A Systematic Approach to Building a Sustainable Digital Soil Map

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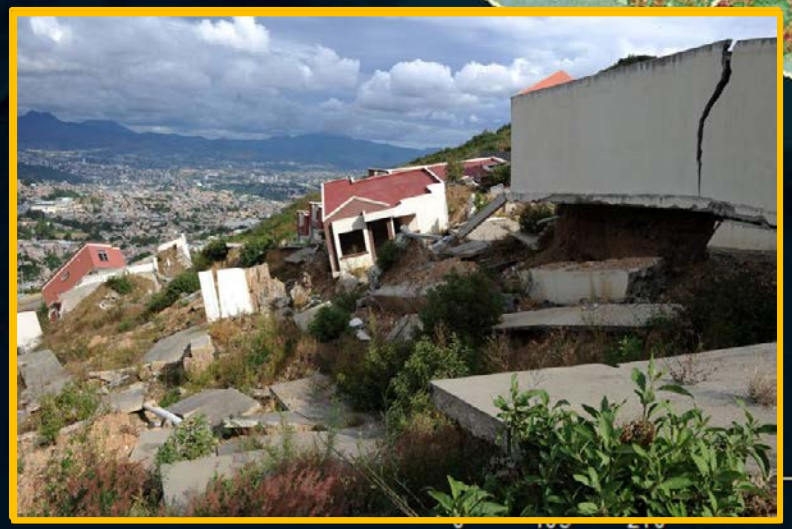
CRS CATHOLIC RELIEF SERVICES faith. action. results.

Soil Information is Important for Development

Challenges of Using DSM in Central America:

- Available point data is sparse, dispersed, and not easily shared
- Many zones are inaccessible: too dangerous, no roads



420 630 840 Kilometers

The ProSuelos/ProSoils Project

Work in **interdisciplinary groups** to utilize the most exact information possible and **local expert knowledge** to produce maps that support field management decisions

The ProSoils Platform

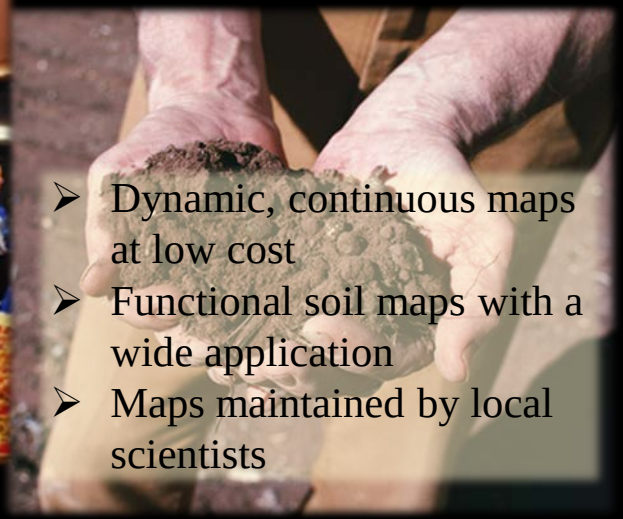
Build the Infrastructure

- Form Interdisciplinary groups
- Data Management and Storage
- Capacity to transfer large files
- Development of an App and a website for extensionists and research

Establish Local Capacity

- Hands-on GIS training
- Soil Science Lectures
- Soil field work
- Technical and scientific guides

Produce Useful Soil Information Products



- Dynamic, continuous maps at low cost
- Functional soil maps with a wide application
- Maps maintained by local scientists

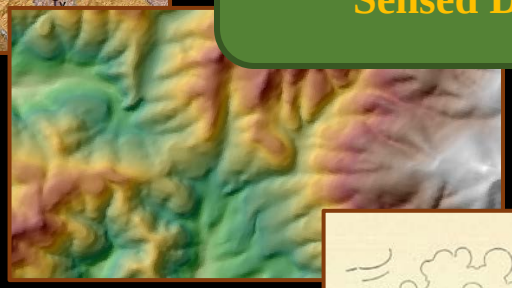
Digital Soil Mapping Approach

Part 1.
Gather Existing Data

- Evaluate Data Quality
- Metadata
- Pre processing data

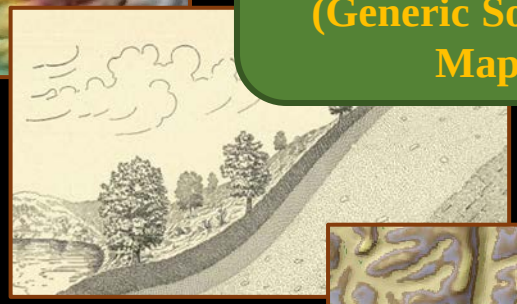
Part 2.
Obtain Elevation / RS Sensed Data

Evaluate the relationship between the forming factors and soil variability



Part 3.
Develop Soil Landscape Model (Generic Soil Class Map)

Use expert knowledge to generate functional maps



Part 4.
Develop a Continuous Soil Map (Property Map or Interpretation Map)

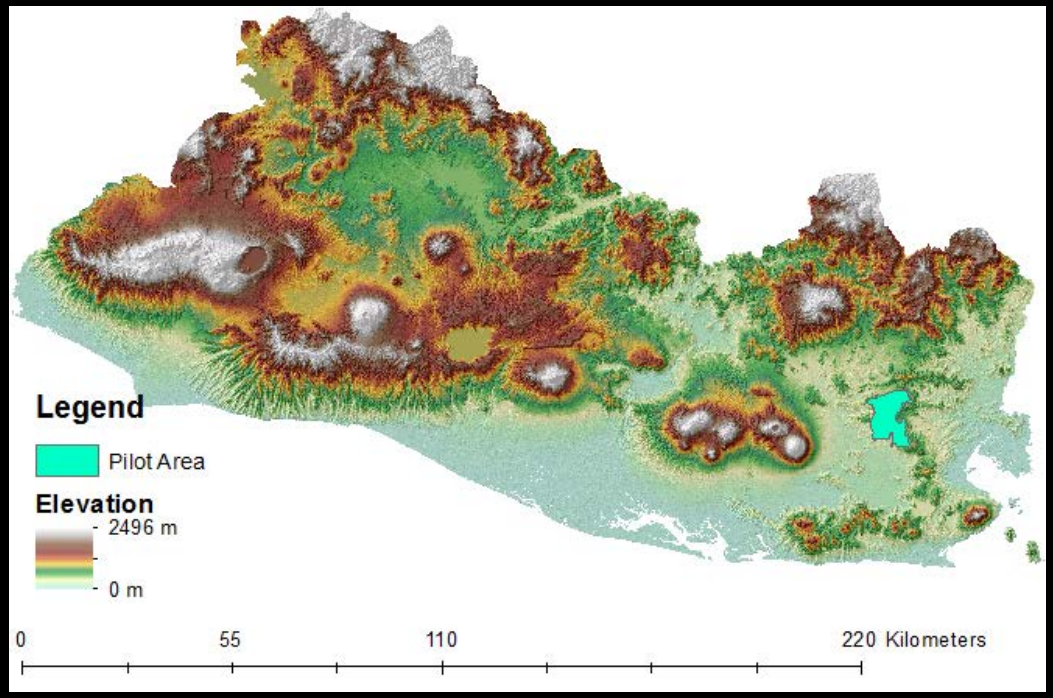
Update the Model with New Data for Version X.X and Validation

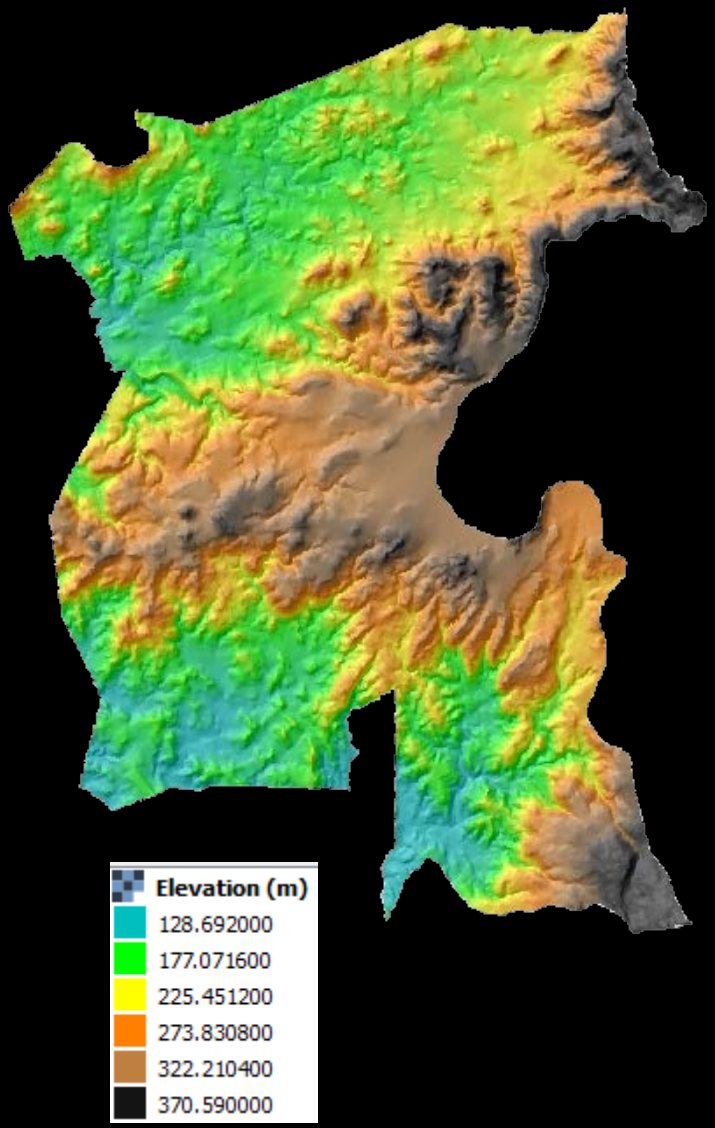
Collaboration

- QGIS & SoLIM
- Field Observations

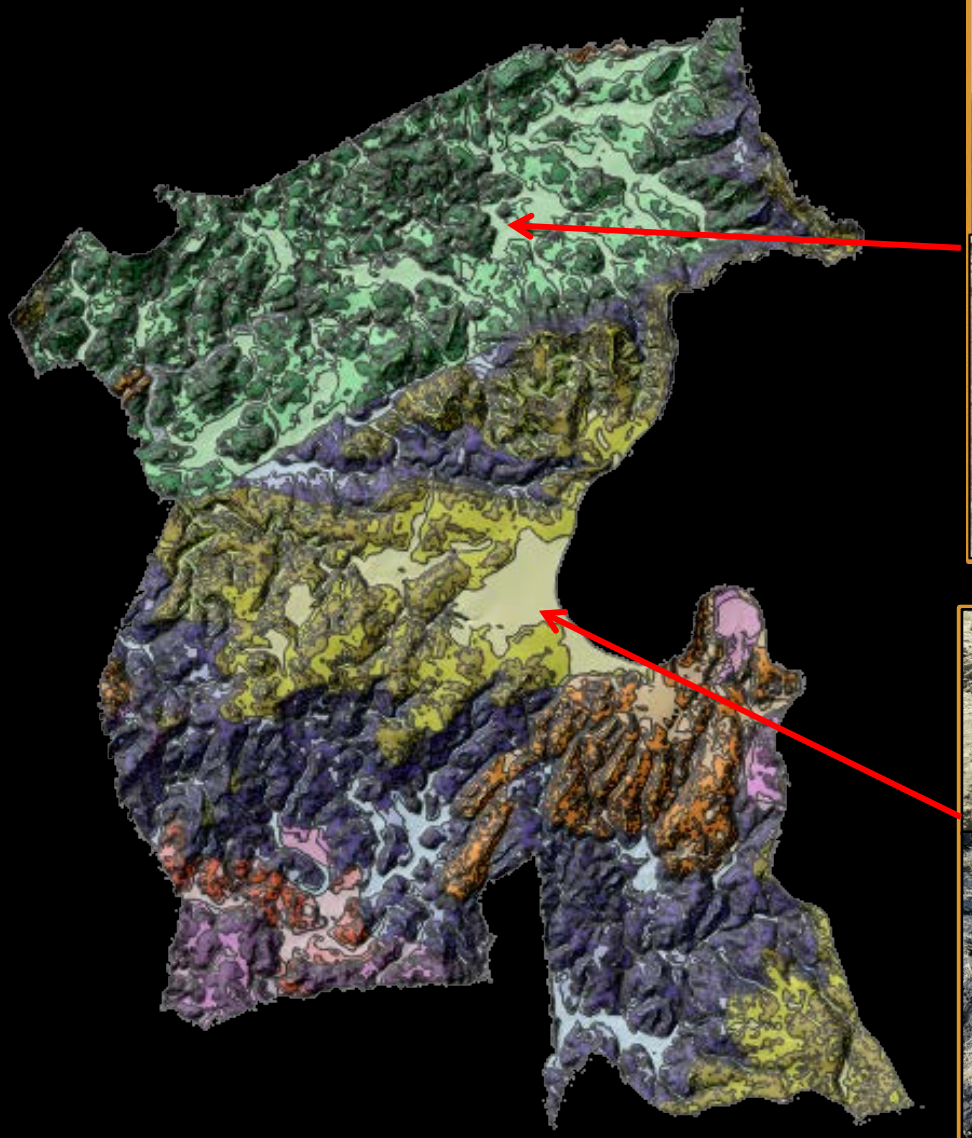
Pilot Area – La Union & Yalaguina

- Part of the Dry Corridor
- Elevation Range: 68 – 607 meters
- Semi-arid
- Volcanic Material and Quaternary Alluvial Parent Materials



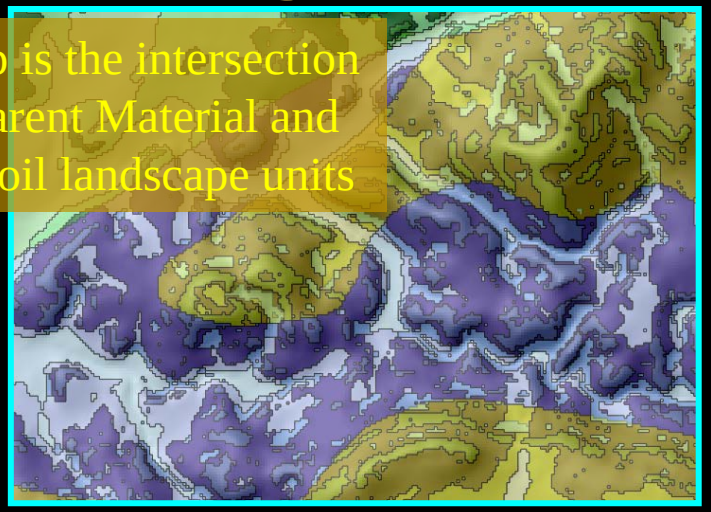


Identifying Patterns in the Landscape

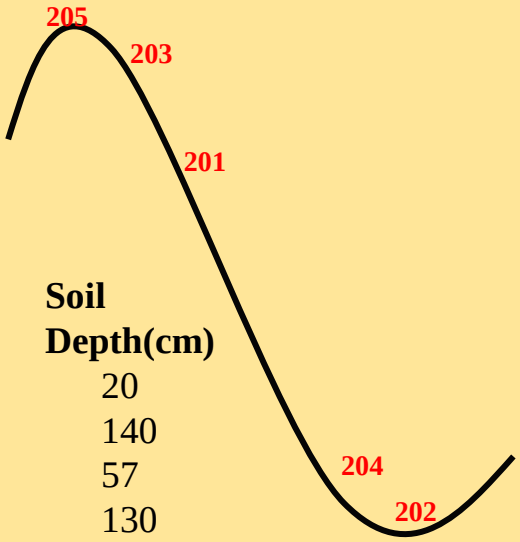


Incorporating Expert Knowledge

The Class Map is the intersection between the Parent Material and the TA based soil landscape units

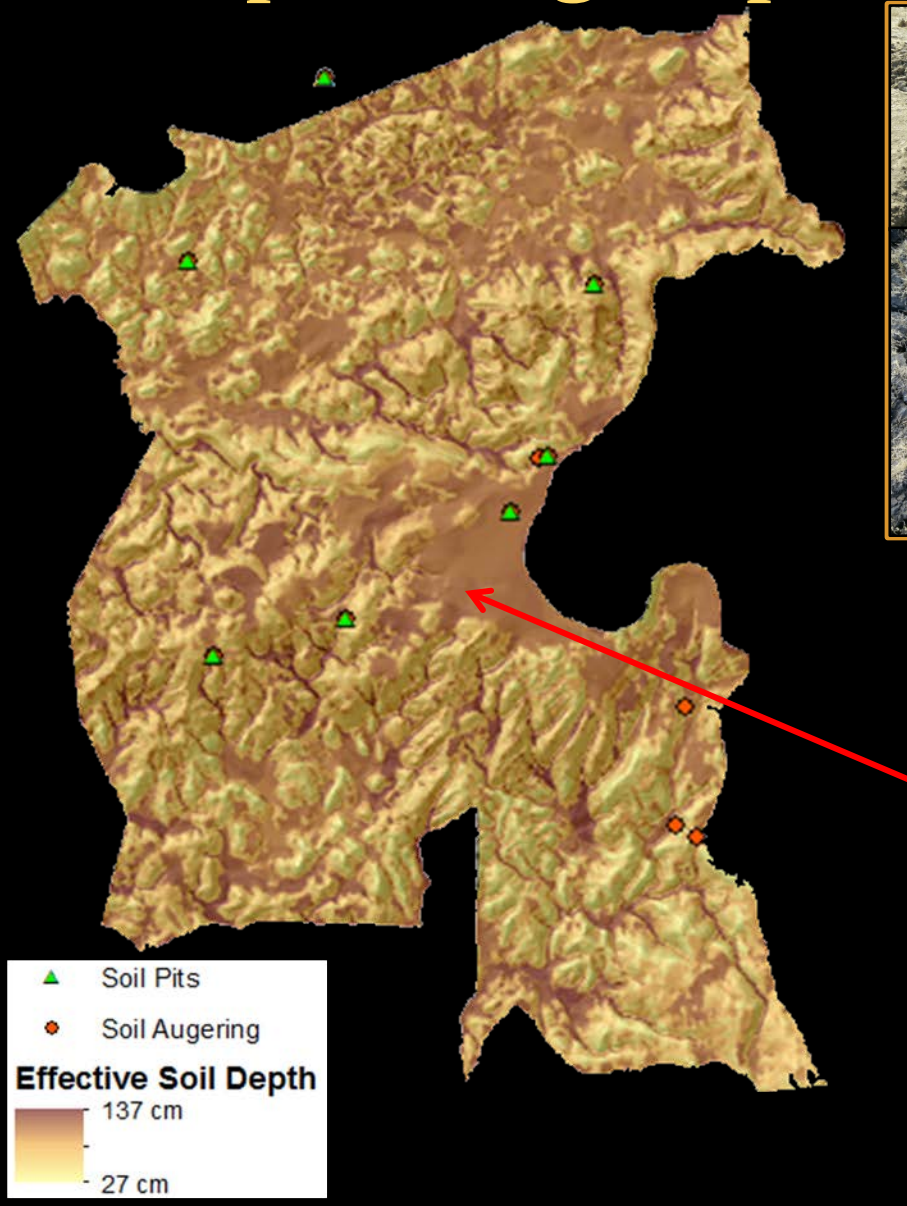


Representative Values for Effective Soil Depth for Map Class Units: 201, 202, 203, 204, 205



Unit	Soil Depth(cm)
201	20
202	140
203	57
204	130
205	120

Incorporating Expert Knowledge



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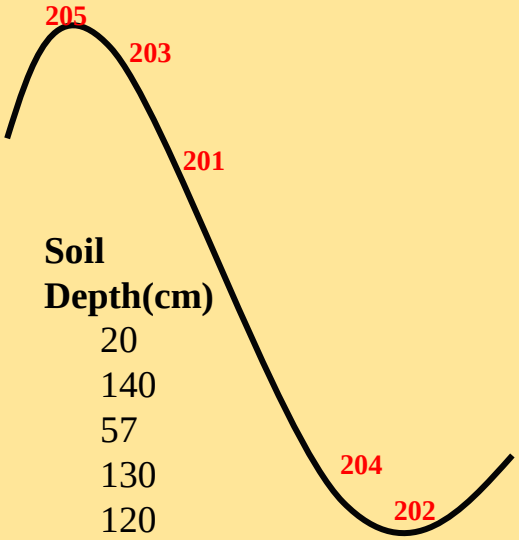

Validation

The property values follow the patterns in the landscape.

- Purposive Sampling for finding patterns in the landscape
  - One transect for each parent material unit

Sampling Schemes for Validating the Model:

Conditioned Latin Hypercube

- 30 new sample points
- applies cost raster which is necessary to consider fuel cost, avoid dangerous areas, inaccessible areas

We will provide RMSE, MAE and confidence intervals for each property map.


!Gracias!
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