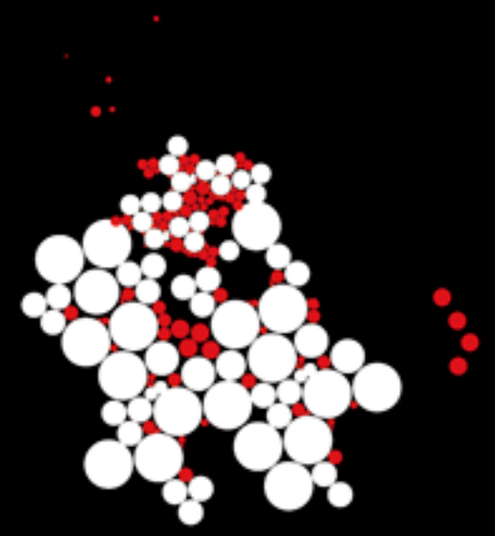
UNIVERSITY OF TWENTE.

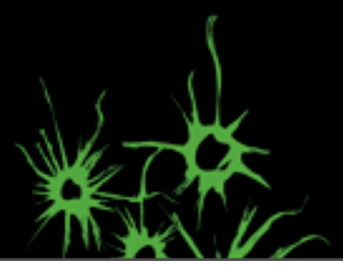


Biases, beliefs and values in participatory modeling and citizen science

Alexey Voinov

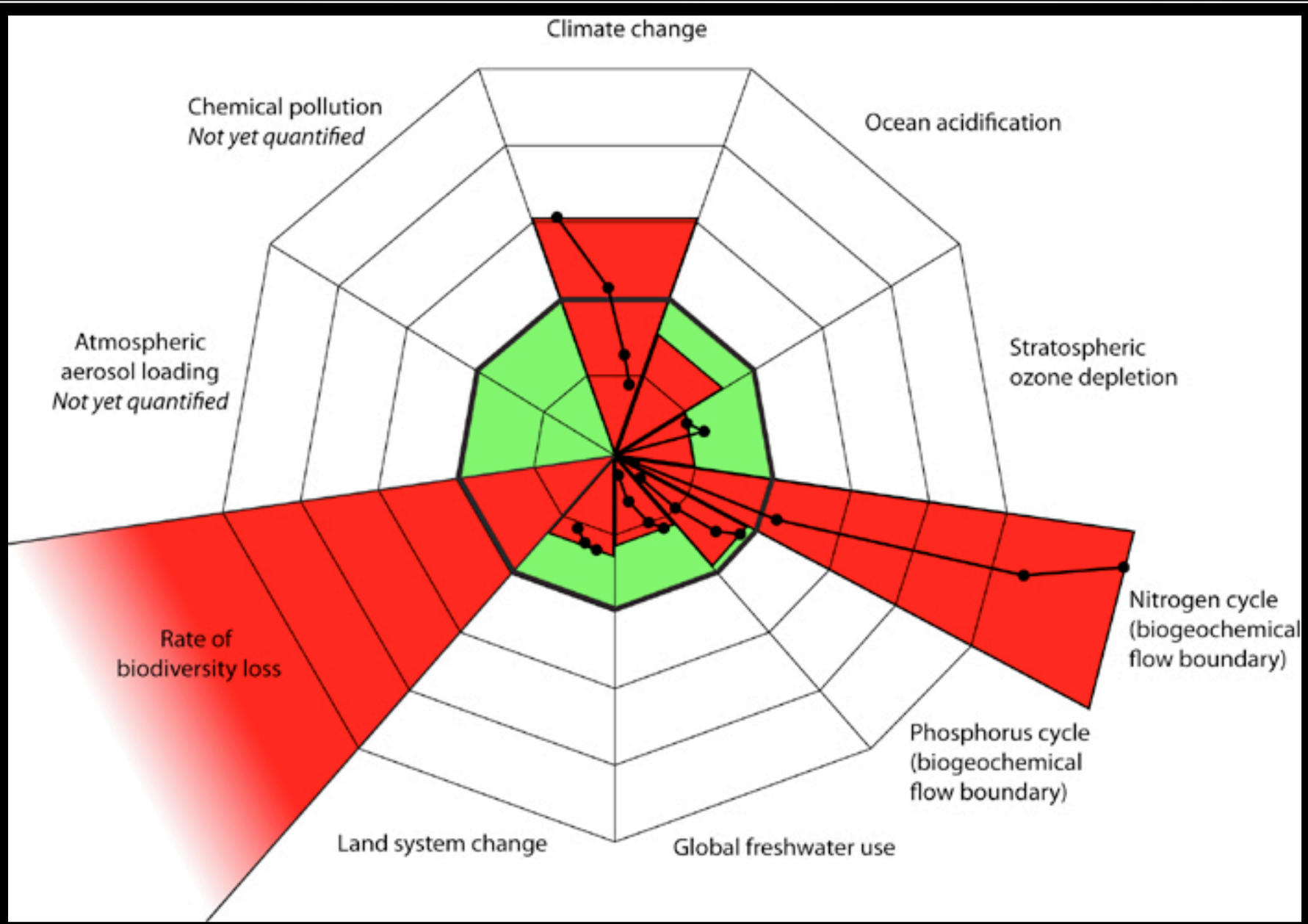
Faculty of Geo-Information Science and Earth Observation (ITC)
University of Twente
aavoinov@gmail.com

Innovations in Collaborative Modeling, 2016



"May you live in interesting times"

Planetary boundaries

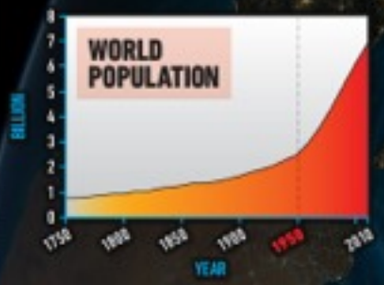


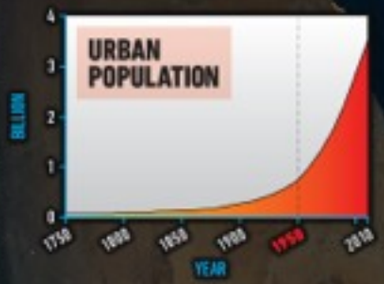
- Estimate of quantitative evolution of control variables for seven planetary boundaries from pre-industrial levels to the present

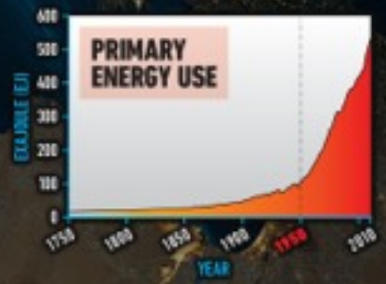
Rockstrom, J. et al., 2009. A safe operating space for humanity. *Nature*, 461(7263), pp.472–475.

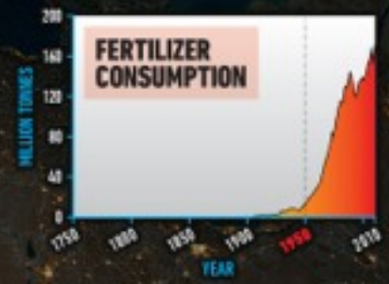
THE GREAT ACCELERATION

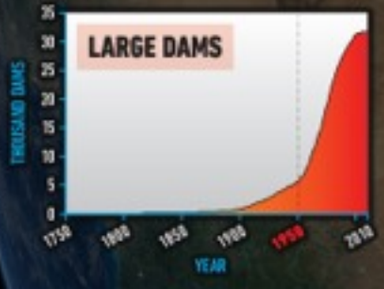
SOCIO-ECONOMIC TRENDS

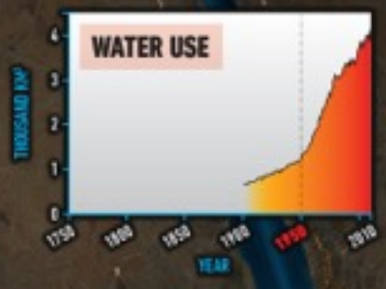




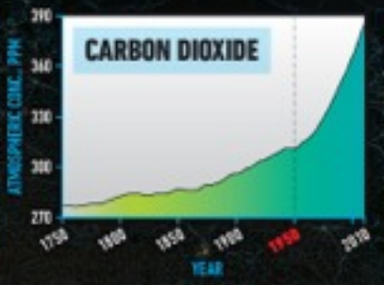


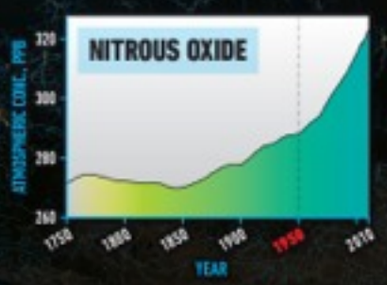


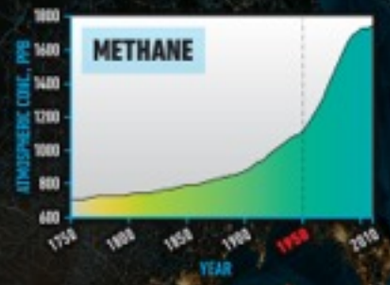


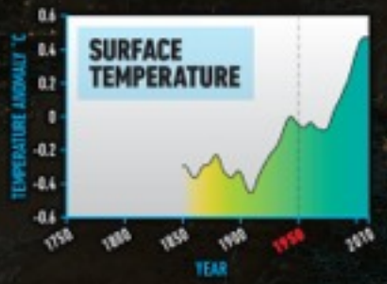


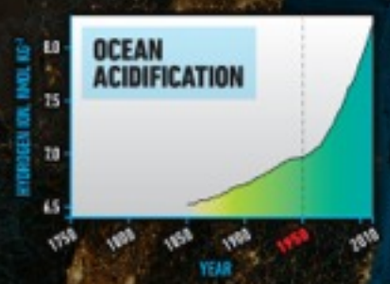
EARTH SYSTEM TRENDS

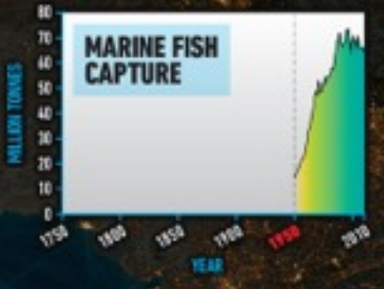


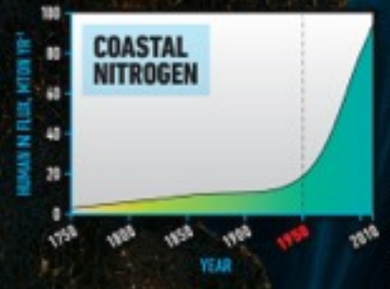


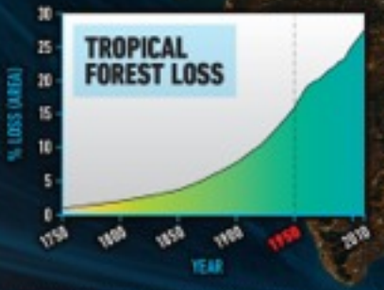


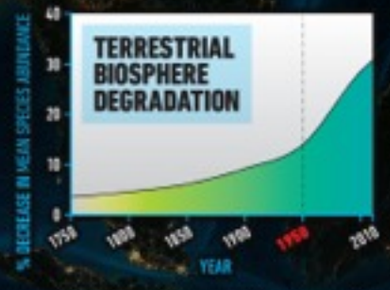








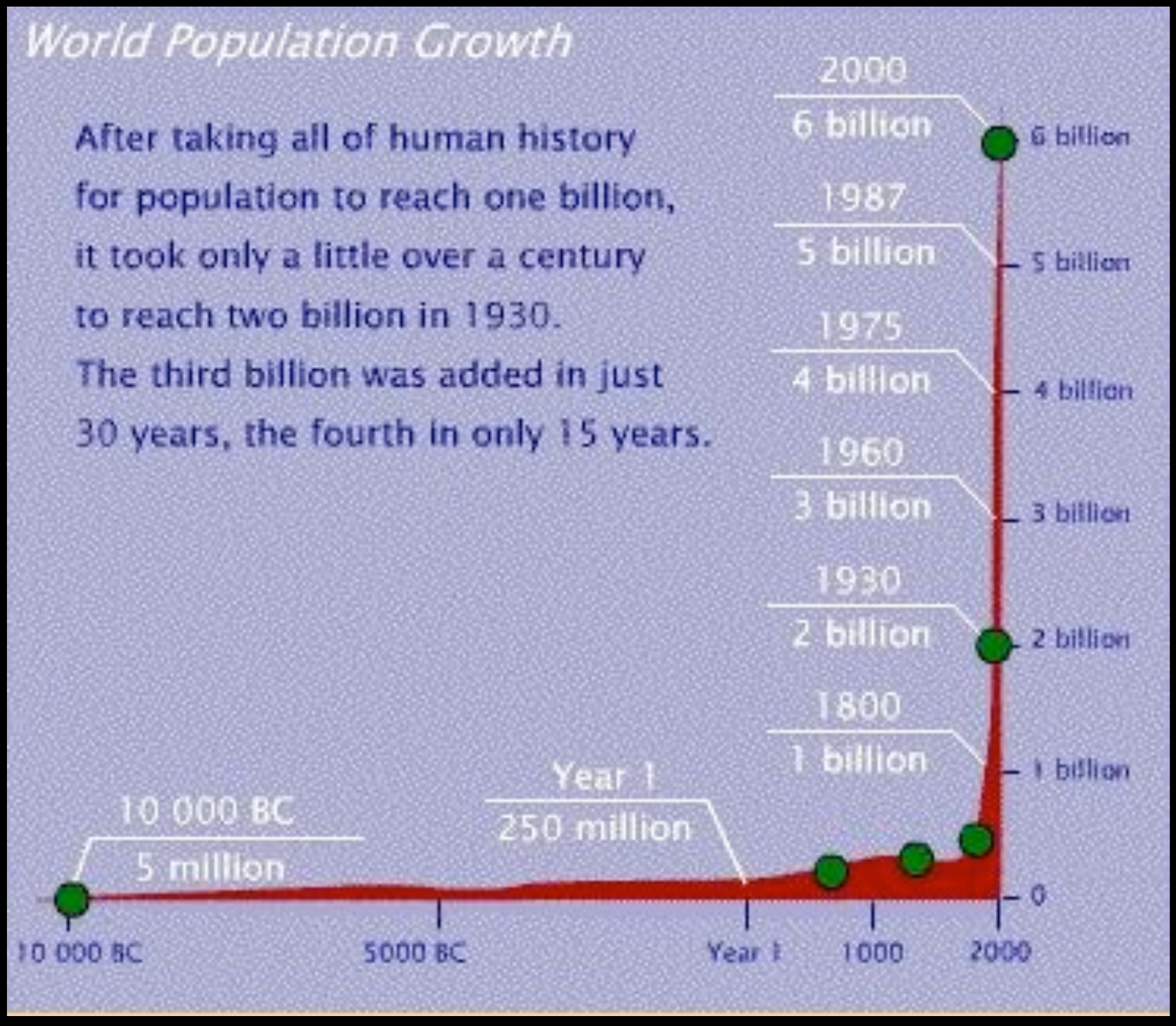


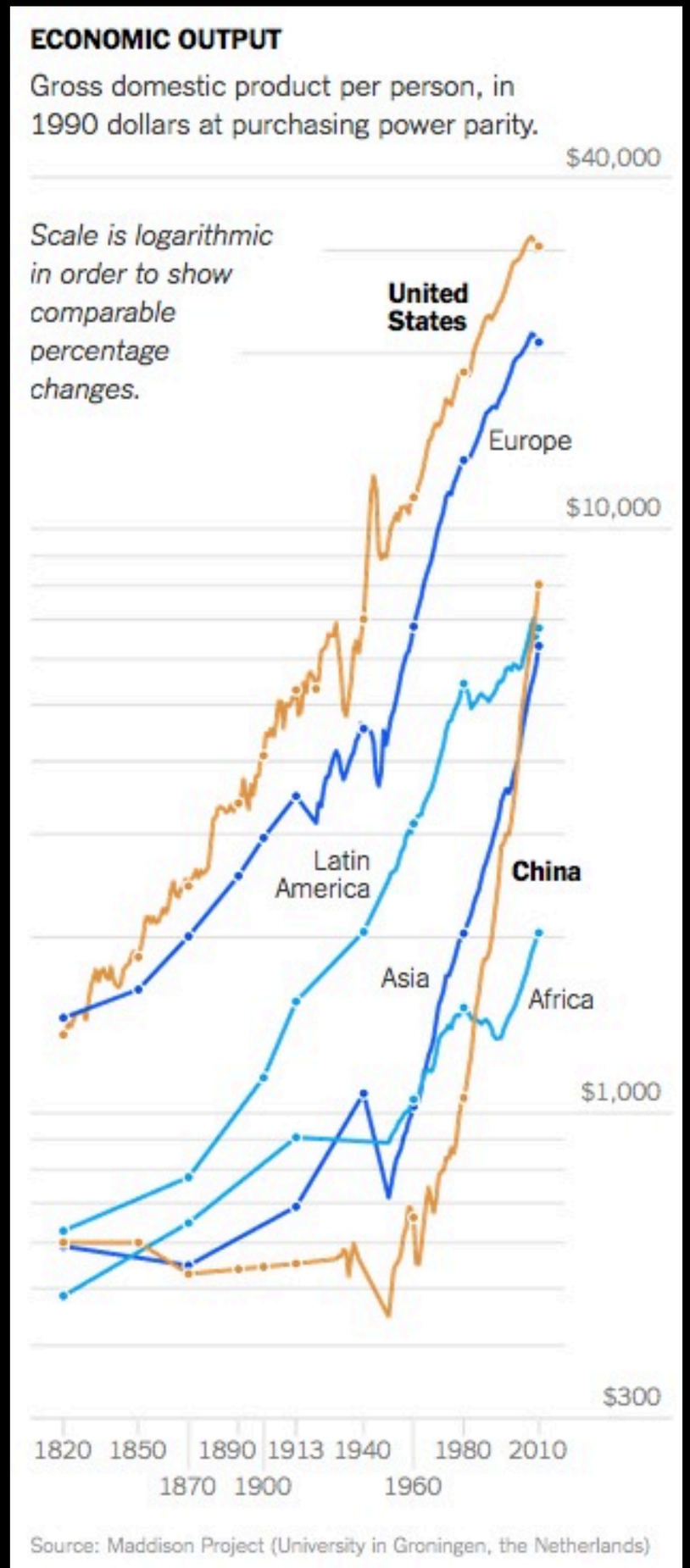


REFERENCE: Steffen, W., W. Broadgate, L. Deutsch, O. Gaffney and C. Ludwig. The Trajectory of the Anthropocene: the Great Acceleration. *The Anthropocene Review*, 16 January 2015.

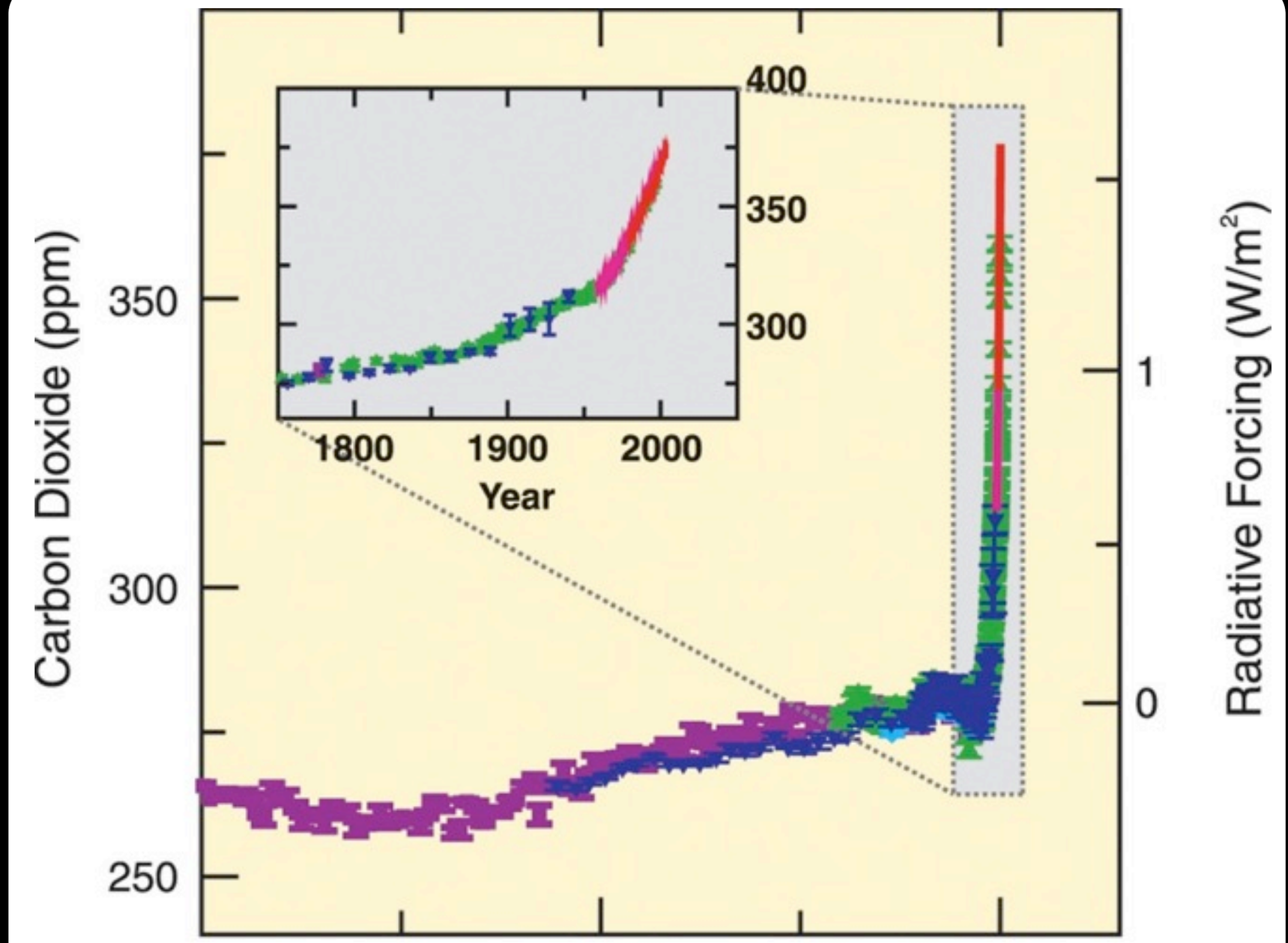
MAP & DESIGN: Félix Pharand-Deschênes / Globaia

Population Growth

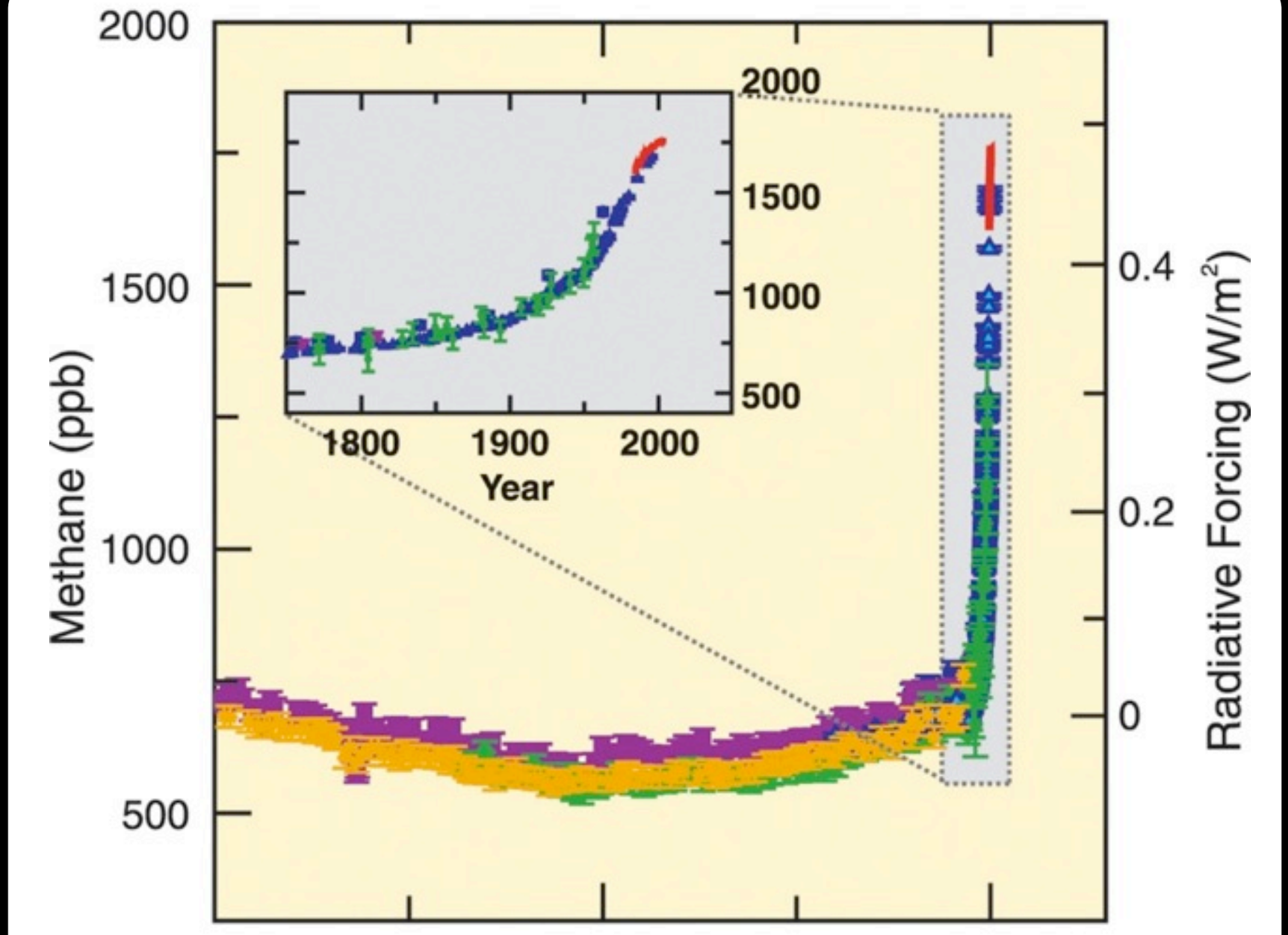




http://www.nytimes.com/2015/12/02/business/economy/imagining-a-world-without-growth.html



IPCC Synthesis Report, 2007



IPCC Synthesis Report, 2007

The Annihilation of Nature

- 50% of all wildlife has been lost worldwide in the last 40 years
- 70% in South America.
- Since 1500, eight mammals have gone extinct,
- Another 27 “possibly extinct”.
- 188 mammals are critically endangered, 450 are endangered, and 493 are threatened with extinction.

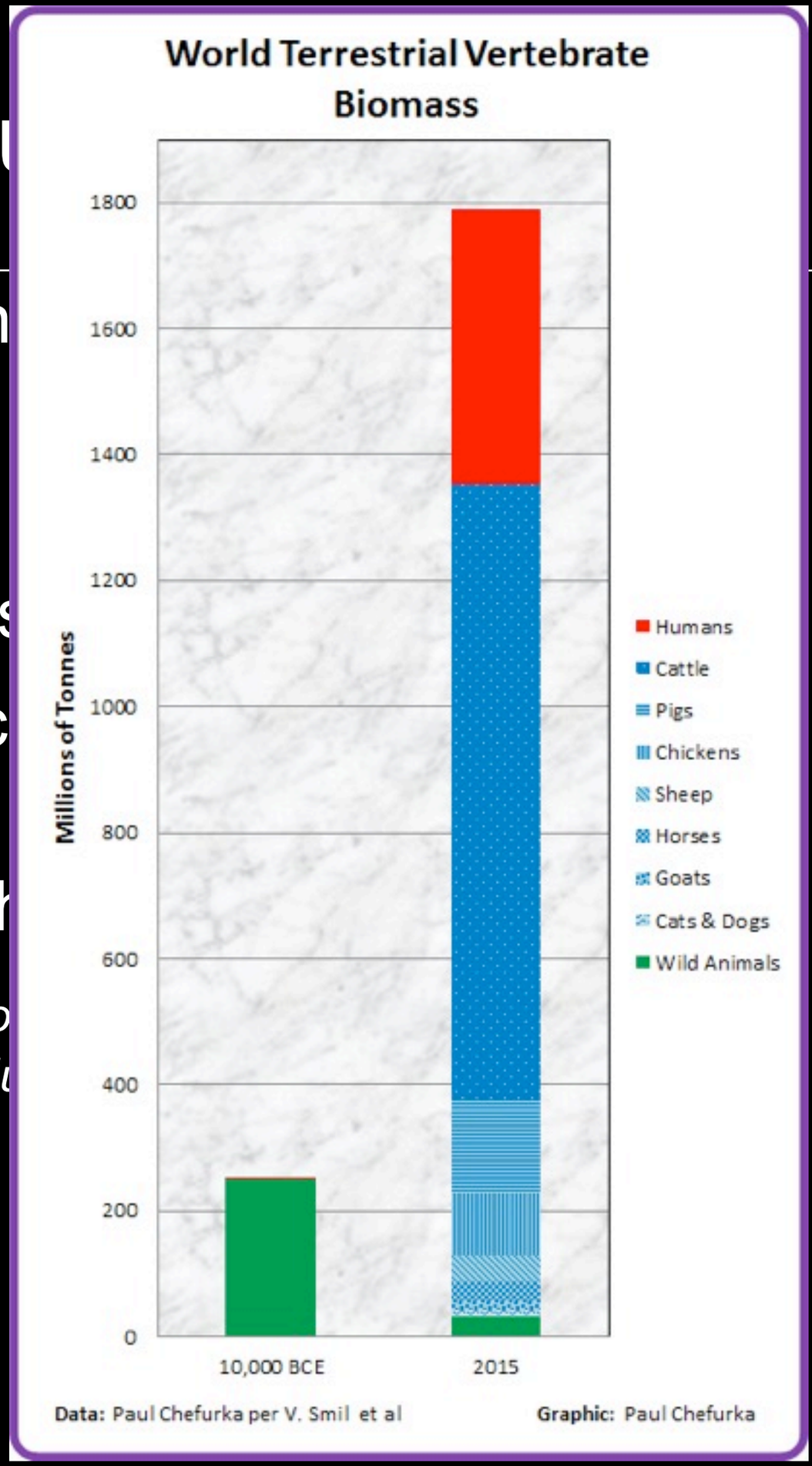
Gerardo Ceballos, Anne H. Ehrlich, and Paul R. Ehrlich
The Annihilation of Nature – Human Extinction of Birds and Mammals

The Annihilation of Natu

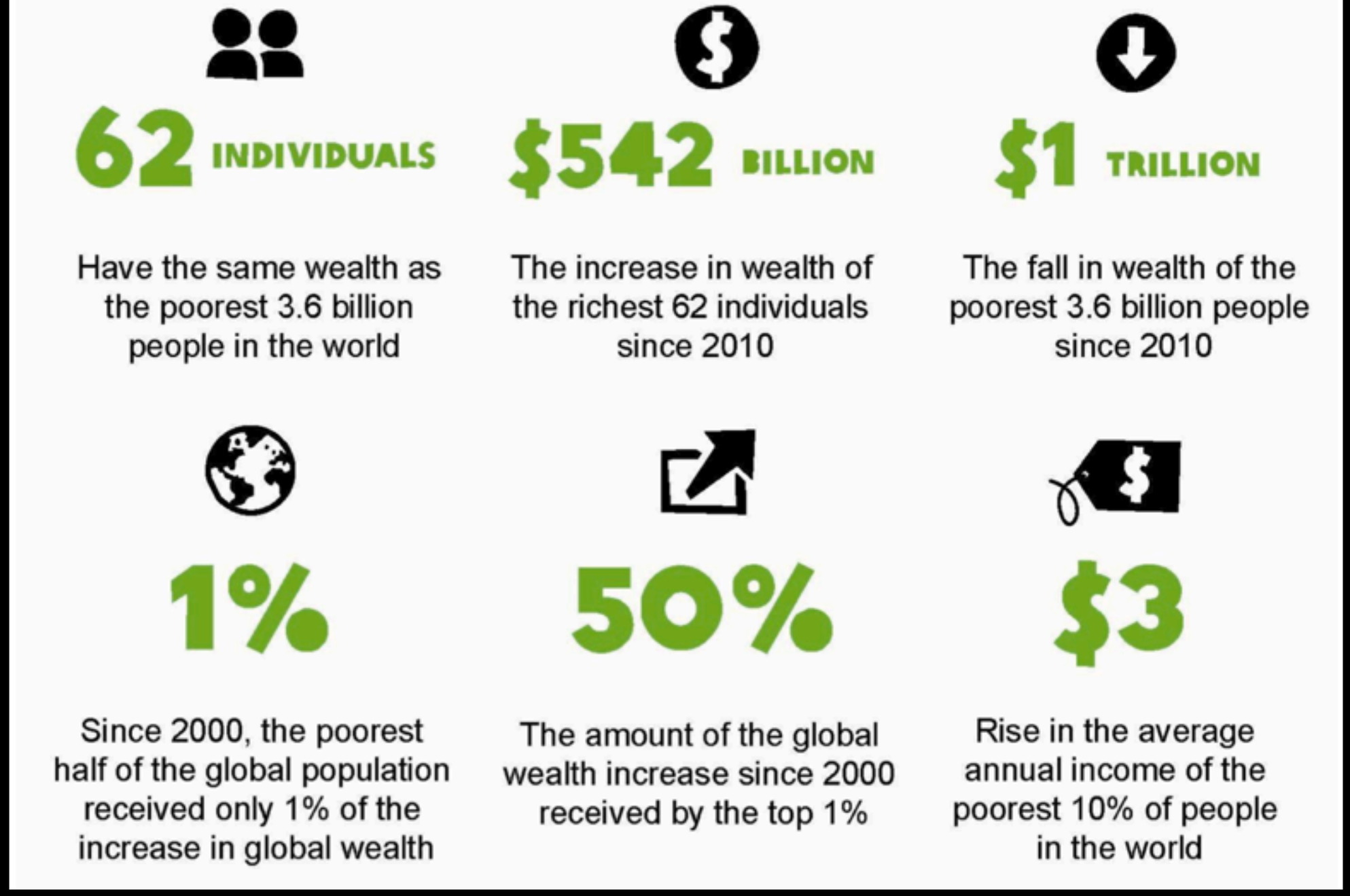
- 50% of all wildlife has been
  40 years
- 70% in South America.
- Since 1500, eight mammals
- Another 27 “possibly extinc
- 188 mammals are critically
  endangered, and 493 are th

Gerardo Ceballo

The Annihilation of Nature – Hu

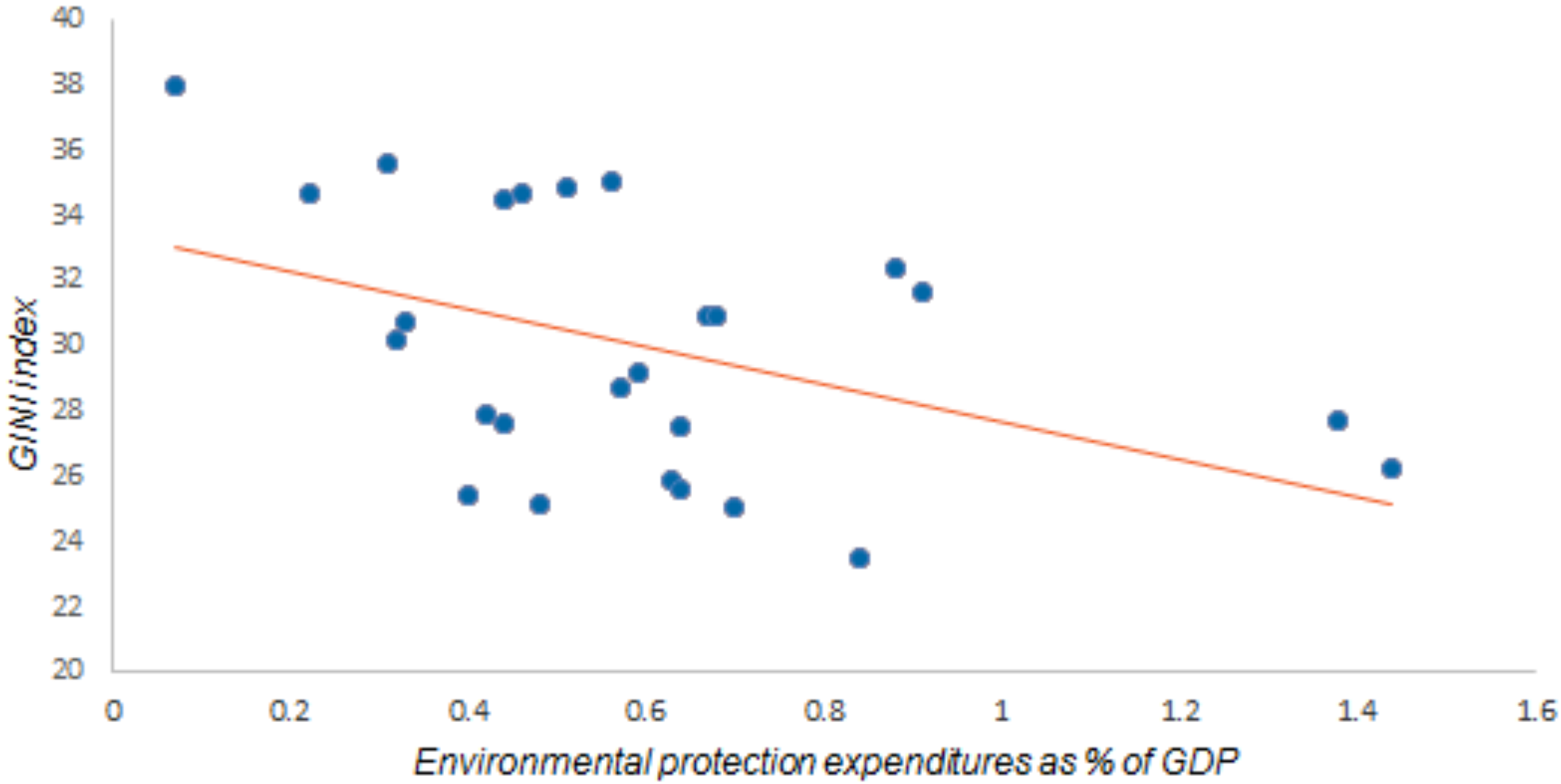


Inequality



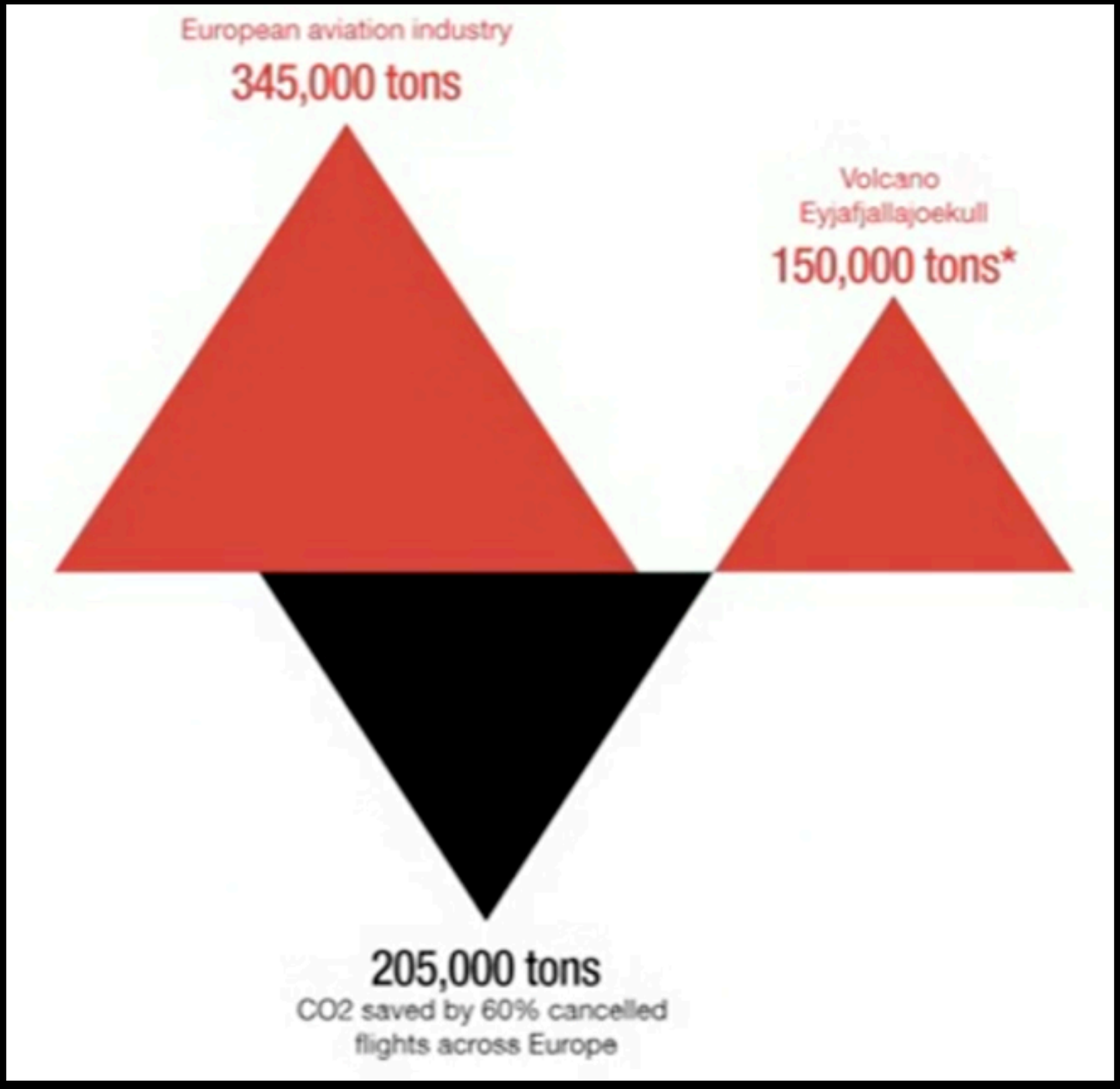
http://oxf.am/Znhx

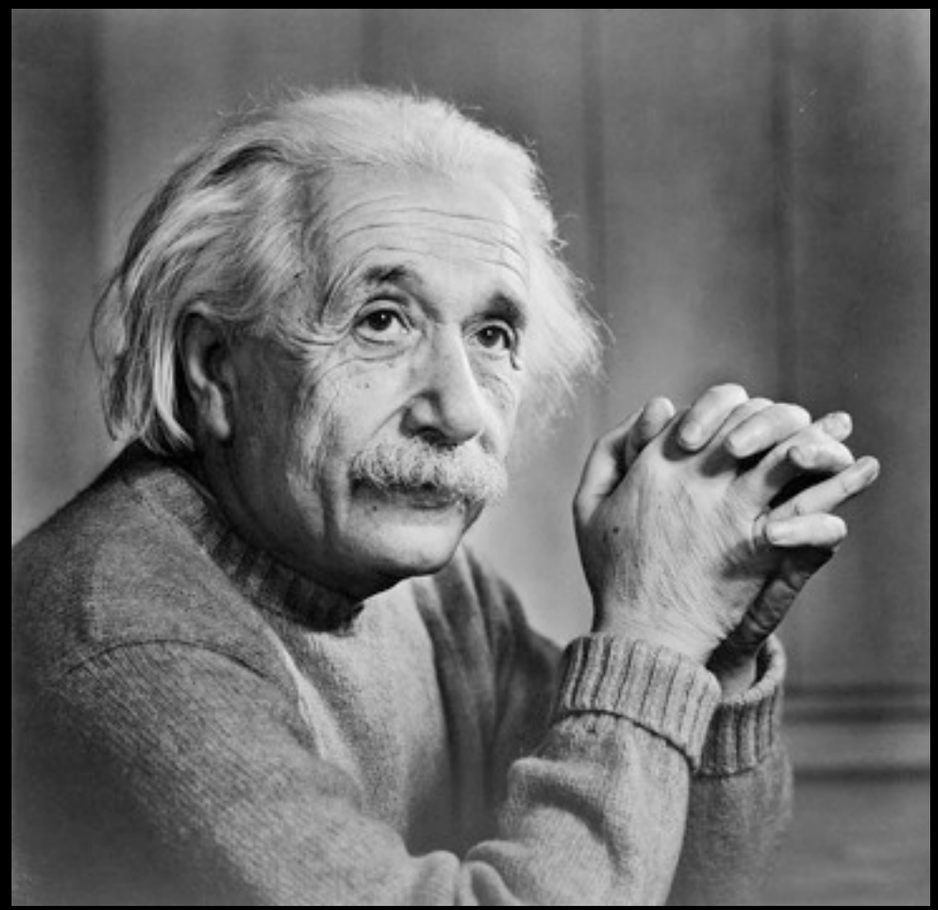
Inequalities and environmental protection expenditures



nef

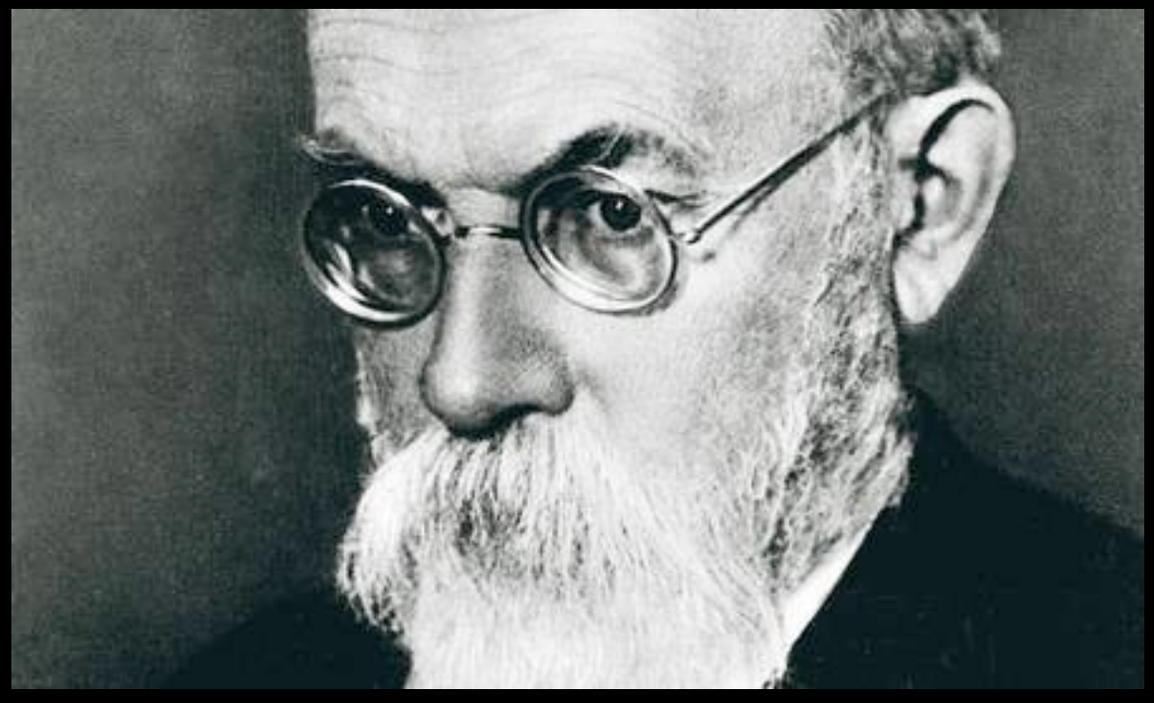
ITC


European aviation industry
345,000 tons
Volcano
Eyjafjallajoekull
150,000 tons*
205,000 tons
CO2 saved by 60% cancelled
flights across Europe



“All of our exalted technological progress, civilization for that matter, is comparable to an axe in the hand of a pathological criminal. ”

— Albert Einstein - Letter to Heinrich Zangger (1917)



“I look forward with great optimism. I think that we undergo not only a historical, but a planetary change as well. We live in a transition to the noosphere.”

— Vladimir Vernadsky - The Biosphere and the Noosphere (1945)

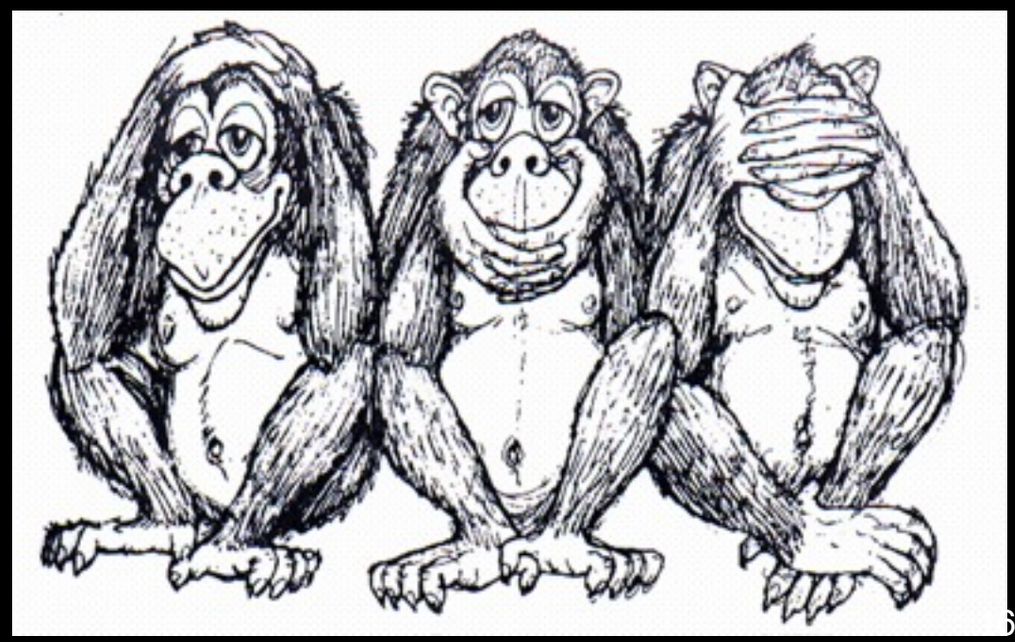
Denial of science

- Lobbying to "reposition global warming as **theory rather than fact**".
- 1992 - The United Nations "Earth Summit" in Rio de Janeiro. Models of the greenhouse effect had "substantially **exaggerated** its importance." [1]
- 1996 - There is too much "**scientific uncertainty**" to justify curbs on greenhouse emissions. [2]
- 1997 - Kyoto, Japan, over 100 nations negotiate a treaty on making Rio's voluntary greenhouse curbs mandatory. Coal and oil industries: “there is too much **scientific uncertainty** to justify any such cuts”.
- 1998 - Marshall Institute, Exxon and the American Petroleum Institute's (API): a $5 million campaign to convince the public that the science of global warming is **controversial and uncertain**.

[1] George C. Marshall Institute, a conservative think tank
[2] William O'Keefe, vice president of the American Petroleum Institute

Denial of science

- 2003 - US Senate: There is **no scientific consensus** on climate change [1]
- 2003 - Another denial study is underwritten with $53,000 from the API
- Ex-oil lobbyist, working for the White House, edits a 2002 report on climate science by adding "**lack of understanding**" and "**considerable uncertainty**" throughout the text
- 2007 - Al Gore testifies to both chambers on climate change. Strong republican **opposition** to any mandatory greenhouse **emission cuts**
- 2009 - “Climategate” - **mistakes in IPCC report** and hacked e-mails
- 2015 - The “climate warming pause”



[1] James Inhofe of Oklahoma (chairman of the environment committee)

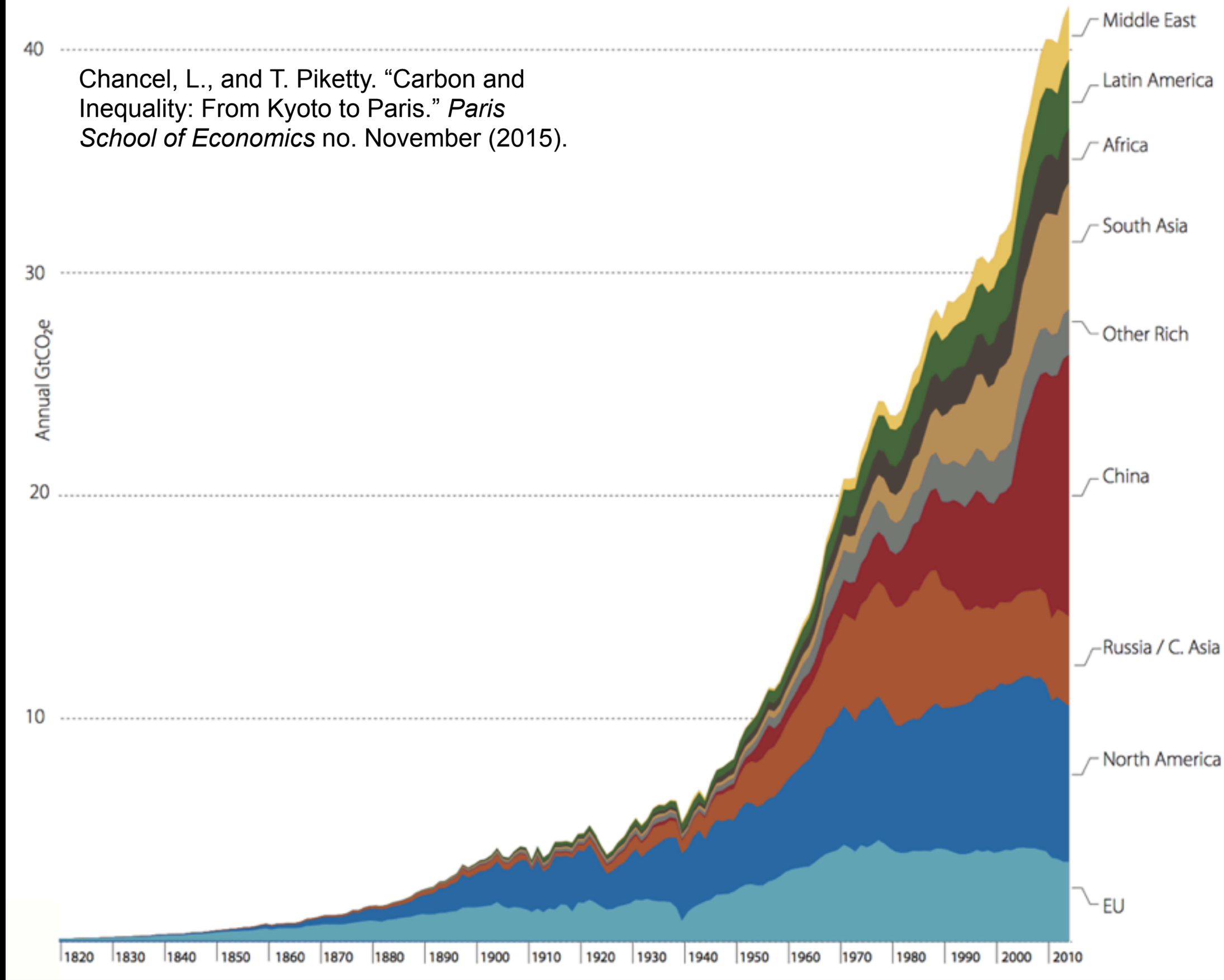
Result: no action

- 2009 - Copenhagen - **no results.**
- 2010 - Emissions had risen by a **record** amount, despite the worst recession for 80 years. 30.6 Gt come from fossil fuels (1.6 Gt more than the previous year).[1]
- 2011 - **No new global climate agreement** will be reached before 2016, and even then, it would not come into force until 2020.[2]
- 2015 - Paris - some hope but still not much happening.

[1] IEA report: http://www.iea.org/index_info.asp?id=1959

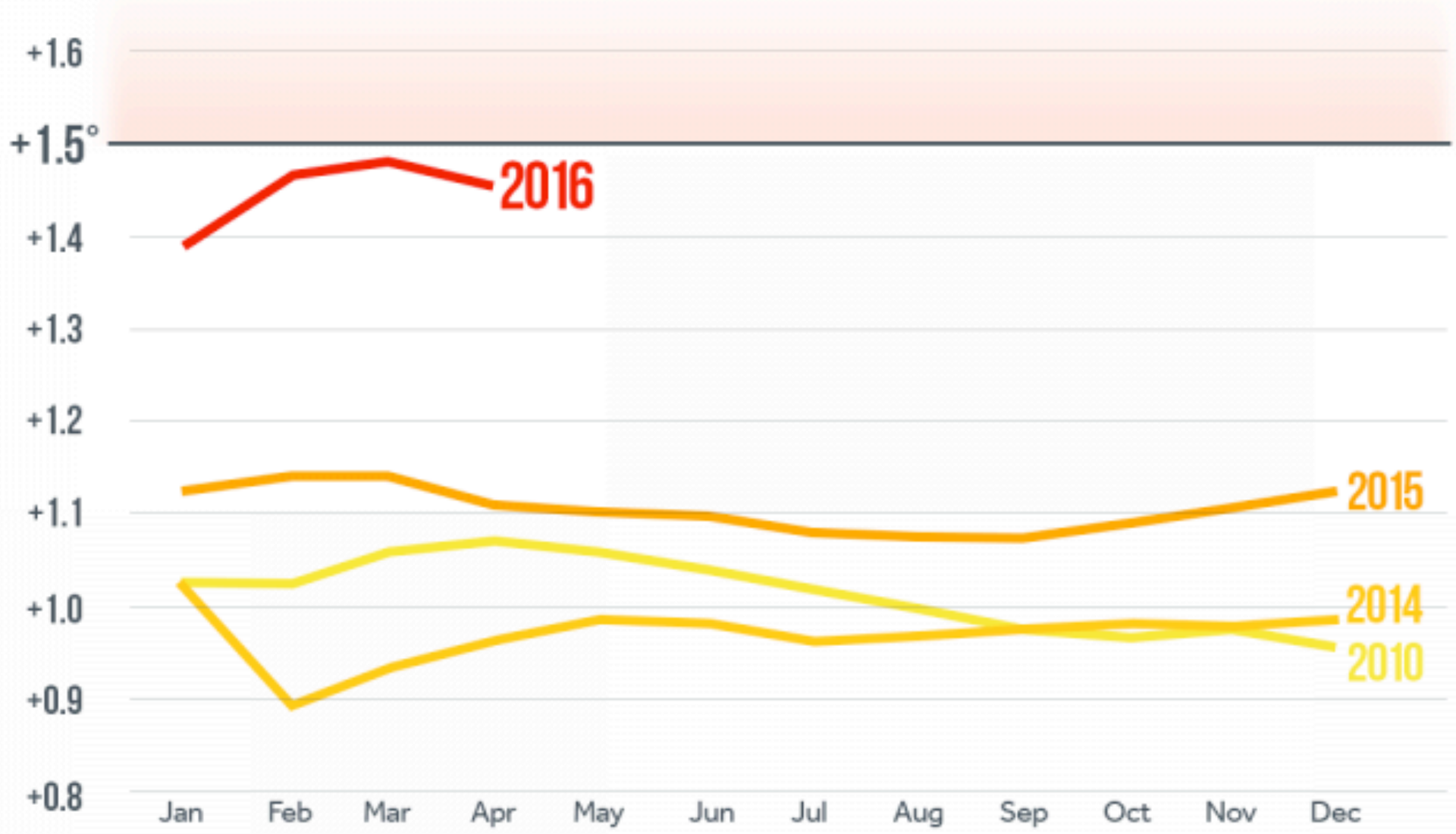
[2] http://www.guardian.co.uk/environment/2011/may/29/carbon-emissions-nuclearpower

Chancel, L., and T. Piketty. “Carbon and Inequality: From Kyoto to Paris.” *Paris School of Economics* no. November (2015).



On the Edge of 1.5°C

Global year-to-date anomalies from 1881-1910 baseline



Source: NASA GISS and NOAA NCEI global temperature data averaged and adjusted to early industrial baseline (1881-1910). Data as of May 2016

CLIMATE CENTRAL

Climate change

- Within a few decades, climate change will have “massively disruptive consequences to societies and ecosystems,” including widespread famines, lethal heat waves, more frequent and destructive natural disasters, and social unrest.

http://whatweknow.aaas.org/get-the-facts/
National Research Council (2013). *Abrupt Impacts of Climate Change: Anticipating Surprises,* Washington, DC: The National Academies Press.

- Need to change the paradigm that science is only about facts and data

- Need to change the paradigm that science is only about facts and data

> "The whole system of science, society and nature is evolving in fundamental ways that cause us to **rethink the way science is deployed** to help people cope with a changing world. **Scientists should be leading the dialogue** on scientific priorities, new institutional arrangements, and improved methodologies to disseminate and utilize knowledge more quickly"
>
> — *Jane Lubchenco, 1998*

Modeling

40+ years of modeling for decision support & environmental assessment...

40+ years of modeling for decision support & environmental assessment...

- A proliferation of models
  - One model cannot be sufficient to represent all the details needed for decision making and planning

40+ years of modeling for decision support & environmental assessment...

- A proliferation of models
  - One model cannot be sufficient to represent all the details needed for decision making and planning
- Many legacy models developed by the “best in the field”
  - Legacy models can be reused as building blocks for more complex systems

40+ years of modeling for decision support & environmental assessment...

- A proliferation of models
  - One model cannot be sufficient to represent all the details needed for decision making and planning
- Many legacy models developed by the “best in the field”
  - Legacy models can be reused as building blocks for more complex systems
- Model integration
  - System of systems approach

40+ years of modeling for decision support & environmental assessment...

- A proliferation of models
  - One model cannot be sufficient to represent all the details needed for decision making and planning
- Many legacy models developed by the “best in the field”
  - Legacy models can be reused as building blocks for more complex systems
- Model integration
  - System of systems approach
- Modeling with stakeholders

Participatory modeling

Voinov, A.A., Gaddis, E., 2008. Lessons for Successful Participatory Watershed Modeling: A Perspective from Modeling Practitioners. Ecological Modelling: 216, p. 197–207.

Participatory modeling

- Companion modeling, mediated modeling, shared vision planning…

Voinov, A.A., Gaddis, E., 2008. Lessons for Successful Participatory Watershed Modeling: A Perspective from Modeling Practitioners. Ecological Modelling: 216, p. 197–207.

Participatory modeling

- Companion modeling, mediated modeling, shared vision planning…
- Participatory modeling is the process of incorporating stakeholders, including the public and decision-makers, into the modeling process

Voinov, A.A., Gaddis, E., 2008. Lessons for Successful Participatory Watershed Modeling: A Perspective from Modeling Practitioners. Ecological Modelling: 216, p. 197–207.

Participatory modeling

- Companion modeling, mediated modeling, shared vision planning…
- Participatory modeling is the process of incorporating stakeholders, including the public and decision-makers, into the modeling process
- Soliciting information from stakeholders: integrating scientific knowledge with local knowledge

Voinov, A.A., Gaddis, E., 2008. Lessons for Successful Participatory Watershed Modeling: A Perspective from Modeling Practitioners. Ecological Modelling: 216, p. 197–207.

Participatory modeling

- Companion modeling, mediated modeling, shared vision planning…
- Participatory modeling is the process of incorporating stakeholders, including the public and decision-makers, into the modeling process
- Soliciting information from stakeholders: integrating scientific knowledge with local knowledge
- Leveling the playing field: co-learning, co-understanding

Voinov, A.A., Gaddis, E., 2008. Lessons for Successful Participatory Watershed Modeling: A Perspective from Modeling Practitioners. Ecological Modelling: 216, p. 197–207.

Participatory modeling

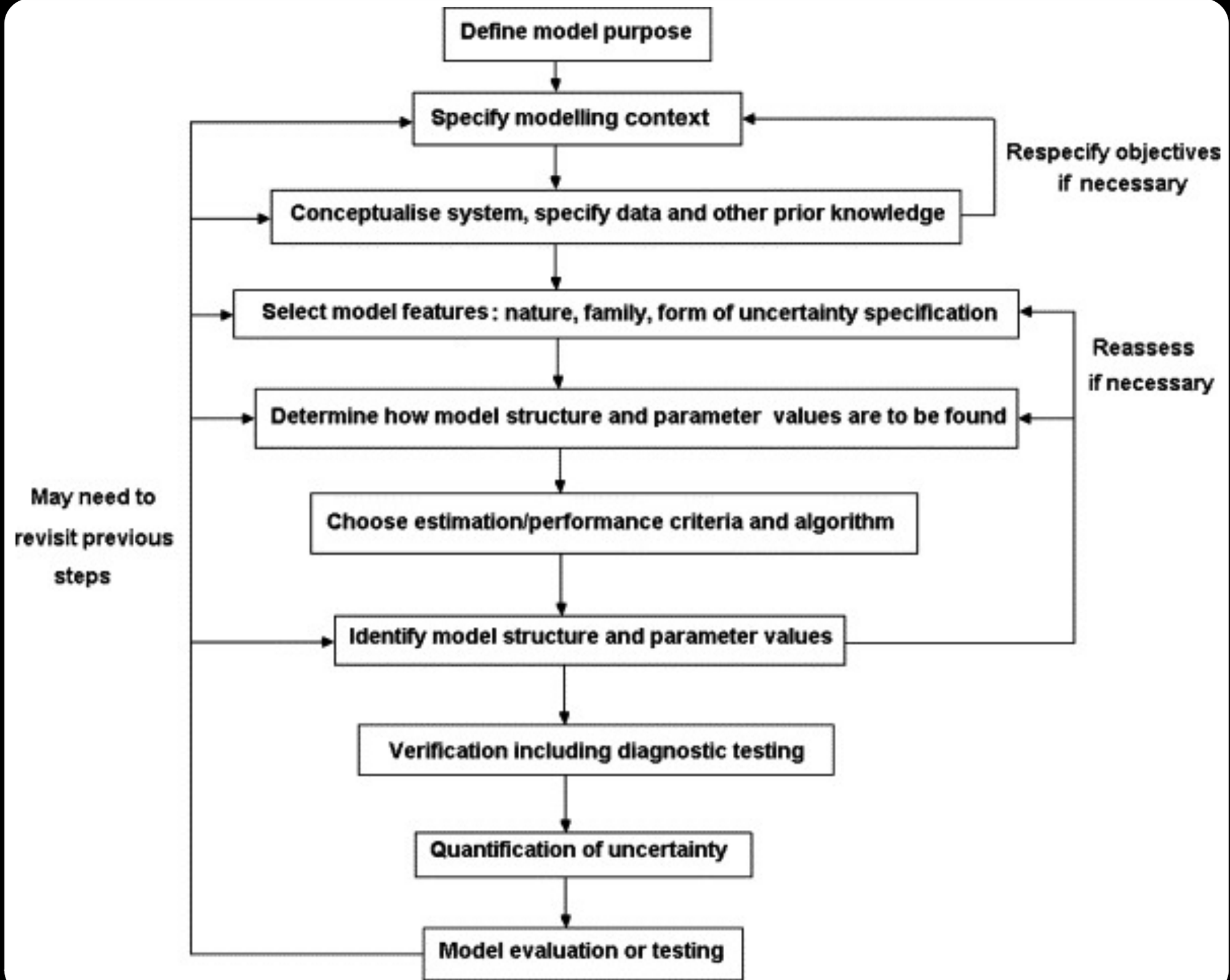
- Companion modeling, mediated modeling, shared vision planning…
- Participatory modeling is the process of incorporating stakeholders, including the public and decision-makers, into the modeling process
- Soliciting information from stakeholders: integrating scientific knowledge with local knowledge
- Leveling the playing field: co-learning, co-understanding
- Goal driven: you know how the model will be used

Voinov, A.A., Gaddis, E., 2008. Lessons for Successful Participatory Watershed Modeling: A Perspective from Modeling Practitioners. Ecological Modelling: 216, p. 197–207.

Participatory modeling

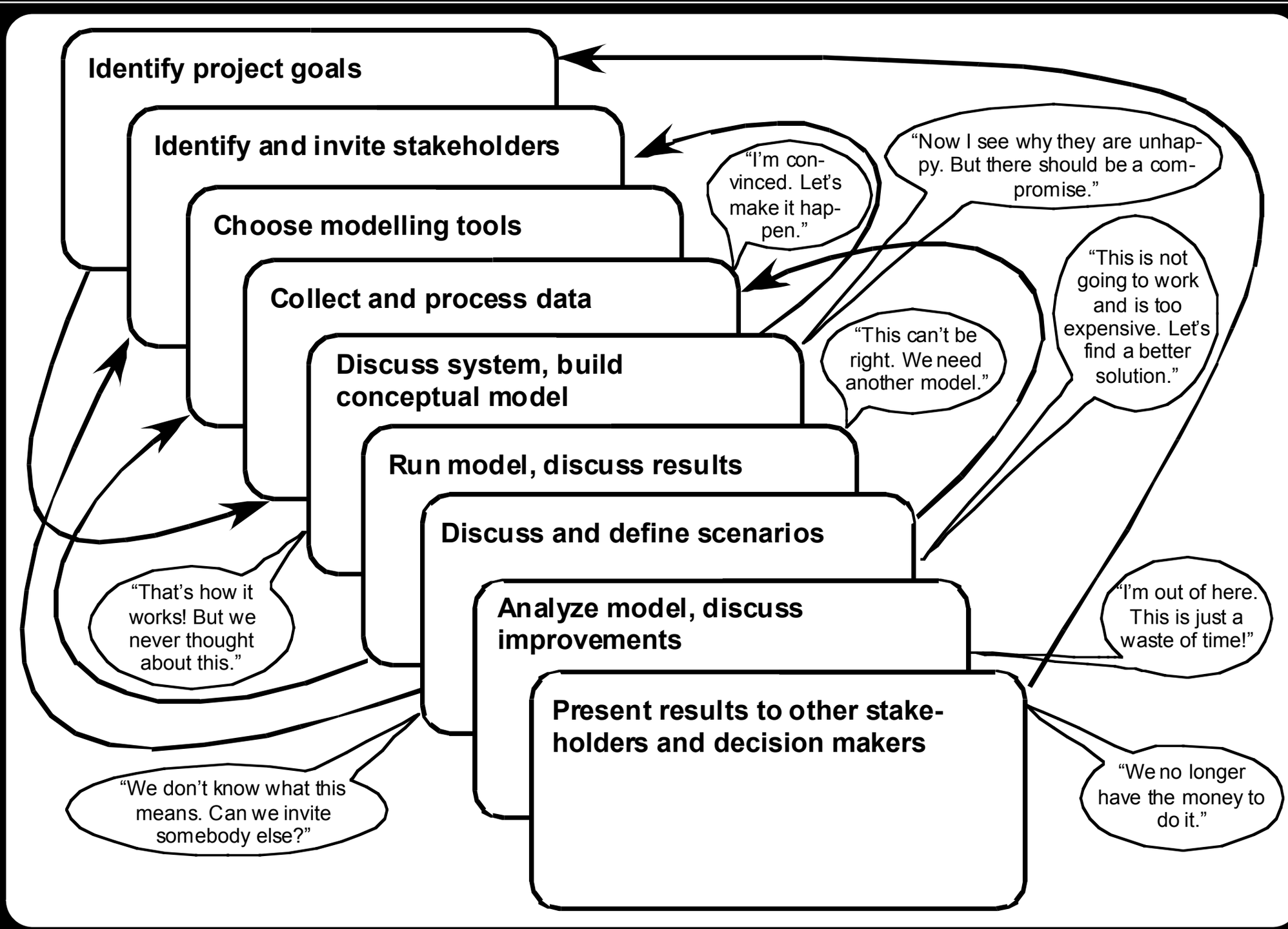
- Companion modeling, mediated modeling, shared vision planning…
- Participatory modeling is the process of incorporating stakeholders, including the public and decision-makers, into the modeling process
- Soliciting information from stakeholders: integrating scientific knowledge with local knowledge
- Leveling the playing field: co-learning, co-understanding
- Goal driven: you know how the model will be used

Voinov, A.A., Gaddis, E., 2008. Lessons for Successful Participatory Watershed Modeling: A Perspective from Modeling Practitioners. Ecological Modelling: 216, p. 197–207.



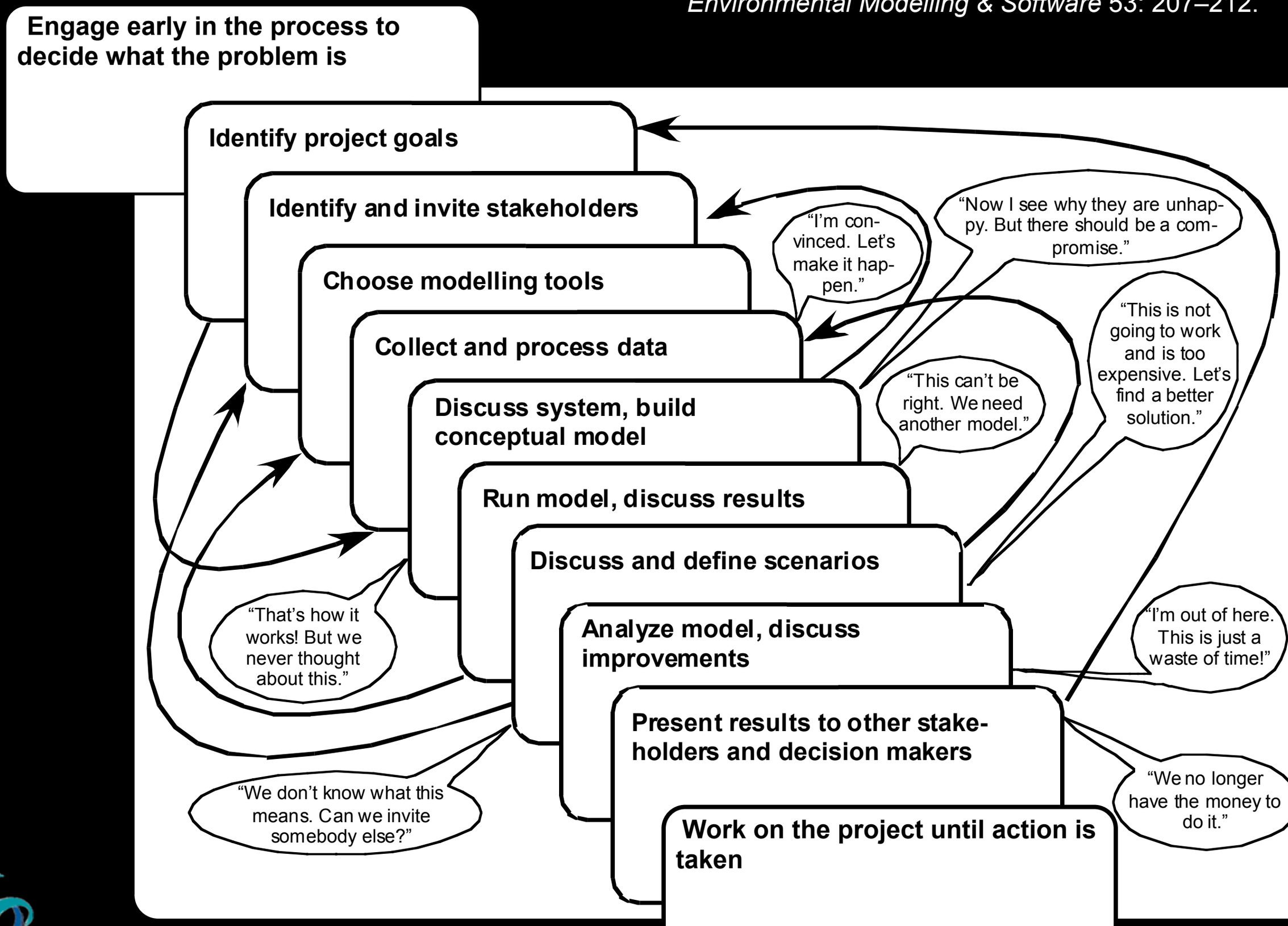
A.J. Jakeman, R.A. Letcher, J.P. Norton, 2006. Ten iterative steps in development and evaluation of environmental models, Environmental Modelling & Software, Volume 21, Issue 5, p. 602-614

The Process



Voinov, A., and F. Bousquet. 2010. Modelling with stakeholders. *Environmental Modelling & Software* 25: 1268-1281.

Voinov, A, et ali. 2014. “Values in Socio-Environmental Modelling: Persuasion for Action or Excuse for Inaction.” *Environmental Modelling & Software* 53: 207–212.



theguardian

News | Sport | Comment | Culture | Business | Money | Life & style

Comment is free

Scientists have a moral obligation to take action on climate change

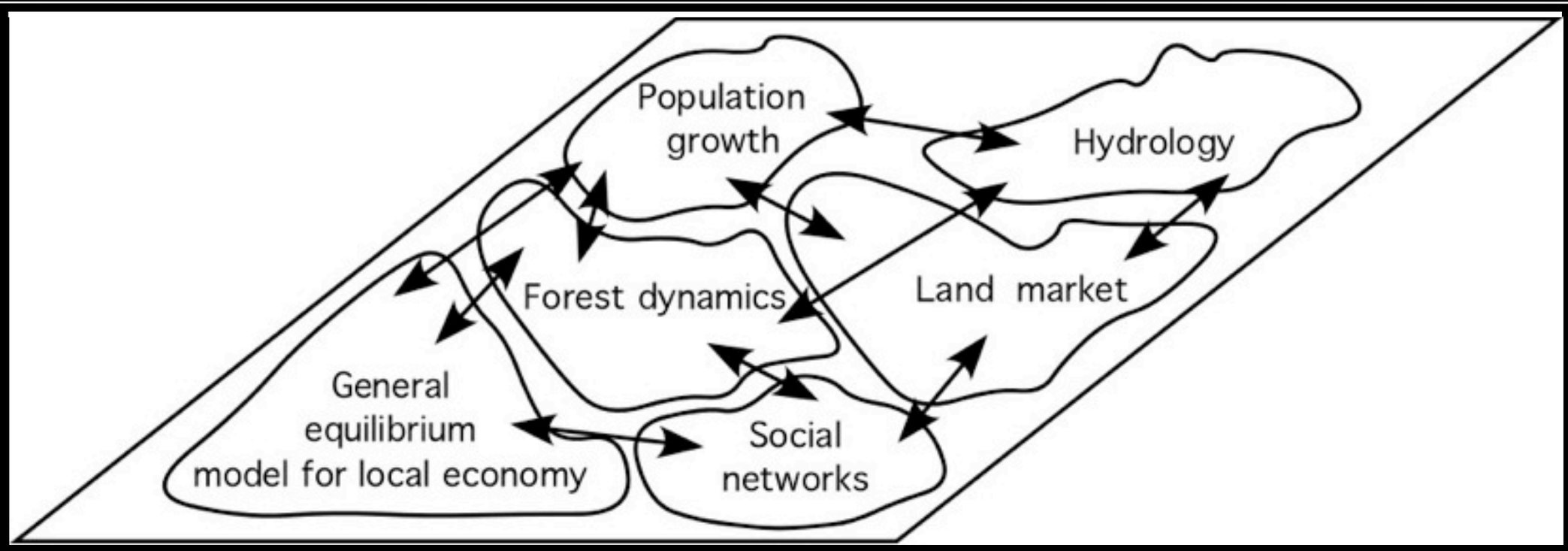
Calling on all scientists to refrain from public advocacy and leadership is wrong. We are in a global crisis, and the scientific fraternity has an ethical obligation to act

Dan Cass
theguardian.com, Thursday 15 August 2013 05.50 BST

Jump to comments (…)

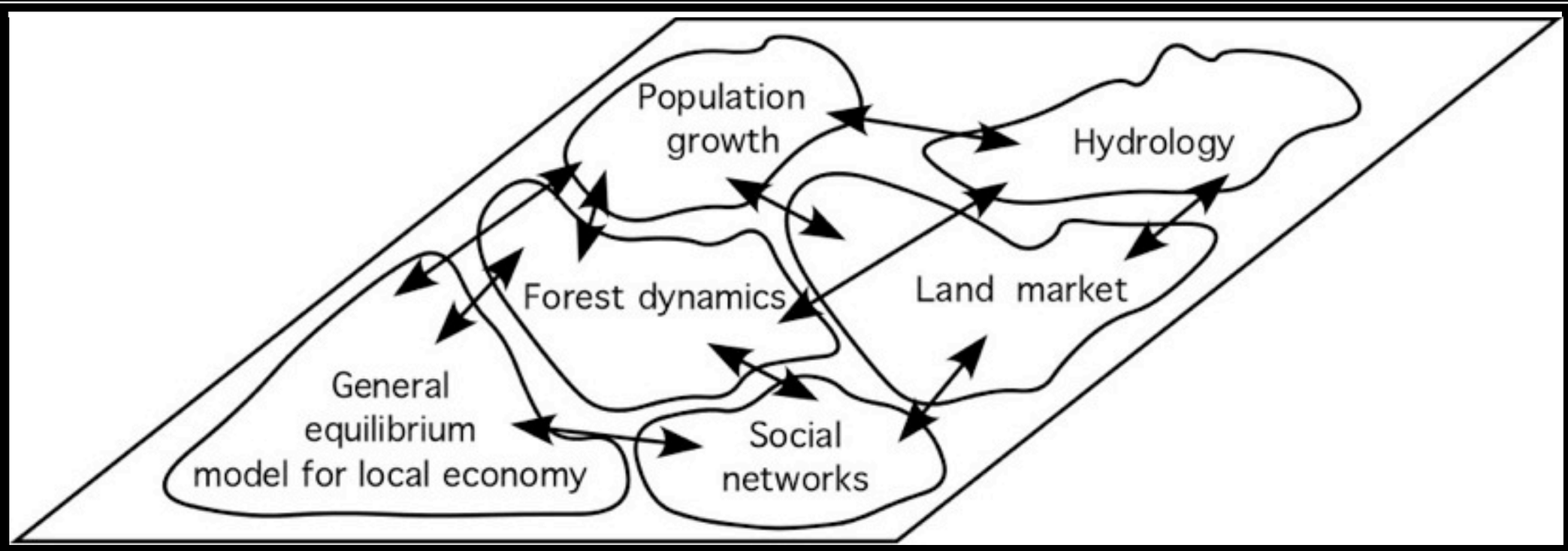
'We need some scientists to show social leadership, not just scientific leadership'. Photograph: Getty/Joe Raedle

Integrated modeling



- “Integrated modeling is a systems analysis-based approach to environmental assessment. It includes a set of interdependent science based components (models, data, and assessment methods) that together form the basis for constructing an appropriate modeling system” *

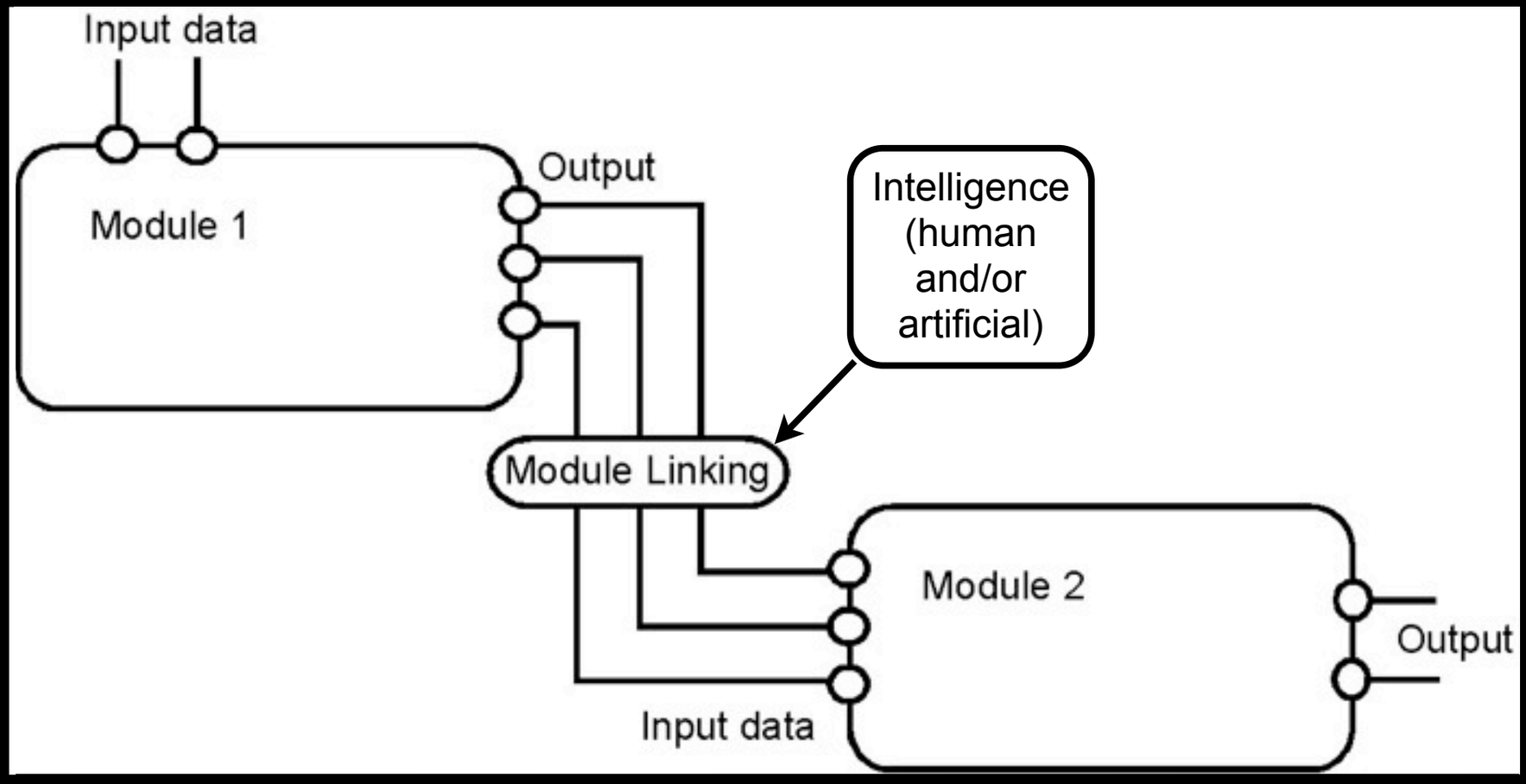
Integrated modeling



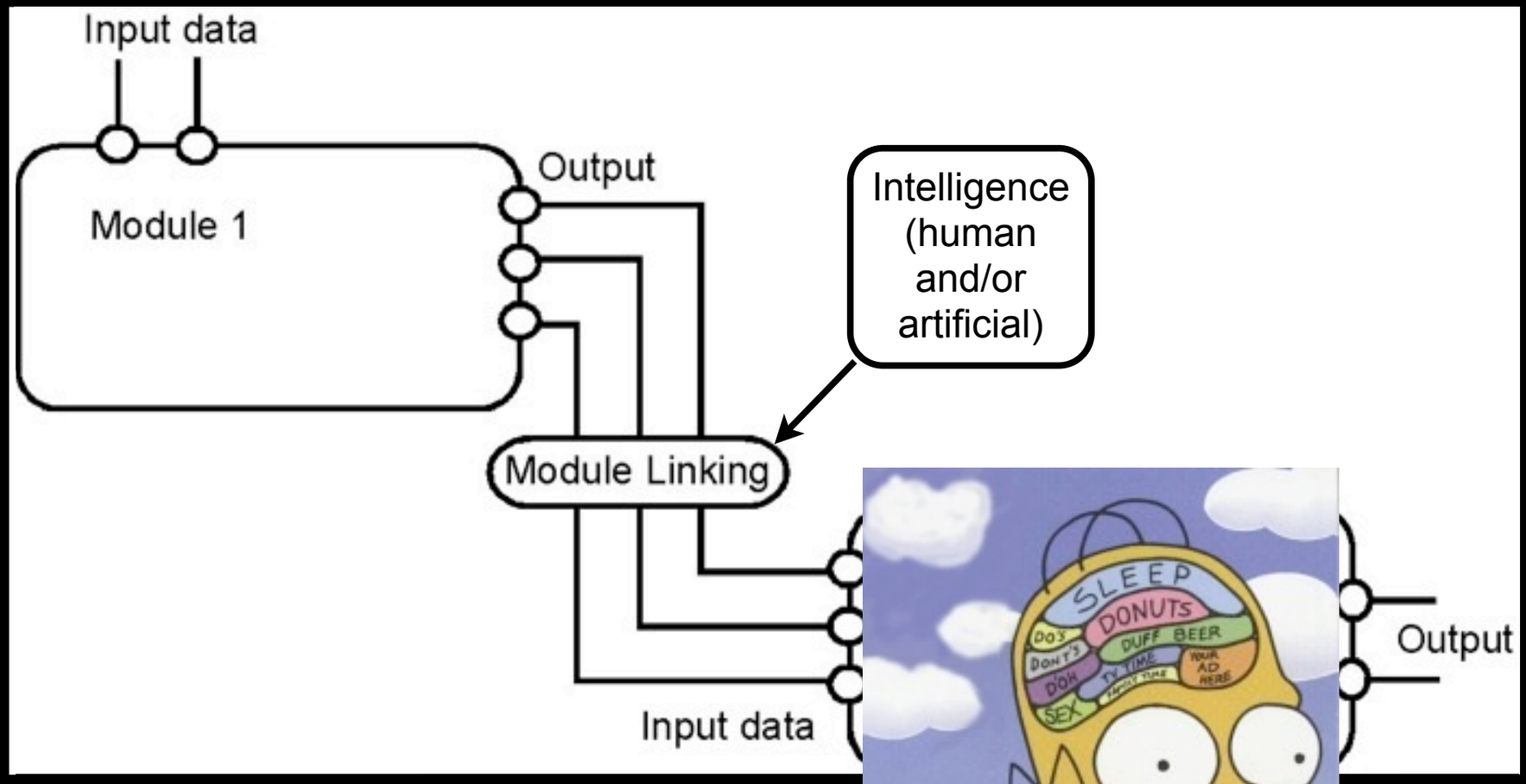
- "Integrated modeling is a systems analysis-based approach to environmental assessment. It includes a set of interdependent science based components (models, data, and assessment methods) that together form the basis for constructing an appropriate modeling system" *

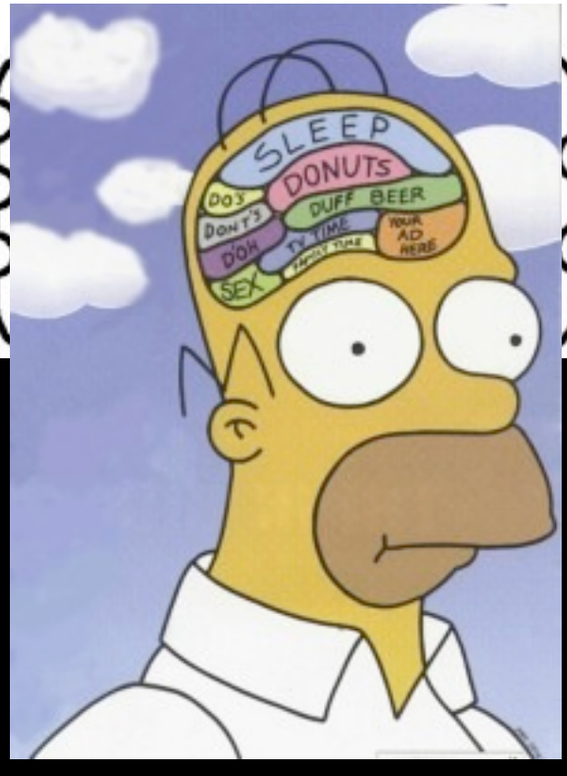
* EPA (2008). White Paper on Integrated Modeling for Integrated Environmental Decision Making: http://www.epa.gov/crem/library/IM4IEDM_White_Paper_Final_(EPA100R08010).pdf

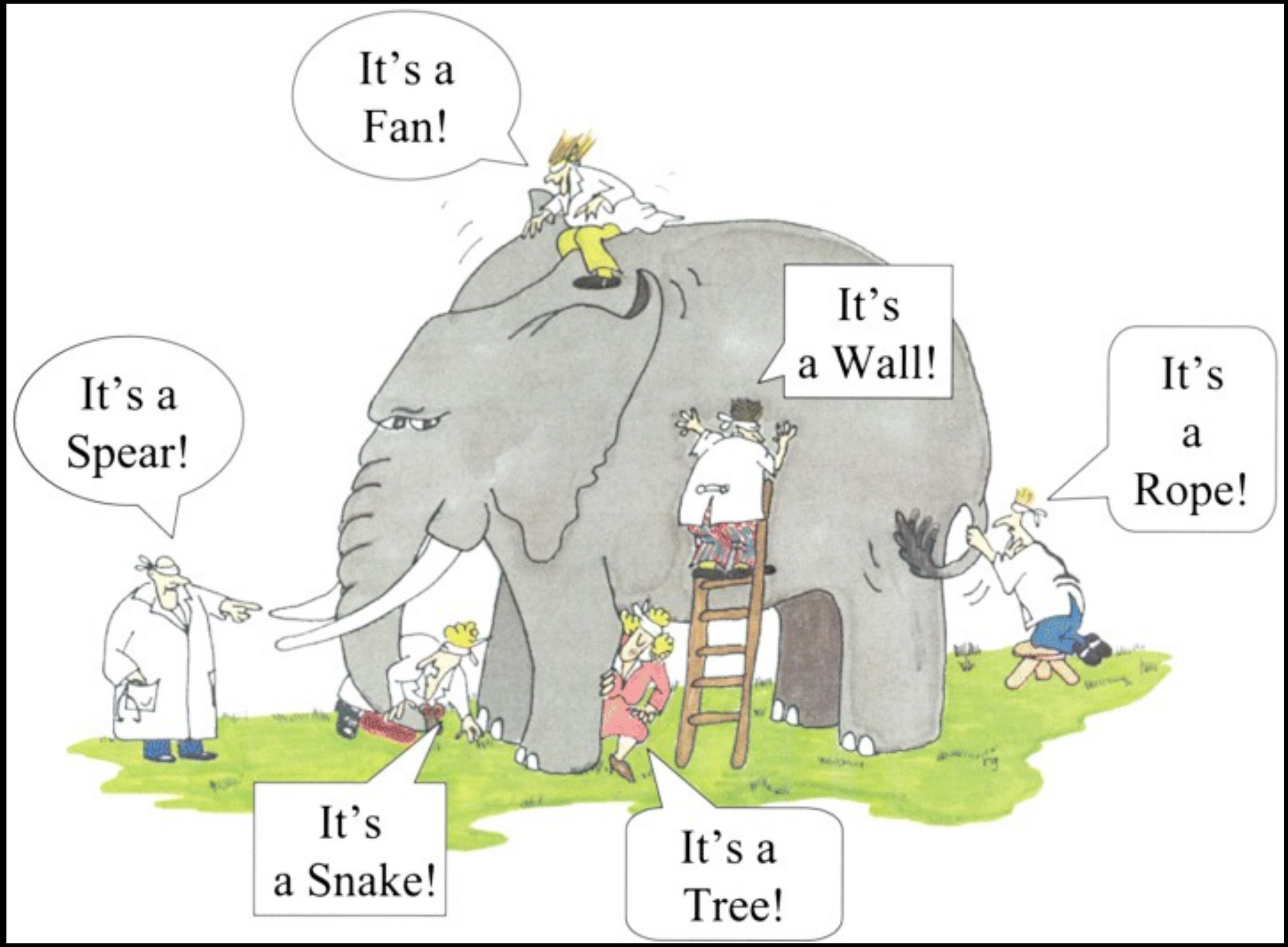
Model integration



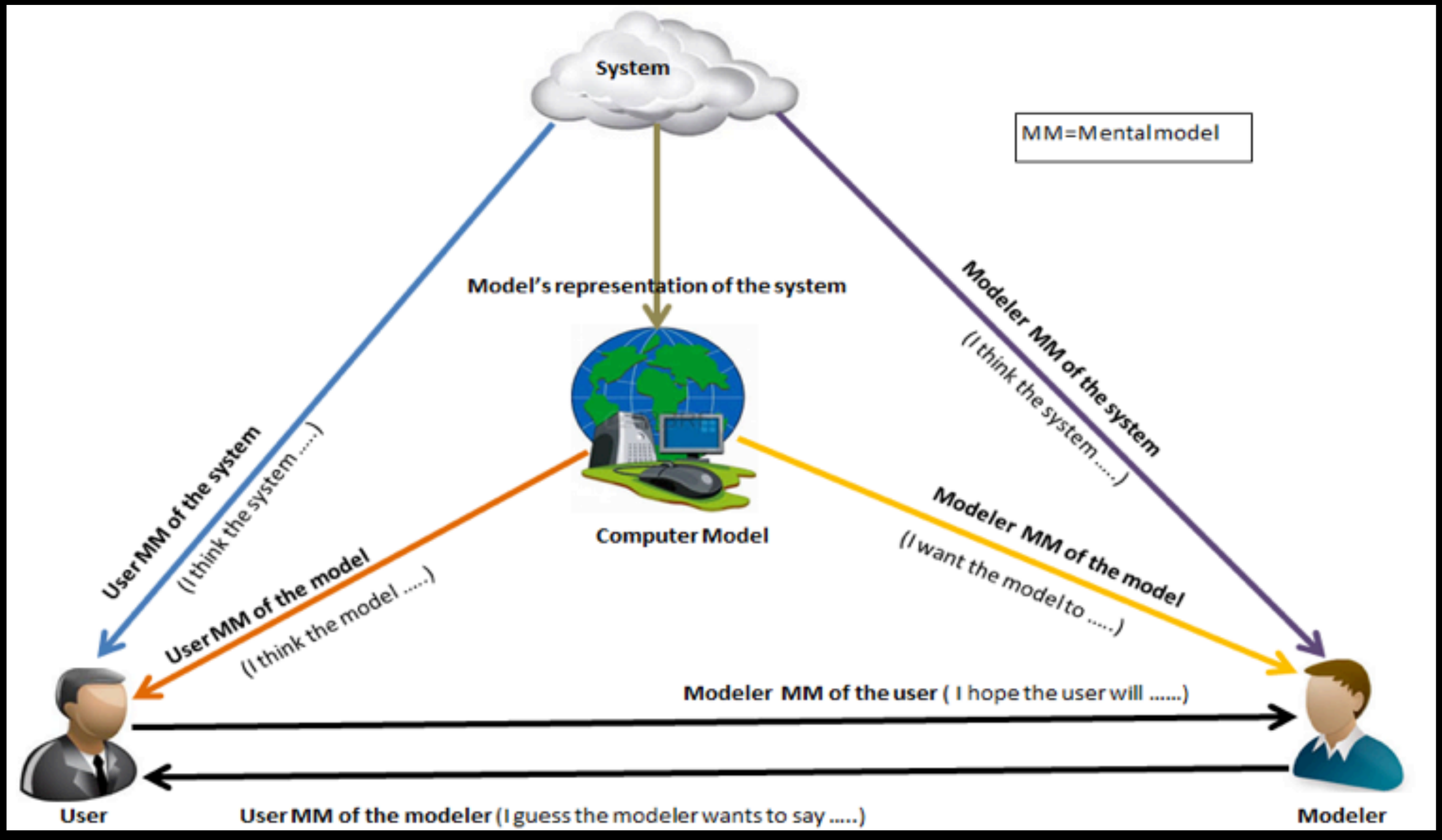
Model integration



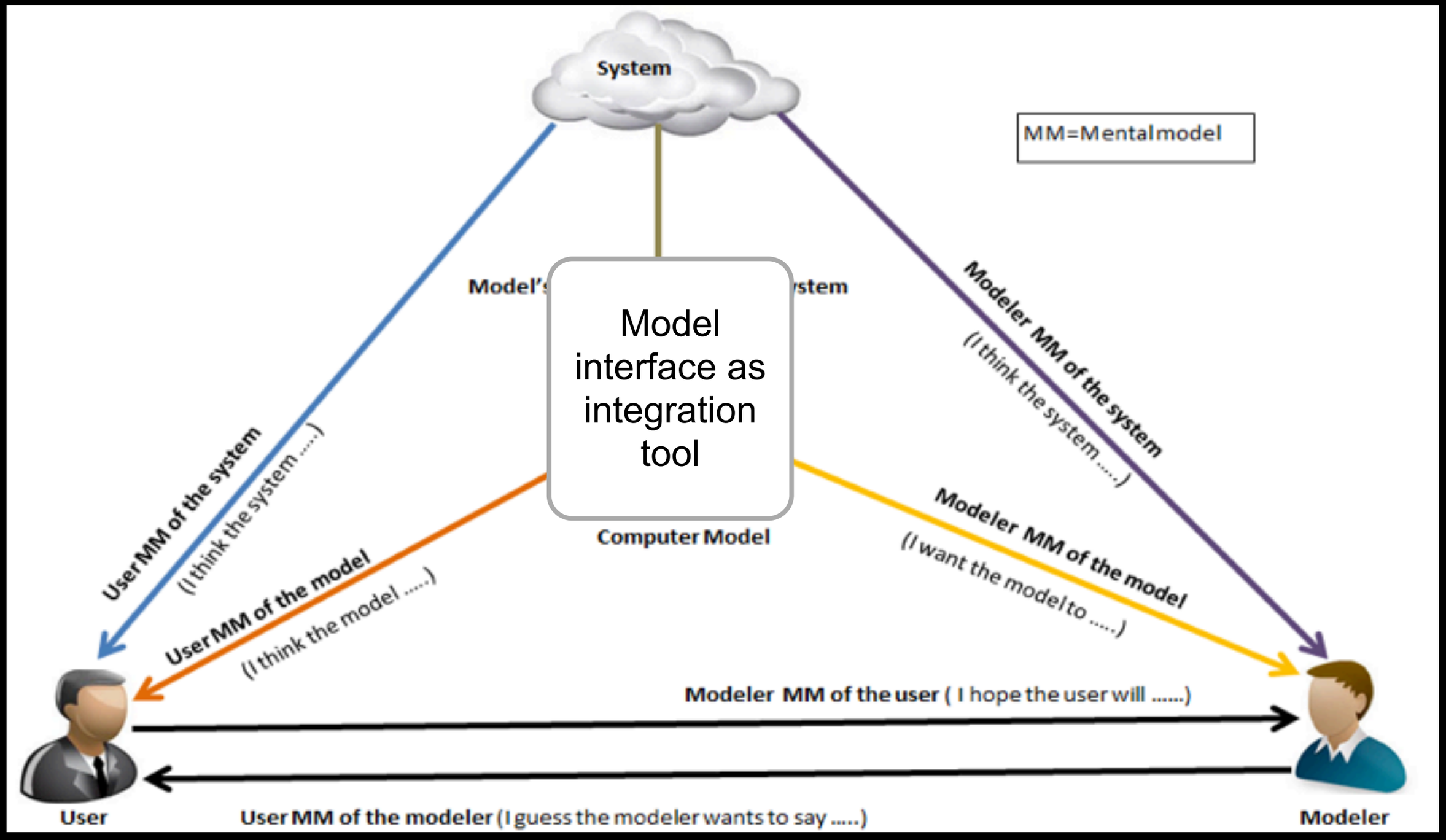


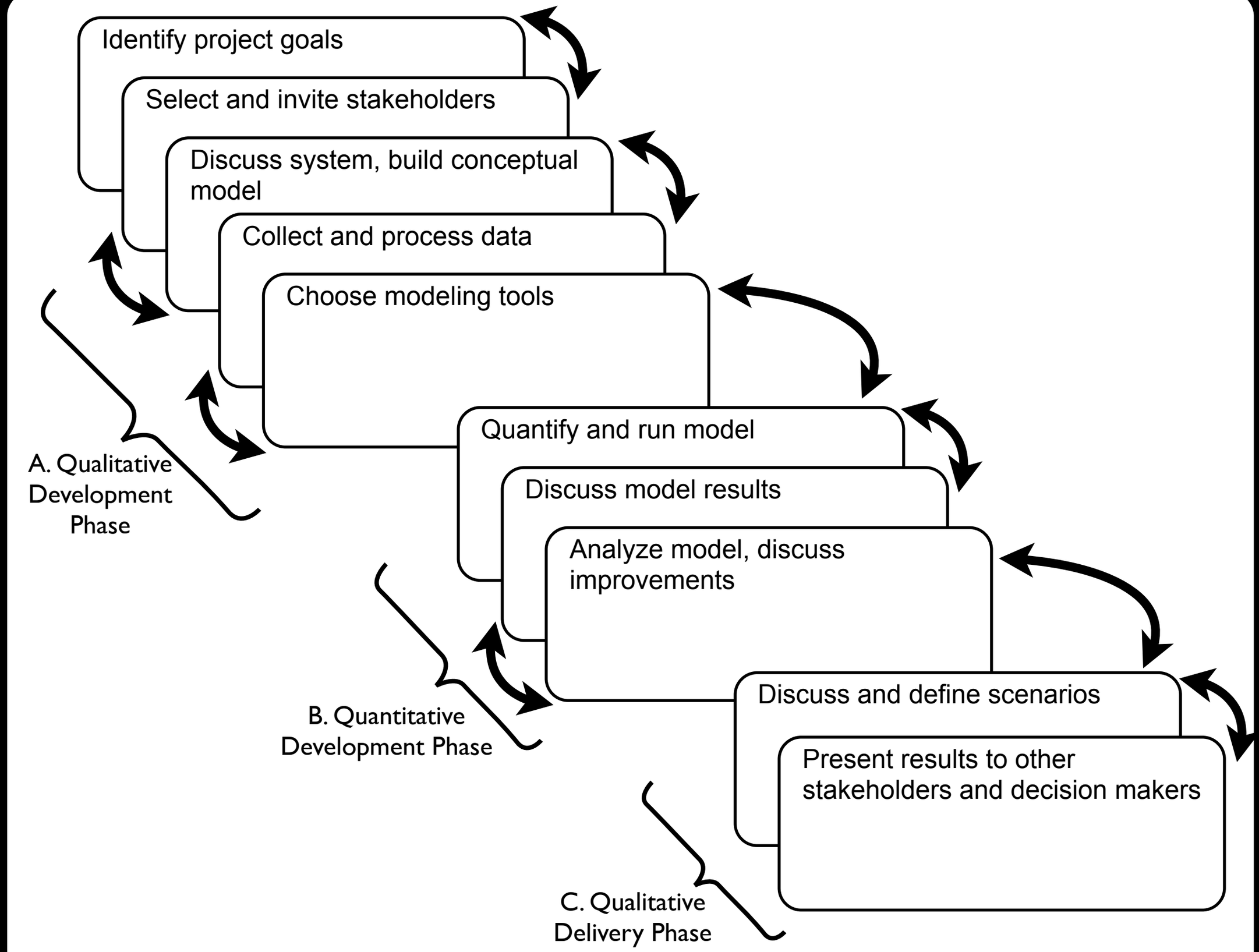

It's a Fan!
It's a Spear!
It's a Wall!
It's a Rope!
It's a Snake!
It's a Tree!

Integrating software and “human-ware”



Integrating software and “human-ware”




Identify project goals
Select and invite stakeholders
Discuss system, build conceptual model
Collect and process data
Choose modeling tools
Quantify and run model
Discuss model results
Analyze model, discuss improvements
Discuss and define scenarios
Present results to other stakeholders and decision makers
A. Qualitative Development Phase
B. Quantitative Development Phase
C. Qualitative Delivery Phase

Problems (software angle - doable)

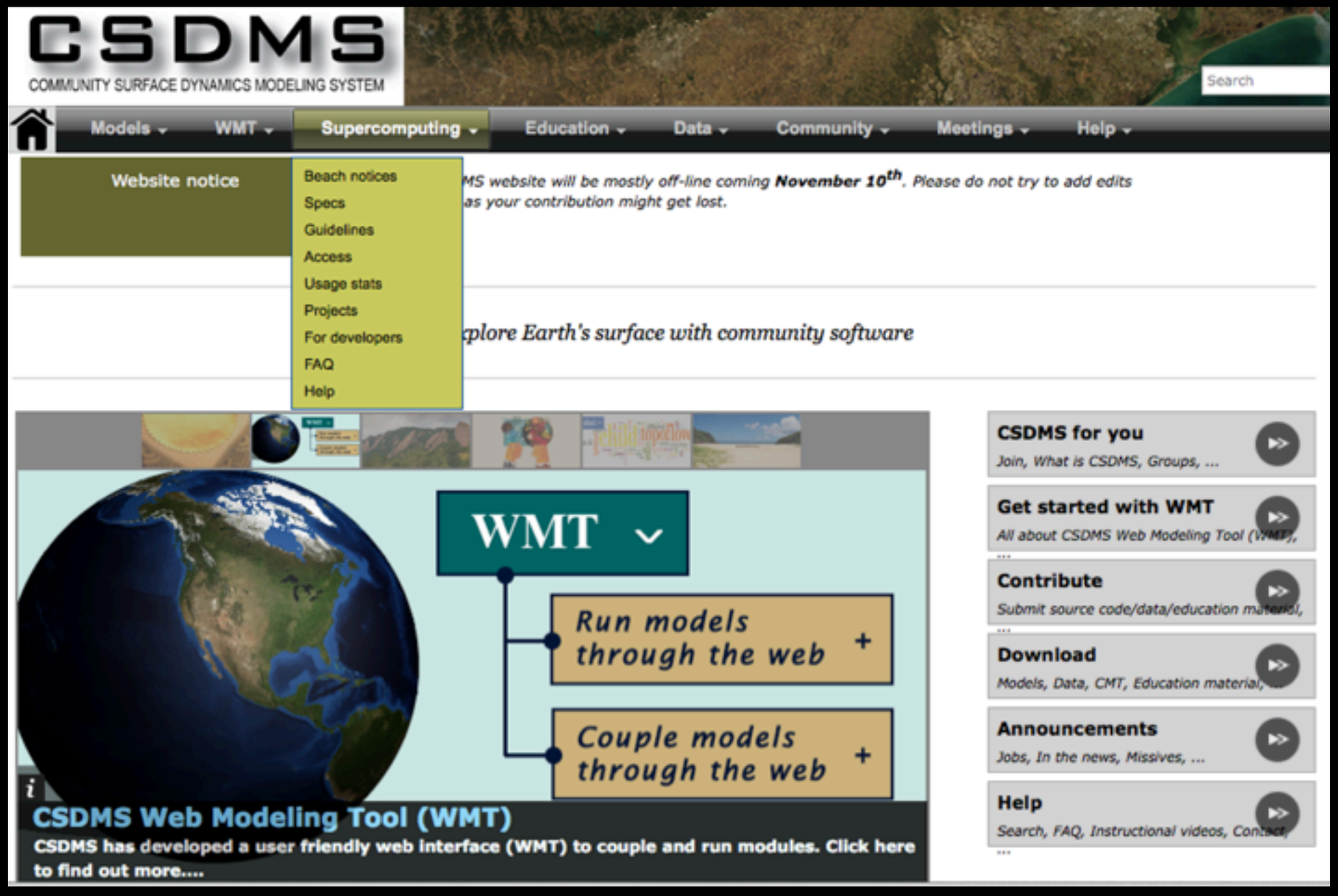
- Written in different languages (conversion is time-consuming and error-prone)
- Code is not well-documented or easy to understand and reuse
- Models have different geometry, dimensionality (1D, 2D or 3D)
- Models may use different types of grids (rectangles, triangles, polygons)
- Each model has its own time loop or "clock"
- Mismatched numerical schemes (explicit vs. implicit).

Problems (software angle - doable)

- Written in different languages (conversion is time-consuming and error-prone)
- Code is not well-documented or easy to understand and reuse
- Models have different geometry, dimensionality (1D, 2D or 3D)
- Models may use different types of grids (rectangles, triangles, polygons)
- Each model has its own time loop or "clock"
- Mismatched numerical schemes (explicit vs. implicit).

Peckham, S. 2010. CSDMS Handbook of Concepts and Protocols: A Guide for Code Contributors. http://csdms.colorado.edu/wiki/Help:Tools_CSDMS_Handbook

CSDMS, OpenMI, etc.

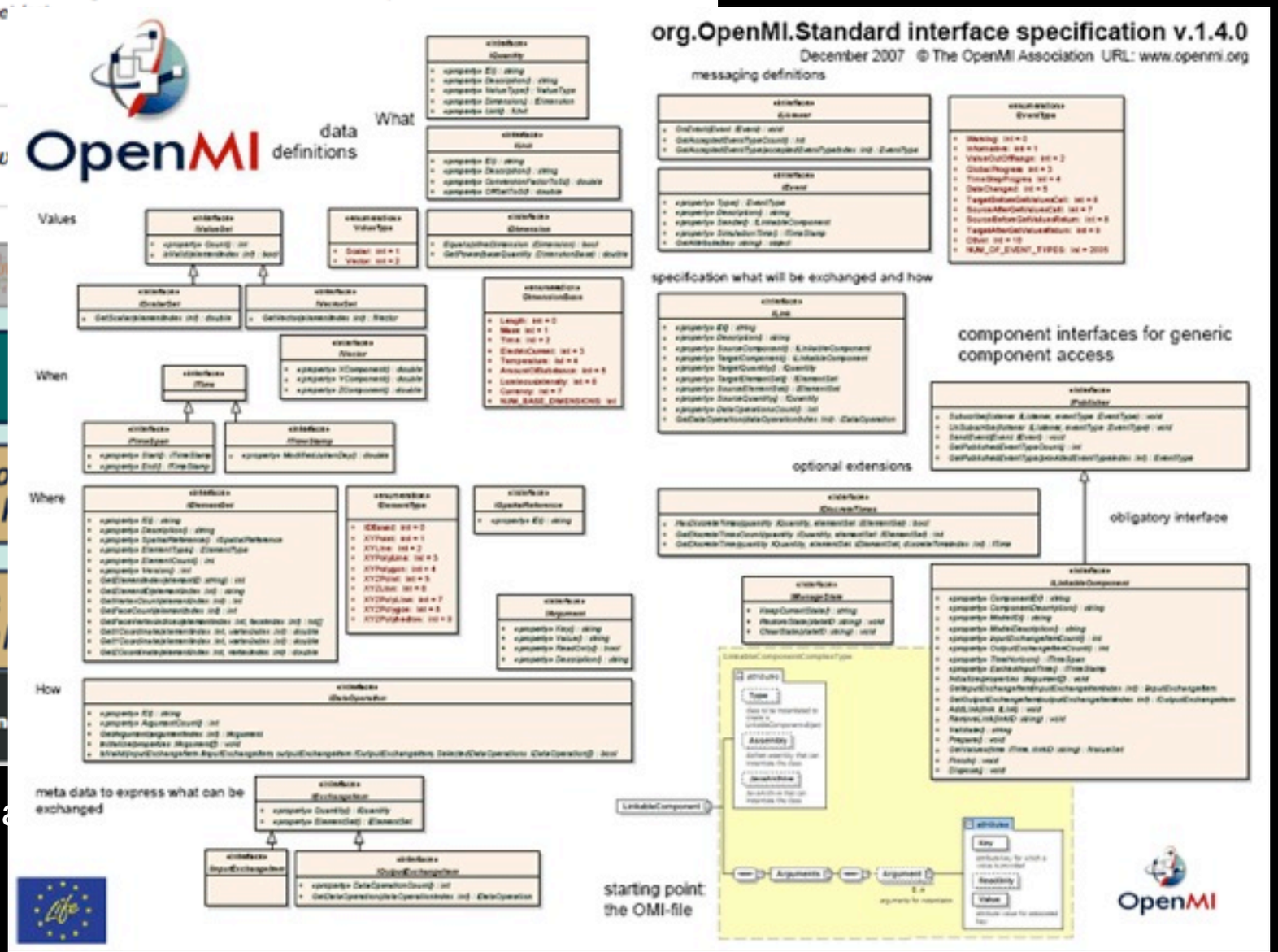


http://csdms.colorado.edu/wiki/Main_Page

CSDMS, OpenMI, etc.

http://csdms.colorado.edu/wiki/Main_Pa

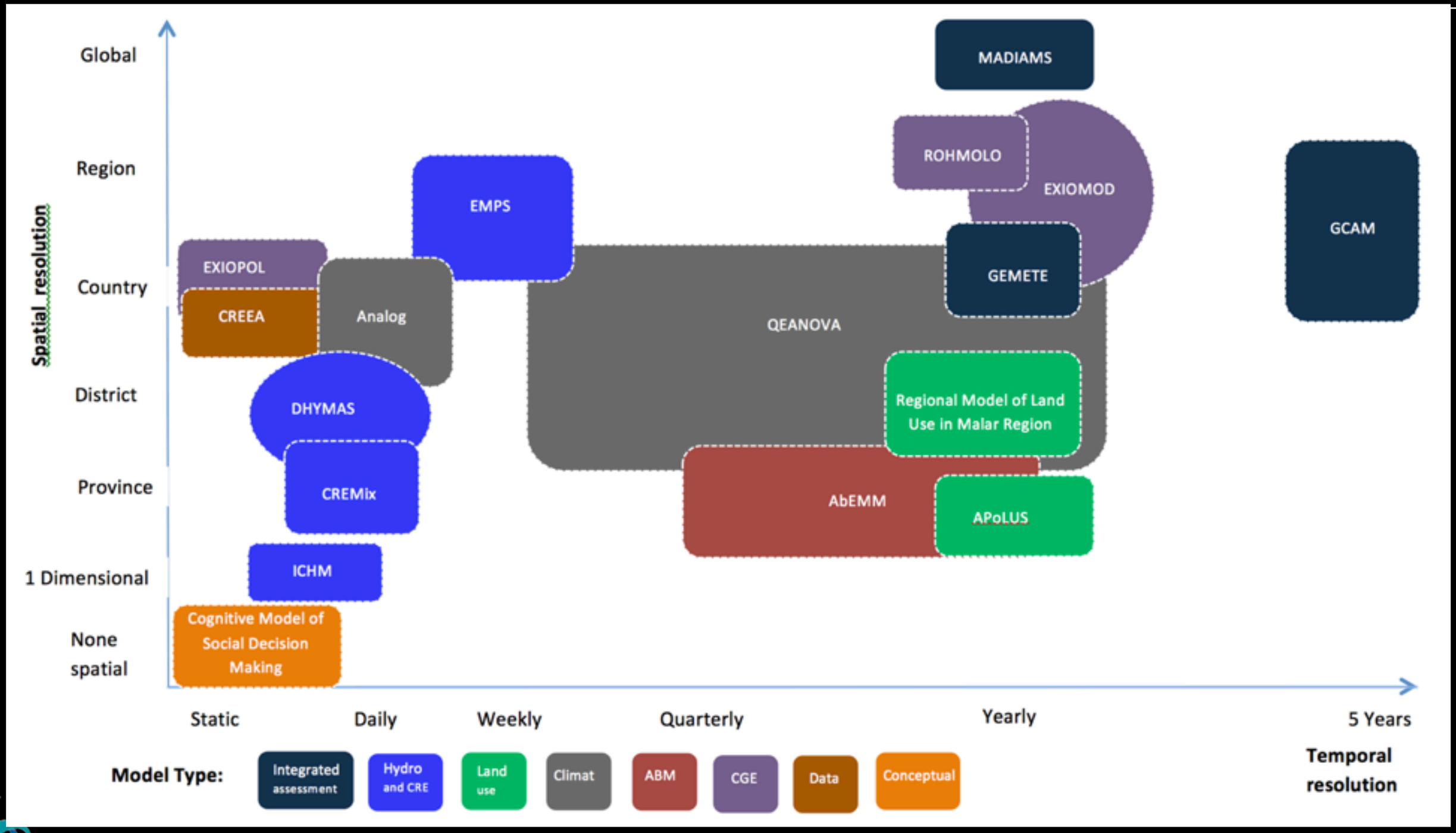
http://www.openmi.org/



Problems (modeling angle - iffy)

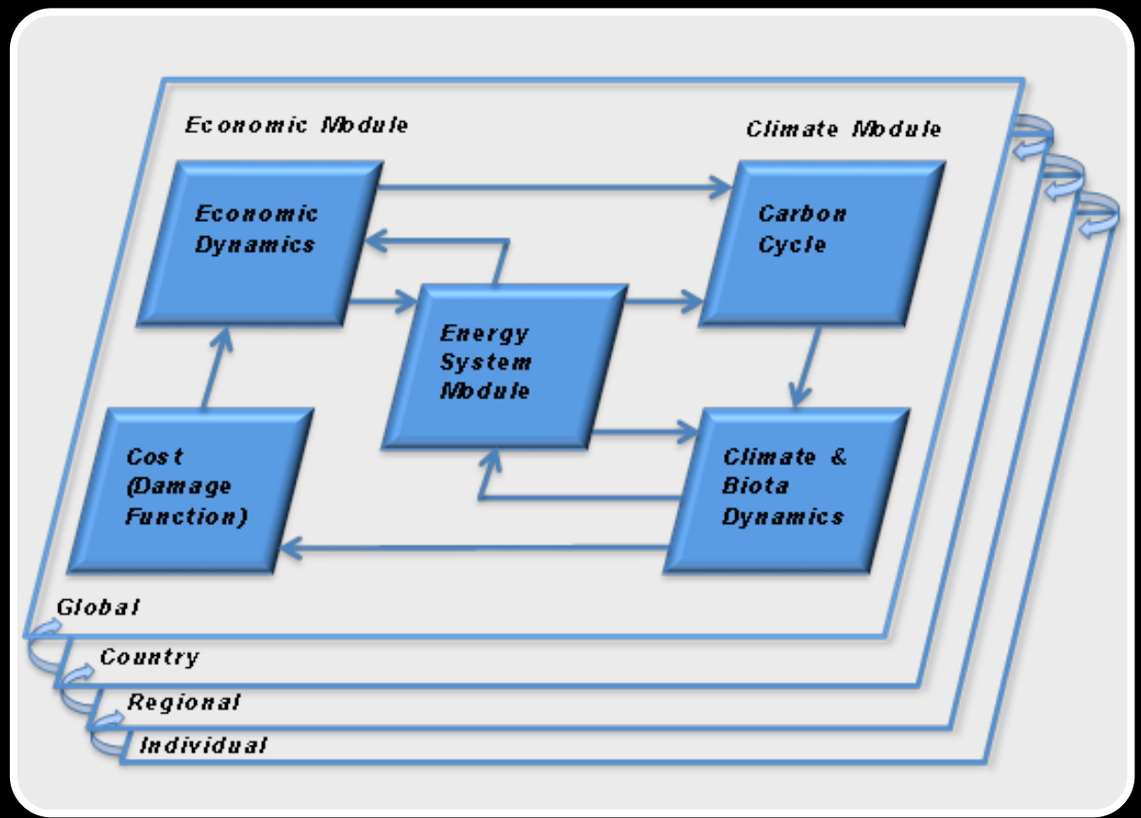
- Are models software? What about mental models?
- Components built by different teams, at different time, at different places. Built for different goals and purposes.
- Teams use different languages. Need to communicate assumptions. Metadata, metamodels and standards.
- What are the modeling paradigms used? Are they compatible? How do we calibrate integrated models?
- What are the scales? Resolutions? Time, space, structure.
- Propagation of error and uncertainties.
- What are models? Modeling as art or science?

COMPLEX model space



Integration of models

- How to operate in a generalized ‘socio-environmental model space’ (empirical models, conceptual models, complex computer simulations, and data sets)?
- Integrate qualitative models of stakeholder knowledge, opinion and scenarios
- Explore the different models along the complexity continuum to understand how information from more aggregated qualitative models can be transmitted to more elaborated and detailed quantitative simulations, and vice versa.



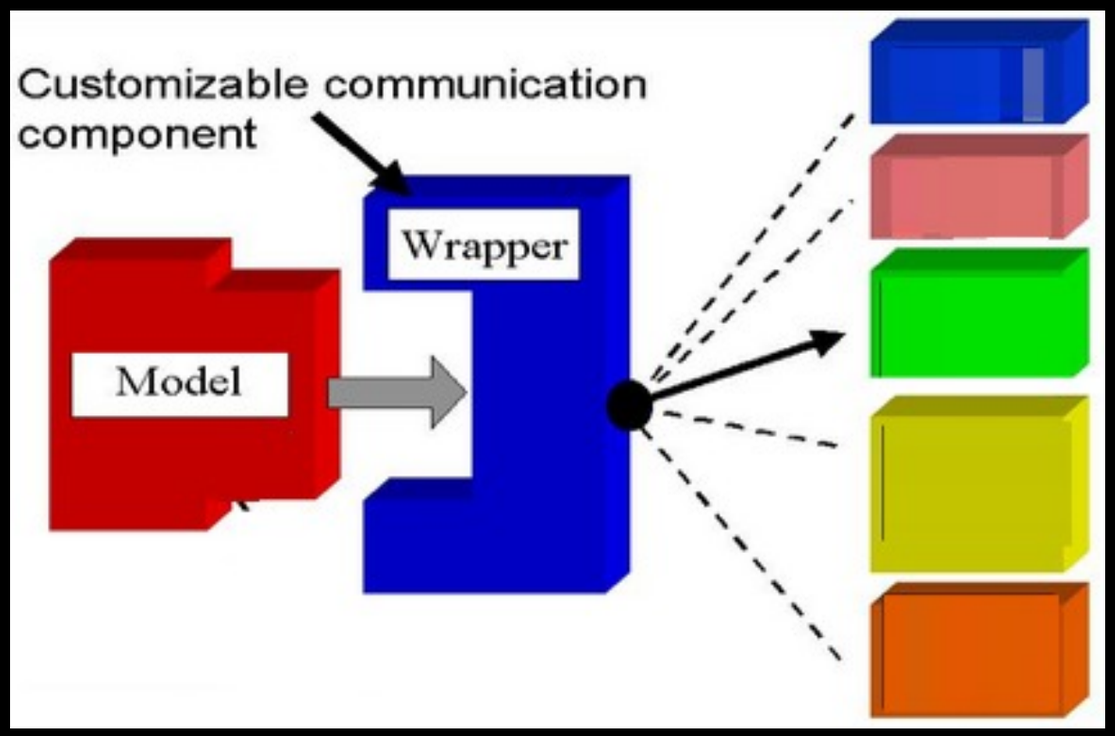
Model integration in COMPLEX

- GCAM - Integrated assessment model (IAM)
- EXIOMOD - Country level Computational General Equilibrium Model (CGE)
- Apolus - Landuse change model
- AbEMM - Agent-based model (energy market in NUTS2)
  - Supply-side: diffusion of low carbon energies (LCE) among heterogeneous firms
  - Demand-side: behavioral change at household level
- MADIAMS - System Dynamics (SD) model

Service oriented architecture

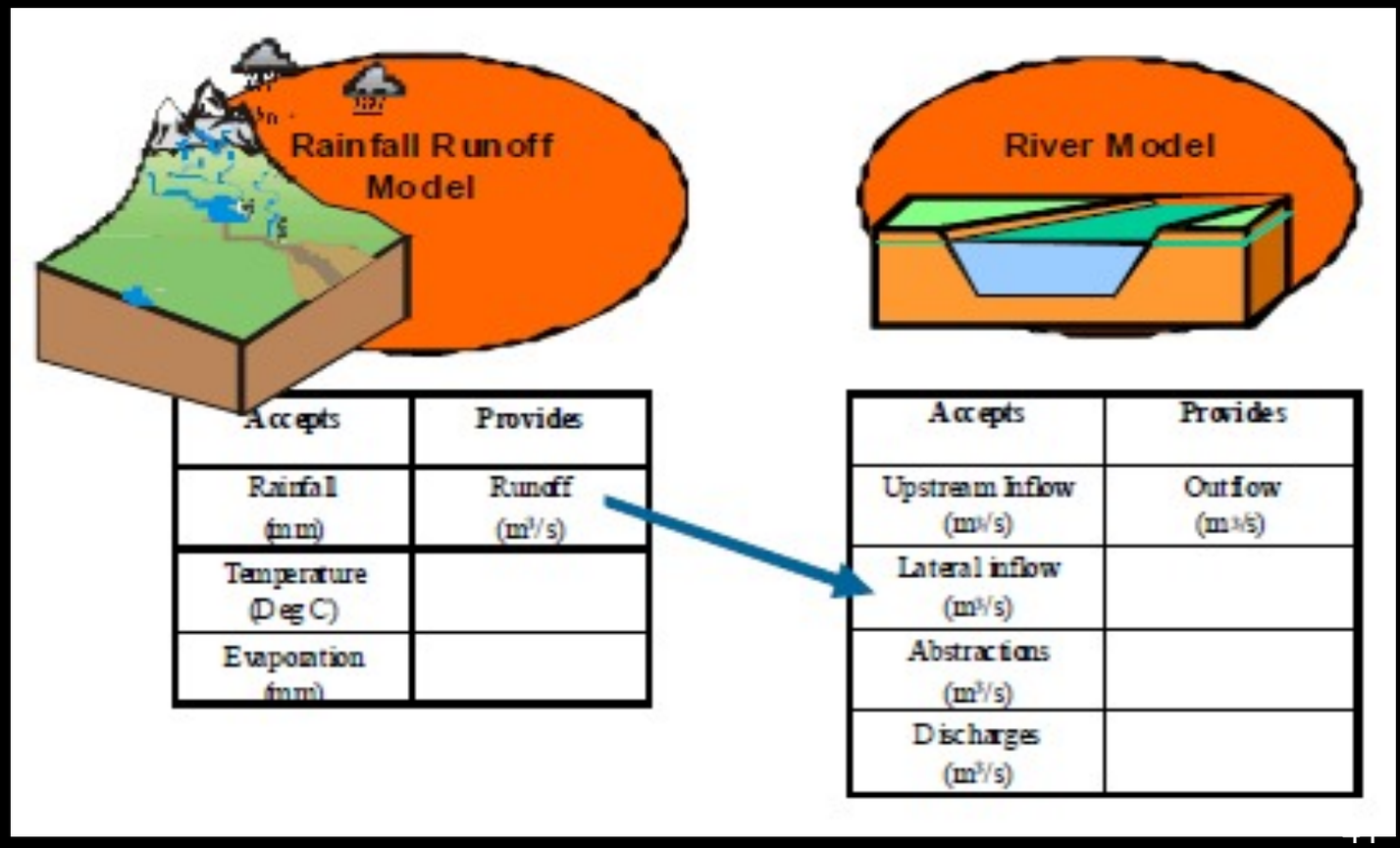
- Probably essential for multi-disciplinary linking
- A model is a composition of two major parts:
  - Interface that defines inputs, outputs and parameters of a model,
  - Core which implements the model processes and equations
- Wrapper is a program or script that sits between a model and the model space

Developing wrappers as a calling interface to existing code to assure language interoperability and to convert existing models into interoperable components.



Semantic mediation

- Ontology enables model integrators to communicate independent of implementation type, modeling framework, and programming language.
- Ontology for integrating multidisciplinary models
  - cover all participating concepts in those disciplines ?
  - what is the scope?



The complexity curse

- With integration, models are becoming even more complex
- Oreskes: “A complex model may be more realistic yet at the same time more uncertain”*
- Complex models are hard to test
- Complex models are hard to communicate
- Complex models are hard to trust
- Complex models are hard to calibrate
  - In environmental modeling calibration is a must.

* Oreskes, N., 2003. "The role of quantitative models in science," in Models in Ecosystem Science, Ed: C. D. Canham, J. J. Cole, and W. K. Lauenroth (Princeton: Princeton University Press), pp. 13-31.

Voinov, A., and C. Cerco. 2010. Model integration and the role of data. Environmental Modelling & Software 25, no. 8: 965-969.

Integrating across model types

- Conceptual, mental models - diagrams, charts, “rich pictures”, cognitive maps;
- Qualitative models - operating in terms of value sets, such as “more”, “less”, “good”, “better”, etc. - fuzzy logic;
- Quantitative models - computer simulations that operate in terms of equations, parameters, measured, observed rates and quantities
- How can we bring them all together?

New Trends in PM

- Quantitative and qualitative growth of social media
- Increasing popularity of mobile applications
- Use of web services
- Broad ‘popular’ access to data and information
- Wider social participation in creating these data and information
- Citizen science

Voinov, A., N. Kolagani, M. K. McCall, P. D. Glynn, M. E. Kragt, F. O. Ostermann, S. A. Pierce, and P. Ramu. “Modelling with Stakeholders – Next Generation.” Environmental Modelling & Software 77 (2016): 196–220.

PM over social media

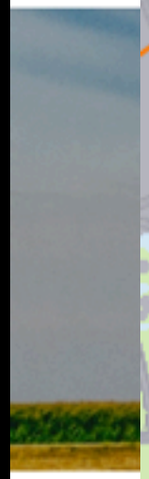
- Engage the society in crafting our models
- Track human decisions while they play with the model
- Jointly choose the most appropriate behavior
- Use the social media to engage the society in making important decisions

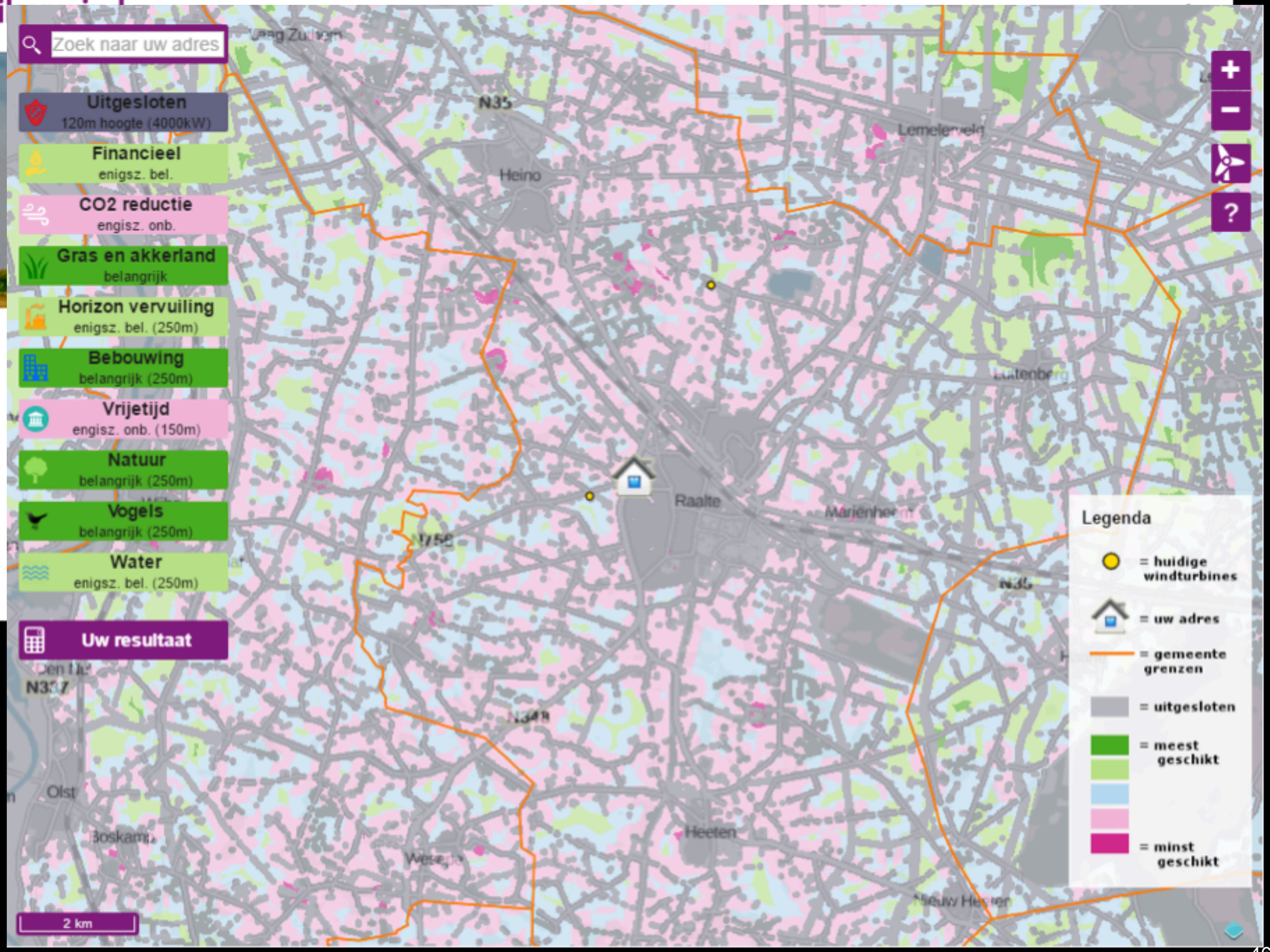
Introductie

Nederland heeft internationale afspraken gemaakt over het terugdringen van CO2 uitstoot. Eén van de mogelijke toepassingen om deze doelstellingen te bereiken is het plaatsen van windmolens op land. Het beschikbare land is echter schaars in Nederland en er zijn veel belanghebbenden, zoals de landelijke overheid, provincies, gemeenten, energieleveranciers, netwerkbedrijven, fabrikanten en consumenten. Als burger kan het lastig zijn om een gefundeerde mening te vormen over dit onderwerp. Dit kan komen door gebrek aan kennis over windturbines en inzicht in de (beschikbare) openbare ruimte in uw directe omgeving.

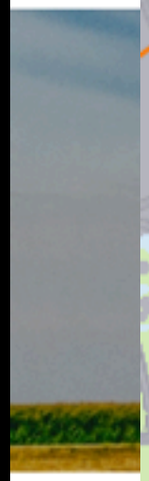
Het doel van dit onderzoek is het testen van een webapplicatie. Deze webapplicatie geeft u de mogelijkheid om meer inzicht te verkrijgen over de beschikbare ruimte binnen zijn/haar gemeente voor de plaatsing van windturbines. Het idee is dat u een sterkere mening vormt over windturbines binnen uw gemeente door meer informatie te verstrekken over windturbines en de hoeveelheid beschikbare openbare

Bli




Zoek naar uw adres
Uitgesloten
120m hoogte (4000kW)
Financieel
enigsz. bel.
CO2 reductie
engisz. onb.
Gras en akkerland
belangrijk
Horizon vervuiling
enigsz. bel. (250m)
Bebouwing
belangrijk (250m)
Vrijetijd
engisz. onb. (150m)
Natuur
belangrijk (250m)
Vogels
belangrijk (250m)
Water
enigsz. bel. (250m)
Uw resultaat
N35
Heino
Raalte
Heeten
Olst
2 km
Legenda
= huidige windturbines
= uw adres
= gemeente grenzen
= uitgesloten
= meest geschikt
= minst geschikt

Bli



Zoek naar uw adres

Uitgesloten
120m hoogte (4000kW)

Financieel
enigsz. bel.

CO2 reductie
engisz. onb.

Gras en akkerland
belangrijk

Horizon vervuiling
enigsz. bel. (250m)

Bebouwing
belangrijk (250m)

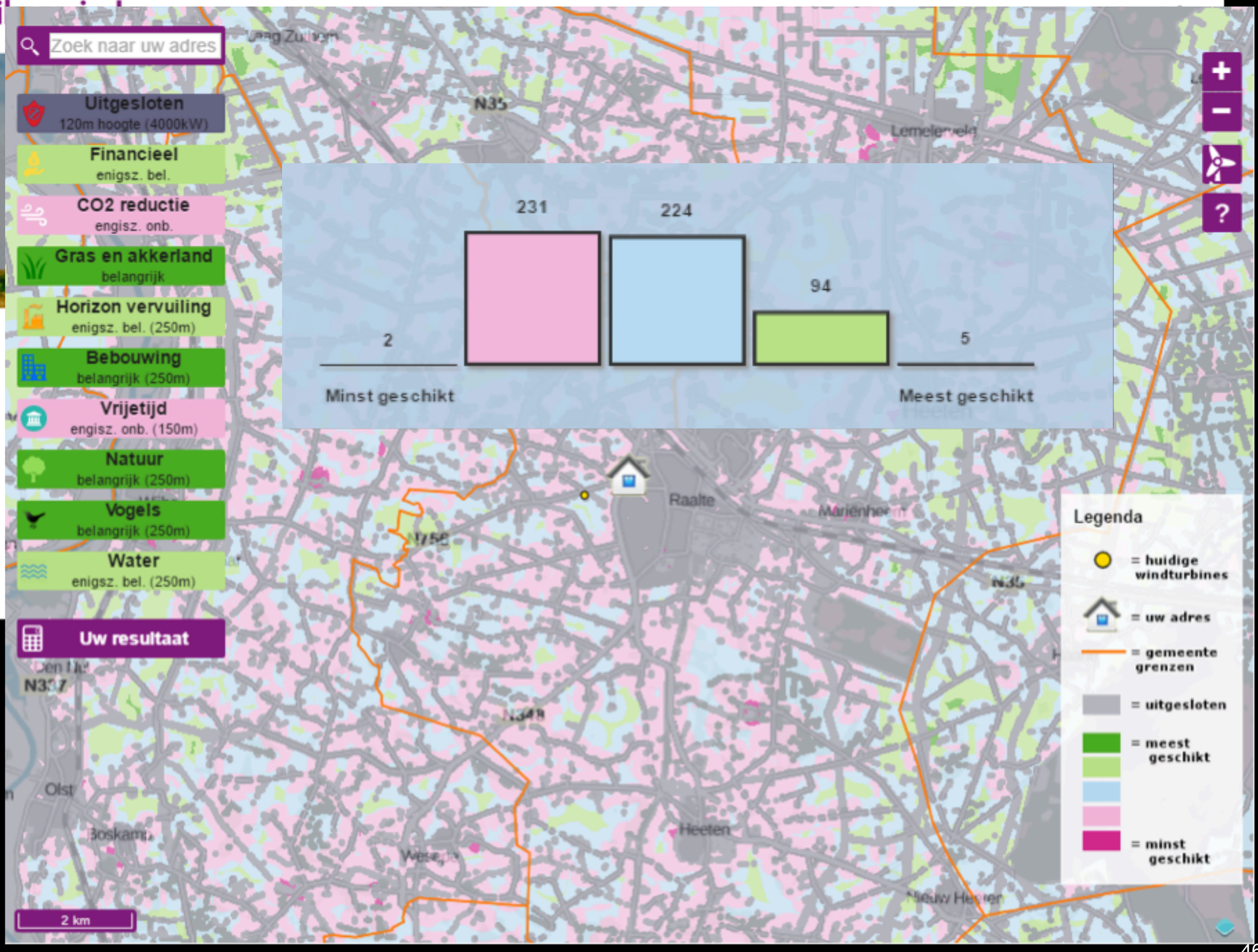
Vrijetijd
engisz. onb. (150m)

Natuur
belangrijk (250m)

Vogels
belangrijk (250m)

Water
enigsz. bel. (250m)

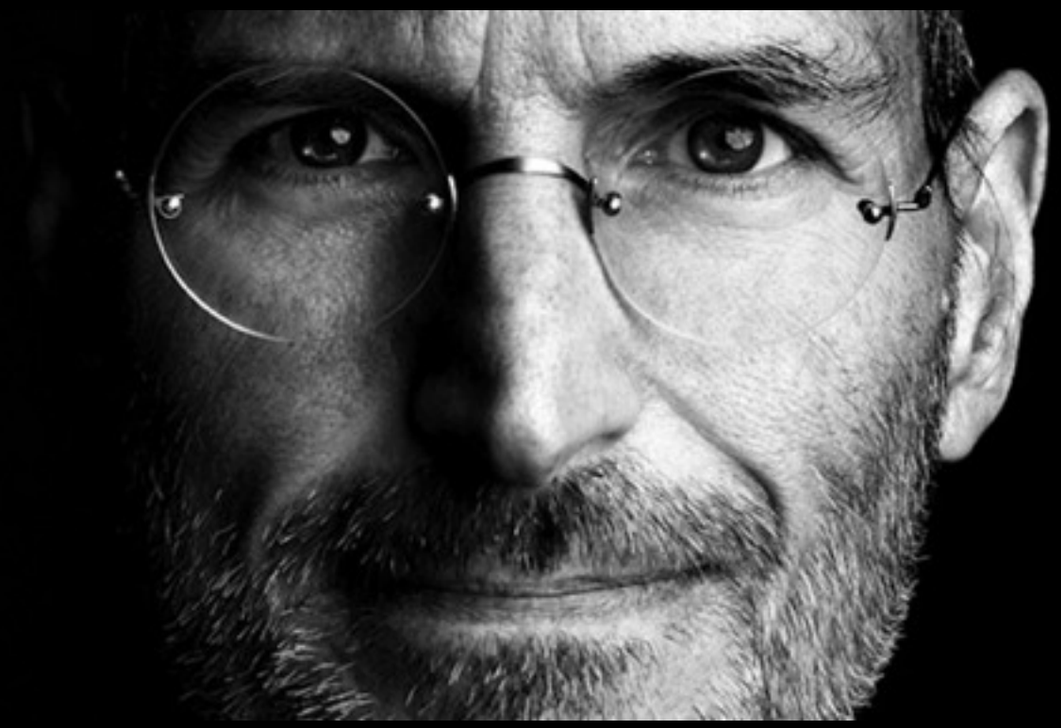
Uw resultaat



Caveats

But...

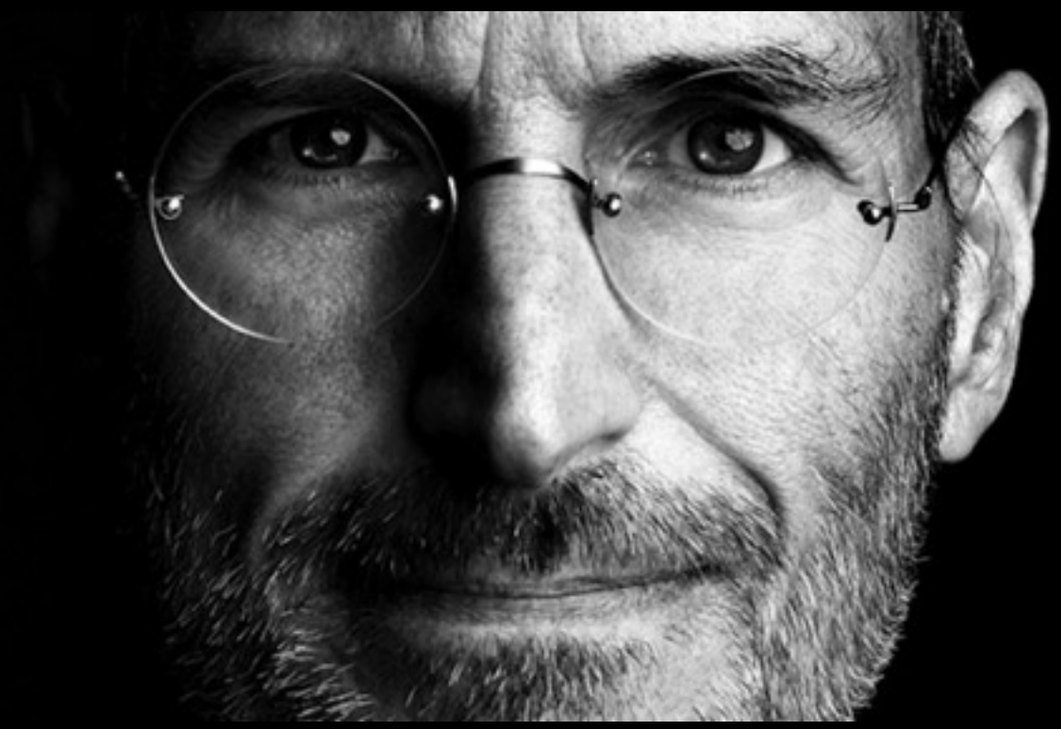
But...



It's really hard to design products by focus groups. A lot of times, people don't know what they want until you show it to them."

— Steve Jobs

But...

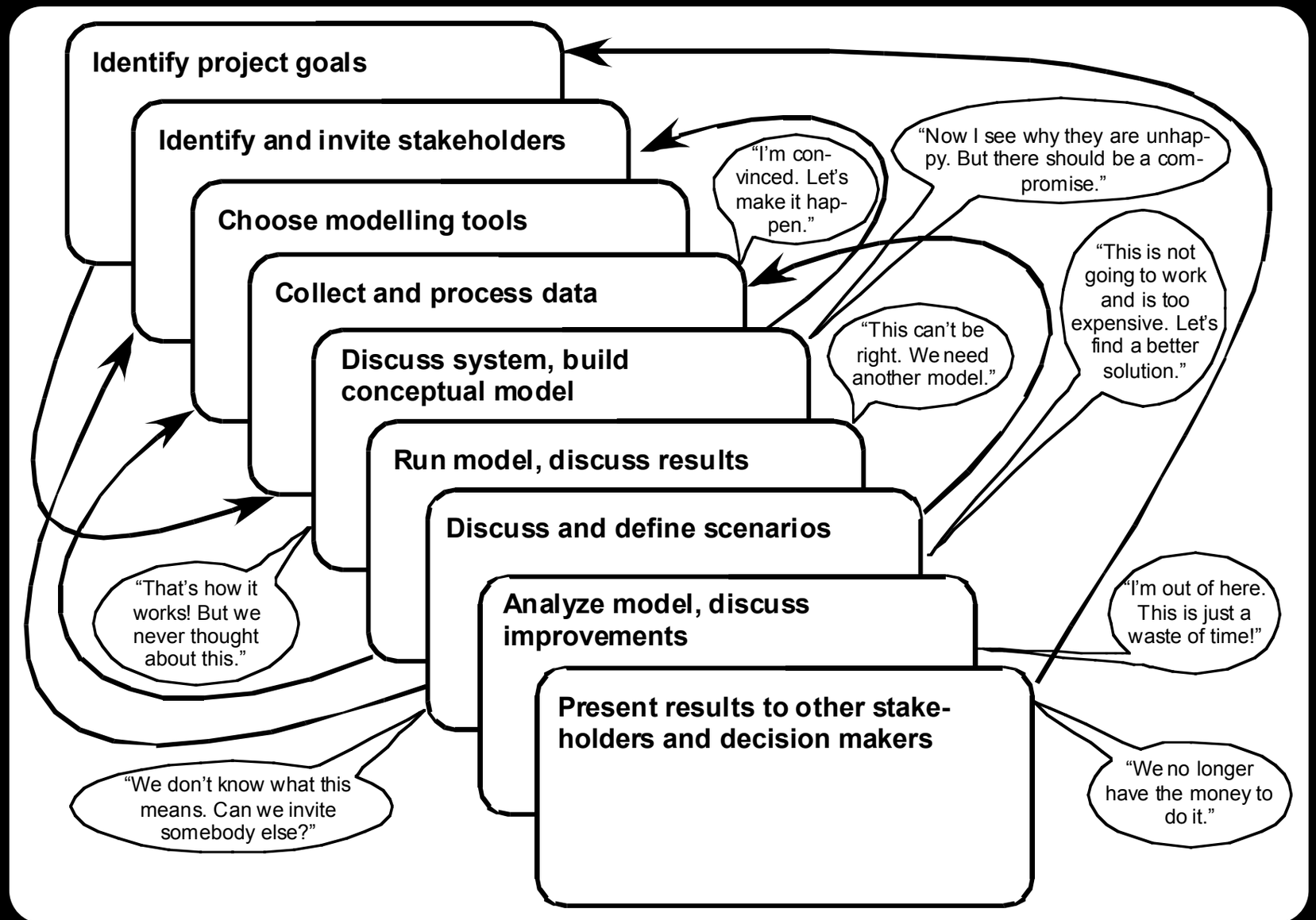


It's really hard to design products by focus groups. A lot of times, people don't know what they want until you show it to them."

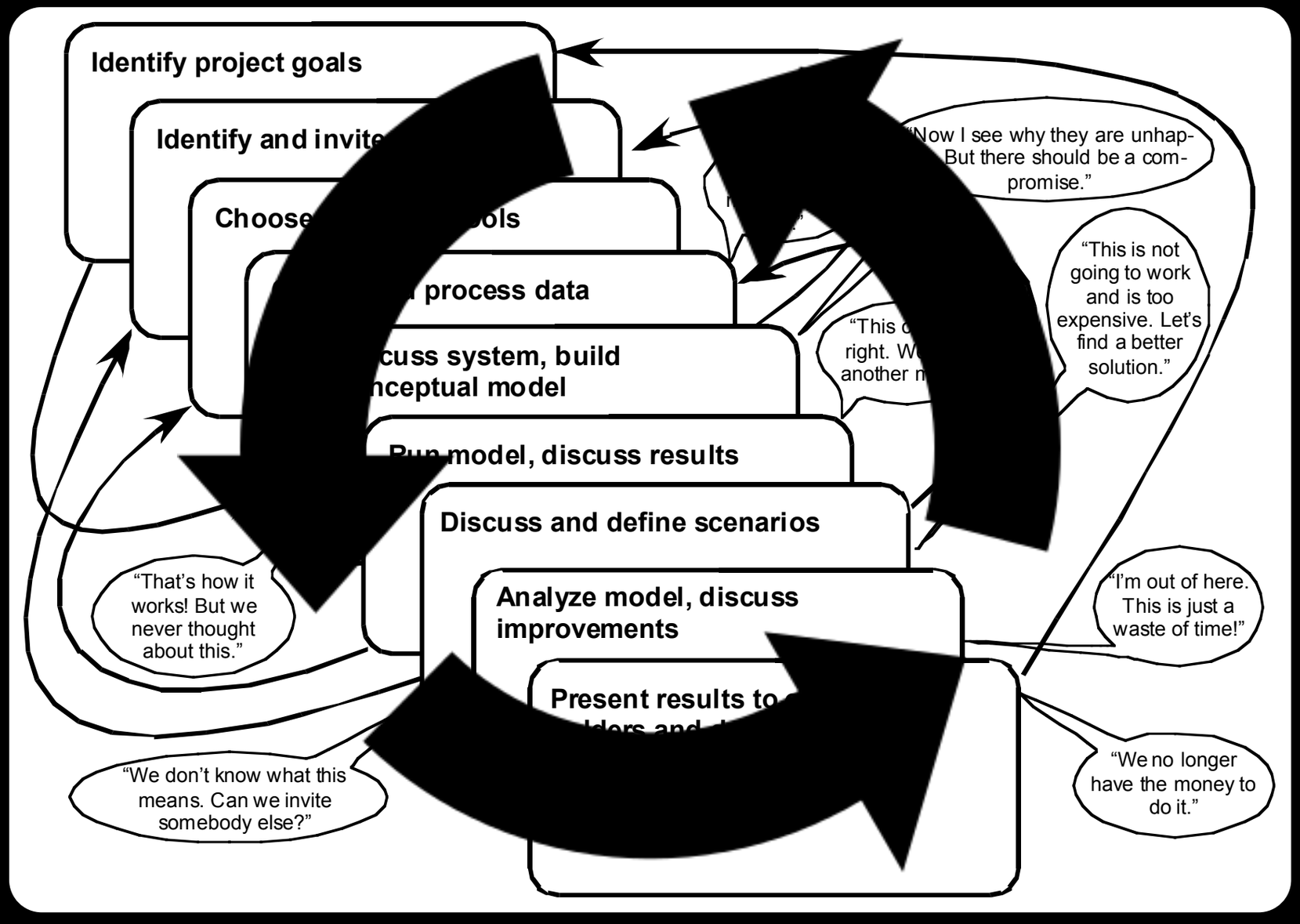
— Steve Jobs

The Observer Effect

But: Process is long and open-ended



But: Process is long and open-ended



But: Uncertainties

- Decreasing uncertainties by making models more transparent and trusted

But: Uncertainties

- Decreasing uncertainties by making models more transparent and trusted
- Increasing uncertainties with information production and sharing biased by group thinking and clustering along cultural, educational or party lines

But: Biases

- ‘Temporal insensitivity’
- ‘Steady-state’
- ‘Man versus Nature’
- Anthropomorphic bias
- ‘Single species’
- Cognitive perceptions and the ‘visible is credible’
- ‘Creeping normality’
- Disciplinary biases
- ‘Dominant stature’
- ‘Managed expectations’
- ‘Confirmation bias’ or ‘myside bias’

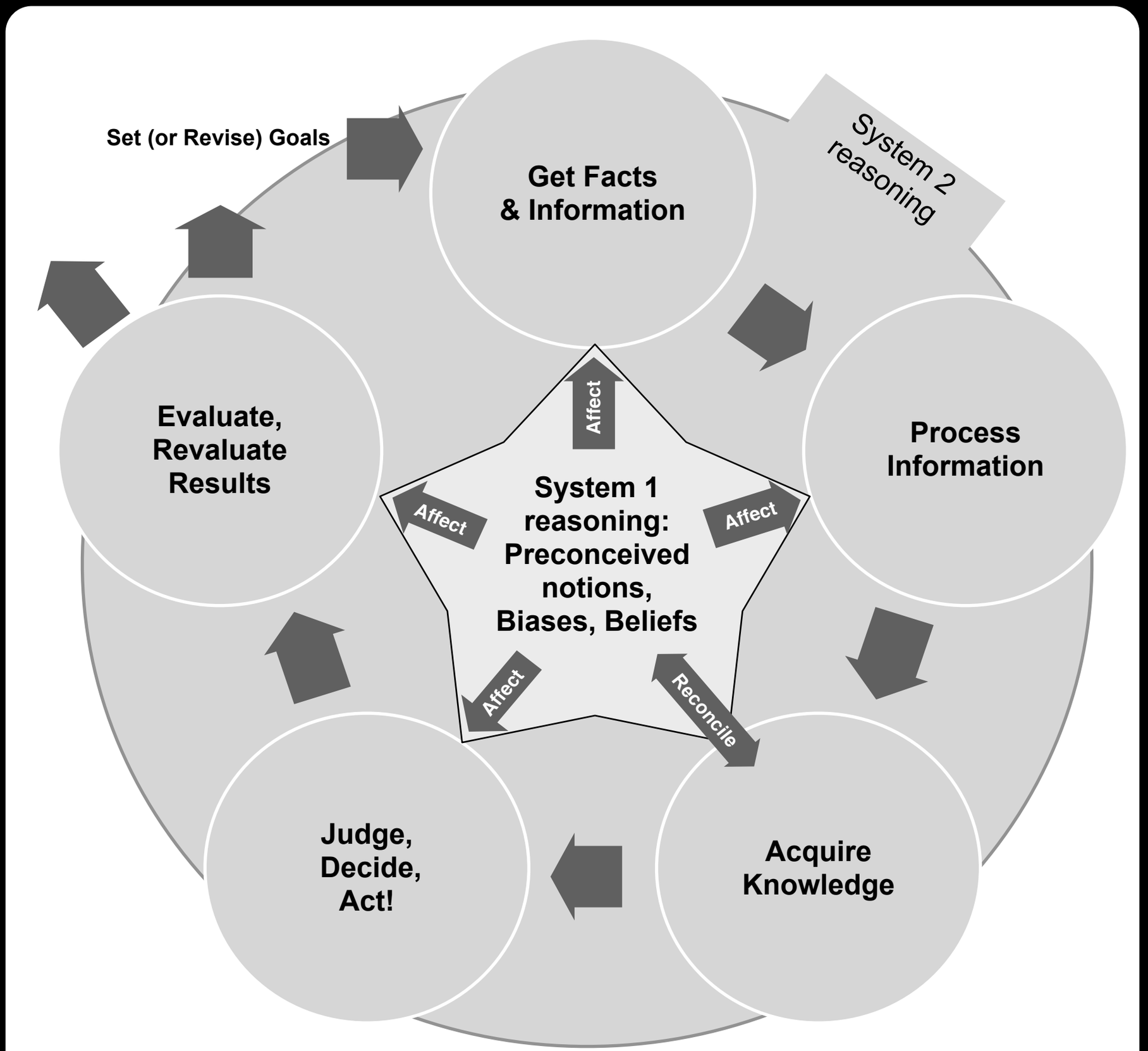
P. D. Glynn, 2014. Integrated Environmental Modeling: Human Decisions, Human Challenges. Geological Society of London.

But: Biases

- ‘Temporal insensitivity’
- ‘Steady-state’
- ‘Man versus Nature’

P. D. Glynn, 2014. Integrated Environmental Modeling: Human Decisions, Human Challenges. Geological Society of London.

- ‘Managed expectations’
- ‘Confirmation bias’ or ‘myside bias’


Set (or Revise) Goals
Get Facts & Information
System 2 reasoning
Process Information
Acquire Knowledge
Judge, Decide, Act!
Evaluate, Revaluate Results
System 1 reasoning: Preconceived notions, Biases, Beliefs
Affect
Affect
Affect
Affect
Reconcile

VIDEOS WTF

NASA Confirms Earth Will Experience 15 Days Of Complete Darkness in November 2015

SHARE Like 93k Tweet 2,190

515,927 LIKE

65,159 FOLLOW

70,327 FOLLOW

161 SUBSCRIBE

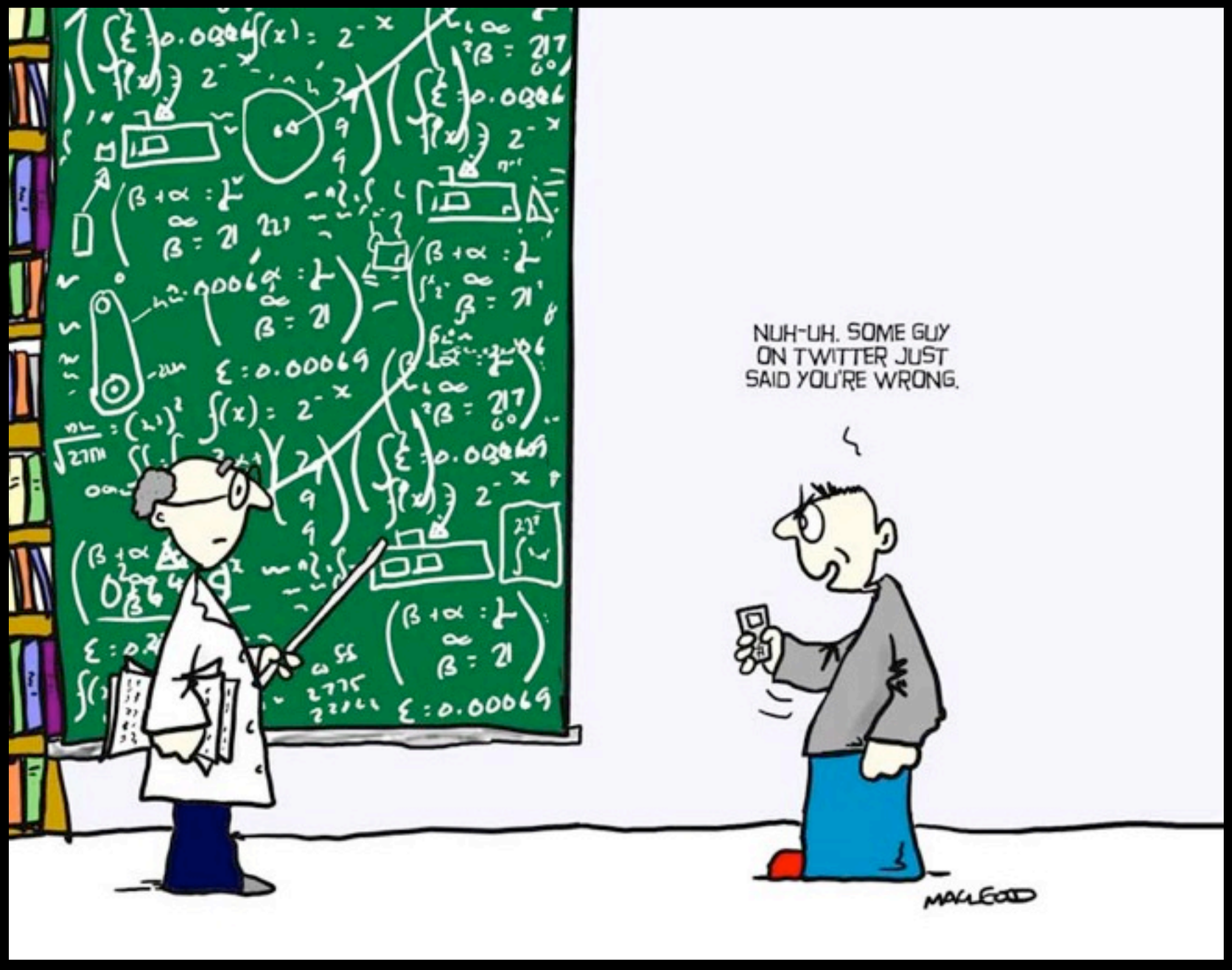
More News

Man Commits Suicide Over Star Wars Main Character Being Black #BoycottStarWarsVII

https://newswatch33.com/science/nasa-confirms-earth-will-experience-15-days-of-complete-darkness-in-november-2015/2/

"...it often happens, that if a Lie be believ'd only for an Hour, it has done its Work, and there is no farther occasion for it. Falsehood flies, and the Truth comes limping after it; so that when Men come to be undeceiv'd, it is too late; the Jest is over, and the Tale has had its Effect…"

Jonathan Swift (1710)


NUH-UH. SOME GUY ON TWITTER JUST SAID YOU'RE WRONG.
MACLEOD

Values and biases in science

- The dominant assumption is that science is value neutral and is supposed to provide information for policy and decision-making: only the latter have to account for societal values and preferences

Sarewitz, D., 2004. How science makes environmental controversies worse. *Environmental Science & Policy*, 7(5), pp.385–403.

Robert Lackey

- "...science, although an important part of policy debates, remains but one element, and often a minor one, in the decision-making process"
- "...scientists can assess the ecological consequences of various policy options, but in the end it is up to society to prioritize those options and make their choices accordingly"
- It is easy — and wrong — for scientists to become stealth policy advocates.

Lackey, R., 2008. Does the Public Expect too Much from Science? *Science Wednesday*. Available at: http://blog.epa.gov/blog/2008/07/science-wednesday-does-the-public-expect-too-much-from-science/.
Lackey, R., 2013. Normative Science. Terra Magazine, pp.1–15.

Values in science do matter

“A scientific man ought to have no wishes, no affections, a mere heart of stone.“

Charles Darwin

Values in science do matter

- Who pays my salary? Will they like it?
- What are the credits from this research?
- What impact factor my research will have?
- How many citations will I get?
- Does this help with my tenure?

“A scientific man ought to have no wishes, no affections, a mere heart of stone.“

Charles Darwin

Values in science do matter

- What are the assumptions we make?
- What are the boundaries of the system?
- What spatio-temporal resolution we choose?
- What models we use?
- What are the experts we invite?
- What accuracy we allow?
- How do we collect, process and use data?
- How do we report our results?
- What objective functions we define for optimization?

It is all about values, norms and preferences prevailing in a society, and the corresponding choices we as individuals make. These are very different and do change.

It is all about values, norms and preferences prevailing in a society, and the corresponding choices we as individuals make. These are very different and do change.


A.B.
light.com.br
© 2003 BMEZINE.COM Duplication and republishing forbidden
BME


© 2003 BMEZINE.COM Duplication and republishing forbidden

P.P.Rubens. The Judgement of Paris 1632

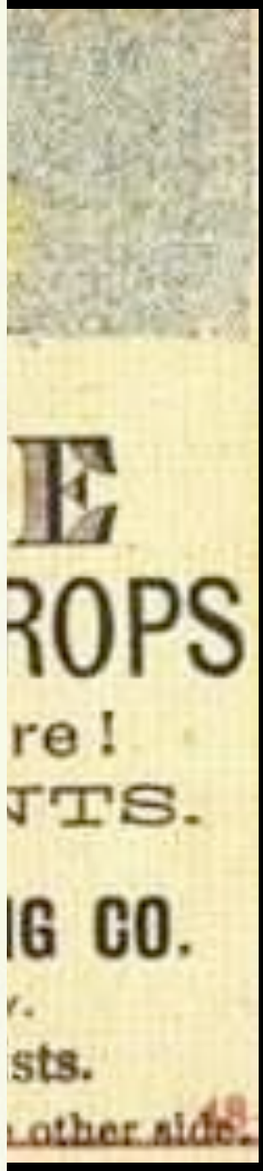
Nnenna-Odunzes-Traditional-Igbo-Wedding-in-Enugu-Nigeria-BellaNaija-2015-006

Dynamics of fashion

Dynamics of fashion


The Chef
does everything
but cook
– that's what
wives are for!
I'm giving my wife a
Kenwood Chef


SO THE HARDER A WIFE WORKS, THE CUTER SHE LOOKS!
1. GOSH, HONEY, YOU SEEM TO THRIVE ON COOKING, CLEANING AND DUSTING- AND I'M ALL TUCKERED OUT BY CLOSING TIME. WHAT'S THE ANSWER?
VITAMINS, DARLING! I ALWAYS GET MY VITAMINS
Kellogg's PEP
Vitamins for pep! PEP for vitamins!*




The
does ev
– that's
wives


Kellogg's
PEP
Vitan


Blow in her face and she'll follow you anywhere.
Hit her with tangy Tipalet Cherry. Or rich, grape-y Tipalet Burgundy. Or luscious Tipalet Blueberry. It's Wild! Tipalet. It's new. Different. Delicious in taste and in aroma. A puff in her direction and she'll follow you, anywhere. Oh yes... you get smoking satisfaction without inhaling smoke.
TIPALET
Smokers of America, do yourself a flavor. Make your next cigarette a
Tipalet®.
New from Muriel.
About 5 for 25¢.

Iver Johnson Revolvers

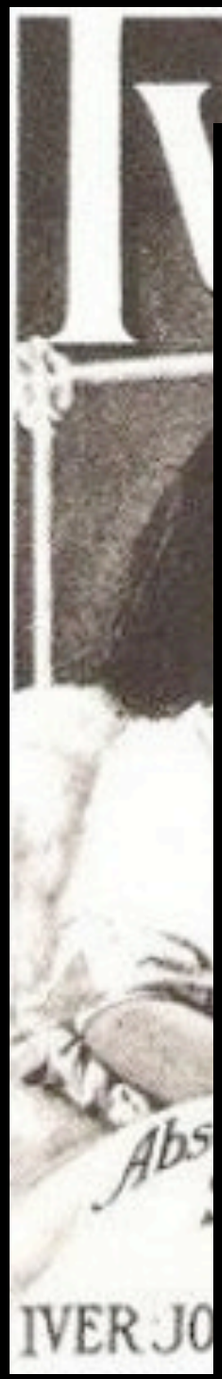
ACCIDENTAL DISCHARGE IMPOSSIBLE

are not toys: they shoot straight and kill. You may need one only once in your lifetime: buy now, so you will have it at that time.

SAFETY $6.
HAMMERLESS AUTOMATIC

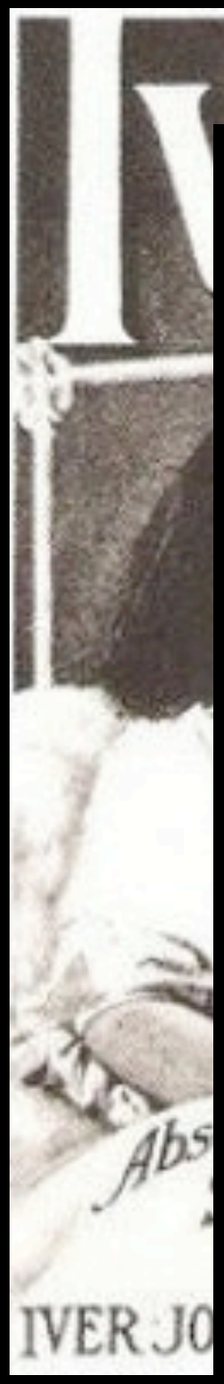
Send for Our fire-arms encyclopædia

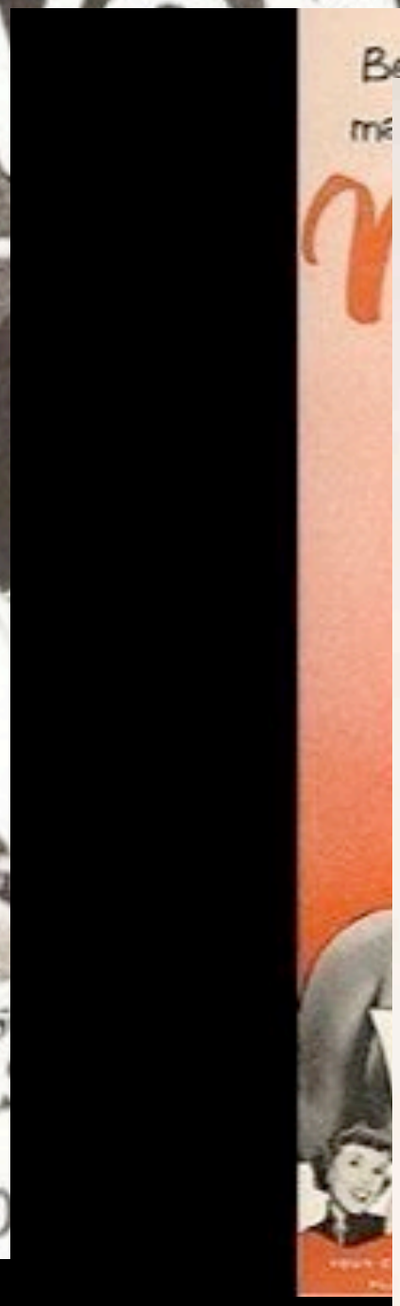
IVER JOHNSON'S ARMS & CYCLE WORKS, FITCHBURG, MASS. U.S.A.


IVER JO


Before you scold me, Mom ...
maybe you'd better light up a
Marlboro
Yes, you need never feel over-smoked ... that's the Miracle of Marlboro!
MARLBORO

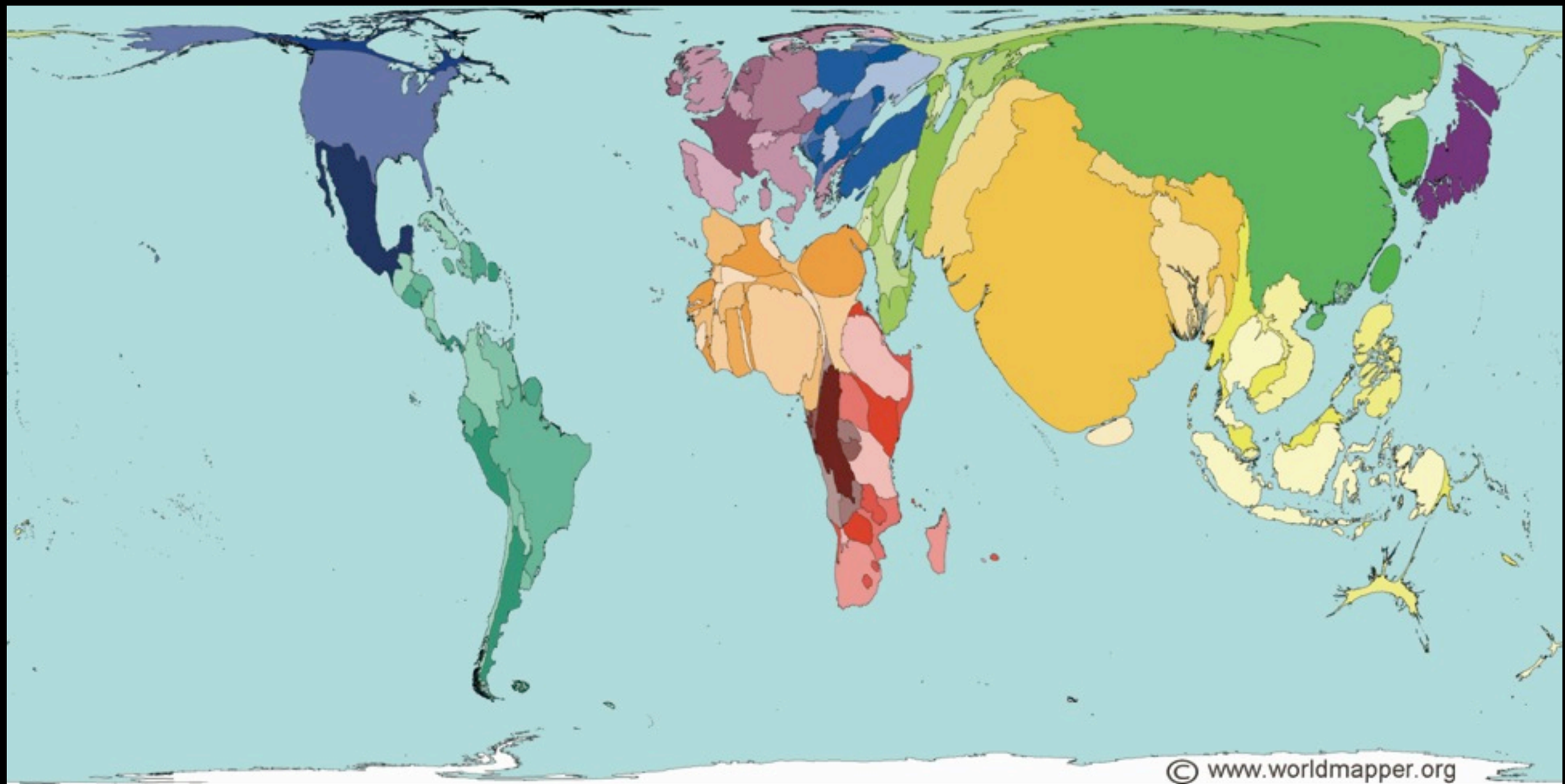

Gee, Mommy you sure enjoy your
Marlboro
Yes, you need never feel over-smoked ... that's the Miracle of Marlboro!
MARLBORO

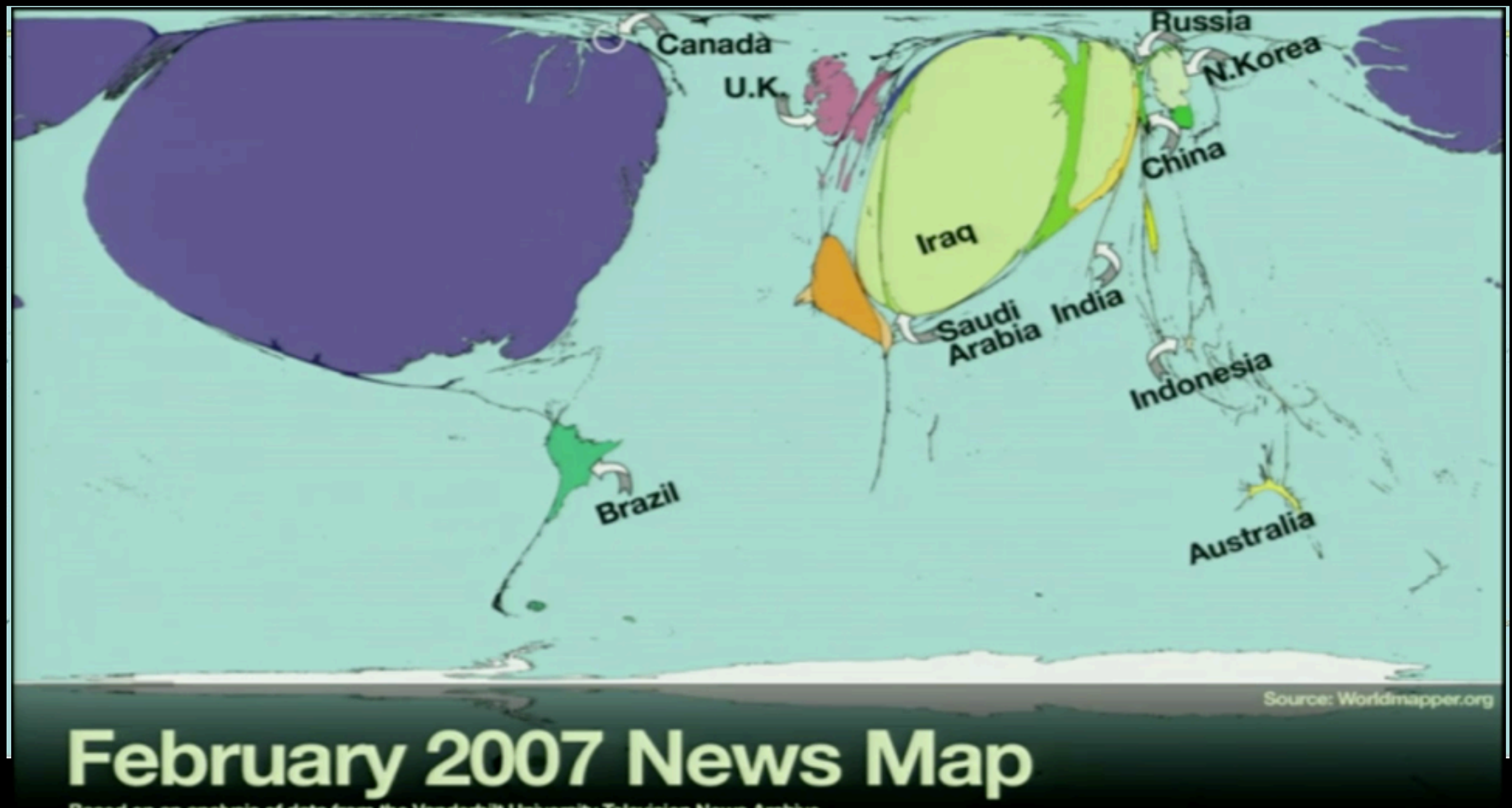

IVER JO




Before you scold me, Mom ...
7up
Why we have the youngest customers in the business
Nothing does it like Seven-Up!


Before you scold me, Mom ...
7up
LUCKY STRIKE
CIGARETTES
A GIFT OF PLEASURE
Santa Claus


© www.worldmapper.org


Canada
U.K.
Russia
N.Korea
China
Iraq
Saudi Arabia
India
Indonesia
Brazil
Australia
Source: Worldmapper.org
February 2007 News Map
Based on an analysis of data from the Vanderbilt University Television News Archive

- "Is it hypocrisy to **honestly believe** in something that is not true? Furthermore, if people honestly believed in something and if they **acted upon such belief**, can one consider such a belief to be a real cause of an ensuing historical event, even if it is not true?... **Human beings create history on the basis not of reality but their perceptions of reality,** perceptions that are often far removed from what actually occurred. But what actually occurred... is visible only from the hindsight that the study of history presents."

(Mark Stoler, 2012. "The Skeptic's Guide to American History")

Solutions

Ten commandments for a socio-environmental modeling agenda

Ten commandments for a socio-environmental modeling agenda

Stop pretending that applied science and models are always objective and value neutral – they are not. Acknowledge implicit decisions and assumptions in modeling, document and communicate them.

Ten commandments for a socio-environmental modeling agenda

Stop pretending that applied science and models are always objective and value neutral – they are not. Acknowledge implicit decisions and assumptions in modeling, document and communicate them.

Be totally transparent about your assumptions and values. Discuss them broad and wide within the modeling process.

Ten commandments for a socio-environmental modeling agenda

Stop pretending that applied science and models are always objective and value neutral – they are not. Acknowledge implicit decisions and assumptions in modeling, document and communicate them.

Be totally transparent about your assumptions and values. Discuss them broad and wide within the modeling process.

Do not confuse personal values and interests with scientific facts. Explain how scientific facts can shape values.

ITC

Make sure science based values are not set in stone – be ready to change them when new knowledge becomes available

Make sure science based values are not set in stone – be ready to change them when new knowledge becomes available

Engage with stakeholders to define problems together

Make sure science based values are not set in stone – be ready to change them when new knowledge becomes available

Engage with stakeholders to define problems together

Engage with policy makers to help them understand the solutions and make sure they act accordingly. Use the modeling process to engage the public in debates about our future

Make sure science based values are not set in stone – be ready to change them when new knowledge becomes available

Engage with stakeholders to define problems together

Engage with policy makers to help them understand the solutions and make sure they act accordingly. Use the modeling process to engage the public in debates about our future

Treat modeling as a process, which evolves and adapts to accommodate new knowledge and data, which does not have a final solution because there are no final solutions for open systems

Always follow the best practices of rigorous model characterization and testing. This is a necessary, but not a sufficient condition of successful modeling

Voinov, A, et ali. 2014. “Values in Socio-Environmental Modelling: Persuasion for Action or Excuse for Inaction.” *Environmental Modelling & Software* 53: 207–212.

Always follow the best practices of rigorous model characterization and testing. This is a necessary, but not a sufficient condition of successful modeling

Explain and appreciate all types of uncertainties as an inherent part of all complex systems

Voinov, A, et ali. 2014. “Values in Socio-Environmental Modelling: Persuasion for Action or Excuse for Inaction.” *Environmental Modelling & Software* 53: 207–212.

Always follow the best practices of rigorous model characterization and testing. This is a necessary, but not a sufficient condition of successful modeling

Explain and appreciate all types of uncertainties as an inherent part of all complex systems

Use all available means of communication and interaction. Do not be afraid to turn around the weapons used in mass media and advertisement. Seek for funding and means to deliver your message in the most compelling and powerful way

Voinov, A, et ali. 2014. “Values in Socio-Environmental Modelling: Persuasion for Action or Excuse for Inaction.” *Environmental Modelling & Software* 53: 207–212.

From Open Source to Open Research

From Open Source to Open Research

- Open Source Software
  - Sourcecode made available with a license in which the copyright holder provides the rights to study, change, and distribute the software to anyone and for any purpose. May be developed in a collaborative public manner
  - Great for bug fixing, continuity and learning.

From Open Source to Open Research

- Open Source Software
  - Sourcecode made available with a license in which the copyright holder provides the rights to study, change, and distribute the software to anyone and for any purpose. May be developed in a collaborative public manner
  - Great for bug fixing, continuity and learning.
- Community modeling
  - A community model is an open source component that is constructed and/or improved through the combined efforts of a “community” of individuals working together to develop, debug, calibrate, document, run and use the model. They include both developers and users, and may be distributed among a number of different institutions, organizations and geographic locations.

From Open Source to Open Research

From Open Source to Open Research

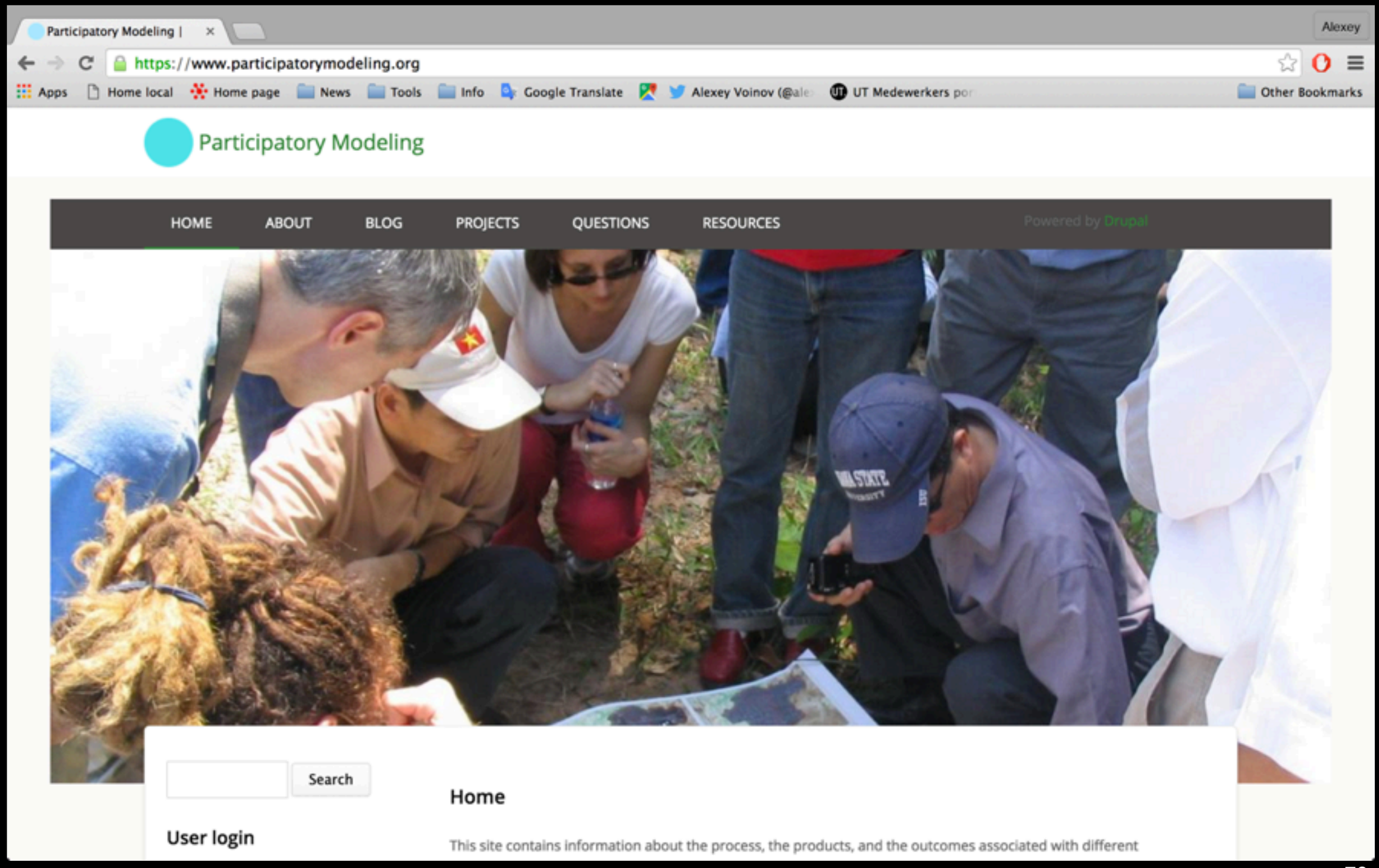
- Community of practice for PM
  - A community of practice is a group of people who share a craft and/or a profession

From Open Source to Open Research

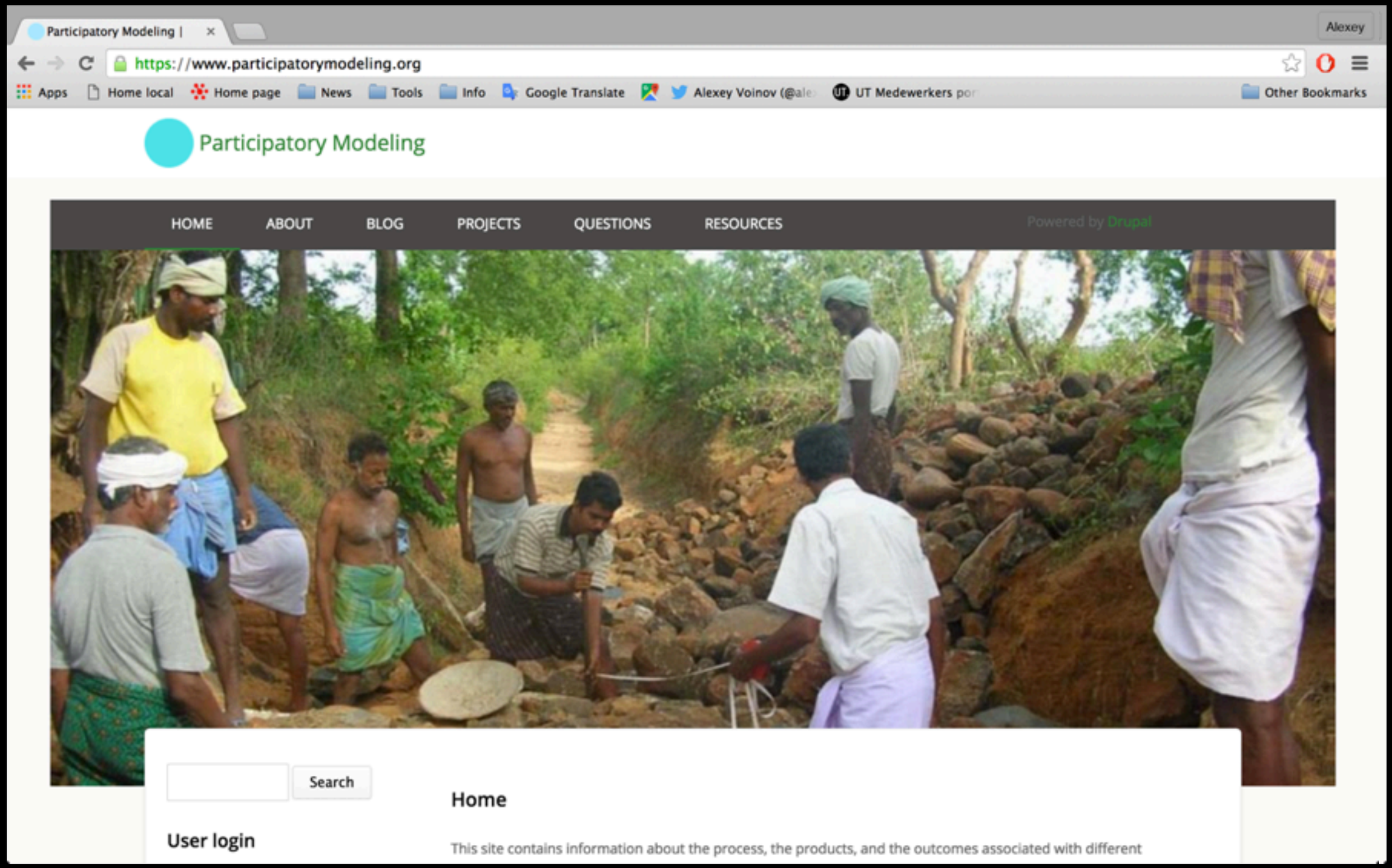
- Community of practice for PM
  - A community of practice is a group of people who share a craft and/or a profession
- SESYNC project: “Synergizing public participation and participatory modeling methods for action oriented outcomes”

www.participatorymodeling.org

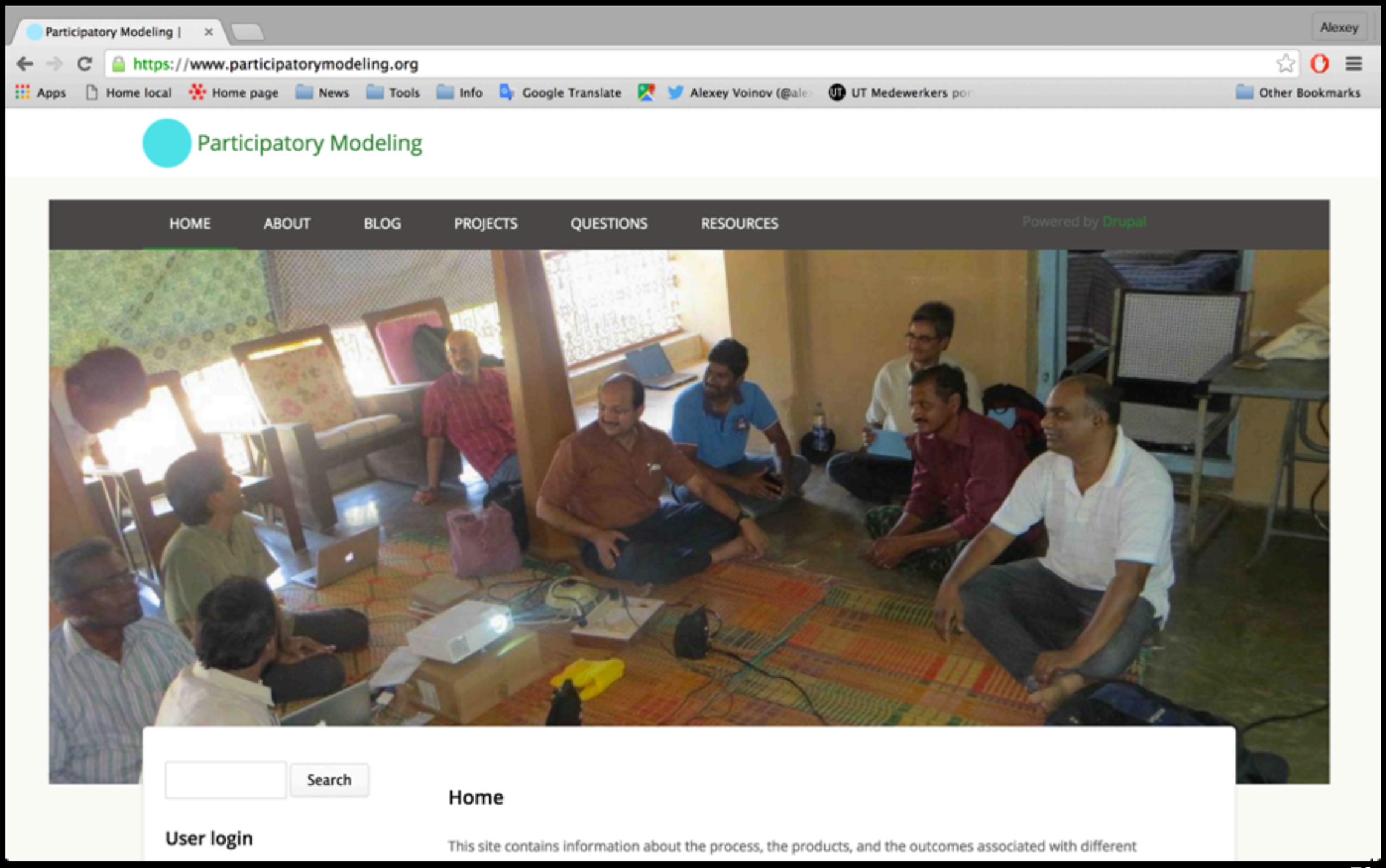
www.participatorymodeling.org



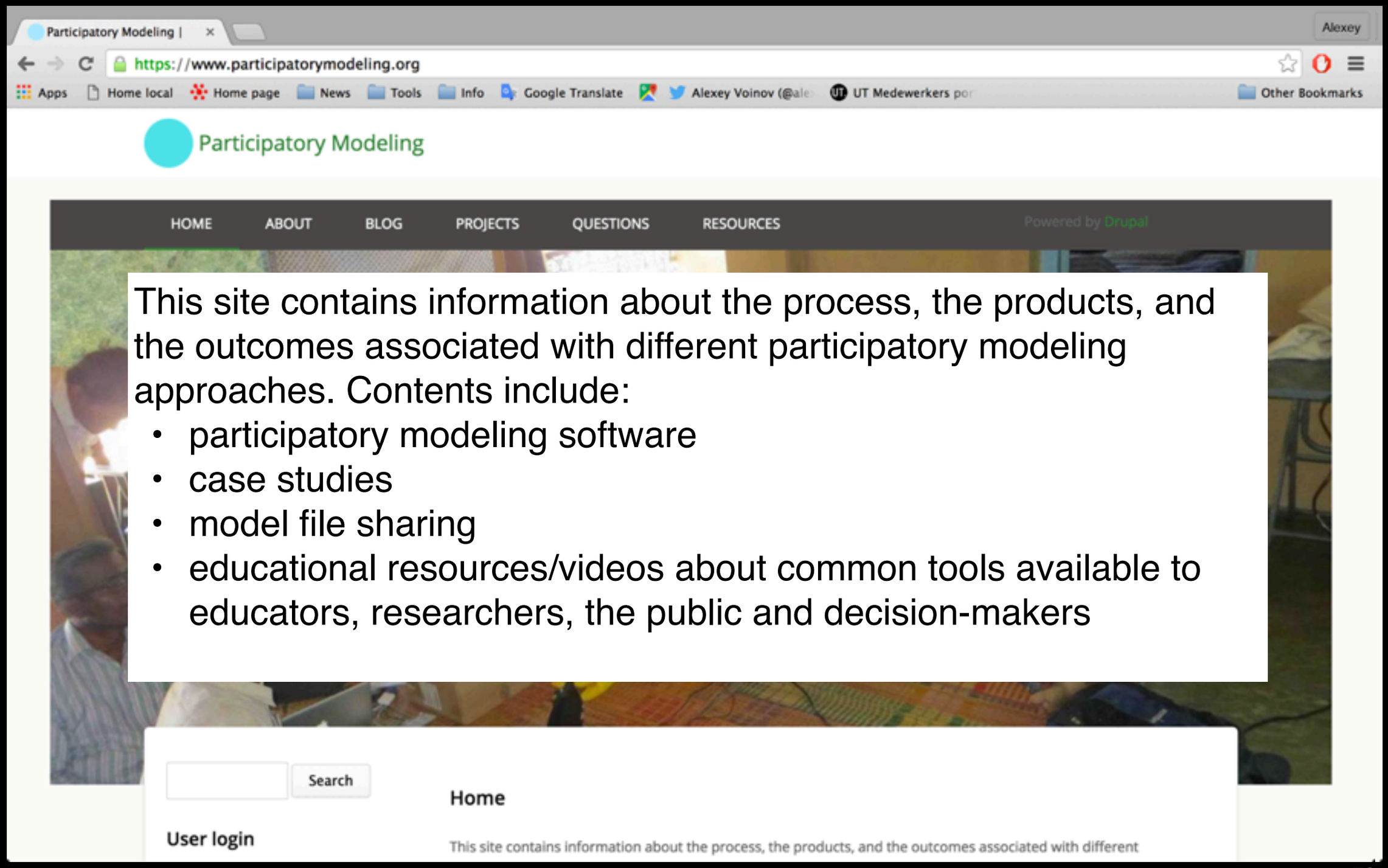
www.participatorymodeling.org



www.participatorymodeling.org



www.participatorymodeling.org



Conclusions

Conclusions

- If you want something to be done - do it

Conclusions

- If you want something to be done - do it
- Practice what you preach

Conclusions

- If you want something to be done - do it
- Practice what you preach
- Learn to integrate models, not just software

Conclusions

- If you want something to be done - do it
- Practice what you preach
- Learn to integrate models, not just software
- Beware of ‘integronsters’

Conclusions

- If you want something to be done - do it
- Practice what you preach
- Learn to integrate models, not just software
- Beware of ‘integronsters’
- Account for biases, values, perceptions

Conclusions

- If you want something to be done - do it
- Practice what you preach
- Learn to integrate models, not just software
- Beware of ‘integronsters’
- Account for biases, v
- Recognize the new i

Conclusions

- If you want something to be done - do it
- Practice what you preach
- Learn to integrate models, not just software
- Beware of ‘integronsters’
- Account for biases, values, perceptions
- Recognize the new information culture
- We are humans, we can be and we are manipulated

- "I know you think you understand what you thought I said but I'm not sure you realize that what you heard is not what I meant."

Alan Greenspan