International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

science for global insight

New Data Sources for Earth Science and AI

Steffen Fritz

Director Strategic Initiatives Program
& Researcher Novel Data Ecosystems for Sustainability

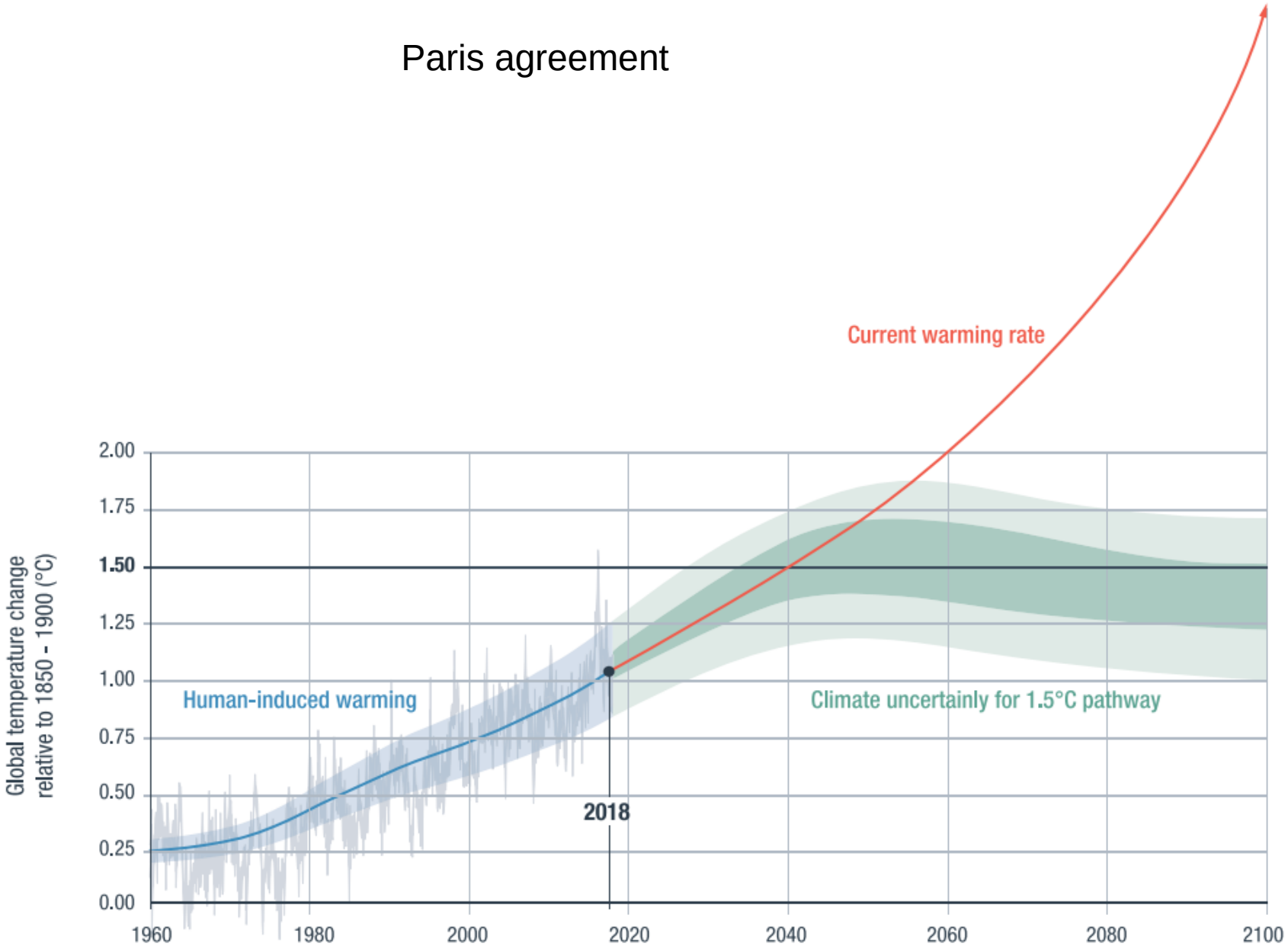
Paris Agreement

Sustainable Development Goals

Sendai Framework for DRR

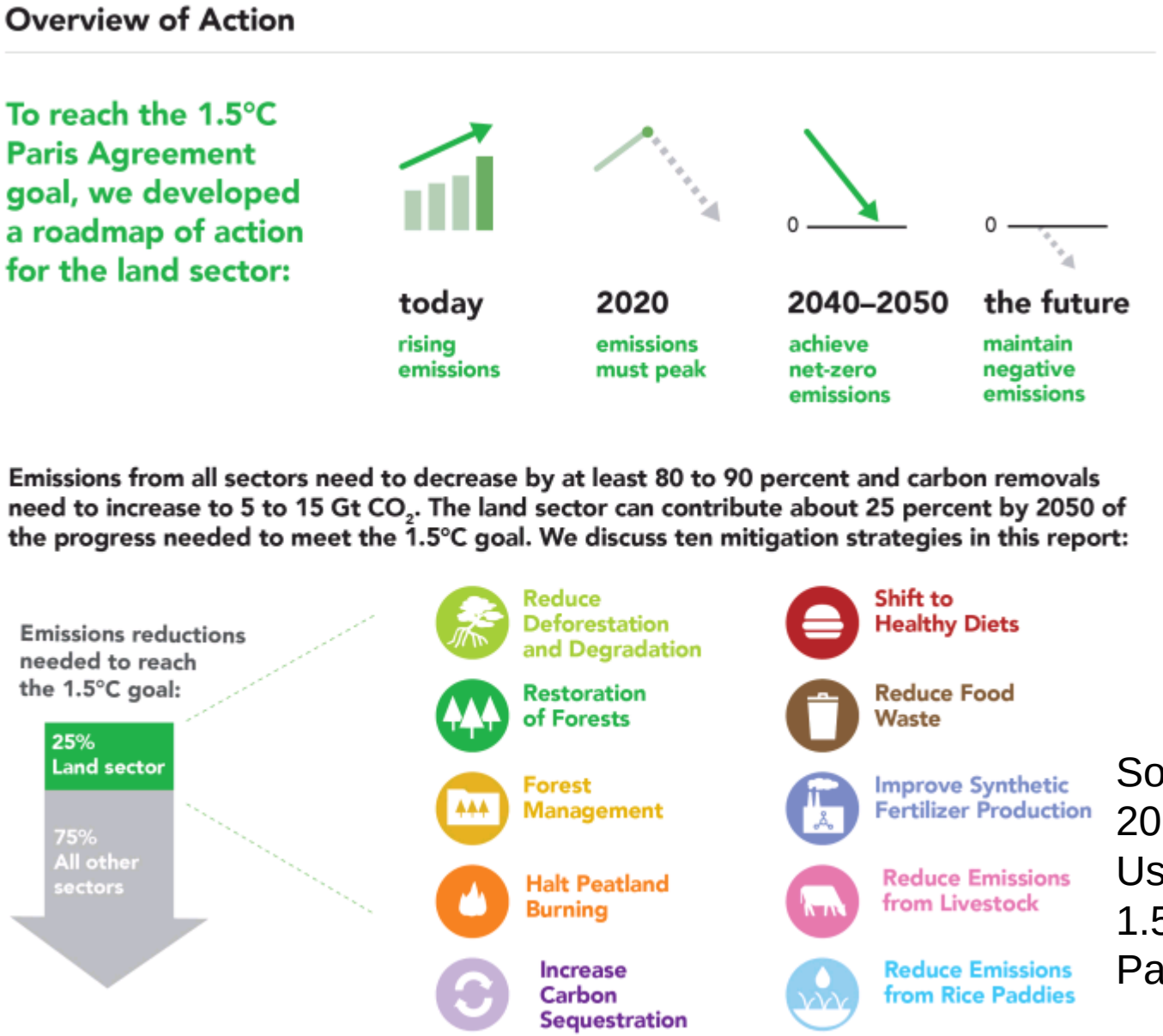
IIASA

Paris agreement



Human-induced warming reached approximately 1°C above pre-industrial levels in 2017.
At the present rate, global temperature would reach 1.5°C around 2040.

Land-use sector: AI, Modelling, EO and Citizen Behaviors



Source: ClimateFocus, 2017, How Improved Land-Use can contribute to the 1.5 degrees, Working Paper

Many Data gaps

- Consistent reliable land cover and land-use change dataset
- Information on crop management – e.g. tillage, harvest time, crop type, oil palm
- Poverty reduction?
- Consumer behavour

BIOeCON

STUDY ESTIMATES LAND AVAILABLE FOR BIOFUEL CROPS

Study Estimates Land Available for Biofuel Crops

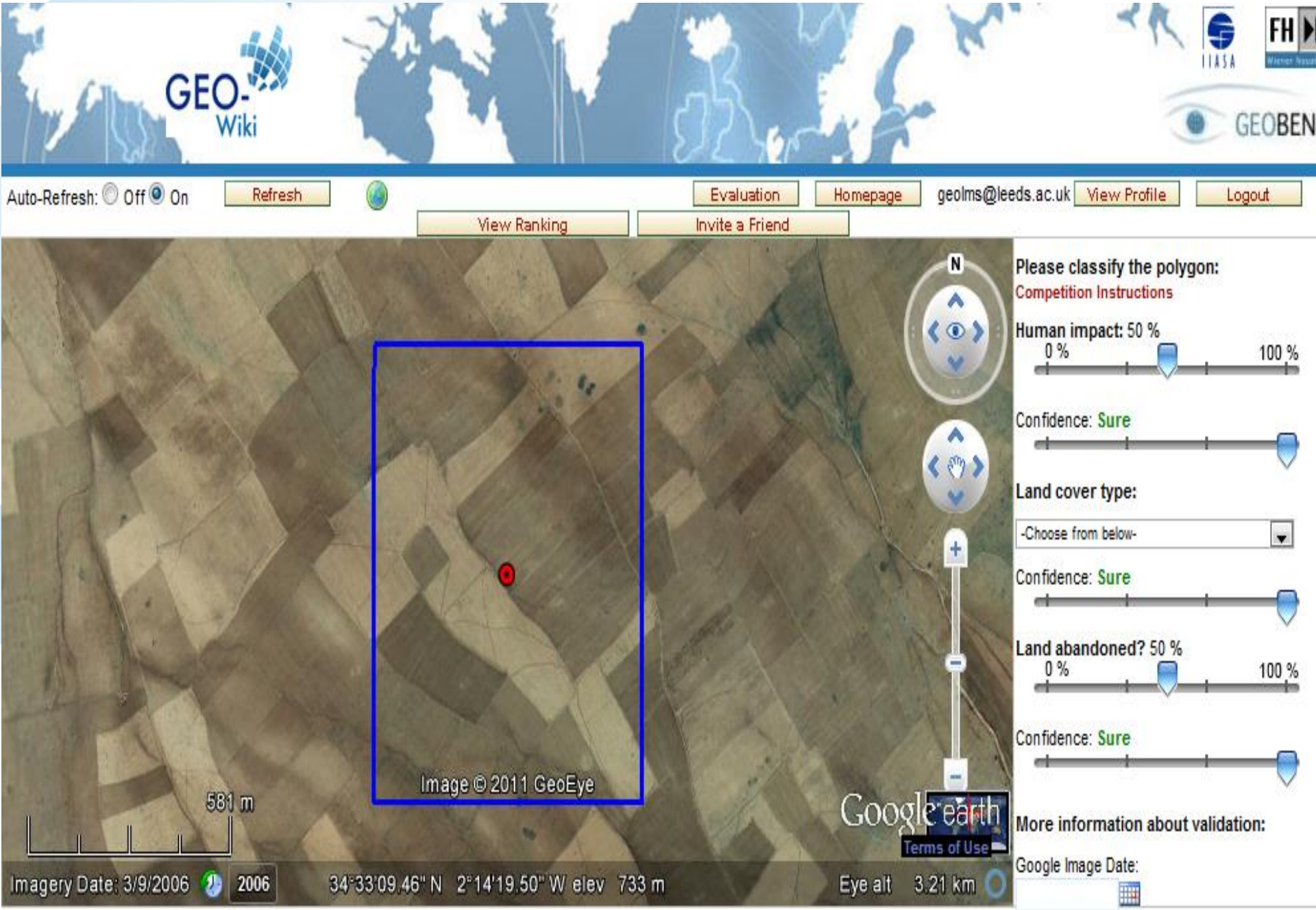
By Science Daily,

January 19, 2011

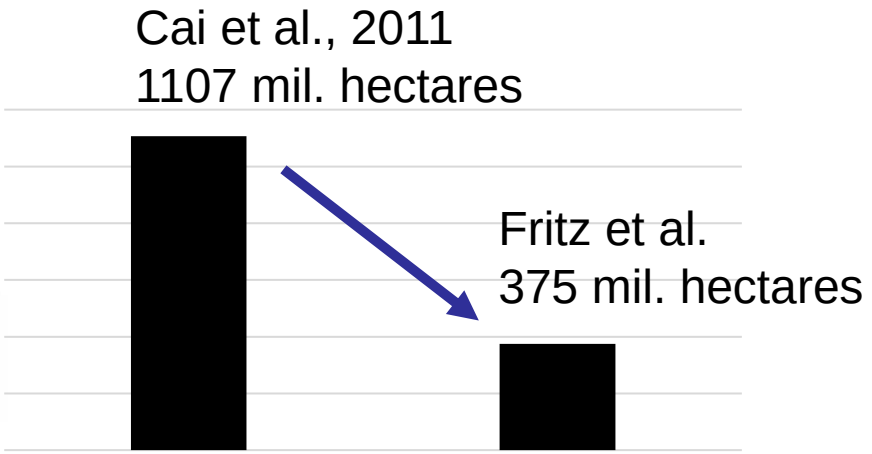
Using detailed land analysis, Illinois researchers have found that biofuel crops cultivated on available land could produce up to half of the world's current fuel consumption -- without affecting food crops or pastureland.

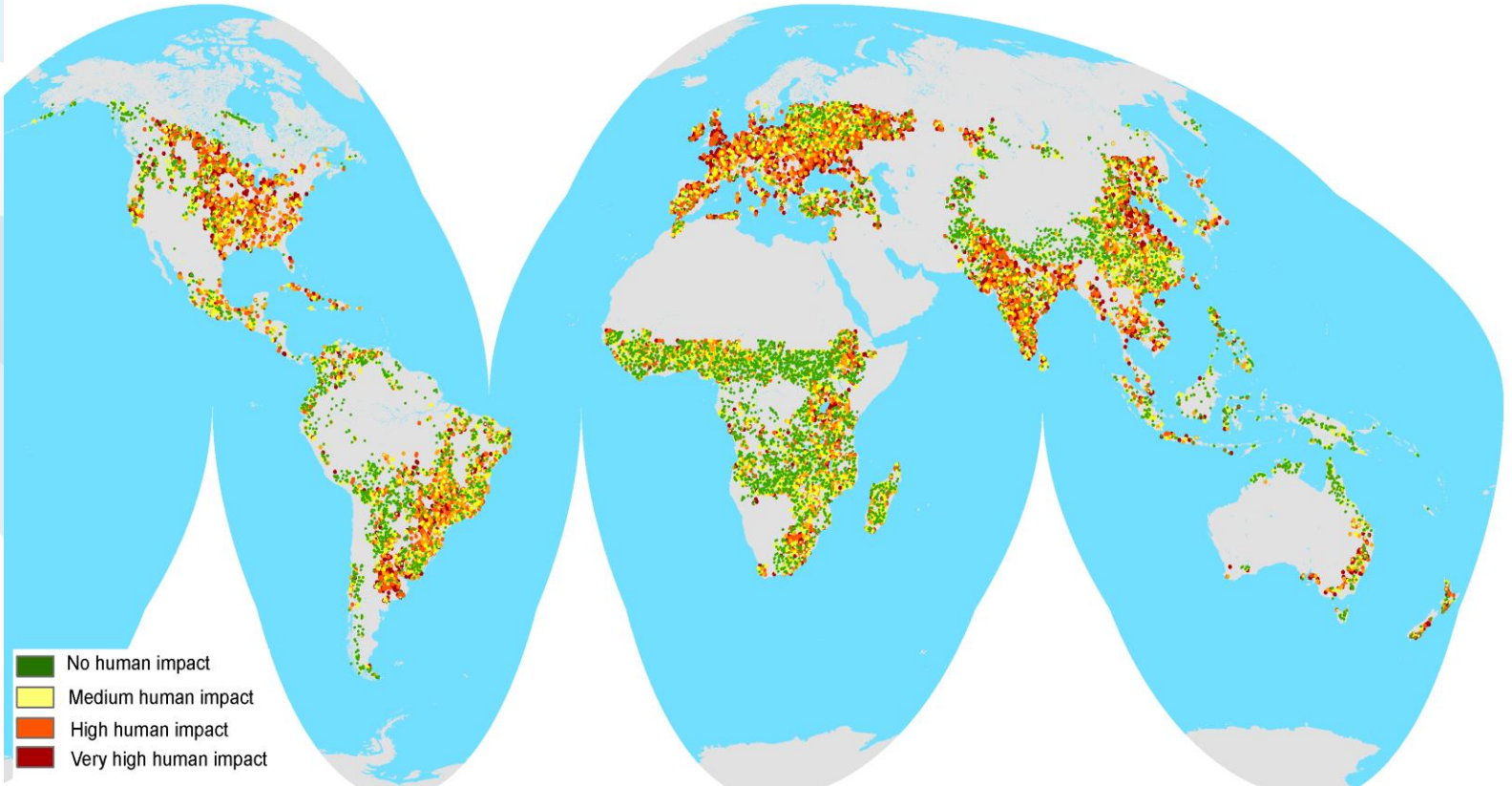
Published in the journal Environmental Science and Technology, the study led by civil and environmental engineering professor Ximing Cai identified land around the globe available to produce grass crops for biofuels, with minimal impact on agriculture or the environment.

Many studies on biofuel crop viability focus on biomass yield, or how productive a crop can be regionally. There has been relatively little research on land availability, one of the key constraints of


GEO-Wiki
IIASA
FH
GEOBEN
Auto-Refresh: Off On
Refresh
Evaluation
Homepage
geolms@leeds.ac.uk
View Profile
Logout
View Ranking
Invite a Friend
N
Please classify the polygon:
Competition Instructions
Human impact: 50 %
0 %
100 %
Confidence: Sure
Land cover type:
-Choose from below-
Confidence: Sure
Land abandoned? 50 %
0 %
100 %
Confidence: Sure
More information about validation:
Google Image Date:
Image © 2011 GeoEye
581 m
Google earth
Terms of Use
Imagery Date: 3/9/2006
2006
34°33'09.46" N 2°14'19.50" W elev 733 m
Eye alt 3.21 km

Downgrading recent estimates of land availability using crowdsourcing



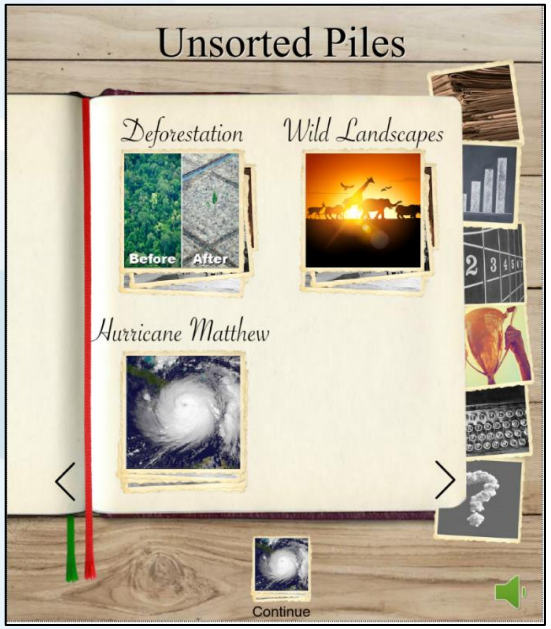


Fritz et al, 2013, Environmental Science and technology

Picture Pile

Mobile and web application designed for
(1) **rapid image assessment** and (2) **change detection**

geo-wiki.org/games/picturepile

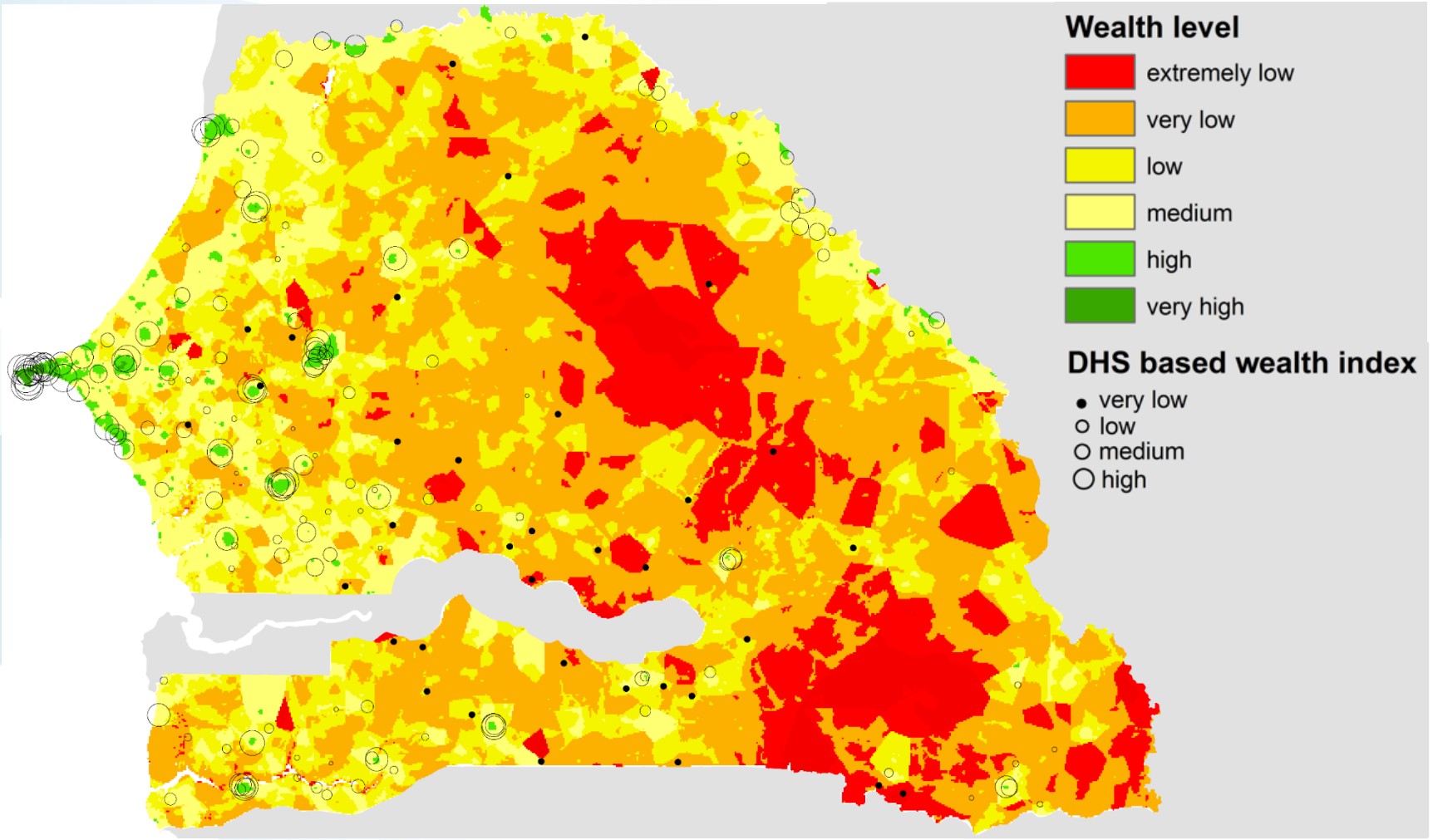


Designed to be **generic and flexible** tool customizable to different domains that requires EO data as an input resource.

Available on the App Store

Get it on Google play

Tracking poverty



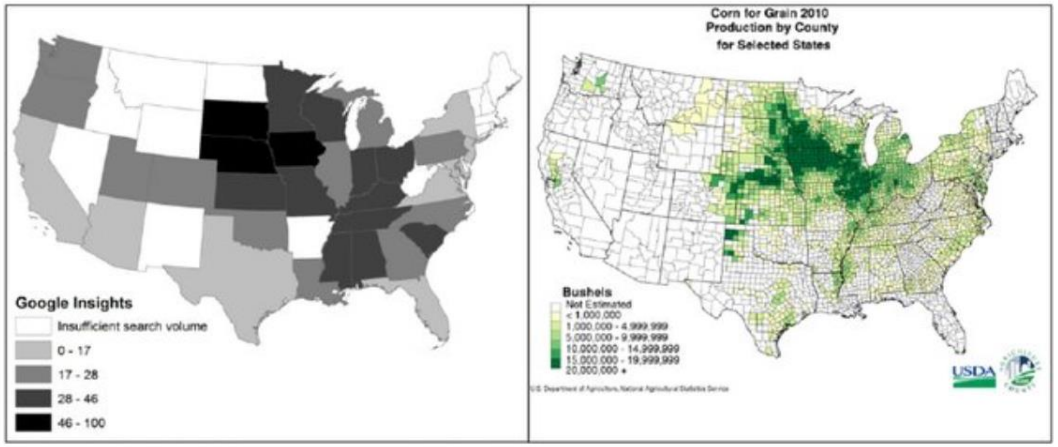
IIASA:Tracking Poverty using satellite imagery and big data
Work done as part of the data for climate challange

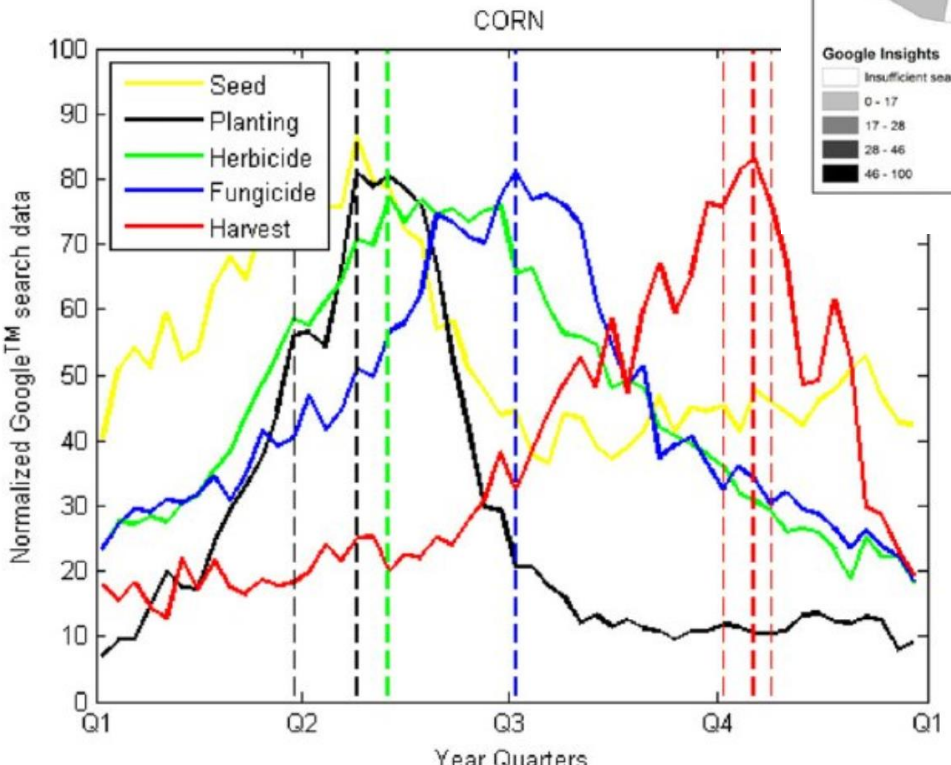
Generating crop calendars with Web search data

June 2012 · Environmental Research Letters 7(2)

DOI: 10.1088/1748-9326/7/2/024022

Marijn van der Velde · Linda M. See · Steffen Fritz · Show all 6 authors · Michael Obersteiner





International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

science for global insight

Thanks!

fritz@iiasa.ac.at