Quantified evidence in science for policy

DESTINATION EARTH INITIATIVE
THE LAUNCH EVENT, 30 March 2022

Andrea Saltelli

Centre for the Study of the Sciences and the Humanities (SVT), University of Bergen, (NO)
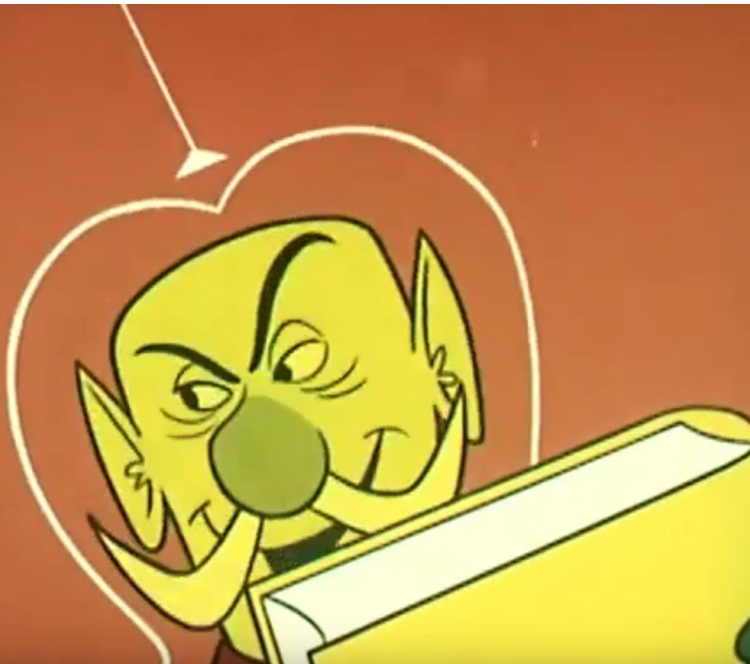
The first Destination Earth (1956) was not about reducing emission ···

··· geopolitics entered the fray

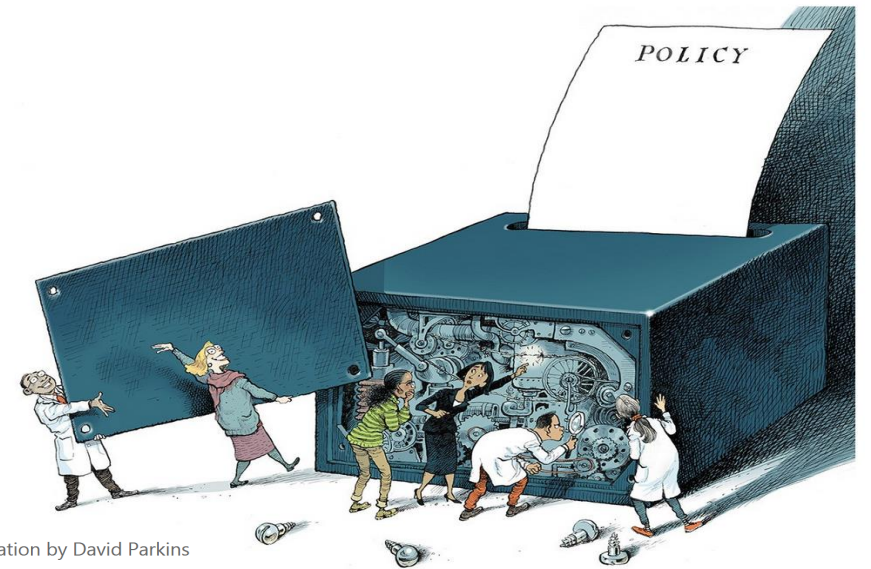# Digital twins and technical quality

Illustration by David Parkins

Five ways to ensure that models serve society: a manifesto

Mind the assumptions

Assess uncertainty and sensitivity

Mind the hubris

Complexity can be the enemy of relevance

Mind the framing

Match purpose and context

Mind the consequences

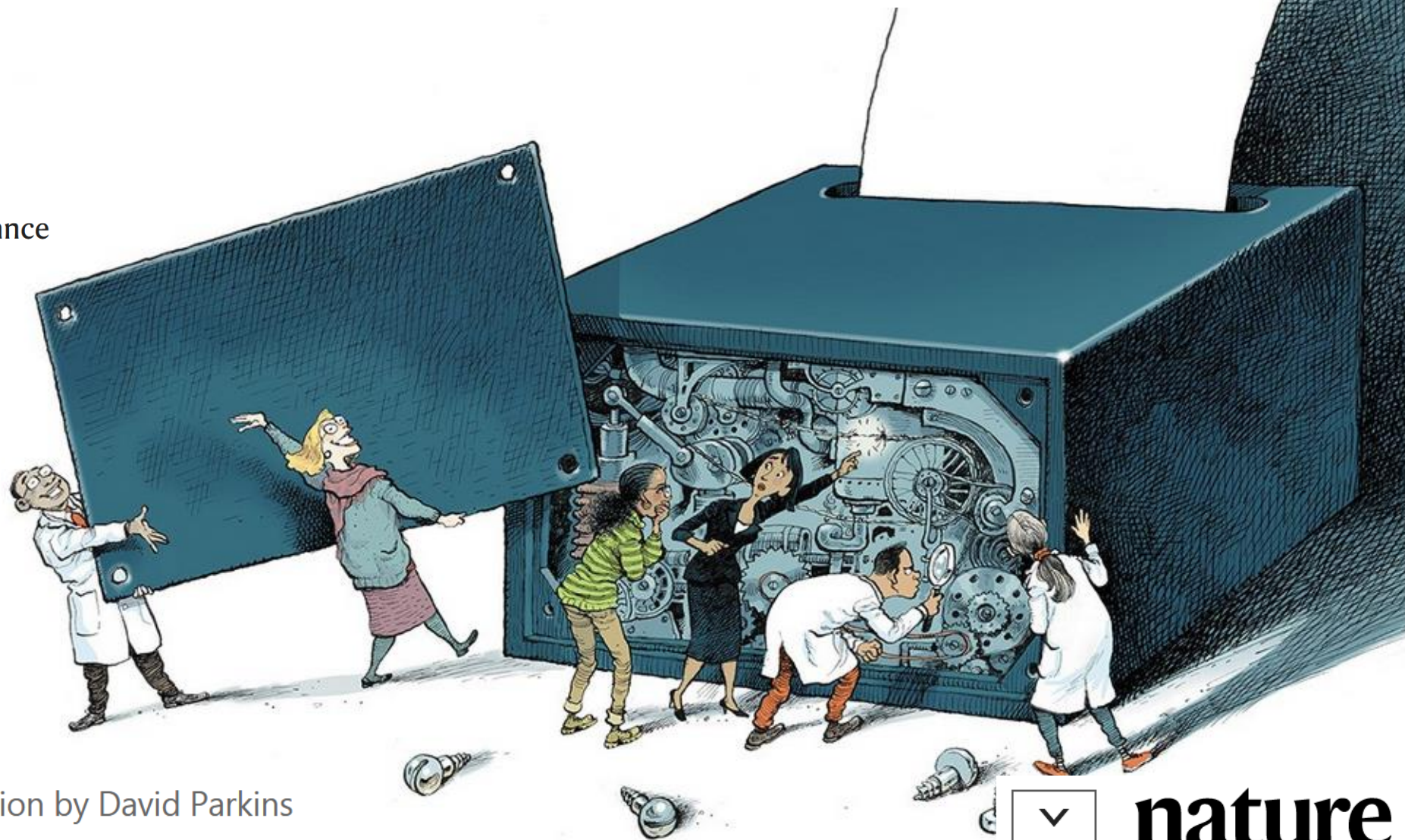Quantification can backfire.

Mind the unknowns

Acknowledge ignorance

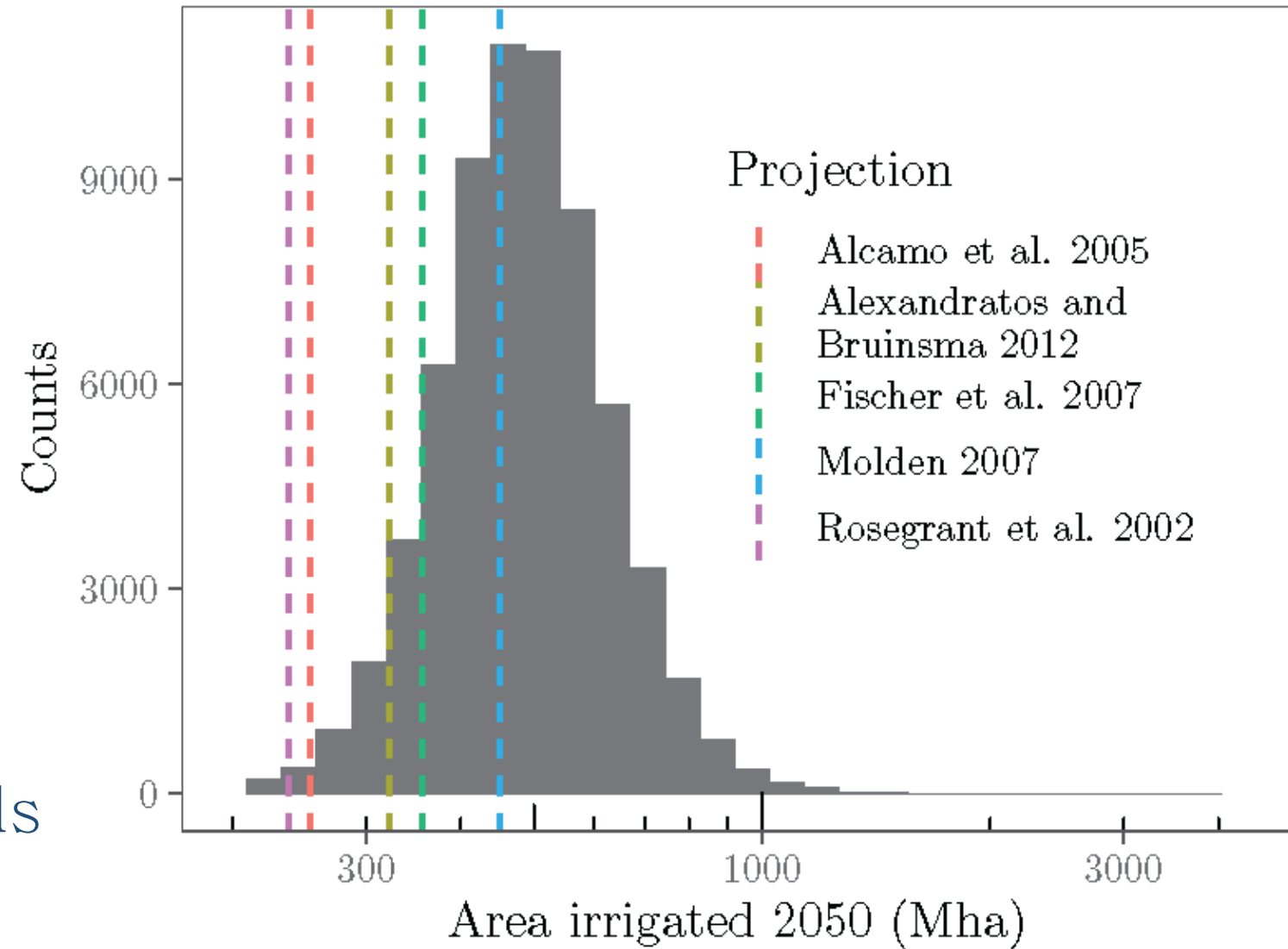Illustration by David Parkins

POLICY

nature

Current Models Underestimate Future Irrigated Areas

Geophysical Research Letters

A. Puy ✉, S. Lo Piano, A. Saltelli

An uncertainty analysis (grey histogram) reveals that the range of possible outcomes is larger and less conservative than official estimates (dashed lines)
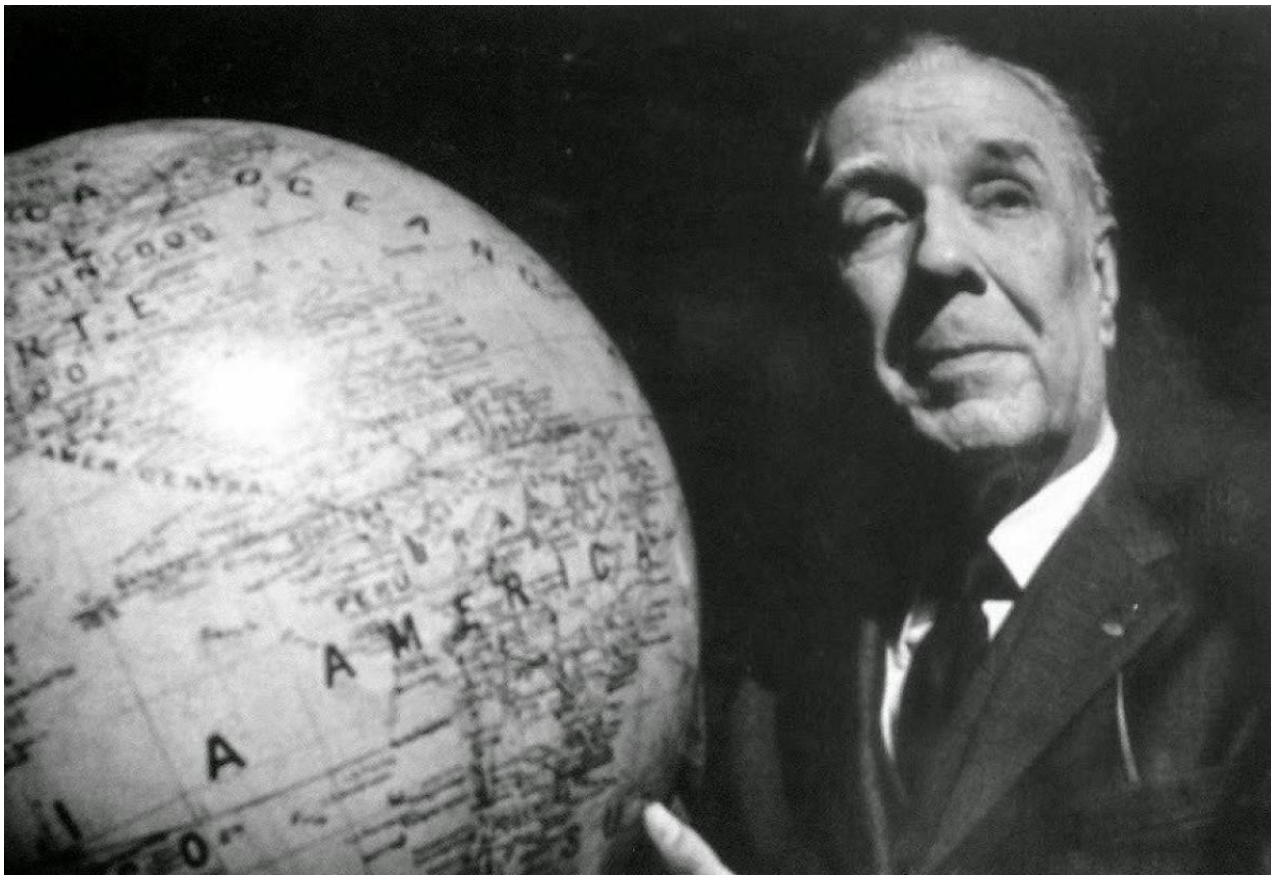
Is this type of analysis possible when many models are combined?

Digital twins and other dimensions of quality

Illustration by David Parkins

En aquel Imperio, el Arte de la Cartografía logró tal Perfección que el mapa de una sola Provincia ocupaba toda una Ciudad, y el mapa del Imperio, toda una Provincia…
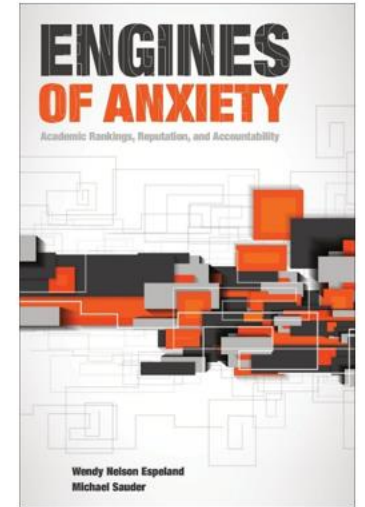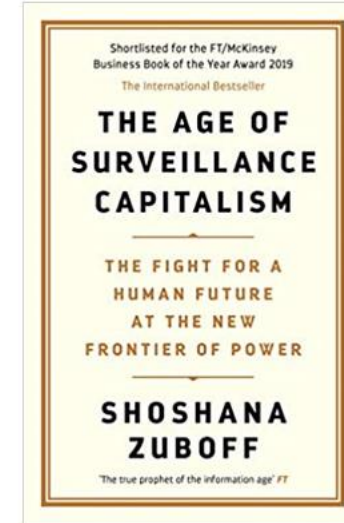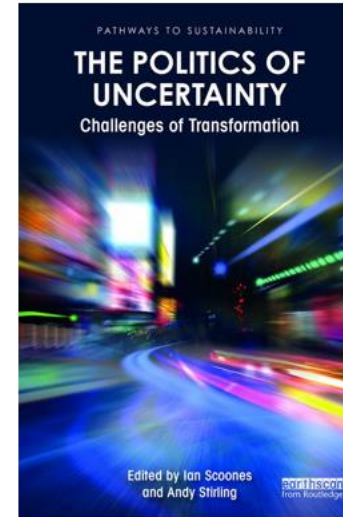
Jorge Luis Borges, Del Rigor en la Ciencia, 1946
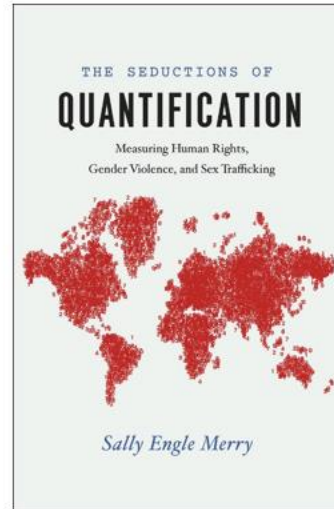
a one-to-one map of the kingdom

… the new machine would be so large, it would resemble a planet, and be of such complexity that organic life itself would become part of its operating matrix

Douglas Adam and the super computer of the 'Hitchhiker's Guide to the Galaxy', 1979

From the fables of
Borges and Adams …
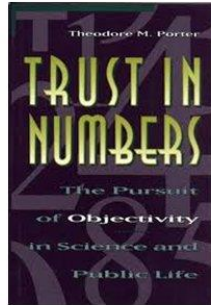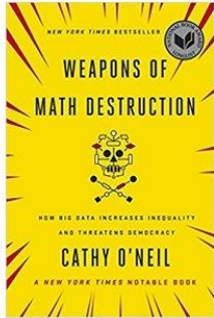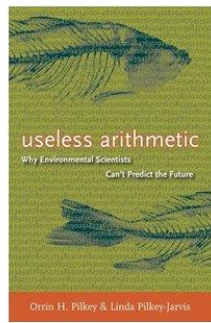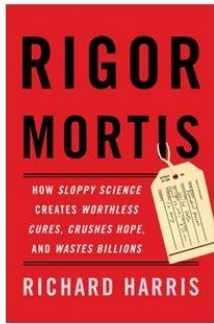
… to a flood of
disciplinary work …
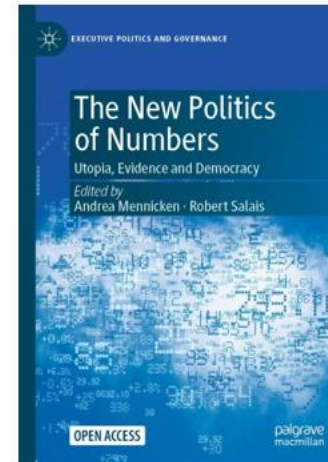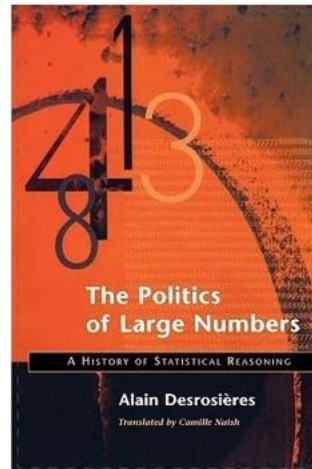
… to the effect that
quantifying has
consequences

Quantification for policy needs more dimensions of quality than purely technical
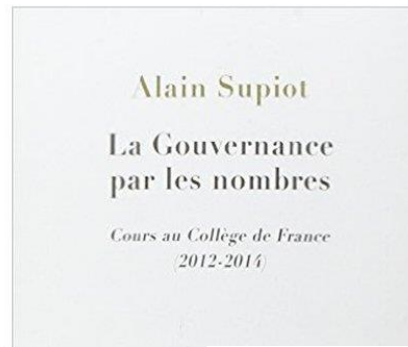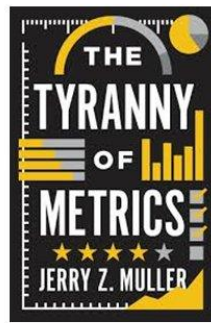

The sanctification of the digital and the enthusiasm about machine learning neglects important concerns

Care of the environment is also ethical and political; digital twins as 'displacement'?
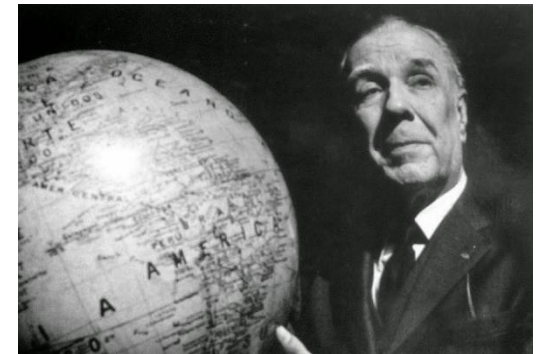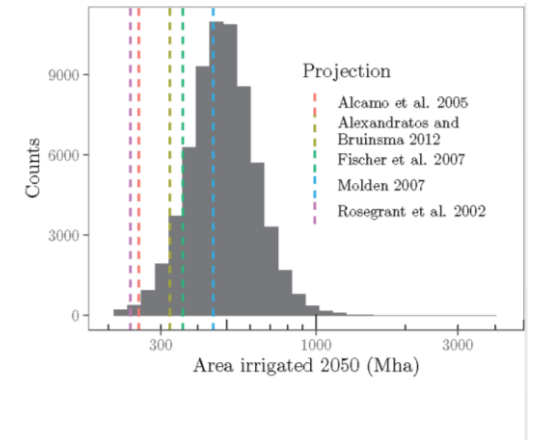
The End

www.andreasaltelli.eu

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Sources

Irrigation

(Arnald Puy, Lo Piano, and Saltelli 2020; Arnald Puy et al. 2021; 2022).

Manifesto

(Saltelli et al. 2020)

Destination Earth

(Nativi, Mazzetti, and Craglia 2021; Bauer, Stevens, and Hazeleger 2021)

Governing by numbers

(Mennicken and Espeland 2019; Salais 2022; Supiot 2017; Zuboff 2019)

Maps and computers of the world

(Borges 1946; Douglas 1979)

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