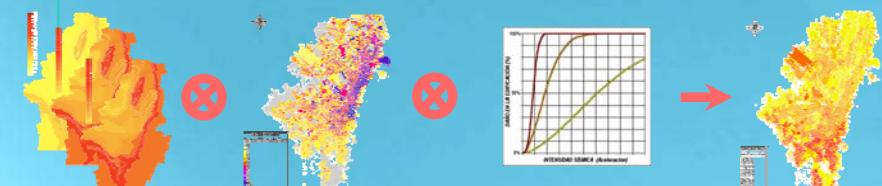
- 1) Compendium of hazard and risk maps
 - Printed Atlas
- 2) CAPRA Geo Node SDI
 - Online data and maps
- 3) Hazard and risk reports
 - Country Risk profiles
 - Indicators of Risk and Risk management
- 4) Software to evaluate risk
 - Hazard models, vulnerability and risk visualization
- 5) Training courses & materials
- 6) Series of user-friendly applications
 - hazard assessment report for territorial planning;
 - cost-benefit application for analysis of retrofitting projects;
 - calculator of technical premiums for insurance.

MULTIPLE NATURAL HAZARDS



PROBABILISTIC RISK MODELING

Hazard (i.e. earthquake)	Exposure (i.e. houses)	Vulnerability (of house to quake)	Risk (i.e probable loss)
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Disaster Impact Analysis
- Scenario or Stochastic -

INFRASTRUCTURE

ECONOMIC

SOCIAL

ENVIRONMENTAL

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Managua Nicaragua



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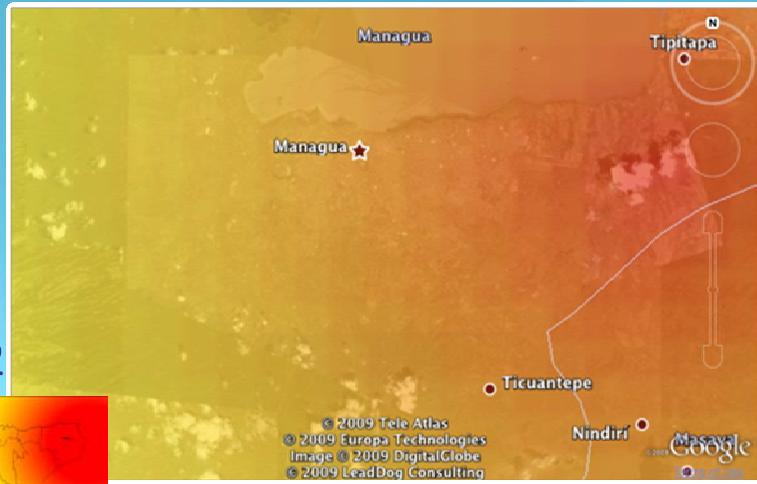
1972 1972
1972 1972 1972



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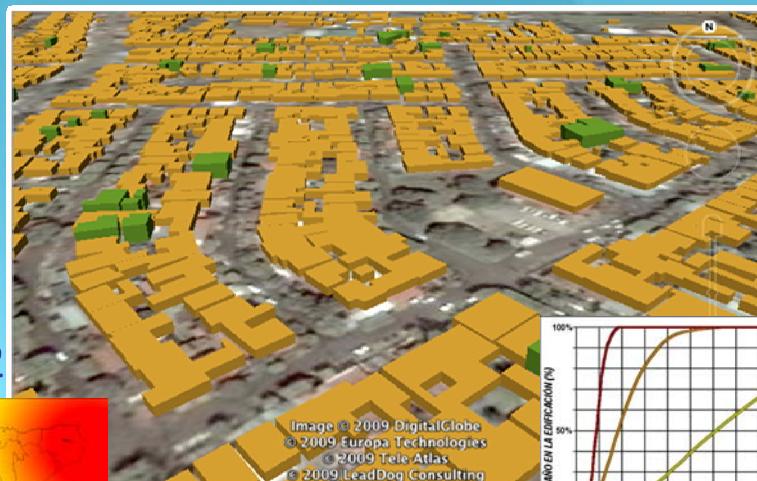
1972



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1972



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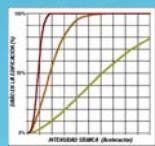
PROBABILISTIC RISK MODELING

Hazard
(i.e. earthquake)

Exposure
(i.e. houses)

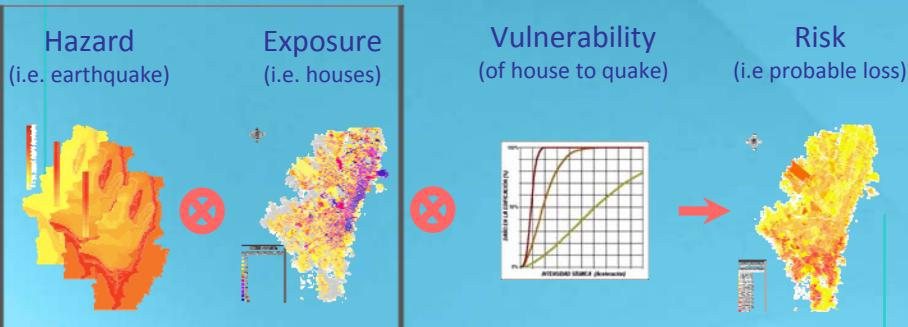
Vulnerability
(of house to quake)

Risk
(i.e probable loss)



Make the best decisions today
to mitigate the disaster of tomorrow

Spatial Data Infrastructure (SDI)



- 1) Locate the data that already exists
- 2) Access and share that data
- 3) Create the data that is not in existence

Spatial Data Infrastructure (SDI)



Necessary, but not sufficient to just have policies, requirements & mandates



Necessary, but not sufficient to just have best of breed software



Align incentives to create a single Spatial Data Infrastructure

There are many examples of effectively aligning incentives using the internet

Web^{2.0}



“Architectures of Participation”

–Tim O'Reilly



Web^{2.0}

An “Architecture of Participation” is both **social** and **technical**, leveraging the skills and energy of users as much as possible to cooperate in building something bigger than any single person or organization could alone.

“Architectures of Participation”

–Tim O'Reilly



Web^{2.0}

contributors not just consumers

Web Portals

Status quo

Portals

“The early days of the internet were flush with people making ‘portals’, to attract users to view things. This hasn’t been in fashion since 2001, yet the mapping world and SDIs in particular still seem tied to the concept.”

– Chris Holmes



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Web Portals	Status quo
<h2>Portals</h2> <p>Too often portals have:</p> <ul style="list-style-type: none"> • No benefit to registering • Few real users • No recognition • No reward for the effort • Uses stick, not carrot <p>There is little incentive to participate</p>	

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Geo Node = Web Portals + **Web^{2.0}**

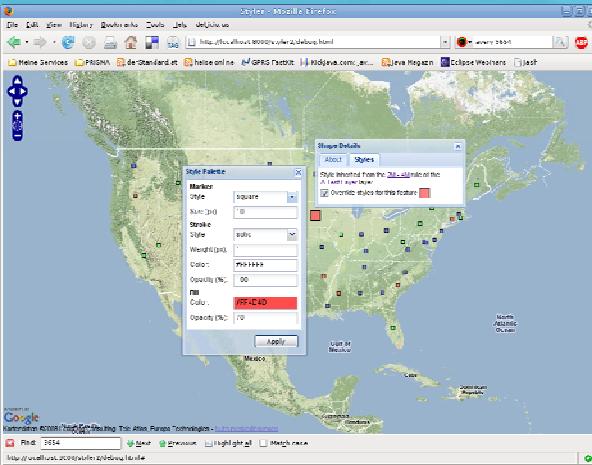
Geo Node

-  Compelling and relevant
-  User at the Center
-  User Responsibility
-  No Barriers or Difficulty

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Geo Node = Web Portals + **Web^{2.0}**

Make beautiful maps



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Geo Node = Web Portals + **Web^{2.0}**

User accounts

- User statistics
- Comments, ratings, tags
- Collaborative Filtering
- Rankings of best ‘views’ and data sets contributed
- Highest rated, most viewed, most shared



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Geo Node = Web Portals + **Web^{2.0}**

Easy upload data and maps

Choose File
Upload

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Geo Node = Web Portals + **Web^{2.0}**

Searchable by Google

Results 21 - 30 of about 161 for laticeps

- [Salmonidae laticeps \(3 records\)](#) - more info >
Salmonidae laticeps
1 of 190 placemarks in GBIF Data Portal Occurrence
Search <→ in mirror.gbif.org
- [Clausocalanus laticeps](#) - more info >
Clausocalanus laticeps
1 of 62 placemarks in GBIF Data Portal Occurrence
Search <→ in mirror.gbif.org
- [Clausocalanus laticeps](#) - more info >
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Geo Node = Web Portals + **Web^{2.0}**

Leverage visualization platforms



Geo Node = Web Portals + **Web^{2.0}**

Metadata

- Derive from data and user actions
- Wiki type editing of metadata
- Automatically available with the Catalog standards

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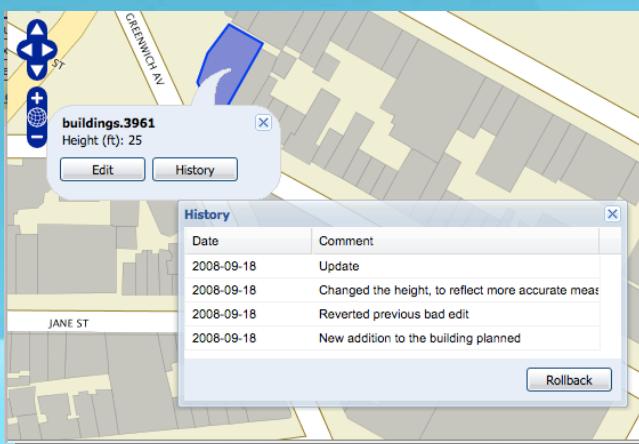
Editing



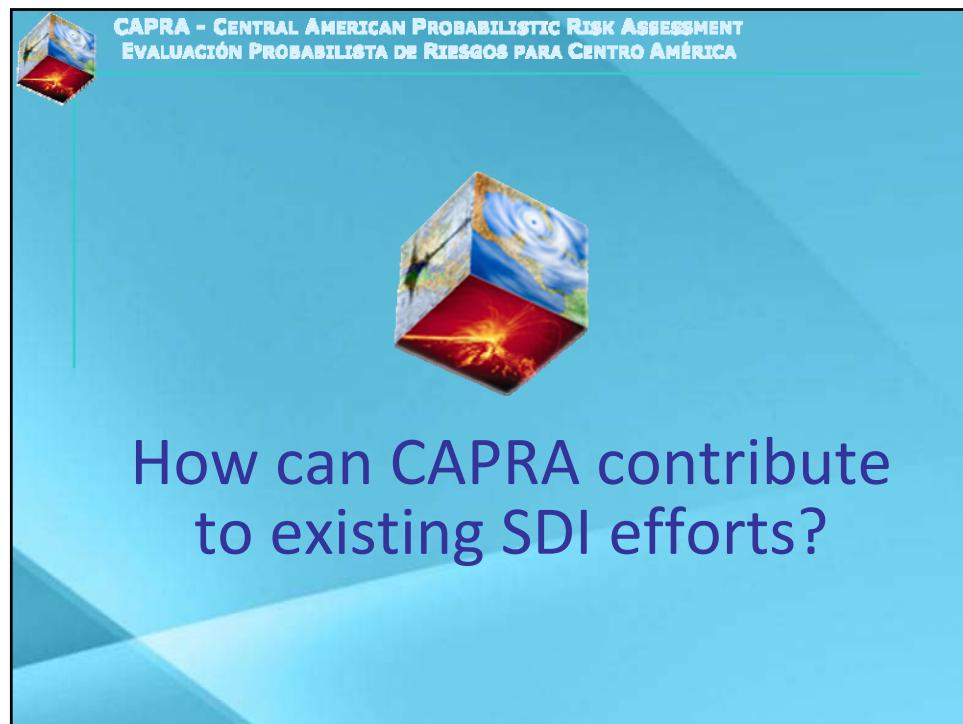
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Versioning and advanced workflow



Rollback



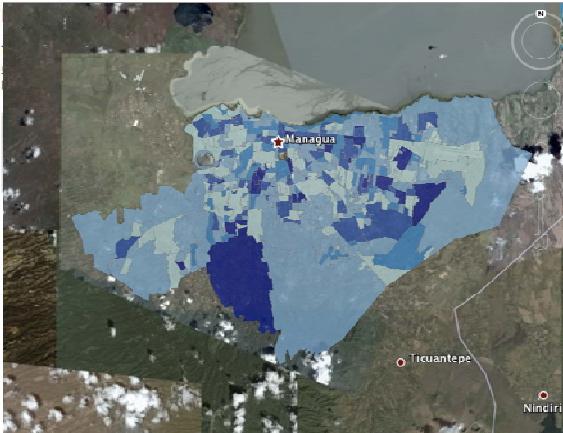
The image is a screenshot of the CAPRA Geo Node interface. It features a header with the CAPRA logo, language links (Español, English), a "Home" button, and navigation links for "Alpha Version" and "www.ecapra.org". Below the header is a dark blue banner with the "Geo Node" title. A navigation bar includes links for "Featured Maps", "Community Maps", "Data", "OGC Services", and "Help". The main content area displays a satellite map of a region, specifically Nicaragua, showing land use and hazard data. Labels on the map include Managua, Tipuantepe, and Nindiri. To the right of the map, a welcome message reads: "Welcome to CAPRA's GeoNode. The GeoNode is a data clearing house for CAPRA. Currently a prototype, it provides tools for the distribution and composition of hazard and risk map data. Its purpose is to inform decisions about future data management developments for CAPRA." At the bottom right of the content area, the word "DEMO" is written in large blue capital letters.

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Español English Home Alpha Version www.ecapra.org

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Featured Maps Community Maps Data OGC Services Help



Welcome to CAPRA's GeoNode

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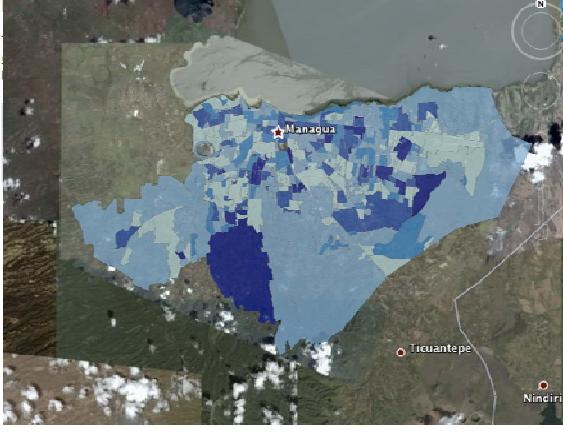
Simple to use and maintain

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Welcome to CAPRA's GeoNode

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Still work to be done

Where do you place these Geo Nodes?

- Everywhere!
- Anywhere you might put a portal
- Anywhere you have an 'Enterprise GIS System'
- Anywhere people share data with each other



Geo Node

Building the
regional
SDI from the
bottom up

We will be placing the
Geo Nodes as requested
in CAPRA countries

Countries control the data locally

Nodes sync regional information



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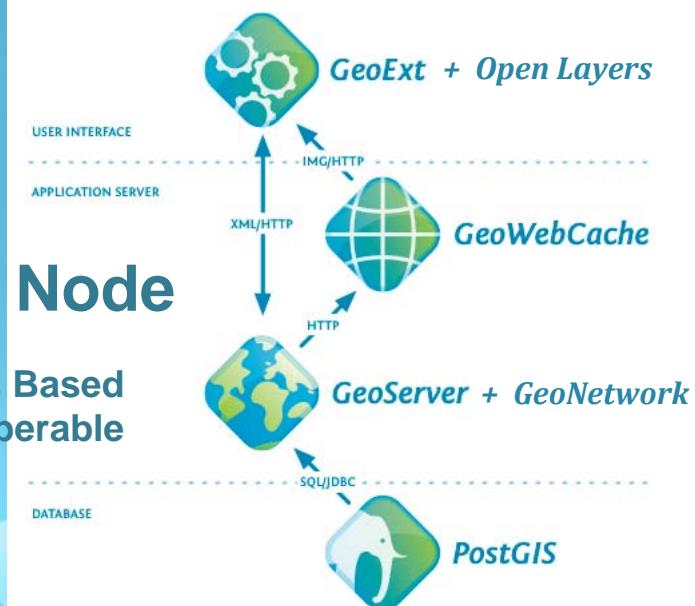
Geo Node

- **Free and Open Source Software**
- **Anyone** can access the same package we use
- Designed so **other** domains and regions will **improve software** in other ways that all nodes can use
- Encourage internal use, make it the easiest way to create and share data
- **Sync nodes** up and down for increased **performance**
- Result is a **true information infrastructure**

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Geo Node

**Standards Based
Interoperable**



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Geo Node

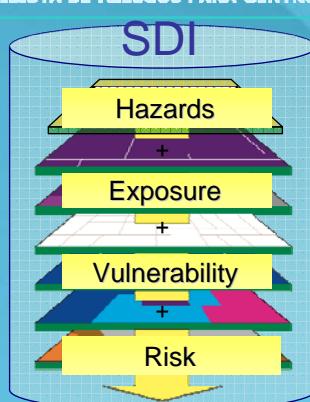
Tool for cooperative data collection

- Align efforts so that amateur, commercial, NGO and governmental creators all naturally collaborate
- Figure out workflows, tools and licenses that work for everyone – to assure **Data Quality**
- Towards living data, constantly evolving - authoritative *and* always up to date



DEMO

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Open Source User focused

Free User driver

Participatory Intuitive

Standards based Lowering barriers

Risk Mapping Engine	Land Use Planning tool	On time damage & loss est.	Climate Impact Scenarios	Cost/Benefit Analysis	Risk Financing Strategies

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Open for collaboration

Thank You

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Mass Collaboration Changes Everything

We are infusing this open architecture ideology at all levels of CAPRA

- 1) At the user community level www.ecapra.org
- 2) At the software architecture level
- 3) At the data level

“To harness the collective work of thousands of contributors, creating a ‘*living instrument*’.”



World Wind



— Ultimately improve disaster risk management —



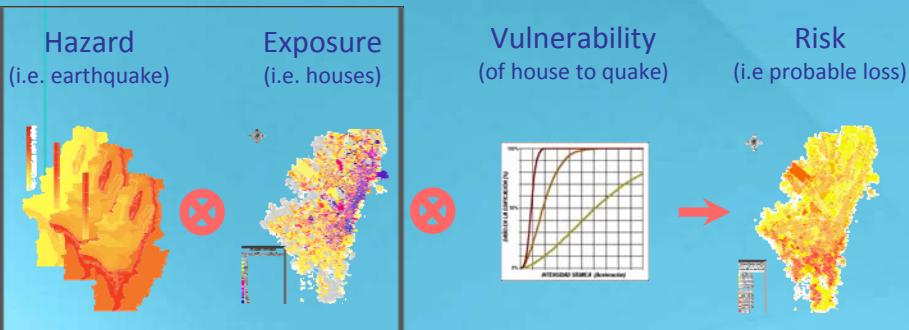
Let commercial players run SDI?

- SDI's are a public good
- Commercial players have profit motive
- Commercial players seek monopoly

DANGER: Governments are handing over data without opening it to anyone else!



Spatial Data Infrastructure (SDI)



“...the sources, systems, network linkages, standards, and institutional issues involved in delivering spatially-related data from many different sources to the widest possible group of potential users at affordable costs.”

— Groot & McLaughlin 2000

San Juan del Sur NICARAGUA



San Juan del Sur NICARAGUA



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San Juan del Sur NICARAGUA

