





Water Management for Sustainable Development: **Neural Networks + Satellite Imagery** Dr. Shay Strong, Chief Data Scientist **OmniEarth** @shaybstrong shay.strong@omniearth.net

#satsummit 2017

- **OmniEarth works with water municipalities** to conserve water & reduce associated costs
  - Governer mandated restrictions in CA
  - Parcel-Level evaluation High accuracy needed for identifying overuse & guiding management
- **Multispectral imagery + LiDAR + SAR + Parcel attributes**
- **Robust classification: Neural Networks**
- Largest areas of water use (& potential savings) = outdoor consumption
  - > 1/2 home's water use
  - 1 sq ft irrigated lawn + pool = 40 gallons/day in CA
- AWS cloud infrastructure facilities 40x efficiency
  - > 120 Terabytes imagery to physically verify each parcel in CA
- Sustainable Development Goals: Water Conservation



MULTI-SPECTRAL IMAGERY: PHYSICALLY VERIFIABLE

FORECASTING/ PRESCRIPTIVE SOLUTIONS BASED ON URBAN/SUBURBAN GROWTH EVALUATE IMPACT OF POPULATIONS' NEEDS

CONSIDERATIONS:

REGIONALLY-SPECIFIC CLASSIFICATIONS AND USE CULTURAL NEEDS/RESTRICTIONS POLITICAL/LEGISLATIVE REQUIREMENTS LIVESTOCK WATER RIGHTS

BROAD REGION PREDICTION APPLICATION STATEWIDE + NATIONWIDE



NET TRAINING + CLASSIFICATION CAFFE (EVALUATED ACCURACY E.G. IBM WATSON. TENSORFLOW, TORCH)

# CHANGE DETECTION/MONITORING

MULTIPLE SEASONS SOCIO-ECONIMC RESPONSES CLIMATE

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