



International Institute for
Applied Systems Analysis
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science for global insight

New Data Sources for Earth Science and AI

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IIASA, International Institute for Applied Systems Analysis

Nations Unies

Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris, France



Paris Agreement

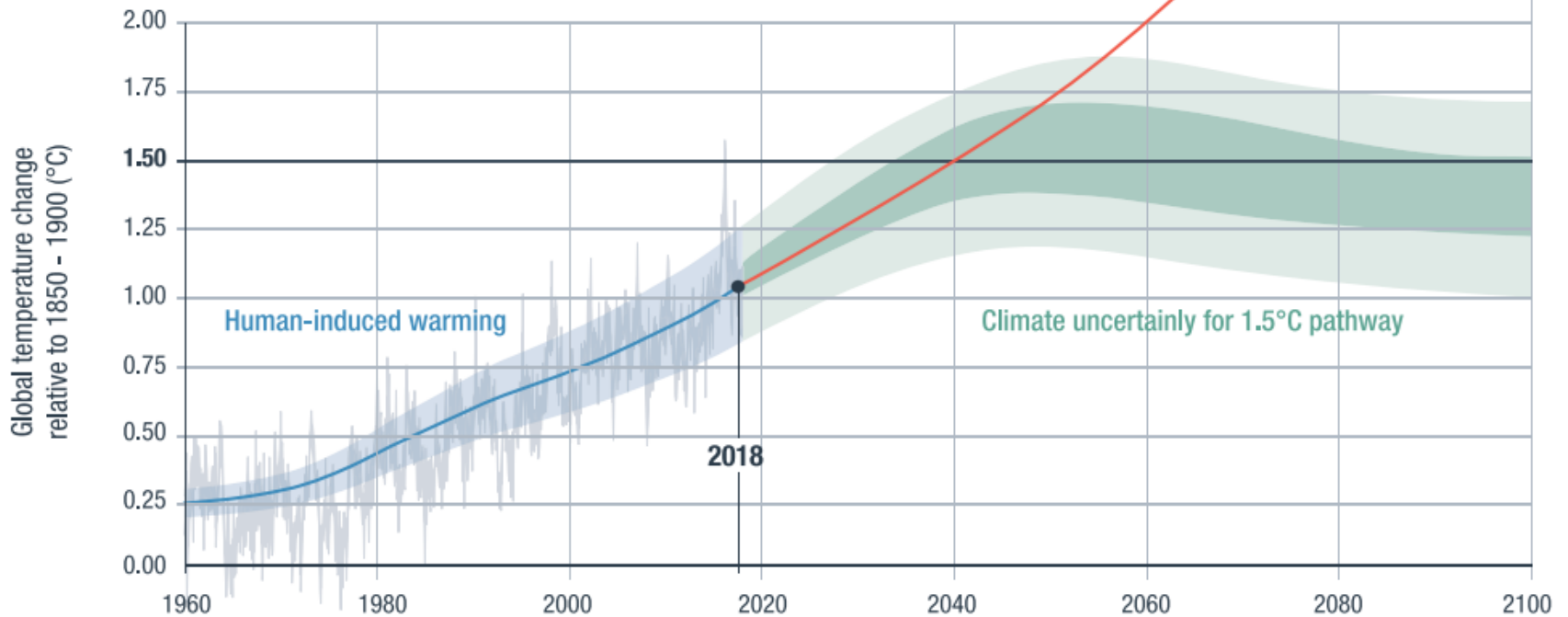
Sustainable Development Goals



Sendai Framework for DRR

7 GLOBAL TARGETS	Reduce	Increase
	Mortality/ global population 2020-2030 Average << 2005-2015 Average	Countries with national & local DRR strategies 2020 Value >> 2015 Value
	Affected people/ global population 2020-2030 Average << 2005-2015 Average	International cooperation to developing countries 2030 Value >> 2015 Value
	Economic loss/ global GDP 2030 Ratio << 2015 Ratio	Availability and access to multi-hazard early warning systems & disaster risk information and assessments 2030 Values >> 2015 Values
	Damage to critical infrastructure & disruption of basic services 2030 Values << 2015 Values	

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

Overview of Action

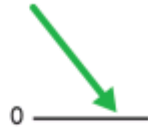
To reach the 1.5°C Paris Agreement goal, we developed a roadmap of action for the land sector:



today
rising emissions



2020
emissions must peak



2040–2050
achieve net-zero emissions



the future
maintain negative emissions

Emissions from all sectors need to decrease by at least 80 to 90 percent and carbon removals need to increase to 5 to 15 Gt CO₂. The land sector can contribute about 25 percent by 2050 of the progress needed to meet the 1.5°C goal. We discuss ten mitigation strategies in this report:

Emissions reductions needed to reach the 1.5°C goal:



Reduce Deforestation and Degradation



Restoration of Forests



Forest Management



Halt Peatland Burning



Increase Carbon Sequestration



Shift to Healthy Diets



Reduce Food Waste



Improve Synthetic Fertilizer Production



Reduce Emissions from Livestock



Reduce Emissions from Rice Paddies

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 behaviour



STUDY ESTIMATES LAND AVAILABLE FOR BIOFUEL CROPS

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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 biofuel development. Of special concern is whether the world could even produce enough biofuels to



Auto-Refresh: Off On

Refresh



Evaluation

Homepage

geolms@leeds.ac.uk

View Profile

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View Ranking

Invite a Friend



Please classify the polygon:

Competition Instructions

Human impact: 50 %



Confidence: **Sure**



Land cover type:

-Choose from below-

Confidence: **Sure**



Land abandoned? 50 %



Confidence: **Sure**



More information about validation:

Google Image Date:



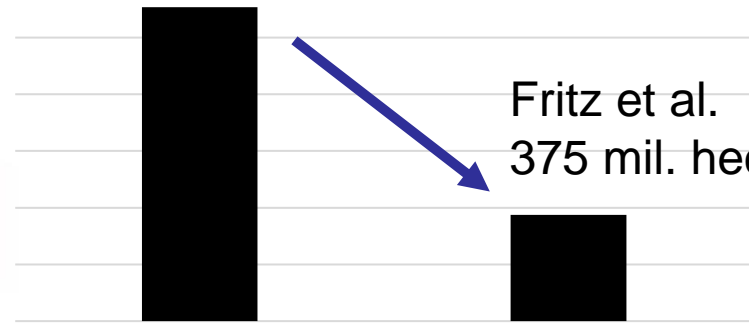
Imagery Date: 3/9/2006 2006

34°33'09.46" N 2°14'19.50" W elev 733 m

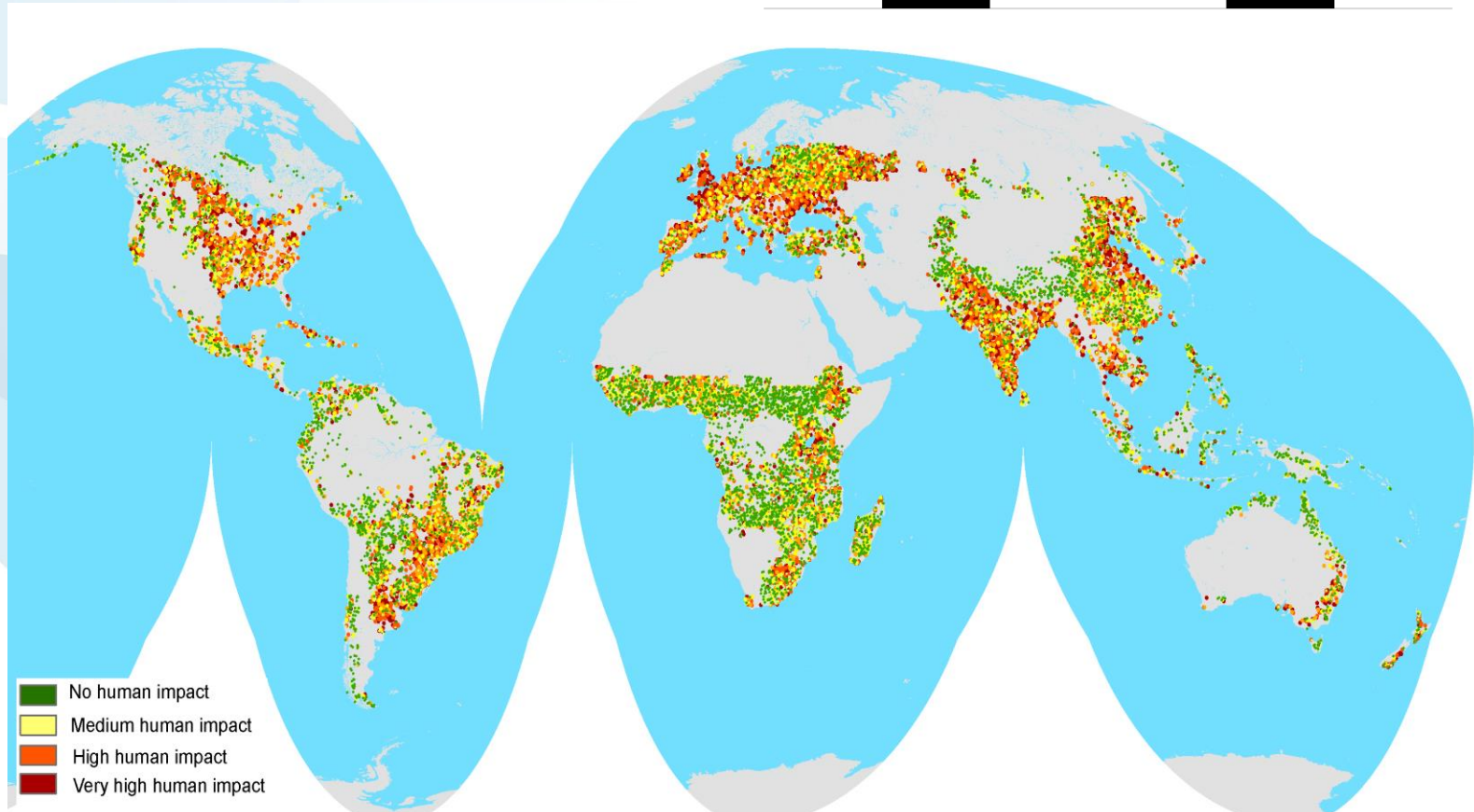
Eye alt 3.21 km

Downgrading recent estimates of land availability using crowdsourcing

Cai et al., 2011
1107 mil. hectares



Fritz et al.
375 mil. hectares

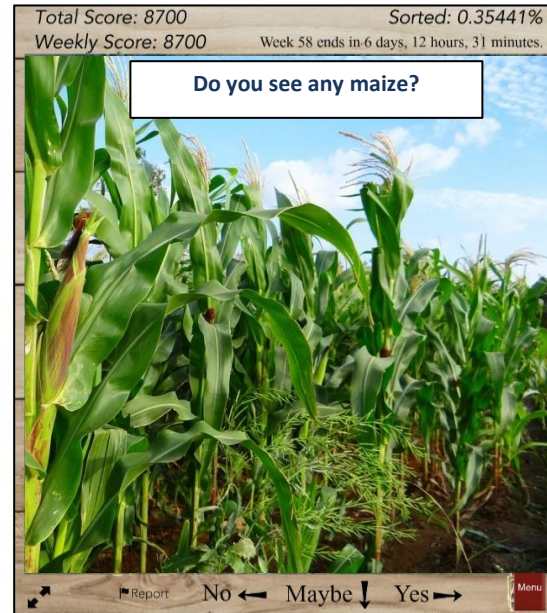
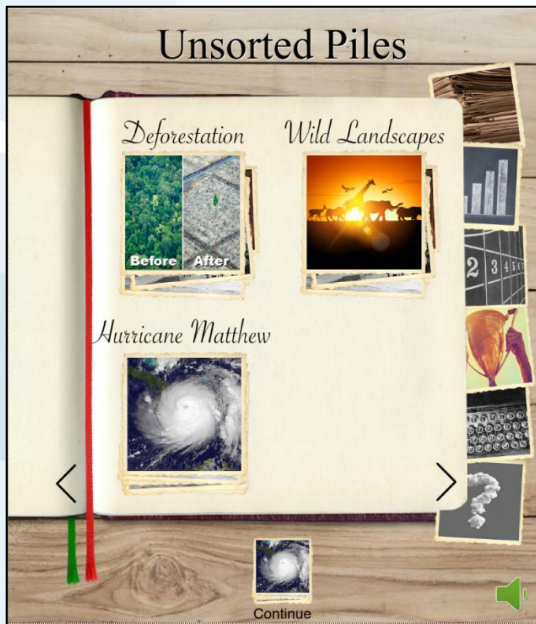


Fritz et al, 2013, Environmental Science and technology

Picture Pile

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

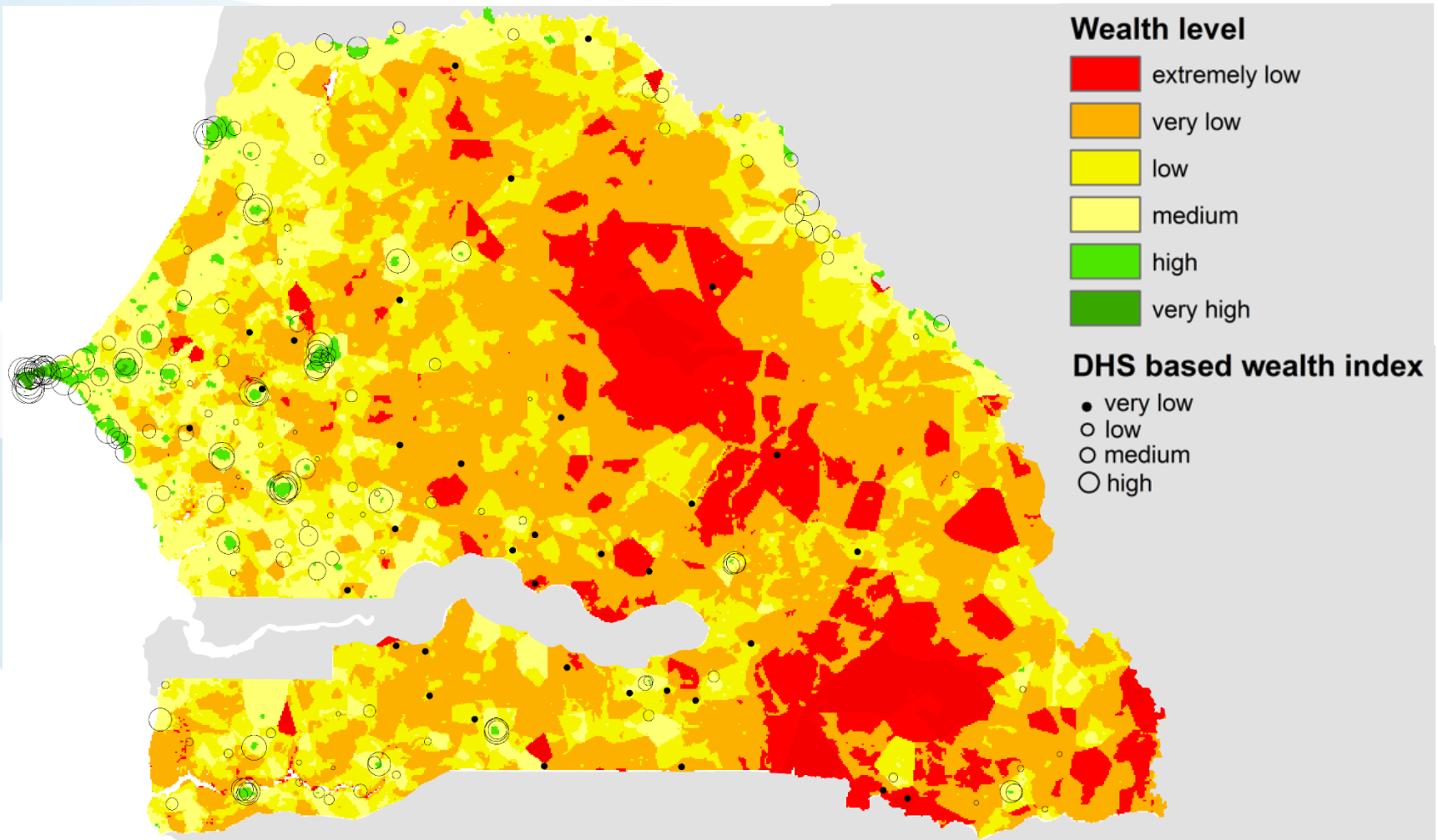
geo-wiki.org/games/picturepile



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



Tracking poverty







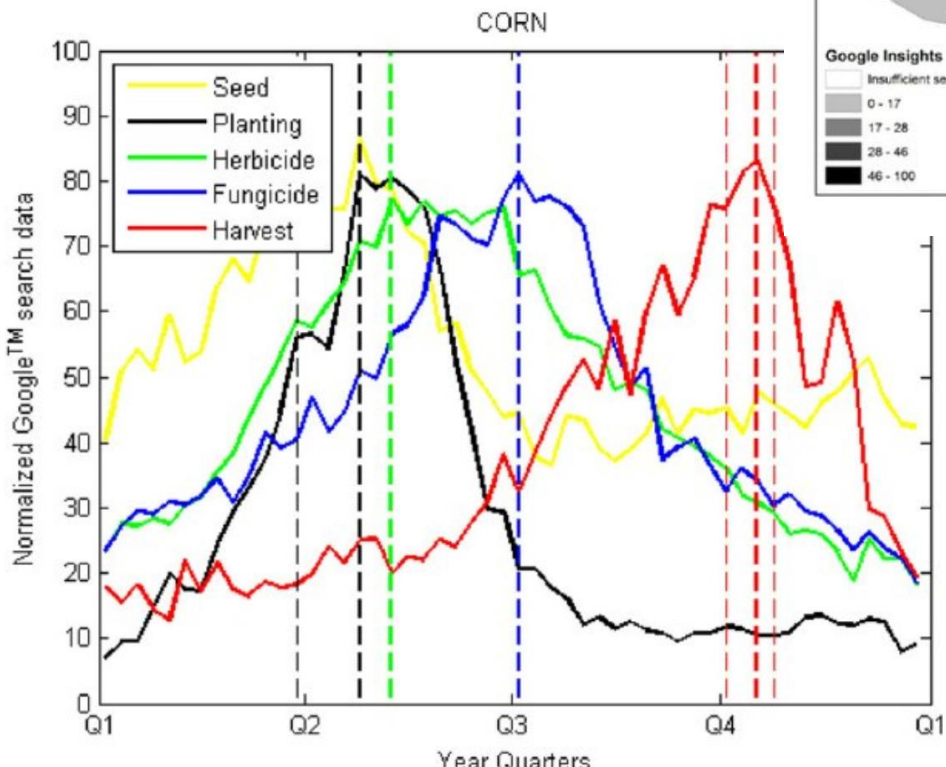
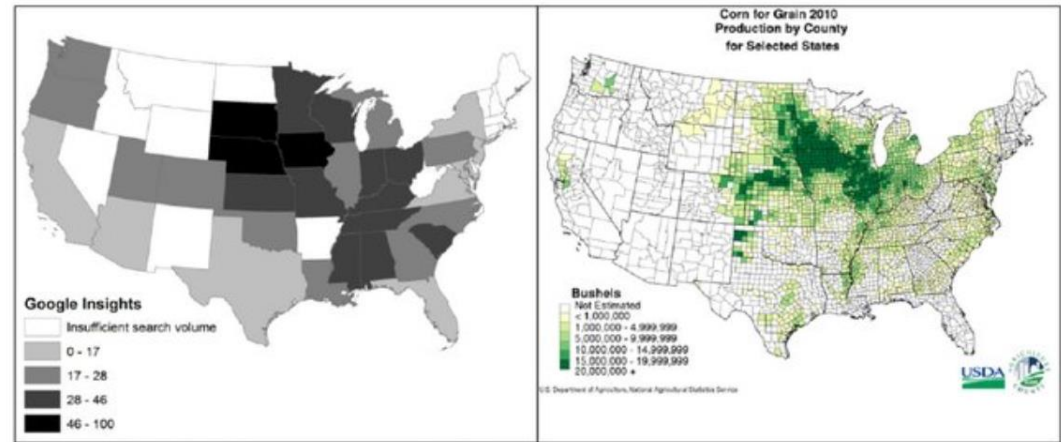
IIASA: Tracking Poverty using satellite imagery and big data
Work done as part of the data for climate challenge

Generating crop calendars with Web search data

June 2012 · Environmental Research Letters 7(2)

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

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Thanks!

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