

Electricity Access in Developing Countries from Aerial Imagery

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The Problem

Electricity, a key resource affecting health and prosperity, is unavailable to 16% of humanity- but it is complex and costly to evaluate access to it, especially in developing countries where the issue is the most severe.

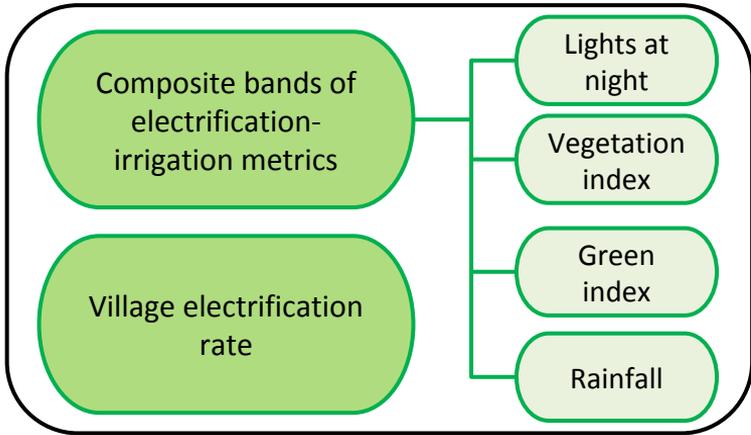
Ultimate Objective

Build an automated method for detecting electricity access for a given region using aerial imagery

Data+ Goal

Create datasets of electricity access indicators that can be used to train a classifier to detect electrified villages

Indian Villages Dataset



We gathered electrification ground-truth data for over 36,000 villages in the Indian state of Bihar (bottom right) and gathered measurements relevant to electricity consumption for those villages including lights at night data and irrigation metrics (bottom left). We found that villages with over 99% electrification

- look brighter during the night
- show greater variation in vegetation coverage during periods of near identical rainfall

Village Name & Electrification Rate	Landsat	Lights at Night	Normalized Difference Vegetation Index	Green Index																
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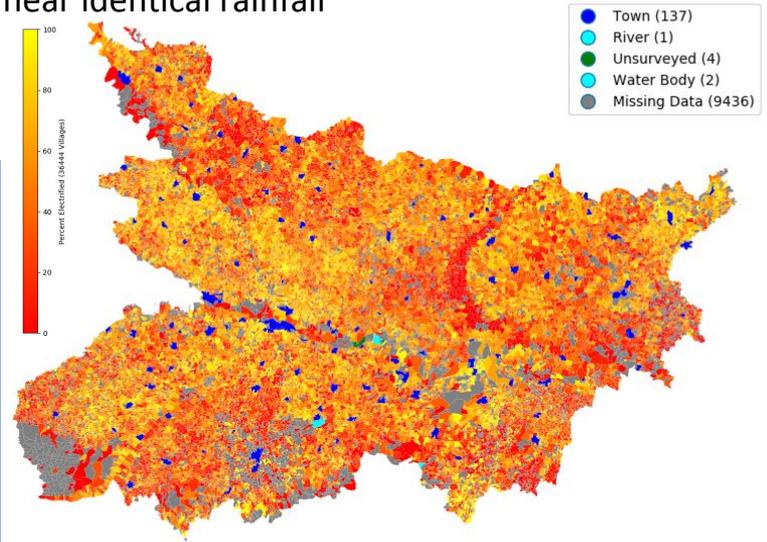
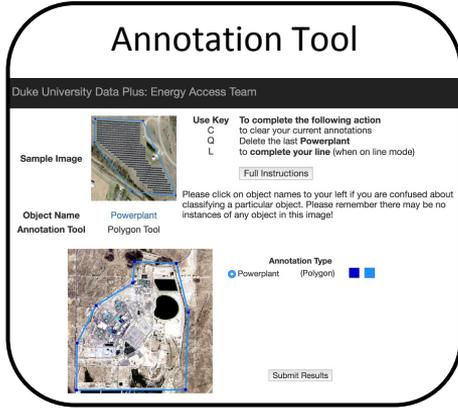
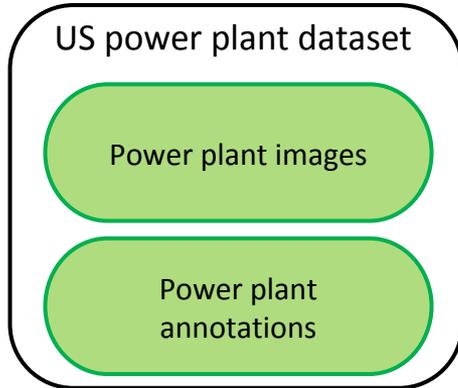


Image Annotation Tool & Power Plant Dataset



Power plants and the connecting transmission lines may indicate regions with access to electricity and enabling mapping of electricity infrastructure. We created a tool to crowdsource image annotations (as points, lines, or polygons) of objects including power plants through Amazon Mechanical Turk.

We used the tool to exactly identify power plants inside Satellite Imagery



A Bass Connections Team will use our datasets to automatically find powerplants and map electricity infrastructure

Type:	Oil	Gas	Hydro	Solar	
					High resolution power plant images with annotations (Scope: U.S.)
					Medium-resolution Landsat images (Scope: global)
					Annotations labeling the power plant within the image (ground truth for machine learning)
	Geo coordinates, station name, state and county name, primary fuel, energy type, CO ₂ emission.				Available metadata