

CMCC SEMINAR - WEBINAR

October 16, 2018 - h.12.00 pm CEST

The political dimension of climate science

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To investigate and model our **climate system** and its interactions with **society** to provide reliable, rigorous, and timely **scientific results**, which will in turn stimulate sustainable growth, protect the **environment**, and **develop science driven** adaptation and **mitigation policies** in a **changing climate**



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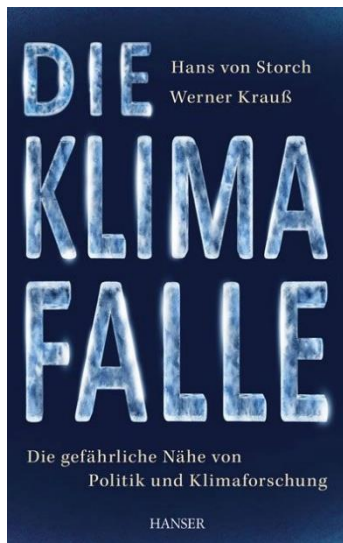


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Advanced study course on climate science

The political dimension of climate science – CUDOS vs. postnormal, or: Die Klimafalle



Hans von Storch

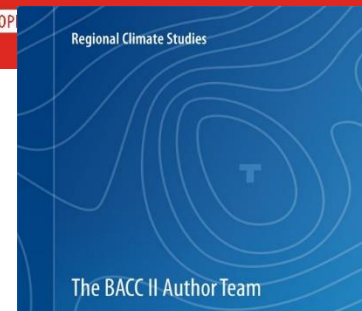
Helmholtz-Zentrum
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Two paradoxes form the nucleus of the problems of scientific expertise and policy-making. The first is the simultaneous scientification of politics and the politicisation of science. This has destructive effects: the increased use of scientific expertise by policy-makers has not increased the degree of certainty, in fact it becomes de-legitimizing. This gives rise to the second paradox: despite the loss of authority of scientific expertise, policy-makers do not abandon their reliance on existing advisory arrangements, nor do the scholars adapt their ideas on science and its relation to politics.

Weingart, P., 1999: Scientific expertise and political accountability: paradoxes of science in politics. *Science and Public Policy* 26, 151-161

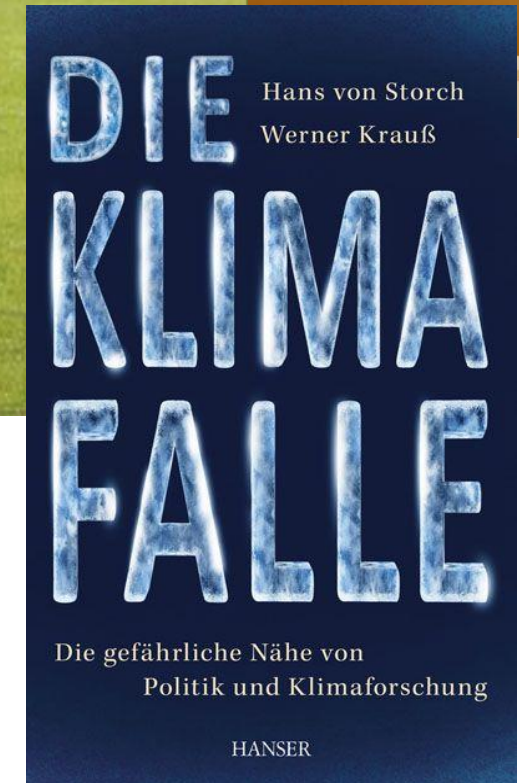
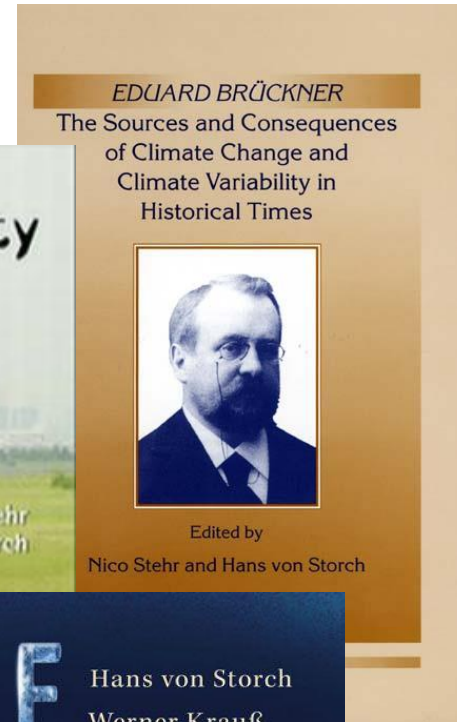
Hans von Storch

1. Climate researcher (in the field since 1971)
2. Coastal climate (storms, storm surges, waves; North and Baltic Sea, North Atlantic, Yellow Sea); statistical analysis
3. Director emeritus of the *Institute of Coastal Research of the Helmholtz Zentrum Geesthacht*, Germany
4. Professor at *Universität Hamburg* and at the *Ocean University of China*
5. Editor-in-chief of the *Oxford University Press Research Encyclopedia on Climate Science*
6. Lead author of IPCC AR3 and AR5.
7. Co-Chair of regional assessment reports Baltic Sea Catchment (BACC) and Hamburg
8. <http://www.hvonstorch.de/klima/>



Second Assessment
of Climate Change for
the Baltic Sea Basin

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Overview

1. **Science and society:** CUDOs norms of Merton, Klimafalle of von Storch and Krauss
2. **Knowledge competition:**
 - The present scientific construction
 - Dominant present cultural construction: Climate catastrophe
 - Cultural constructions: Nature strikes back
 - Skeptics
 - Outdated scientific constructions
3. **Science in Society:** Postnormality
4. The topology of political (and journalistic) **utility**

The issue is the interaction of society (public, policymaking and management economy, media) and of science.

Science is a social process, but is usually considered special in its ability to correctly deconstruct, analyze and describe complex phenomena.

How much do climate science and society steer each other? How independent are the different social spheres of people and concepts?

What does society expect from climate science? Which function should climate science have? – A kind of state-funded Greenpeace or elite circles based on conservative views and traditions? Or CUDOS-guided „Honest broker“?

Robert K Merton's **CUDOs** norms of scientific practice (1942)

- **Communalism**: the common ownership of scientific discoveries, according to which scientists give up intellectual property rights in exchange for recognition and esteem.
- **Universalism**: according to which claims to truth are evaluated in terms of universal or impersonal criteria, and not on the basis of race, class, gender, religion, or nationality.
- **Disinterestedness**: scientists, when presenting their work publicly, should do so without any prejudice or personal values and do so in an impersonal manner.
- **Organized skepticism**: all ideas must be tested and are subject to rigorous, structured community (peer review) scrutiny.

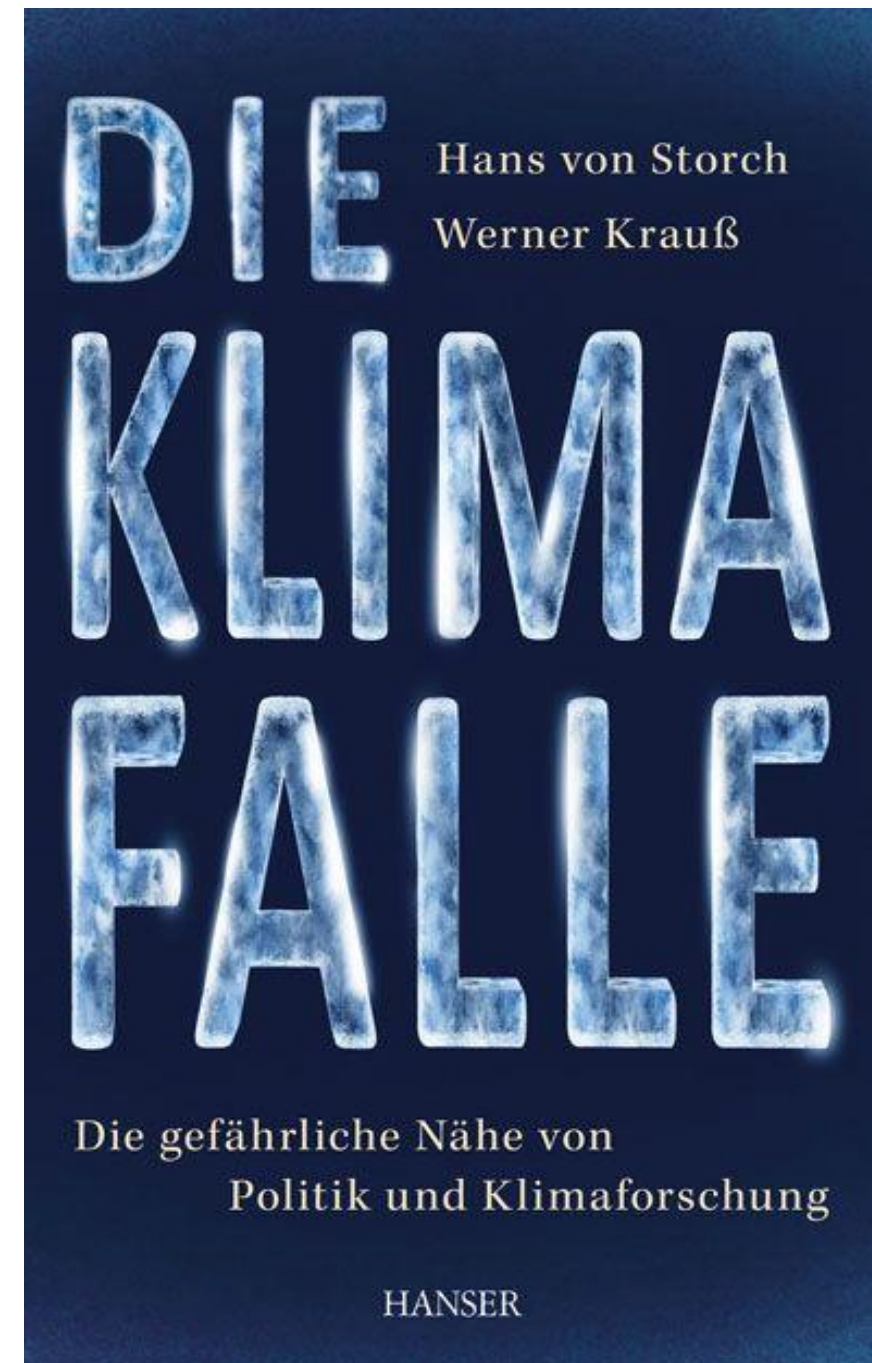
These norms are often violated – science does not follow comprehensively these rules (1,2), but climate scientists accept the norms as normative guideline . The data of an on-line survey of climate scientists (3) suggests that while CUDOs remain the overall guiding moral principles, they are not fully endorsed or present in the conduct of climate scientists.

1. Grundmann, R., 2012: "Climategate" and the Scientific Ethos Social Studies of Science. *Science Technology Human Values* DOI: 10.1177/0162243911432318,
2. Stehr, N. 1978: The norms of science revisited: social and cognitive norms. *Sociological Inquiry* 48: 172
3. Bray, D., and H. von Storch, 2015: The Normative Orientations of Climate Scientists. *Science and Engineering Ethics*, DOI 10.1007/s11948-014-9605-1

Die Klimafalle (climate trap)

For **society** and science

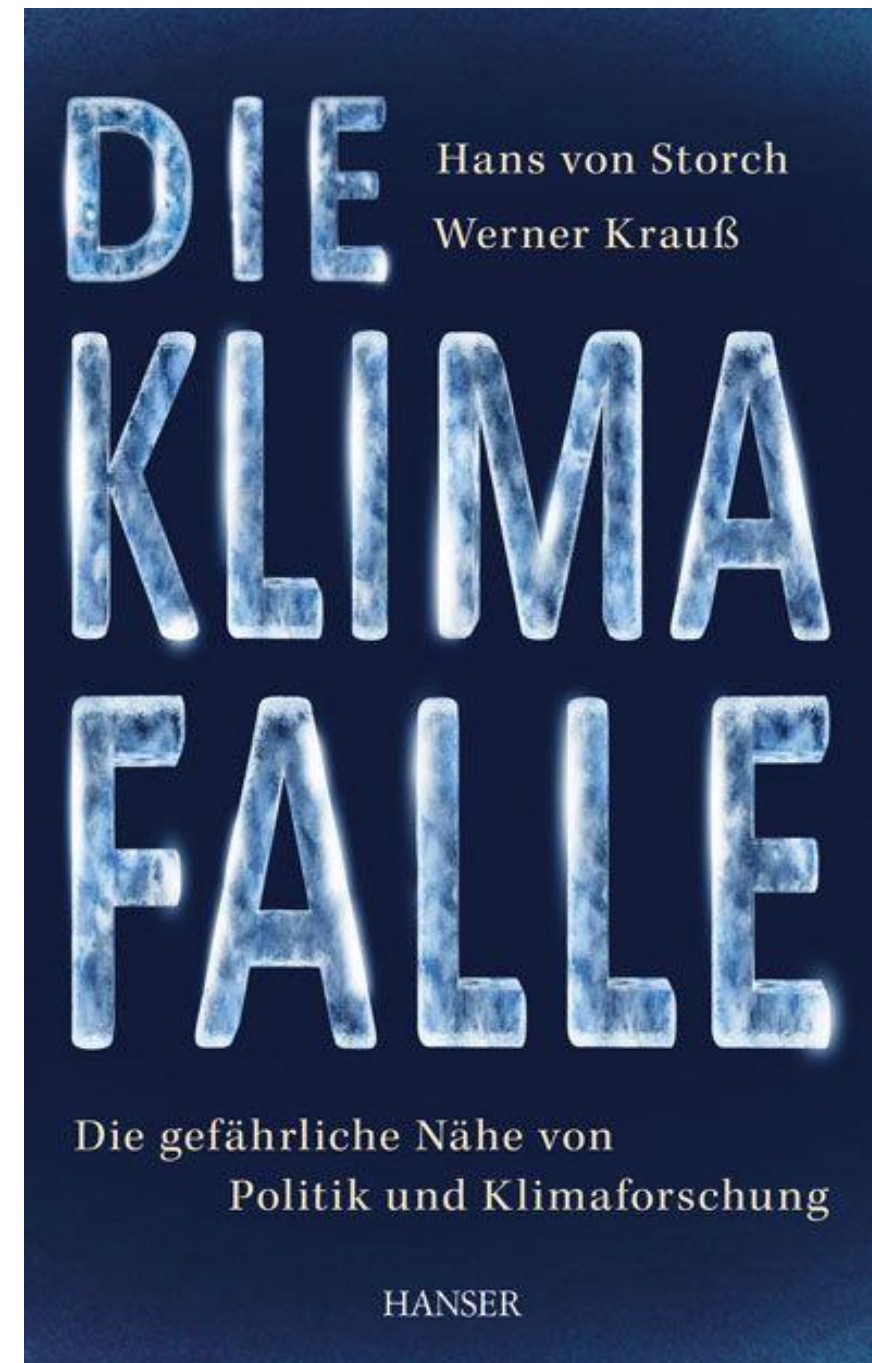
- Society pursues a normative goal, but perceives this goal as a scientifically legitimized imperative (climate protection policy, Paris' goal of maximum 1.5 or 2 K warming at the end of the 21st century).
- Since the goal represents a scientific conclusion („fact“), a political debate of this goal is not needed.
Opponents are morally inferior (bad, bribed).
Supporters act with the authority of science and morale.
- As a consequence, **policy-making is de-politicized**; the necessary political negotiations do not take place, and an efficient climate policy, carried by the whole society, is impossible.



Die Klimafalle (climate trap)

For society and **science**

- Climate science has identified a problem: anthropogenic climate change. It can inform, which climatic effects are connected with which climate policy implementations.
- Climate science is confronted with the claim that science would determine a policy, which is without alternative and must be coercively implemented. Thus, science becomes a warrantor of a moralist-conservative policy.
- Thus, a **politicization of science** takes place, which hinders an open and critical debate within climate science. The quality of climate science (e.g., in the sense of CUDOS) is reduced (cf. Waldsterben).



Knowledge competition:

- The present scientific construction
- Dominant present cultural construction: Climate catastrophe
- Cultural constructions: Nature strikes back
- Skeptics
- Outdated scientific constructions

Note: The term “construction” does not imply that this process would be arbitrary, or would be done with the intention of fraud, misrepresentation or other manipulative purposes.

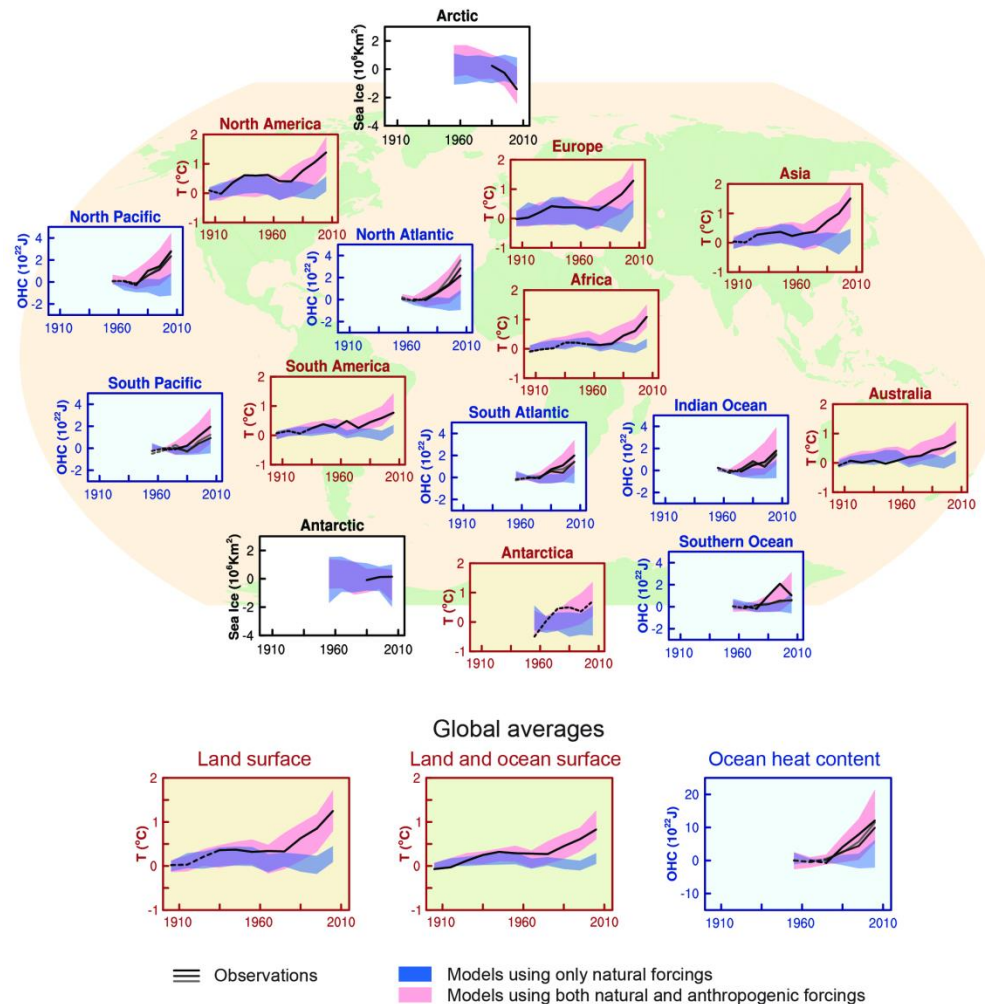
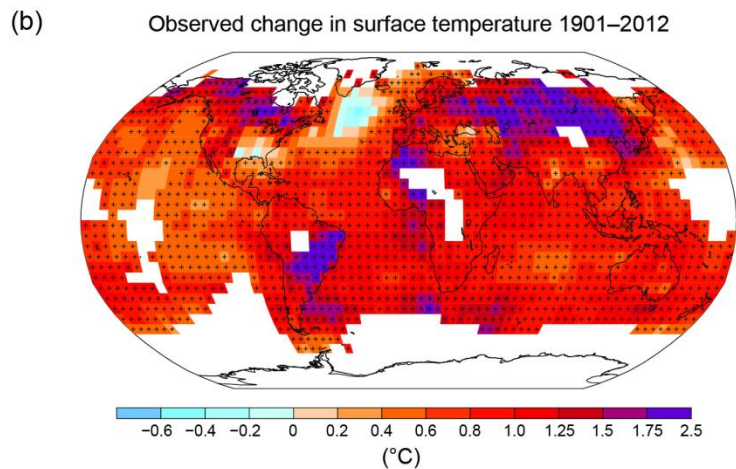
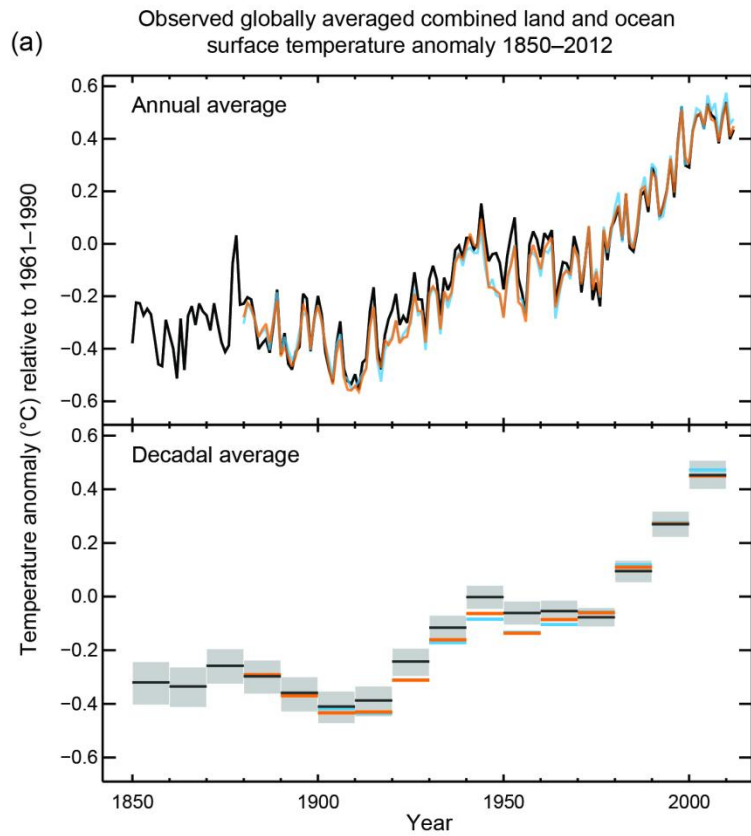
The terms reminds on the fact that conclusions and new understandings are built in consistence with earlier findings and understanding.

Knowledge competition: The present scientific construction

Within the scientific community there is consensus:

- There is a **global warming**, which is **inconsistent with internal causes** (detection)
- Thus, the warming needs an explanation with **external causes**. Only when **greenhouse gases** are considered a dominant driver, a consistent explanation can be found (attribution)
- The change manifests itself in the **thermal regime**, in **sea level** rise and, plausibly, in more heavy rainfall events.
- Many **details** are uncertain, such as
 - the speed of rise of global sea level and of temperature,
 - the regional and local manifestations, and
 - the co-effect of different “drivers” (say, greenhouse gases, aerosols, land use change incl. urban effects)

This scientific construction of the anthropogenic climate change is broadly supported among climate scientists. It is documented by the collective efforts of the [Intergovernmental Panel on Climate Change \(IPCC\)](#).



Key finding of Working Group I of the IPCC.

- Temperatures rise almost everywhere, however with different speeds.
- Without a dominant contribution by Greenhouse gases an explanation of this warming is not possible.

The assertion „the science is settled“ is misleading, since many aspects of climate change are still in dispute.

such as

- Change of windstorms (frequency, intensity)
- Speed of increase of sea level
- Future of ice bears
- Frequency of health problems related to kidney stones
- Frequency of depressions.

Knowledge competition

Dominant present cultural construction:
Climate catastrophe

According to this construction, climate is changing because of human activities, such as deforestation. The weather is less reliable than in earlier times; the seasons are unsteady, storms more violent. Climatic extremes take on catastrophic, never seen dimensions.

The factors, leading to this change, are related to „our greed and stupidity“. Sometimes, justice is a significant mechanism, sometimes the revenge of nature for human environmental sins (see below). Sometimes these changes reflect good's wrath.

This climate catastrophe may be averted by keeping the change within the 2° limit. Reaching this goal depends crucially on the engagement of the individuals (abstinence of air travel, usage of bikes, vegetarian food; good example for other people.)

OUR DROWNING WORLD

Population, Pollution and Future Weather

Antony Milne, Environmental Scientist, believes that before long we shall be engulfed, quite literally, by the consequences of our greed and stupidity. Nearly two thirds of our earth could disappear under polar ice cap water, melting as a result of ozone depletion and deforestation, For this will be the inevitable outcome of industrialisation, urbanisation, over-population and the accompanying pollution.

The author has amassed evidence from all over the world to support his apocalyptic thesis. Catastrophe, however, is unlikely to be averted because of inertia, myopia and unenlightened self-interest, both national and transnational.

Contents

Part One: The Urban Hothouse

Exploding Megacities, The Urban Heat Bomb, The Hot Skies, The Balding Earth, The Greenhouse Effect.

Part Two: The Coming Floodwave

The Warming Warning, The Cosmic Connection, The Disintegration of Antarctica, The Floodwave Effect, Floodshock.

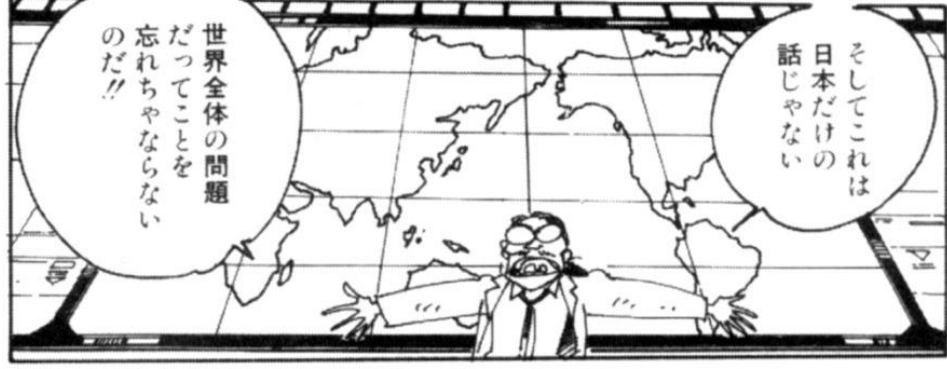
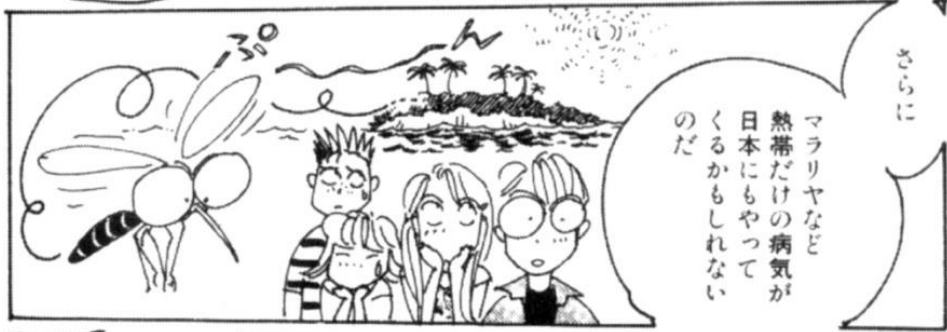
Antony Milne is a science writer and researcher specialising in the geographical sciences. He is a past Research Fellow in environmental economics and physics, and is now a member of the Institution of Environmental Sciences. Among his other books are *Noise Pollution*, *Floodshock* and *London's Drowning*.

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EUROPA 2100: ALLES WÜSTE



NO-Klima-Studie: Bald steht London unter Wasser und Mitteleuropa droht die Versteppung Klimakatastrophe ist nicht aufzuhalten

Die Klimakatastrophe ist unaufhaltbar. Temperaturen steigen unaufhaltsam, ganze Städte versinken im Wasser, Gletscher schmelzen weg.

Das Horrorscheenarion des Jahres 2100: London, Amsterdam und New York stehen unter Wasser. Südeuropa ist eine Wüstenlandschaft. Die heimischen Gletscher sind auf 30 Prozent ihrer jetzigen Größe zusammengeschrumpft.

Eine bisher streng geheim gehaltene UN-Klima-Studie alarmiert. Besorgniserregender Inhalt: Bis zum Jahr 2100 wird es weltweit im Durchschnitt um drei Grad wärmer. Das klingt vielleicht nicht bedrohlich, aber jede kleinste Temperaturschwankung hat enorme Auswirkungen. So war die Eiszelt nur fünf Grad kälter als heute.

Am Freitag herrschte Aufmerksamkeit in der UNO-Generallversammlung. Margaret Beckett, die britische Staatssekretärin im Außenamt, trat als Rednerpult: „Wir können uns nicht mehr retten vor den schrecklichen Auswirkungen. Auch europäische Millionenstädte werden unter Wasser stehen.“ In der Studie finden sich weitere Horror-Details: Die Arktis wird im Sommer eisfrei, heute fruchtbare Gebiete werden bald veröden und Südeuropa wird einer Wüste gleichen. An dieser Studie haben hunderte Wissenschaftler weltweit fünf Jahre lang gearbeitet.

Emissionen hauptschuldig. Die Hauptursache für diesen Hitzesturz liegt in dem rasanten Anstieg der Treibhausgas. Die moderne Industrie und der private Verkehr tragen die Schuld an der Klimamiserie. Ohne Pause werden gefährliche Emissionen ausgestoßen.

Lösung? Auch wenn heute die Emissionen auf null gesenkt werden könnten, es würde nichts helfen. Die Temperaturen würden trotzdem unaufhaltsam um 0,5 Grad steigen. Die Realität lässt aber vorerst keinen Optimismus zu: Länder wie China und Indien erhöhen gerade ihren Ausstoß an Klimakillern Jahr für Jahr drastisch.

Notfallplan. Der Plan der Europäischen Union und der UNO sieht eine Reduktion der Erderwärmung um 2 Grad vor. Experten sehen ein Emissions-Einsparungspotenzial von 50 Prozent. Da hilft es aber nicht, wenn nur die Privaten ihre Autofahrten einschränken, die gesamte Industrie muss umdenken – weg von fossilen Brennstoffen hin zu erneuerbaren Energieformen.

Sorge herrscht nach dieser Studie auch im österreichischen Landwirtschaftsministerium. Minister Josef Pröll will den Anteil an er-

Info-Box Bedrohte Regionen

Bei einer Erderwärmung, wie sie für das Jahr 2100 prognostiziert wird, ist in Südamerika die Trinkwasserversorgung in Gefahr. Die Küstengebiete werden sich stark verändern, dass die Länder wahrscheinlich nicht mehr auf Einnahmen aus dem Tourismus hoffen können.

Besonders bedroht: Costa Rica und Ecuador. In den Polarregionen wird die Eisfläche jährlich um 30 Prozent wegschmelzen. Die Flächen, die derzeit von Dauerfrost bedeckt sind, werden bis 2100 auf ein Zehntel ihrer jetzigen Größe geschrumpft sein.

neuerbarer Energie verdoppeln und den Anteil von Biosprit bei Treibstoffen auf 20 Prozent erhöhen: „Bereits die Katastrophe in New Orleans vor einem Jahr hat uns dramatisch vor Augen geführt, was Klimawandel bedeutet.“ Wenn nicht, drohen auch Österreich ungeahnte Risiken: Hitzewellen von ungekannter Intensität, Dürreperioden und Umweltkatastrophen. Dann werden Sommer mit deutlich über 40 Grad und tropische Nächte in unseren Breiten keine Seltenheit. Das prognostizieren Forscher des Max-Planck-Instituts in Deutschland.

Die Landwirtschaft wird am meisten leiden: Dürreperioden, Ernteeausfälle und eine Ausbreitung von Insekten in Mittel- und Südeuropa. Im UN-Bericht machen sich auch die Wissenschaftler große Sorgen: „Die Hälfte der europäischen Pflanzenwelt ist durch den Klimawandel gefährdet oder vom Aussterben bedroht.“

ÖSTERREICH: Welche Städte trifft es am stärksten?

Klimaforscherin Kromp-Kolb: Erderwärmung ist bedrohlich



Helga Kromp-Kolb spricht über Klimawirkungen auf Landwirtschaft und Tourismus.

ÖSTERREICH: Wie sehen Sie den neuen UN-Bericht?

KROMP-KOLB: Der Bericht ist eine gute Analyse. Wir wissen, dass der Klimawandel bedrohliche Ausmaße annimmt. Die Änderungen passieren aber rascher, als wir dachten.

ÖSTERREICH: Werden künftig Palmen in unseren heimischen Gärten wachsen?

KROMP-KOLB: Nein, es wird weiterhin kalte Winter geben. Aber Anpassungen sind notwendig. Je längerfristiger die landwirtschaftlichen Investitionen – etwa beim Wald oder bei Weinbergen – desto wichtiger die Planung: Soll der Weingarten erneuert werden oder nicht? Hat der Bach noch genügend Wasser? Der Hochwasserschutz muss für die Klimaverhältnisse in nächsten 50 bis 100 Jahren gebaut werden, nicht für die derzeitigen. Der Klimawandel betrifft auch die Architektur: Häuser werden für einige Jahrzehnte gebaut.

„Meeresspiegel können um 4 Meter steigen.“

Helga Kromp-Kolb

KROMP-KOLB: Der Meeresspiegel könnte bis zur Jahrhundertwende um 4 m steigen, das heißt in den nächsten 25 Jahren grob um einen Meter. Küstenstädte wie London oder Venedig sind stark betroffen.

„Berggipfel werden brüchig.“

Helga Kromp-Kolb

ÖSTERREICH: Welche Regionen sind am meisten bedroht?

KROMP-KOLB: Die Erwärmung nimmt an den Polen und landeinwärts zu: In Europa ist z.B. Skandinavien stark betroffen. In den vergangenen 50 Jahren betrug die Erwärmung global 0,6 Grad Celsius, in Österreich 1,8 Grad Celsius, in Alaska 4 Grad Celsius. Wenn Infrastruktur auf gefrorenem Boden steht, kann das gefährlich werden. So war das Sonnblick-Observatorium gefährdet, weil der Gipfel brüchig geworden ist. In den Alpen nehmen Felsstürze und Muren zu.

ÖSTERREICH: Welche Städte trifft es am stärksten?

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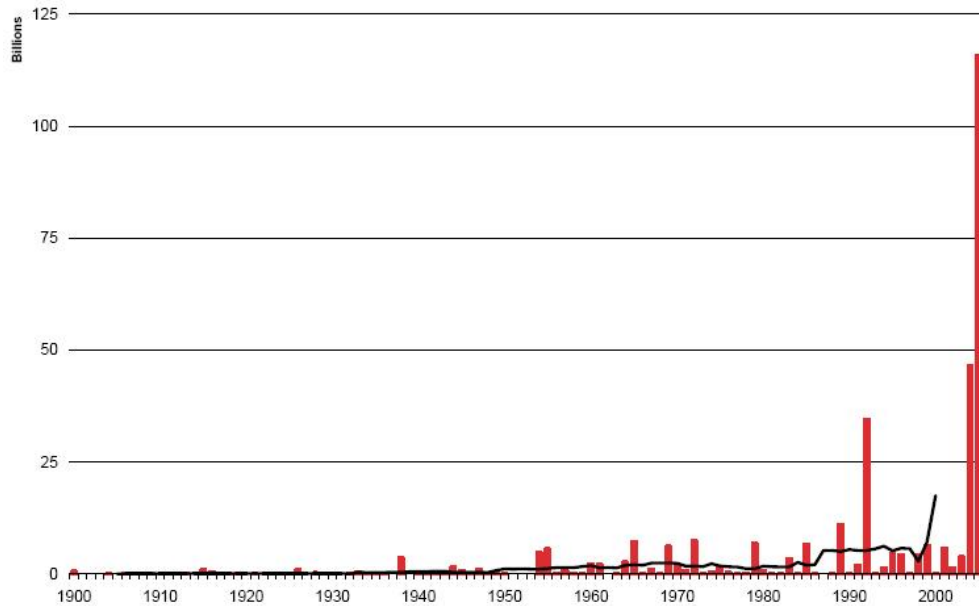
129,-

Europas Pflanzenwelt ist gefährdet.

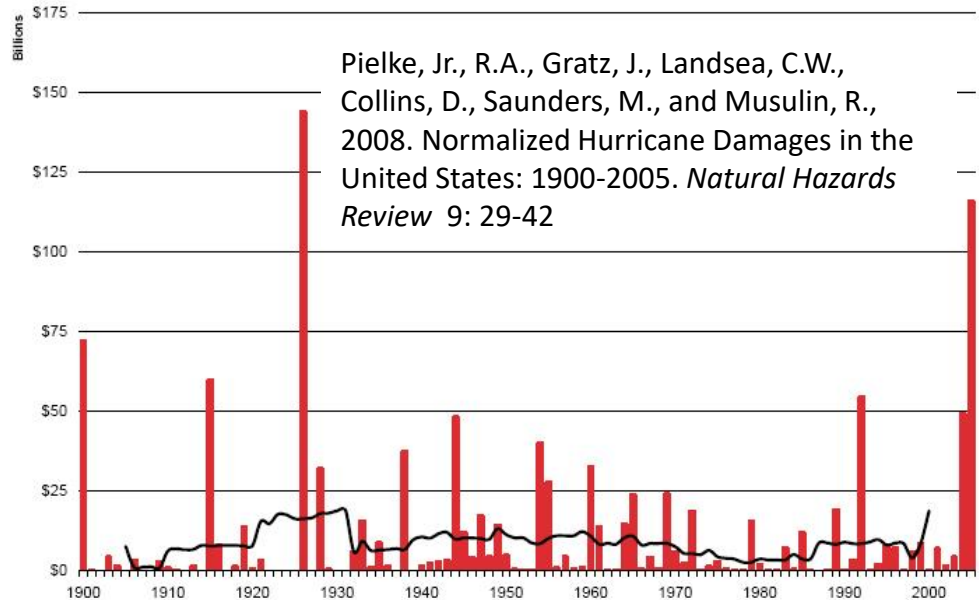
Michael Pollack

Elisabeth Hirt

Total Losses per Year from Atlantic Tropical Cyclones in 2005 Dollars
(11-year centered average)

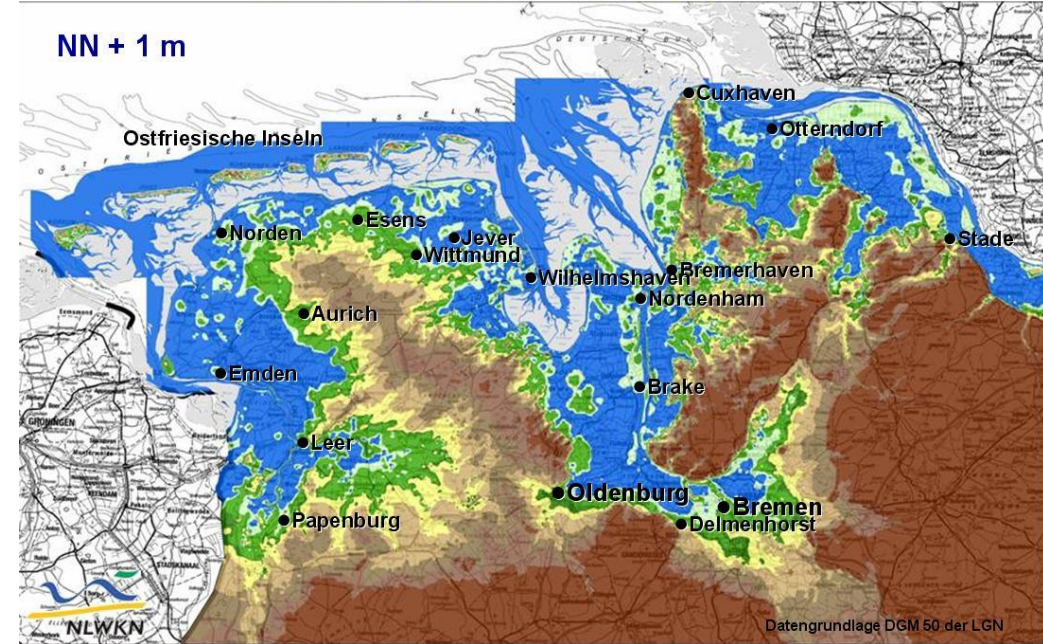


CL05 Normalized Losses per Year from Atlantic Tropical Cyclones
(11-year centered average)



Pielke, Jr., R.A., Gratz, J., Landsea, C.W., Collins, D., Saunders, M., and Musulin, R., 2008. Normalized Hurricane Damages in the United States: 1900-2005. *Natural Hazards Review* 9: 29-42

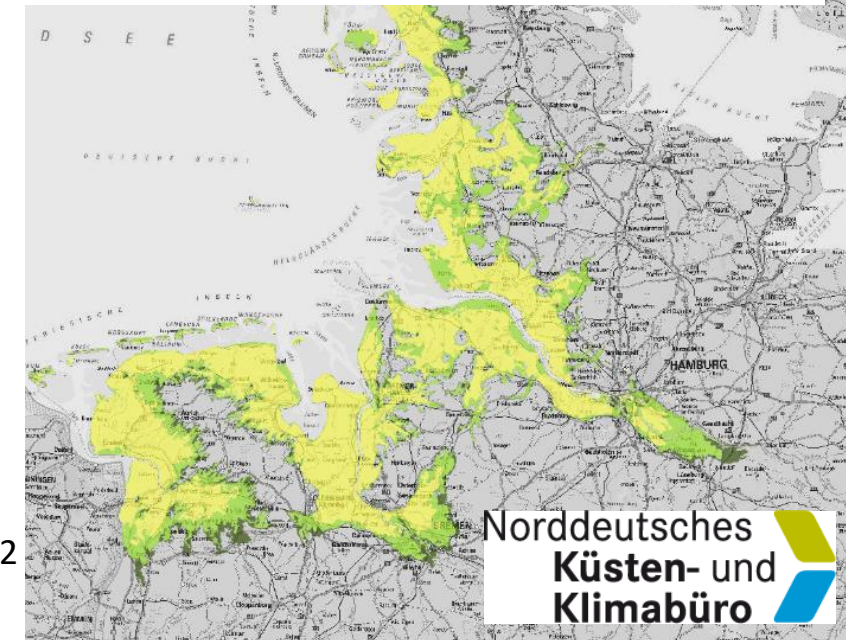
Das Küstengebiet in Niedersachsen



<http://www.sturmfluten-klimawandel.de>

- Which areas are presently protected by coastal defense systems?
- Which areas may be threatened if coastal defense fails?

Yellow: present high tide level
Light green: storm surge 16.2.1962
Dark green: 16.2.1962 + 1,10 m



Norddeutsches
Küsten- und
Klimabüro

Knowledge competition

Cultural constructions: Nature strikes back

Historically, the view that „higher powers“ use weather for punishing and giving directions is very old. Such weather, in particular catastrophes, would punish a sinful society, and express a divine demand for a religiously or environmentally sound life.

Thus, „nature“ becomes an indicator of the dispersion and the intensity of sinful behavior.

Originally the „higher powers“ were gods, in modern times it is more often „the environment“.

UK storms are divine retribution for gay marriage laws, says Ukip councillor

Former Tory David Silvester says 'natural disasters' are result of David Cameron acting 'arrogantly against the Gospel'

Press Association

theguardian.com, Saturday 18 January 2014 15:07 GMT



Henley-on-Thames riverside properties partially submerged in floodwaters: Silvester says it is the prime minister's fault that large swaths of the nation have been afflicted by storms and floods. Photograph: Toby Melville/Reuters

Ovädret lamslår stora områden i Europa. I Prag evakueras 50 000 människor i de centrala delarna av staden. I Sverige pratar folk om den "onormalt varma sommaren". Samtidigt sprider sig oron för att det dramatiska vädret beror på växthuseffekten.

Naturen slår tillbaka våldsamt

DE HÄFTIGA REGNEN och de förödande översvämningarna i dess spår stämmer precis med vad den förstärkta växthuseffekten ska resultera i. Den sköna värmen denna och flera andra somrar de senaste tio åren passar också som hand i hand i forskarnas modeller för en pågående klimatförändring. Men detta är ändå inga säkra bevis på att växthuseffekten orsakat sommarens katastrofer. Regnen på vårt klot har alltid varit mer eller mindre våldsamma. Revolutionsåret 1789 fick till exempel Östlandet i

Norge ta emot häftiga regn som saknar sitt motstycke i modern tid. En del av oss minns somrar på 1950-talet som känns helt i klass med årets.

Men extremt väder har väl ändå blivit vanligare?

–Det finns ingen statistik som visar att häftiga regn, stormar och andra extrema vädersituationer blivit vanligare, svarar man på SMHI.

Det är alltså inte i vad vi själva ser och minns vi kan finna stöd för att dagens våldsamma väder är en följd av klimatförändringen. Men det finns, inte

Analys/Lars-Ingmar Karlsson



"De ökande utsläppen av koldioxid och andra växthusgaser lägger sig kring jorden som ett våtvarmt omslag."

minst i rapporterna från IPCC, den forskarspäckade klimatpanelen i FN:s regi:

- Snötäcket på norra halvklotet har minskat med tio procent sedan slutet av 1960-talet.
- Havsytan kring Arktis längst i norr krymper liksom världens mindre glaciärer.

- Havsytan har stigit med en till två decimeter under 1900-talet.

FÖR ETT PAR VECKOR sedan kom en färsk brittisk forskarrapport om att det första halvåret i år varit det varmaste sedan mitten av 1800-talet på norra halvklotet.

–Det finns inget som talar

emot att klimatet håller på att förändras, säger Markku Rummuainen, chef för det svenska klimatprojektet Sweclim.

Det är så långt som forskarna vill gå när det gäller "bevisen" om att deras modeller om växthuseffekten stämmer. Men i praktiken är de flesta klimatforskare tämligen säkra på att de ökande utsläppen av koldioxid och andra växthusgaser lägger sig kring jorden som ett våtvarmt omslag.

Och att de här gaserna förstärker våldsamma regn, stormar, torkar och andra mer ex-

trema vädersituationer med katastrofala följder för dem som drabbas.

Forskarnas modeller har accepterats av allt fler. Inte ens den amerikanske presidenten George W Bush lägger ner någon stor energi på att ifrågasätta klimatförändringen.

TROTS ATT TECKNEN hopar sig på att vi själva och vårt sätt att leva är orsak till klimatförändringen och dess förödande följder – där Tjeckien kan vara ett exempel – är problemen långt ifrån lösta.

Alla länder utom USA har nu mer eller mindre frivilligt gått med på att begränsa sina utsläpp enligt klimatavtalet från Kyoto 1997. Att minska koldioxidutsläppen upplevs alltid av något land som alltför stora uppoffringar.

I den tyska valrörelsen har både inrikesministern Otto Schily och miljöministern Jürgen Trittin påpekat behovet att skydda miljön. Så konkret brukar sällan klimatförändringen behandlas i ett val.

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Knowledge competition

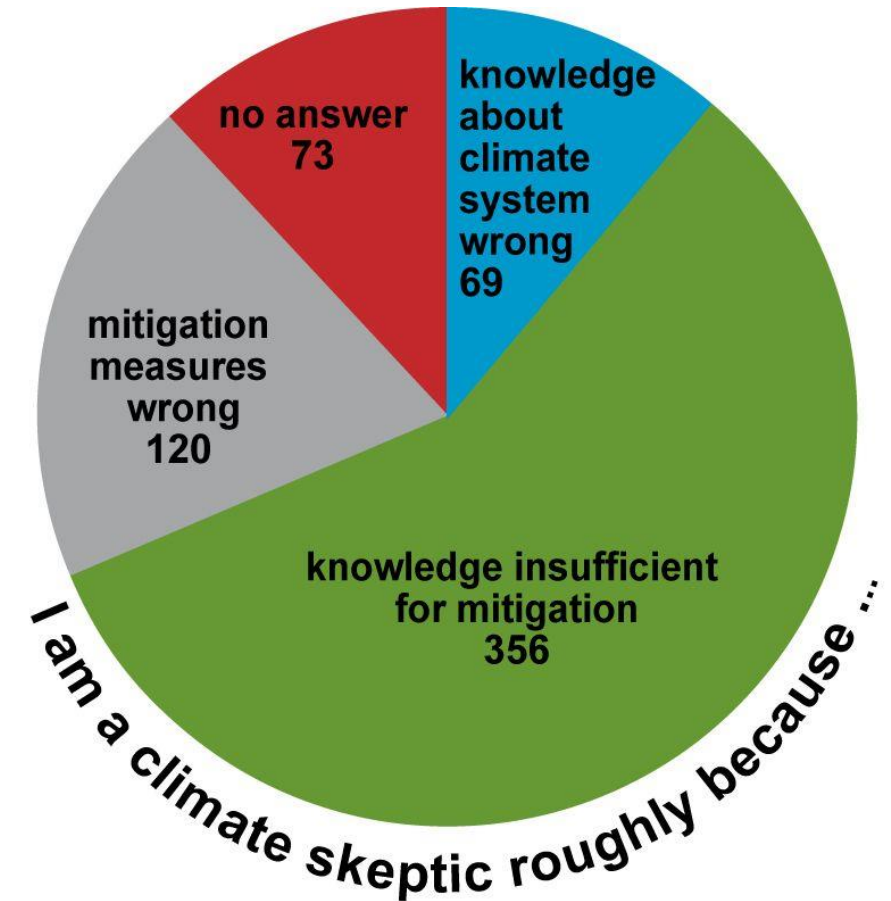
Skeptics

A large variety of perceptions exist according to which the dominant explanations about climate change and its anthropogenic sources as well as the dominant political „solutions“ are flawed.

Frequent views claim

- that there is no human driver behind the increase of GHG concentrations, or
- that the temperature (etc.) response to this increase is strongly overestimated, or
- that the impacts of the climate change would be benevolent and hardly malevolent.

These perceptions share the conclusion that a massive mitigation of emissions is not needed; instead a hidden political agenda of socialization, uniformization and surveillance society would be pursued.



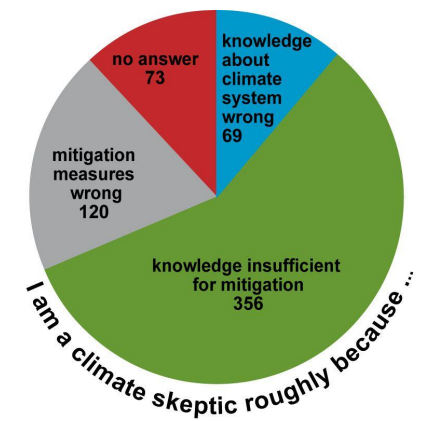
Survey among readers of the dormant weblog "Klimazwiebel";
not representative



The claim

„Knowledge about climate system wrong“

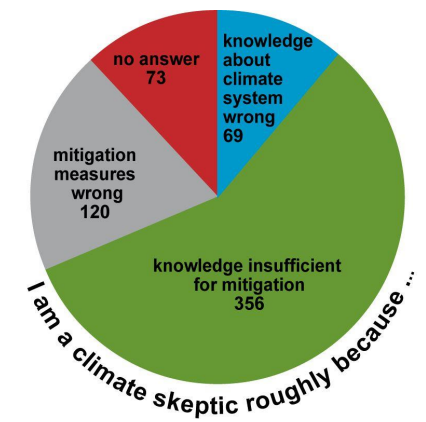
- Key knowledge of **classical scientific disciplines** are not taken into account. Example: Geology has long shown that massive climate change is a common and recurrent phenomenon in Earth history; the present change would therefore not be anything new nor alarming.
- Climate scientists would downplay existing uncertainties; alternative explanations would not receive the deserved attention – while at the same time, few uncertainties are attached to these alternatives (e.g., Vahrenholt in Germany, on the role of the sun).
- Skeptics share with alarmists their demand for authority on explaining and drawing societal conclusions. Obviously, their explanations and conclusions are different, but scientists shall have interpretive dominance („Deutungshoheit“).



The claim

„Knowledge insufficient for mitigation“

- Based on the alleged primacy of science over policymaking: Scientific insight would determine „right“ or „optimal“ policy.
- A view shared by alarmists.
- However, in democratic regimes, political conclusions are not **determined** by scientific conclusions, but only (to some extent) **conditioned** by scientific assessments of alternative options.
- Political propositions are determined by political (societal) preferences, which often are camouflaged as scientific necessities.



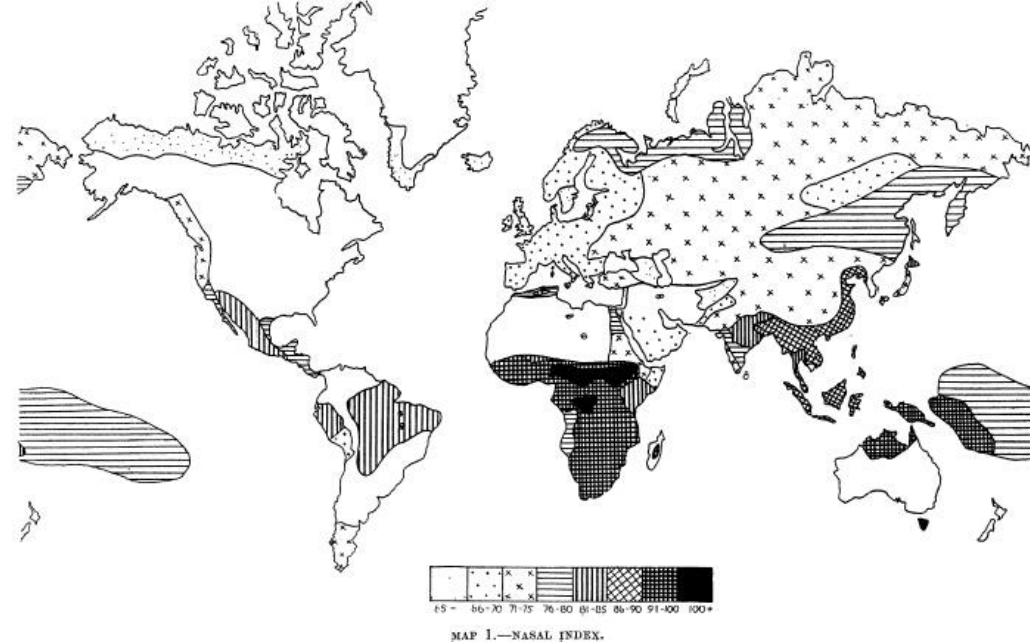
Knowledge competition

Outdated scientific constructions

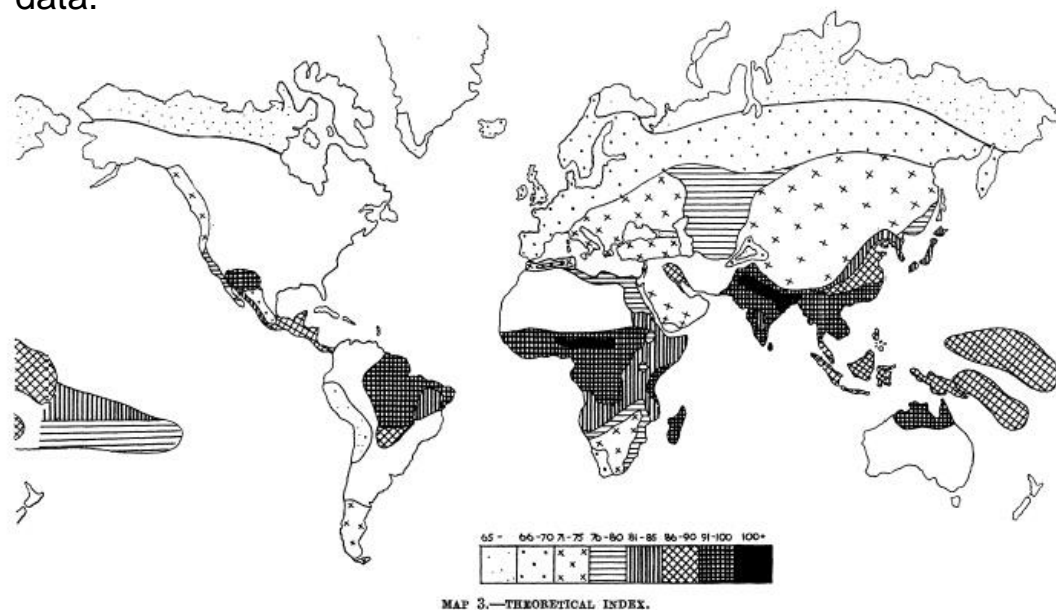
Climatic determinism – climate as a key factor determining the development and fall of civilizations, the level of criminal activity, for the superiority of certain world regions, for societal violence, ability to learn and usage of libraries. This theory was used as a legitimation of colonialism, and is implicit in scenarios of contemporary climate change scenarios.

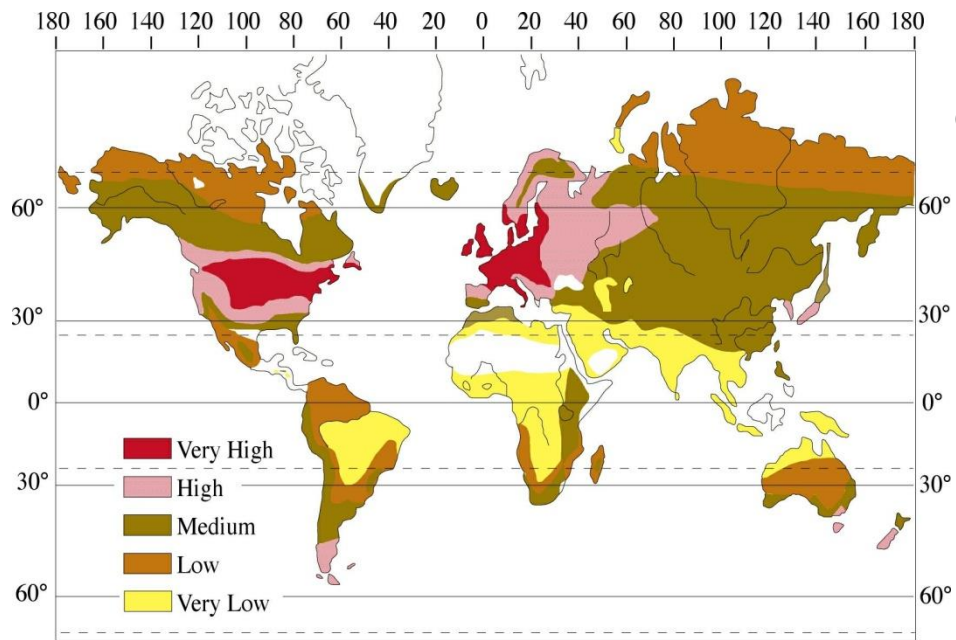
Humans have to live in „harmony“ with „their“ climate; any disturbance of this balance will lead to serious repercussions in the life of people and the success of civilizations.

Stehr, N., and H. von Storch, 1999: An anatomy of climate determinism. In: H. Kaupen-Haas (Ed.): *Wissenschaftlicher Rassismus - Analysen einer Kontinuität in den Human- und Naturwissenschaften*. Campus-Verlag Frankfurt.a.M. - New York (1999), 137-185, ISBN 3-593-36228-7

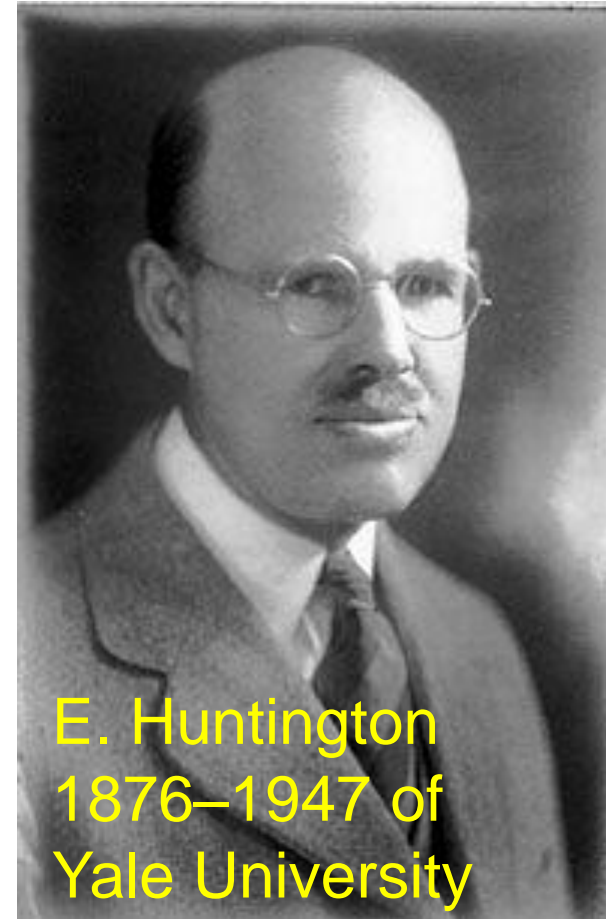
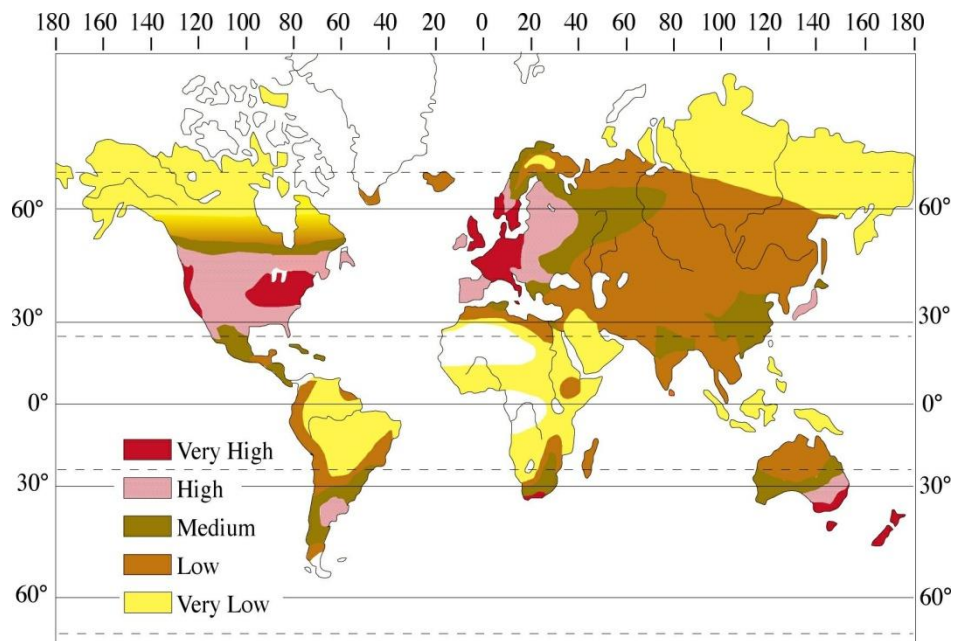


Davies' (1923, 1929 and 1932) „nose index“ derived from observations and estimated from temperature and humidity data.





Map of „mental energy“ conditioned by climatic conditions



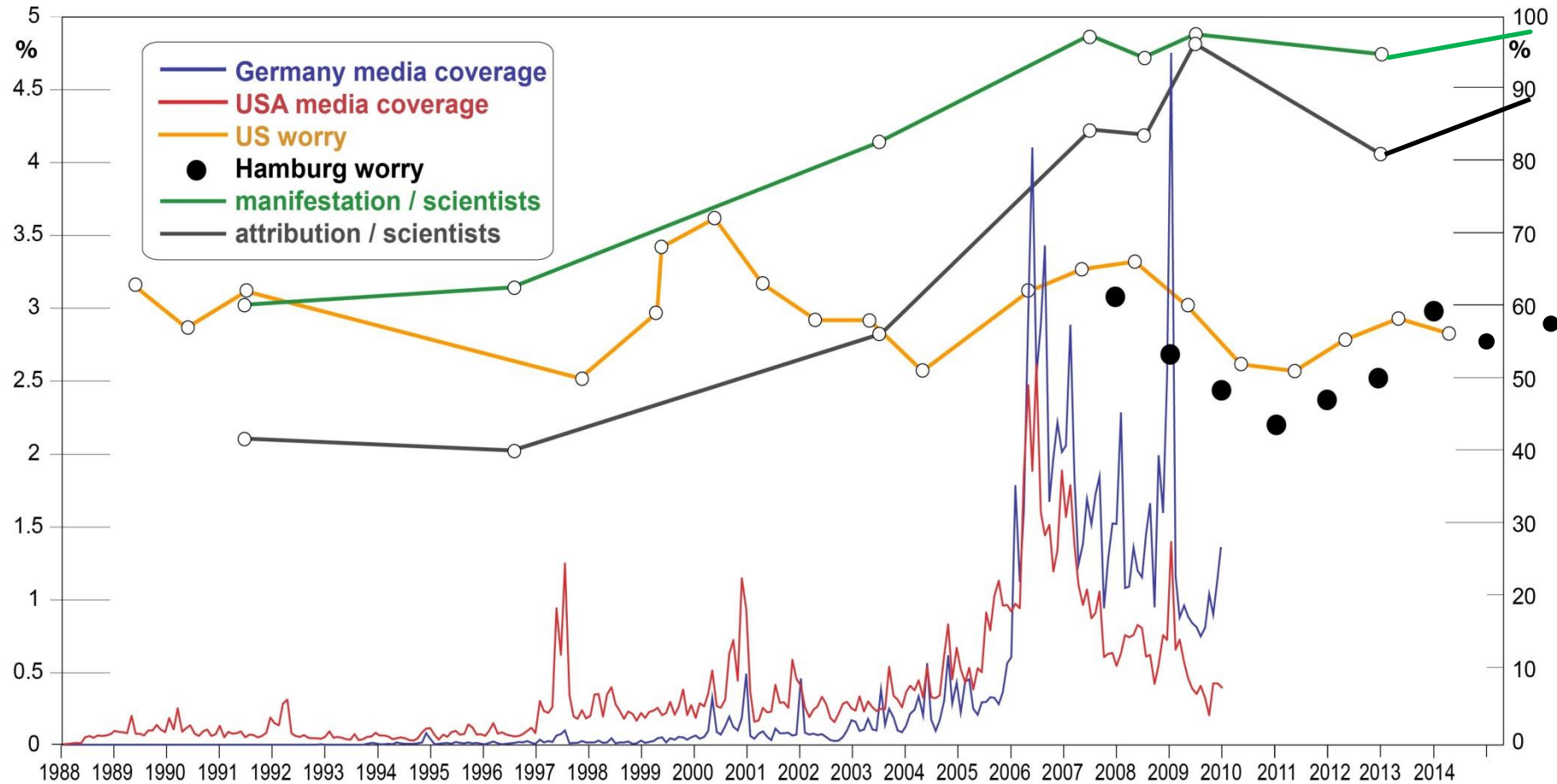
Distribution of civilizations in 1916, according to expert opinion.

Knowledge market

- The science-policy/public interaction is not an issue of „knowledge speaks to power“.
- The problem is not that the public is stupid or uneducated.
- A problem is that the scientific knowledge is confronted on the „explanation marked“ with other forms of knowledge (pre-scientific, outdated, traditional, morphed by different interests). Scientific knowledge does not necessarily “win” this competition.
- Problem is that science is presented as if there is a well-defined problem, which needs one specific “solution”.
- The social process „science“ is influenced by these other knowledge forms.

Science in Society

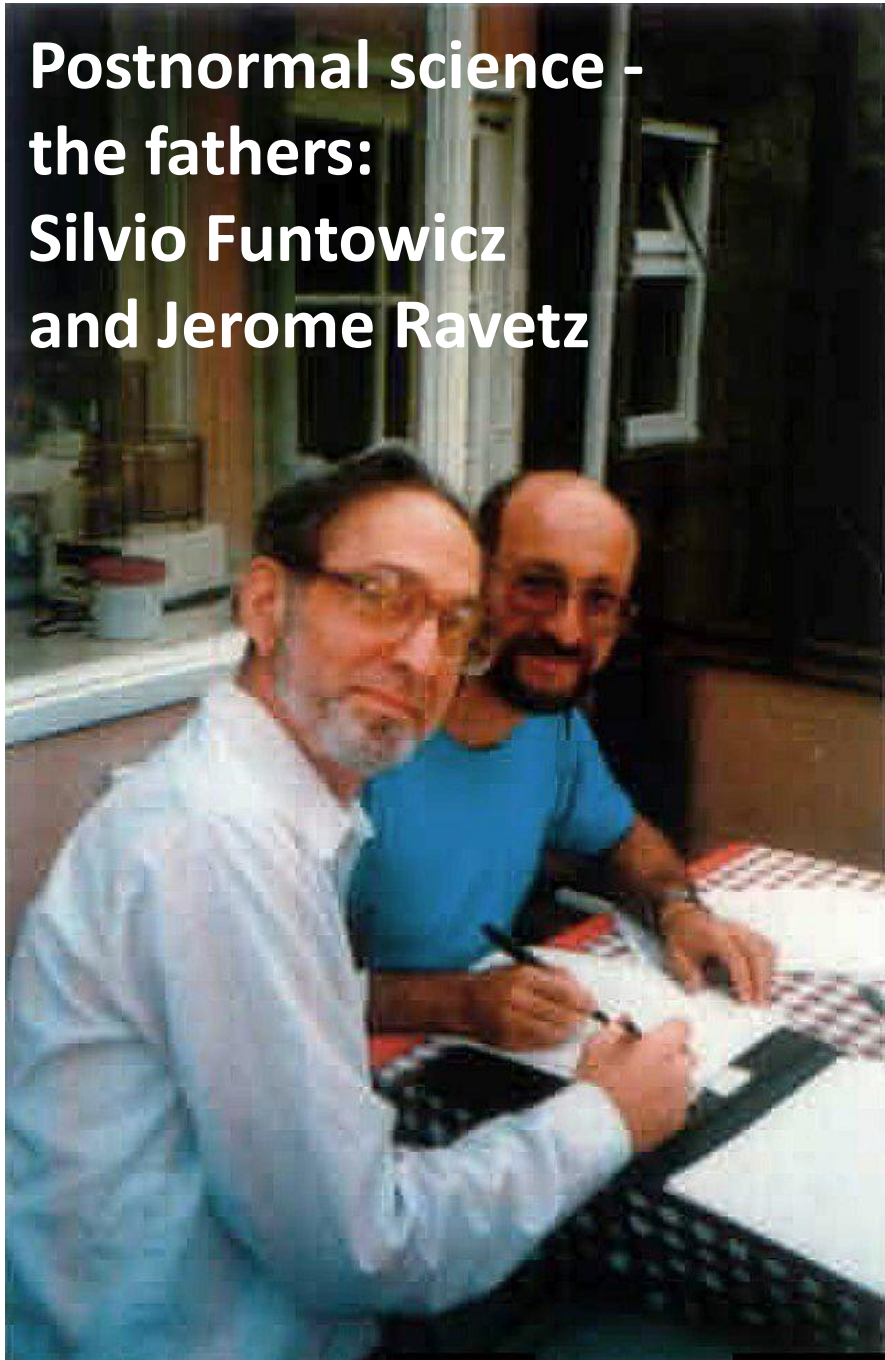
Different perceptions among scientists and the public



Ratter, Philipp, von Storch, 2012: Between Hype and Decline – Recent Trends in Public Perception of Climate Change, *Environ. Sci. & Pol.* 18 (2012) 3-8

Bray, D., 2010: The scientific consensus of climate change revisited. *Env. Sci. Pol.* 13: 340 – 350

**Postnormal science -
the fathers:
Silvio Funtowicz
and Jerome Ravetz**



Fotos © Jonatan Funtowicz and Bruna De Marchi



Postnormality

Jerry Ravetz, Silvio Funtovicz, 1986
and earlier

State of science, when *facts uncertain, values in dispute, stakes high and decisions urgent.*

In this state, science is not only done for reasons for curiosity but is asked for as support for preconceived value-based agendas.

Climate Science is in a post-normal phase (Bray and von Storch, 1999)

facts uncertain: *e.g. sensitivity of global mean temperature to doubling of CO2 concentration*

values in dispute, *e.g., do we cement the world according to our present preferences or do we accept a generationally dynamical development?*

stakes high, *e.g., costs for re-organizing global energy market and future damages*

decisions urgent, *e.g., to be efficient, re-organization of e.g., traffic must be begun now.*

Characteristic for postnormal conditions is

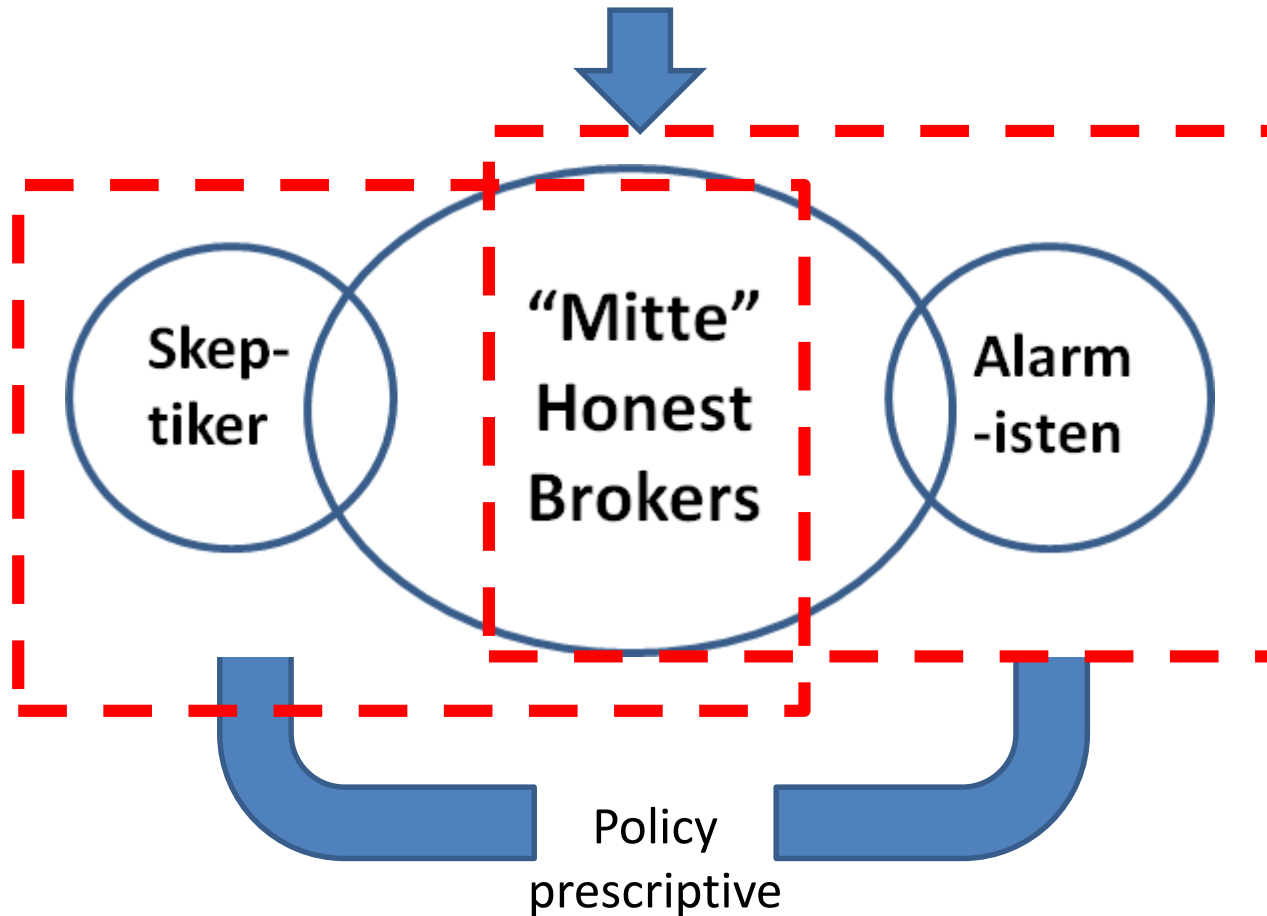
- Science is „de-scientized“, and „politicized“.
- Policy is „de-politicized“, and „scientized“.
- Policy decisions are framed as being “without alternative” – scientific knowledge leads to unique „solutions“ which need to be implemented without further democratic influence on the substance.
- Some scientists act as policy activists, while exploiting their public authority as scientists.
- Emergence of different knowledge claims, among them “alternative facts”.
- A post-normal situation is not “bad”, but needs recognition as such:
 - limitation of scientific expertise to the methodically sound core (re-scientizing), and
 - re-establishment of openly value-based democratic decision process (re-politicizing).

Climate scientists ...

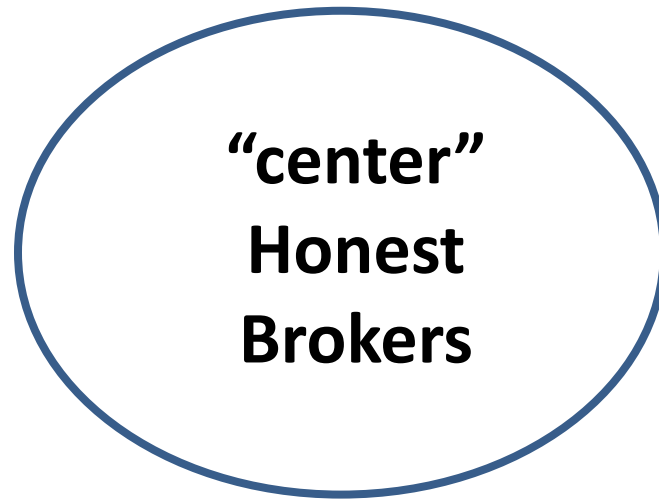
- transgress into policy-prescribing
- regularly so,
- uniformly (same direction) so.
- Trivialize social dynamics, and try to model the world, including the social sphere, as if its dynamics would be governed by a set of deterministic (or stochastic) equations.

The topology of political (and medial) utility of climate science

CUDOs guided generation
of knowledge and management



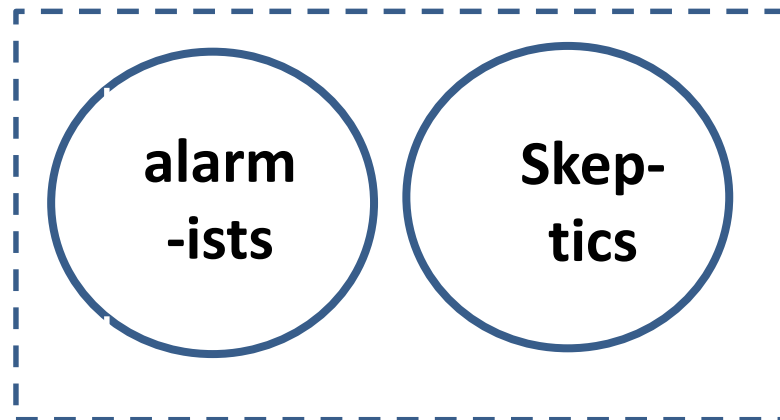
The topology of political (and medial) utility of climate science



Sustainable usage of the resource „science“

Preparation of knowledge, which allows society (and policymaking) assessing the options, and their effects on climate, of climate policy.

Quality management of science, by making science an advisor, but not a determinator of policy decisions.



Consumption of the resource “science”

by instrumentalization of scientific results for pre-chosen political choices.

Patronizing the democratic process of forming a political will.

Take home: **Task of physical climate science is**

- to offer explanation for a complex world, its dynamics, links and dependencies.
- **not** to derive what **needs** to be done, but what **can** be done.
- establish measures to establish quality of science by insisting on scientific method (cf. Merton's CUDOs).
- The *capital of science* is not the utility of the scientific findings but the methodology used to obtain such findings.

Take home: Summary and Outlook

1. Climate science offers robust answers to the key questions on climate change, namely on the reality of warming, the presence of external causes, and attribution attributing of greenhouse gases as the dominant cause of the change. Other questions are still contested.
2. Climate science supports the political process of the formation of a democratic will. The results of this process, however, is a matter of social negotiation processes.
3. Climate science is in a post-normal state, with political actors claiming that their „good“ case is coercively supported by science.
4. There is a market of knowledge claims, which influence the understanding and deciding by stakeholders, media and public. The scientifically constructed knowledge does not necessarily win this competition
5. Skeptics and alarmists agree in their stance that science has to play the decisive role in taking political decisions.
6. The „center“ of the scientific community is beginning to fight against this appropriation of the interpretation of scientific results. In the media, however, mostly the „extremists“ are present.

Q&A session



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October 30, 2018 - h.12.30 pm CET

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Elisa Lanzi - Presenter

*Organization for Economic Co-operation
and Development (OECD) – Paris*

Enrica De Cian - Moderator

*Fondazione CMCC - Euro-Mediterranean
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