

Collective **A**wareness **P**latformS for **E**nvironmentally- sound **L**and management based on data techno**L**ogies and **A**grobiodiversity

Challenge

Soil Health Assessment & Monitoring

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1st CAPSELLA Hackathon
18 November 2016, Athens



Why is Soil so important ?

SOIL
IS A NON-RENEWABLE
RESOURCE

2015
International
Year of Soils

It is the basis for

- food
- feed
- medicines
- ecosystem services
- fuel



Food and Agriculture
Organization of the
United Nations

A Global Challenge



Food and Agriculture
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United Nations

on a real **problem** ...

NATURAL RESOURCES CONSERVATION SERVICE (NRCS)



unlock the secrets in the soil

www.nrcs.usda.gov

"We know more about the movement of celestial bodies than about the soil underfoot."

-Leonardo da Vinci



some facts ...

Living in the soil are plant roots, bacteria, fungi, protozoa, algae, mites, nematodes, worms, ants, maggots, insects and grubs, and larger animals.

science of soil

soil is
made of about **45% minerals**
25% water
5% organic matter **25% air**



what's underneath



Healthy soil has amazing water-retention capacity.

Every **1%** increase in organic matter results in as much as **25,000** gal of available soil water per acre.



One teaspoon of healthy soil contains

100 million-1 billion individual bacteria



All of the soil microbes in **1 ac/ft** of soil weigh more than **2 cows**

Earthworm populations consume **2 tons** of dry matter per acre per year, partly digesting and mixing it with soil

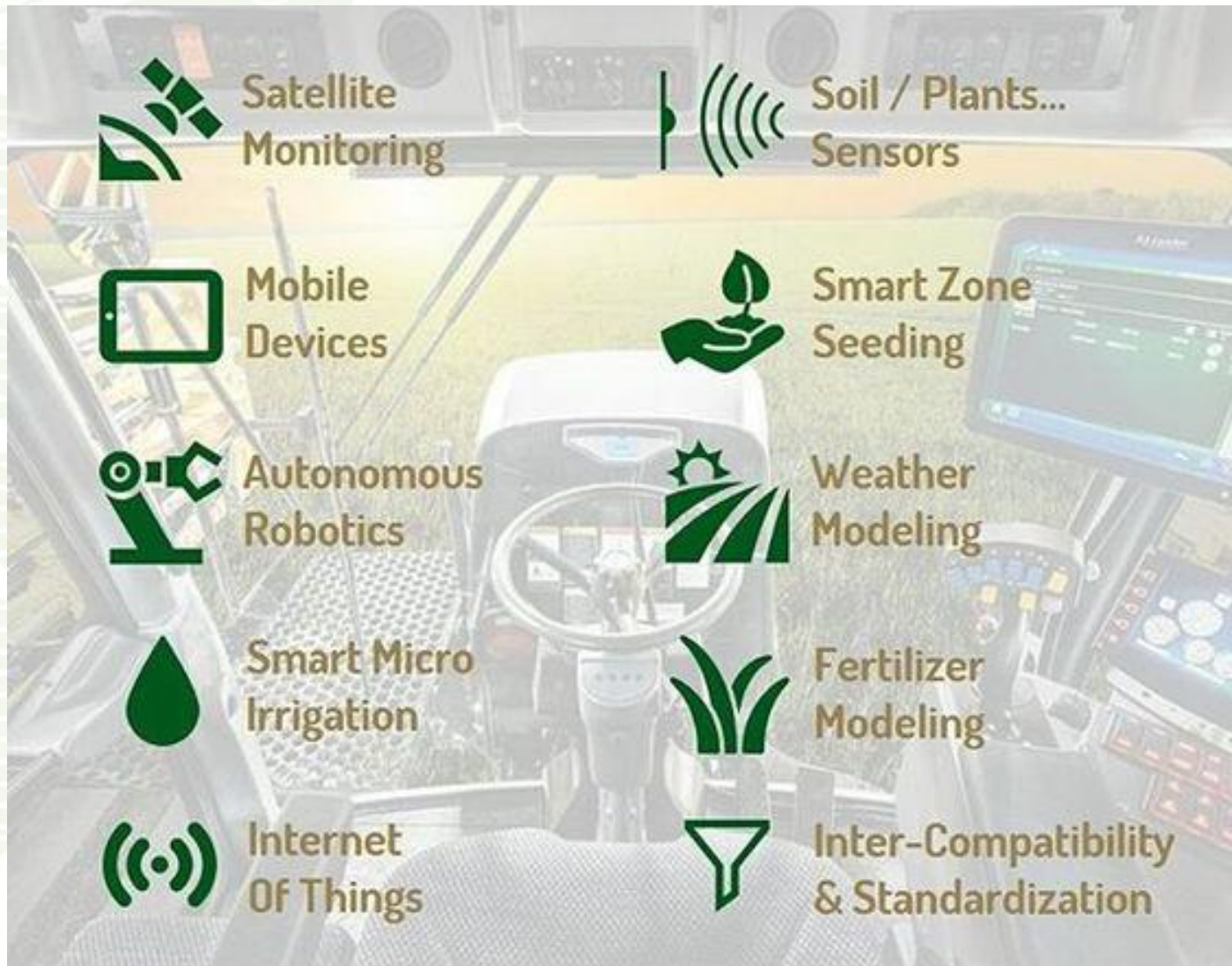


the problem goes **deep** ...



Jerry Glover, an agroecologist from National Geographic shows off a perennial wheatgrass plant's long roots, which grow deeper than annual plants' roots, improving soil structure and reducing erosion.

... and needs support from various **Technologies**



and **Data** sources



Agriculture



Biodiversity

Data

in Field observations

Sensor

Weather

Satellite



CAPSELLA Challenge

Soil Health Assessment & Monitoring

Goal

- to facilitate knowledge sharing on Soil Health according to climatic condition, types of crops and agronomic practices

Available Datasets

- **Satellite imaging** (Google, ESA, etc.)
- **Weather data** (Weather Underground, AccuWeather etc.)
- **User-driven observations** (LADA*)
- and many more ...

Seek Solutions

- for monitoring soil condition by integrating farmers' observations with available location-specific open data and share this knowledge with others

* www.fao.org/fileadmin/templates/nr/kagera/Documents/LADA_manuals/part2_d.pdf

Thank You

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