

The art of communicating science to decision-makers

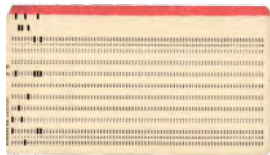


Dr Jan Marco Müller
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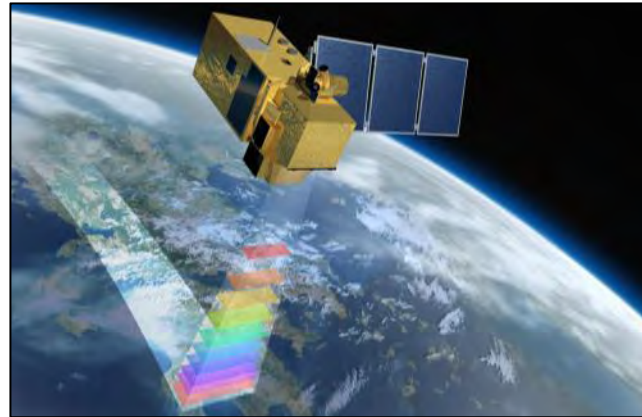
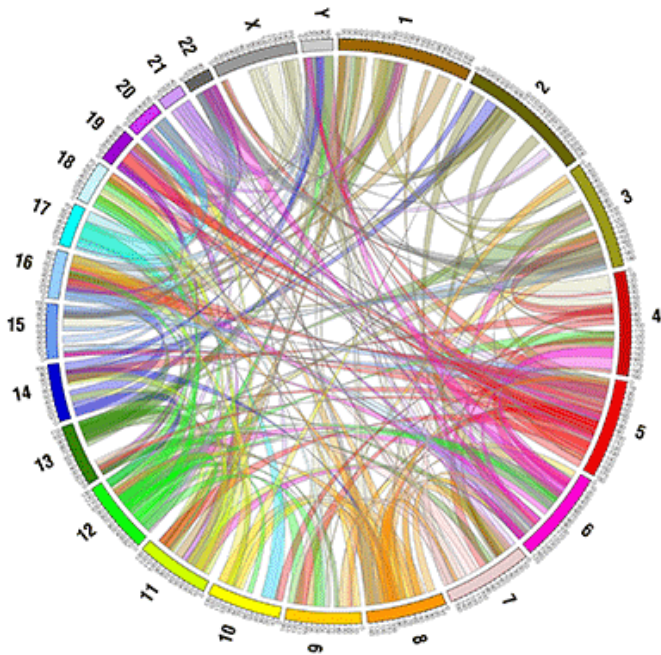
We live in a world that is changing fast

The world has become
much more complex
(and thus confusing)
> *Globalisation*

Technological progress has
accelerated dramatically
> *Digitalisation*



Also science is changing: Data comes from more and more sources



The way we do politics is changing as well



The media landscape is changing, too



EXECUTIVES AND MANAGEMENT

Amazon's Jeff Bezos Explains Why He Bought The Washington Post

By MIKE ISAAC DECEMBER 2, 2014 2:45 PM 22 Comments



November 17, 2015

THE HUFFINGTON

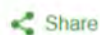


Live Reporting

By Alexandra Fouché and David Walker
All times stated are UK

20:57 No explosives found in Hanover after alert

German officials say no explosives have been found and no made in Hanover, Reuters reports. Earlier, a football match there between Germany and the Netherlands was cancelled because of a "concrete threat"



IN THE FIELD

AAAS: Science journalism in crisis?

14 Feb 2009 | 00:32 GMT | Posted by Mitch Waldrop | Category: [American Association for the Advancement of Science](#)

'Science journalism in crisis' was the title of a special press briefing this afternoon, jammed with worn looking science reporters. And the news, as expected, was bleak—but not entirely so.

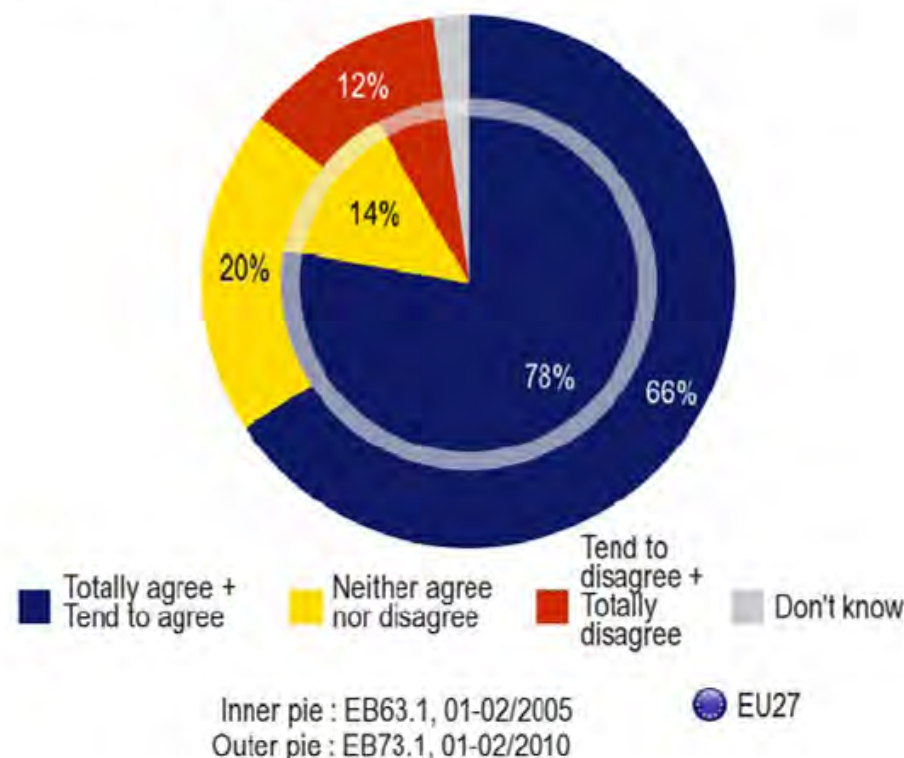
The organizer, University of Wisconsin journalism professor (and Pulitzer prize winner) Deborah Blum

**Other societal groups tend to be louder
and better organized than scientists!**

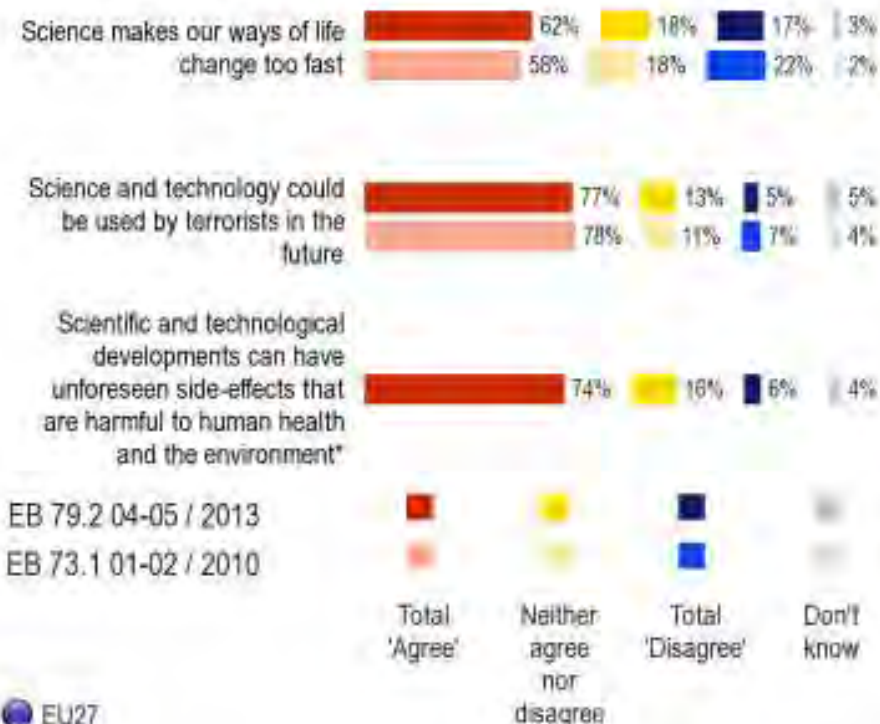


People feel uneasy about science and technology dictating political choices

(ASK ONLY TO SPLIT A) Science and technology make our lives healthier, easier and more comfortable



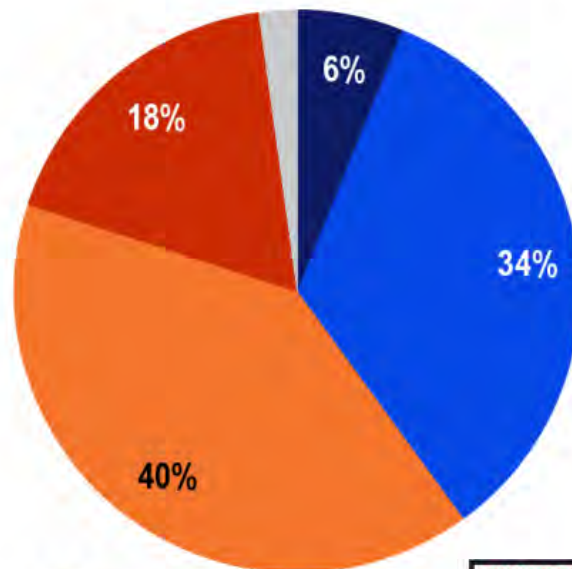
QD9. I would like to read out some statements that people have made about science, technology or the environment. For each statement, please tell me how much you agree or disagree.



Source: Special Eurobarometer 340 (2010)

Source: Special Eurobarometer 401 (2013)

QD1. How informed do you feel about developments in science and technology?



- Very well informed
- Fairly well informed
- Not very well informed
- Not at all informed
- Don't know

Source: Special Eurobarometer 401 (2013)



Research not communicated is research not done!



Residents in wildfire-prone areas underestimate their risk

July 27, 2015 • Social Sciences, Social Sciences

The vast majority of people living in areas prone to wildfires know they face risk, but they tend to underestimate that risk compared with wildfire professionals.

At the same time, they tend to over-estimate the importance of specific risk factors beyond their control - such as the composition of vegetation on their property - while giving less heed to those they can



Speak a language everybody understands!



Photo credits: Background Stadium Thomas Faivre-Duboz,
forest taken from H.-D. Viktor Boehm (globalcarbonproject),
Photo montage by Alan Belward, Joint Research Centre



ACCENT
ATMOSPHERIC COMPOSITION CHANGE
THE EUROPEAN NETWORK OF EXCELLENCE

Answers to the Urbino Questions



ACCENT's FIRST POLICY-DRIVEN SYNTHESIS

Answers by the atmospheric chemistry and air pollution research community to questions posed by the policy maker regarding the robustness of the analysis leading to the European Commissions 2005 Thematic Strategy on Air Pollution

1.6 What are the important precursors for background ozone, and how will they change in the next 20 to 30 years?

1. The most important precursors of background ozone are methane (CH_4) and carbon monoxide (CO), which are long-lived gases, and nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOC), relatively short-lived species. The mix of these short- and long-lived gases will be a critical factor in future trends.
2. Model calculations indicate that half of the increase of tropospheric ozone since pre-industrial times is due to the summed increase of CH_4 , CO and NMVOC emissions (ca. 25 % for CH_4 , and 25 % for $\text{CO} + \text{NMVOC}$). The other half is due to changes in the chemistry of the atmosphere induced by the increase in NO_x .

1.7 Are these findings robust enough to justify additional emission control requirements in Europe?

1. Yes. Reductions of NO_x and VOC emissions in Europe will further reduce high (peak) ozone levels over Europe and will also reduce Europe's contribution to hemispheric ozone. Clearly, an effective control of hemispheric ozone, and its contribution to background ozone, will require the reduction of the emissions of NO_x , NMVOC, CH_4 and CO also in other regions in the northern hemisphere.

Make it short!

WHAT CONSTITUTES THE OZONE (*) BACKGROUND OVER EUROPE?

(*) we mean ozone between 0 and 10-12 km altitude, hence: tropospheric ozone

If all continental European man-made emissions of gases leading to the production of ozone (O_3) were switched off, there would still be ozone over Europe. That ozone is referred to as *background ozone*. It is derived from natural sources of ozone precursors in Europe, intrusions of ozone from the stratosphere, and from long-range inter-continental transport of ozone and its precursors formed from natural and anthropogenic sources in various regions of the world. European anthropogenic emissions generally lead to an increase of the ozone levels compared to the background levels. However, close to sources of nitrogen oxide (NO), ozone is reduced largely due to reaction of NO with O_3 .

It is important to notice that ozone is the third most important anthropogenic greenhouse gas after carbon dioxide (CO_2) and methane (CH_4).

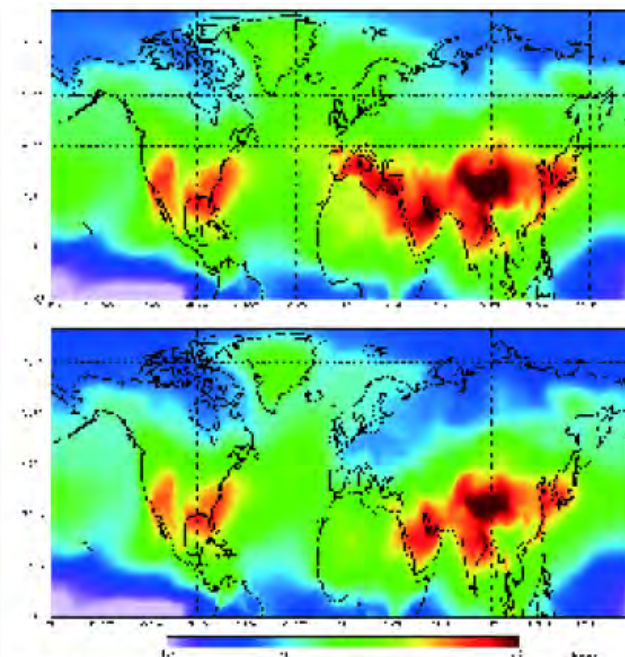


Figure 1. Annual mean ozone at the Earth's surface, for 1997, simulated by the GEOS-CHEM model. The top panel shows ozone from all sources; in the lower panel anthropogenic emissions on the European continent have been switched off, to reveal background ozone levels over Europe. (source: Isabelle Bey, EPFL Lausanne)

Timing is an issue!



Don't allow yourselves to be put at loggerheads!

Heated chemicals debate continues with open letter to EU
chief scientist

Share 20 | Share | Tweet 25 | Share 15

Published: 23/07/2013 - 08:01 | Updated: 23/07/2013 - 11:06



Eighty-one scientists have
written an open letter to the European Commission
President's science advisor.

Bridging the EDC divide

Under the watchful eye of the EU chief scientific advisor, scientists involved in the

Meeting on endocrine disruptors

Office of the Chief Scientific Adviser, European Commission, Brussels, 24.10.2013

Conclusions agreed by the participants

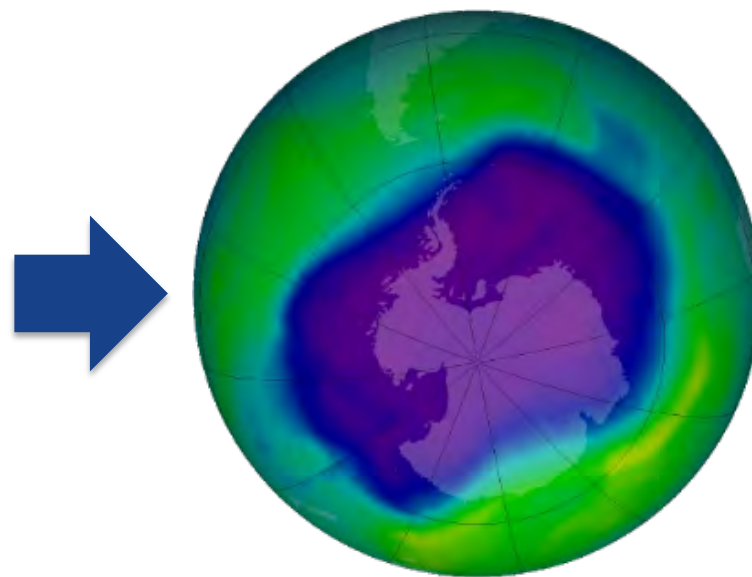
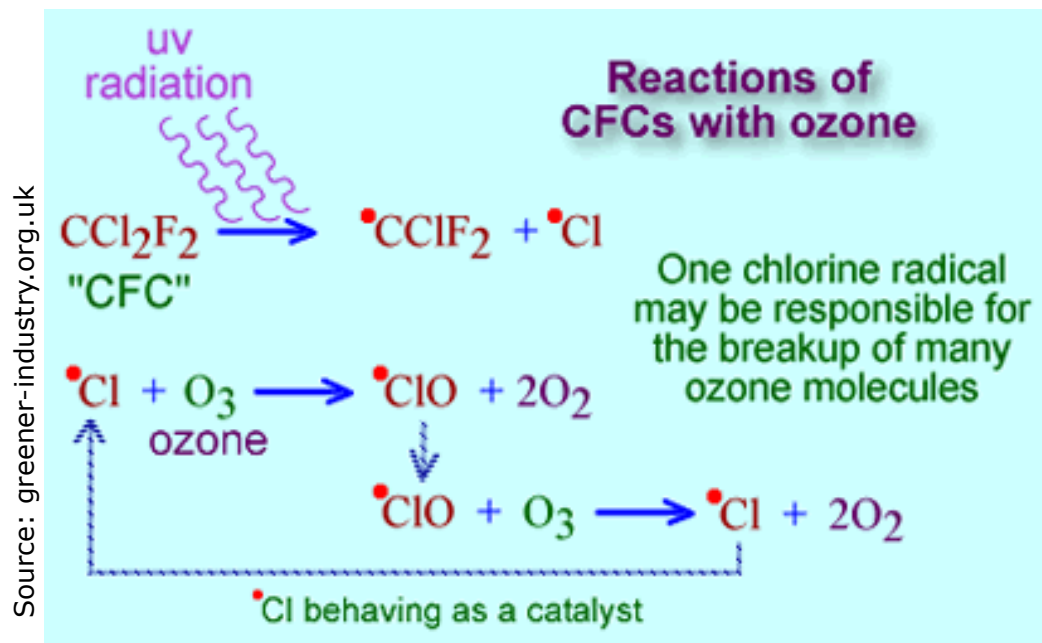
1. The participants appreciate the initiative of the Chief Scientific Adviser to help discuss the remit of scientific consensus around issues on endocrine disrupting substances (EDCs).
2. EDCs are a good example where scientific advice is an essential element for environment and health related policy-making.
3. There is substantial agreement as well as uncertainty on scientific issues around EDCs. Some of the main consensus and uncertainties are as follows:

the existence of
tally, as such a step is
experiments.

accepted that there
based on an
such chemicals act, so
EDCs.

the scientists agreed it
butes to, and interacts
es do not reveal who
ting the "no-threshold"
cts are exhibited by
sures to EDCs will
eshold, they say.

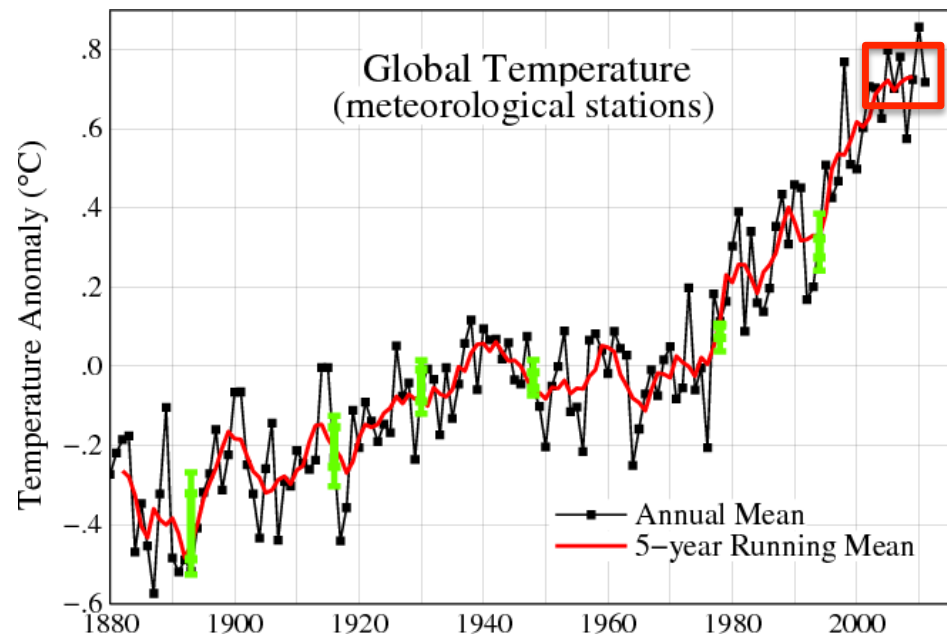
Talk about scientific consensus: it's boring for a scientist, but it's a powerful tool!



Raise your voice when science is being misused!



Daily Mail, 13 Oct 2012



Source: Goddard Institute for Space Studies



European
Commission

Beware of pitfalls!

nature International weekly journal of science

Home | News & Comment | Research | Careers & Jobs | Current Issue | Archive | Audio & Video | For Authors

Archive > Volume 516 > Issue 7531 > Research Highlights: Social Selection > Article

NATURE | RESEARCH HIGHLIGHTS: SOCIAL SELECTION

Study points to press releases as sources of hype

Scientists, press officers and journalists online are pointing to a study that traces the origins of exaggerated claims in health news.

Chris Woolston

12 December 2014

PDF Rights & Permissions

Researchers love to blame the news media when reports about science are misleading or even wrong. But a December [study](#)¹ making the rounds online suggests that much of the hype and misinformation about health-related research in the news has its roots in university press releases — which are almost always approved in advance by the researchers themselves.

nature International weekly journal of science

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Archive > Volume 526 > Issue 7574 > Editorial > Article

NATURE | EDITORIAL

Abstract thoughts

Scientists, meeting organizers and the media must take care with preliminary findings.

21 October 2015

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The rough and tumble of professional science is no place for the faint-hearted. Progress rests on honest appraisal of methods and results. Ideas must be challenged and conclusions defended. One of the most important transitions for any researcher is swapping the textbook scrutiny of the undergraduate years for critical and creative thinking. At the centre of this culture is the academic conference.



Science Media Centers are booming



Science Media Centre
where science meets the headlines

▼ working with us about us publications international smcs cc



welcome to the
Science Media Centre

*an independent press office helping to ensure that the public
have access to the best scientific evidence and expertise
through the news media when science hits the headlines*



SMC JAPAN

Science Media Centre of Japan

一般社団法人

サイエンス・メディア・センター

aus

SMC

australian science media centre



Science
Media
Centre.



**SCIENCE MEDIA
CENTRE OF CANADA**

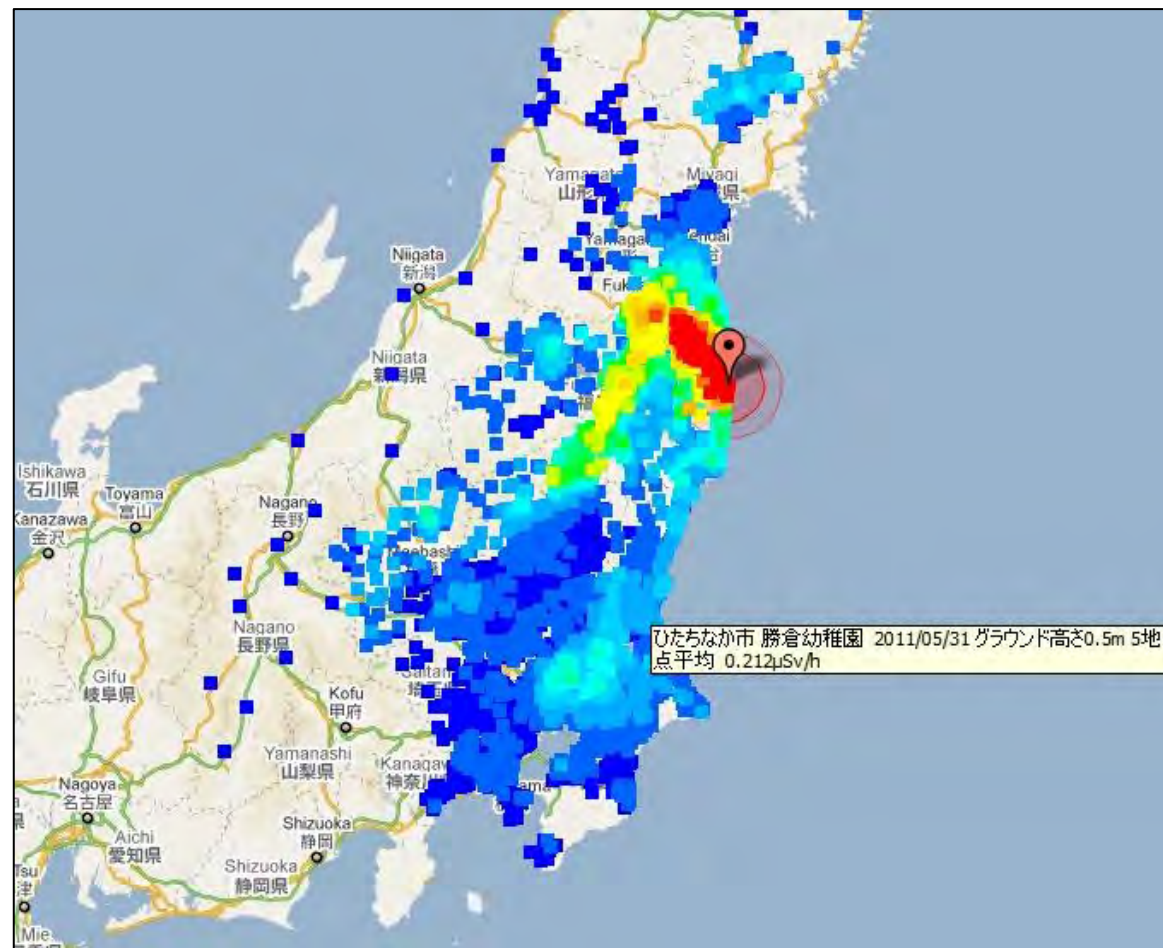


**CENTRE CANADIEN
SCIENCE ET MÉDIAS**



science
media center
germany

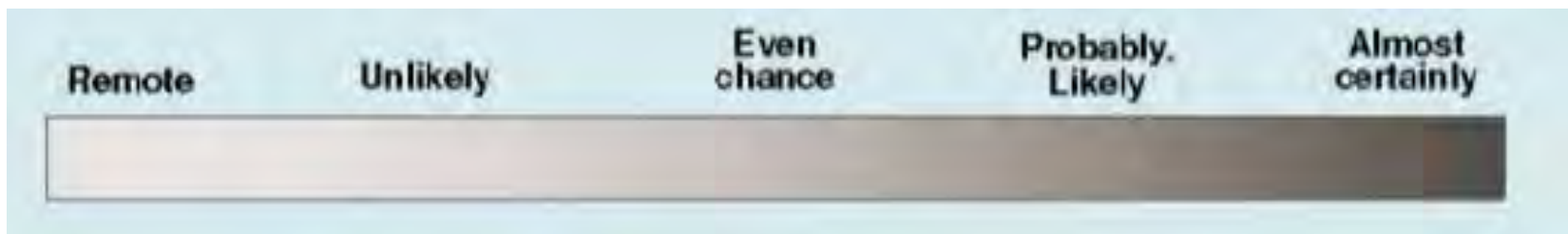
Not all messages will be politically convenient



Communicate uncertainty by using words and images rather than numbers

"I am taking a shot in the dark here"

"I am almost certain, but there are still a few remaining doubts to clear up"

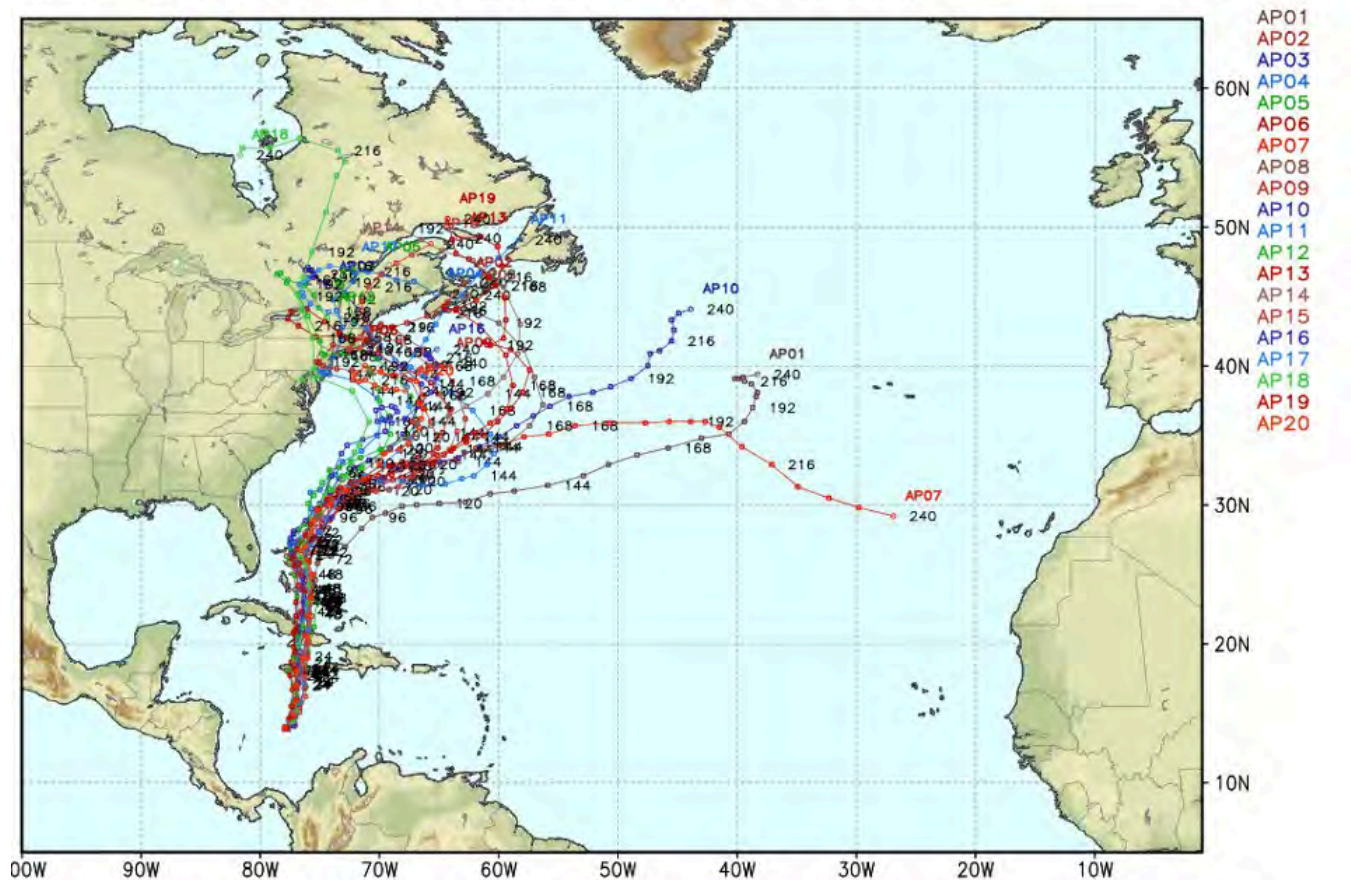


Source: Peter M. Sandman, David Spiegelhalter

Uncertainty can be visualized

AL18 SANDY NCEP Ensemble Guidance [20-members] valid: 2012102318

Track Models



Model guidance only -- expert interpretation required. Check NHC Official Forecasts
Created by Dr. Ryan Maue, WeatherBELL Analytics.

Refresh Image every 30-minutes for most recent data

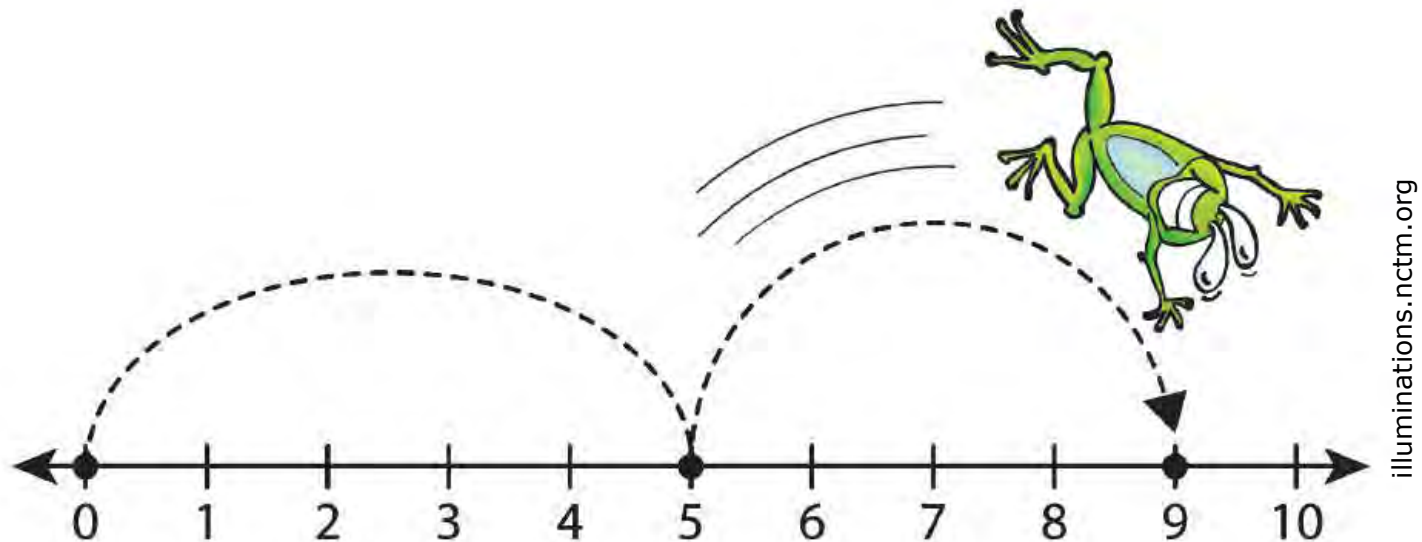
**Don't be afraid of communicating numbers,
they can be very powerful**



People actually like numbers

	3							
			1	9	5			
	9	8					6	
8				6				
4					3			1
				2				
	6					2	8	
			4	1	9			5
							7	

**But numbers are a means to an end –
they will make an impact only if...**



...you tell a good story!



What do you see here?



We have observed a new
boson with a mass of
 $125.3 \pm 0.6 \text{ GeV}$
at
 4.9σ significance



CERN, 4 July 2012



Fabiola Gianotti

Why did this particular measurement create such a huge media hype?



It was all about emotions!



Scientific measurements can be quite emotional





The million \$ question:
Which of these topics
is the lowest on the
political agenda?

15	●	\$ 1 Million
14	●	\$ 500000
13	●	\$ 250000
12	●	\$ 125000
11	●	\$ 64000
10	●	\$ 32000
9	●	\$ 16000
8	●	\$ 8000
7	●	\$ 4000
6	●	\$ 2000
5	●	\$ 1000
4	●	\$ 500
3	●	\$ 300
2	●	\$ 200
1	●	\$ 100

50:50



A: Data privacy

B: Shale gas

C: Migration

D: Soil protection

Soil is dirty, but not sexy





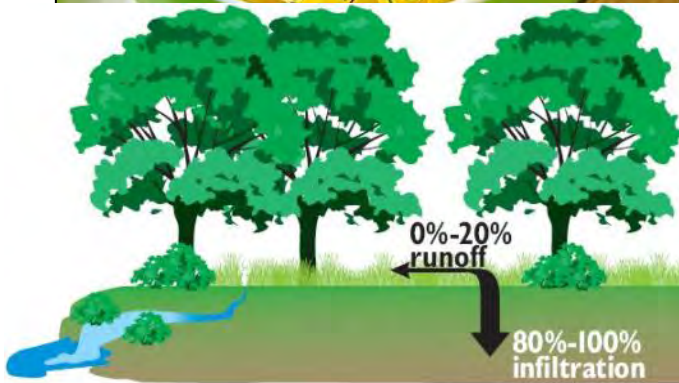
Why is **SOIL** precious?



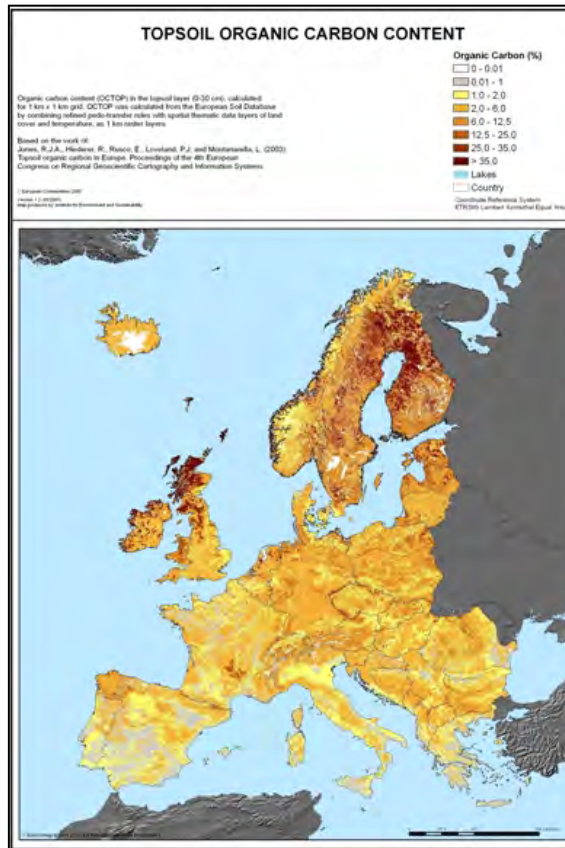
Soil underpins our planet's life support systems



Soil provides ecosystem services



Soil plays an important role in the global climate system



JRC



Peter Prokosch



cheas.psu.edu

Soil is part of our natural heritage – to protect it is an ethical obligation



Soil is also cultural heritage!





**If SOIL is so important,
why don't we talk
about it more?**



Most people live in urban environments



**We usually don't see soil,
even if it is in front of our eyes**



Soil doesn't hit the media, unless in emergencies





**What can we do to
make **SOIL** interesting?**



Boring soil picture



Interesting soil picture



Use ambassadors!

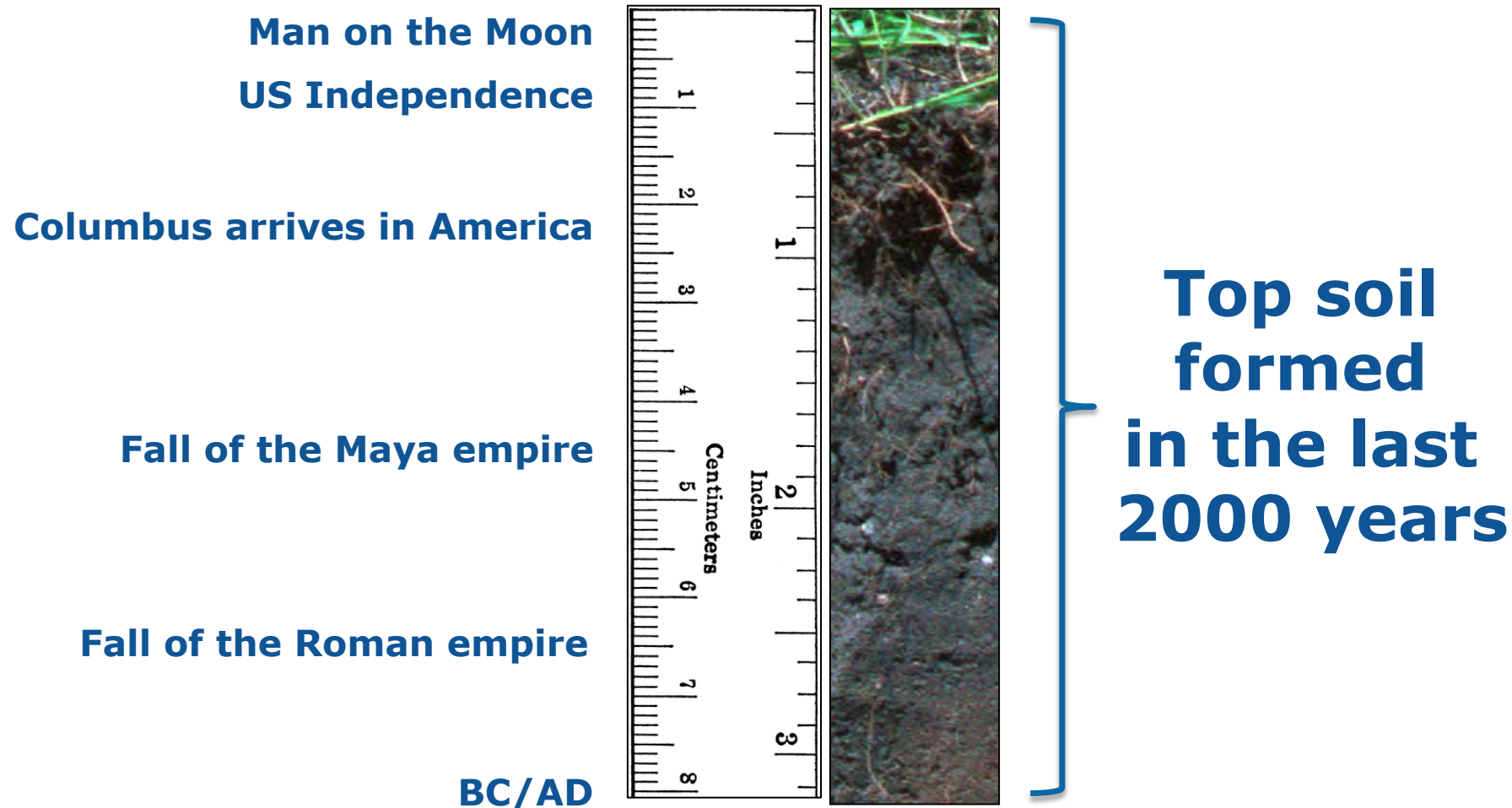




European
Commission



Soil builds up over millenia



...and it's gone in a few seconds!



Say why it concerns YOU!



Thank you for your attention!

