



# The art of communicating science to decision-makers

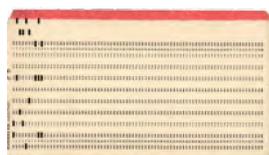


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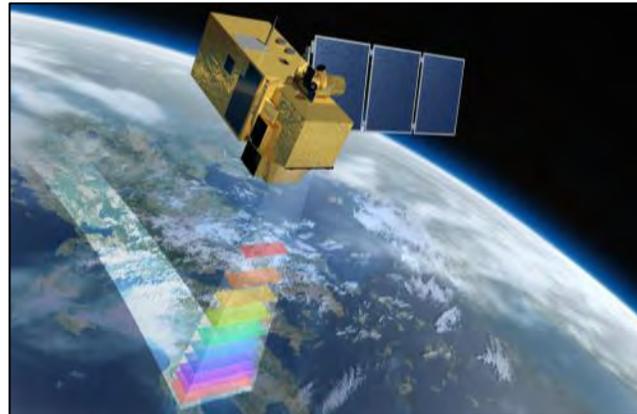
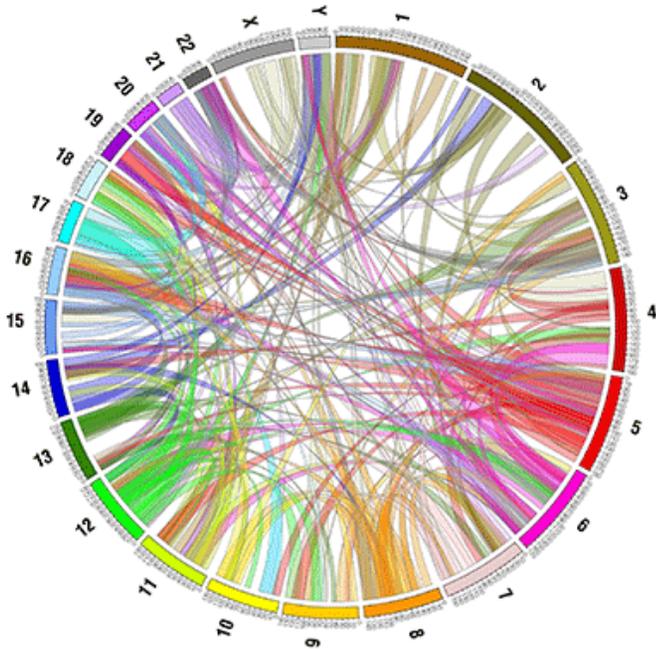
# We live in a world that is changing fast

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





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# The way we do politics is changing as well





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# 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

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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"

[Share](#)

**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



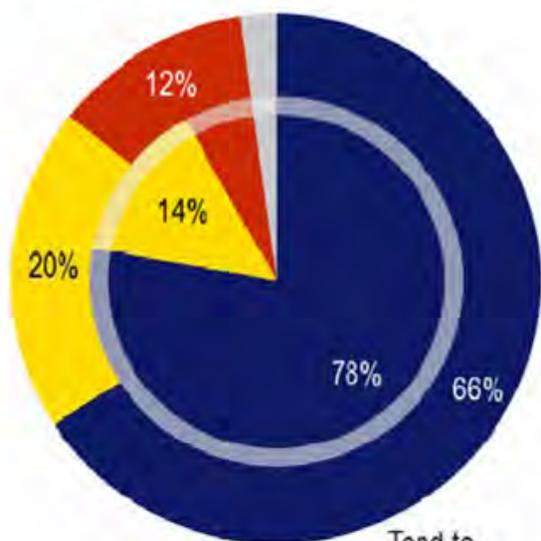
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**Other societal groups tend to be louder  
and better organized than scientists!**



# 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



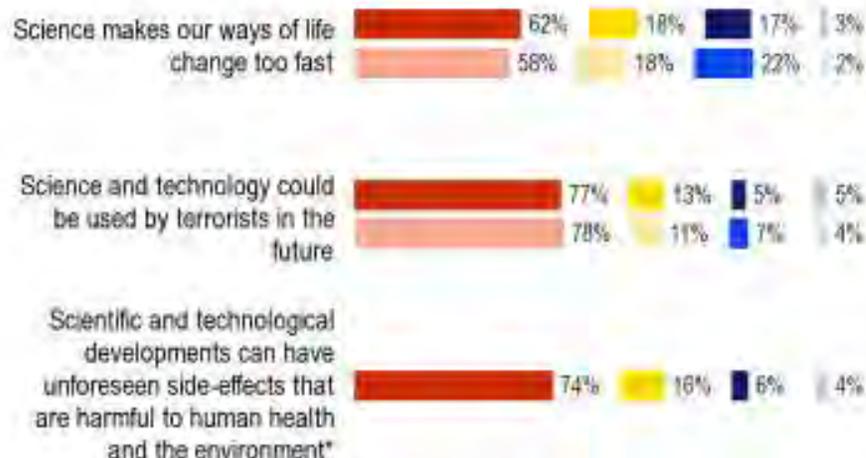
■ Totally agree + Tend to agree   
 ■ Neither agree nor disagree   
 ■ Tend to disagree + Totally disagree   
 ■ Don't know

Inner pie : EB63.1, 01-02/2005  
 Outer pie : EB73.1, 01-02/2010

 EU27

Source: Special Eurobarometer 340 (2010)

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.



EB 79.2 04-05 / 2013

EB 73.1 01-02 / 2010

■ Total 'Agree'   
 ■ Neither agree nor disagree   
 ■ Total 'Disagree'   
 ■ Don't know

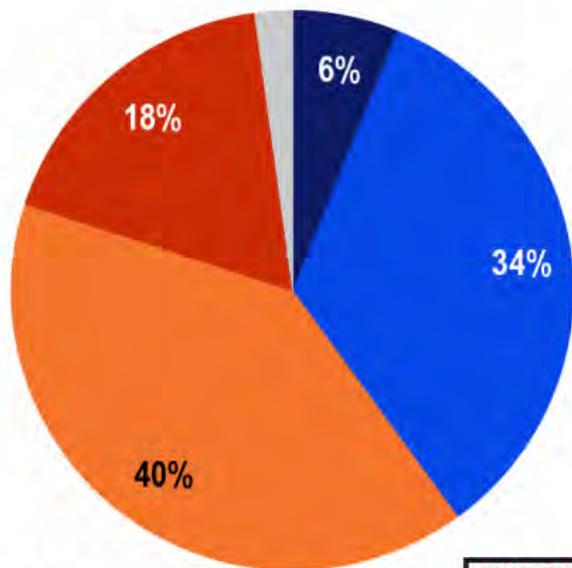
 EU27

Source: Special Eurobarometer 401 (2013)



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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!



**CU** News Center  
UNIVERSITY OF COLORADO BOULDER

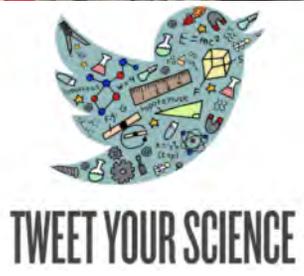
Releases Features Multimedia Center In-Depth Series For The Media Campus

## 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!

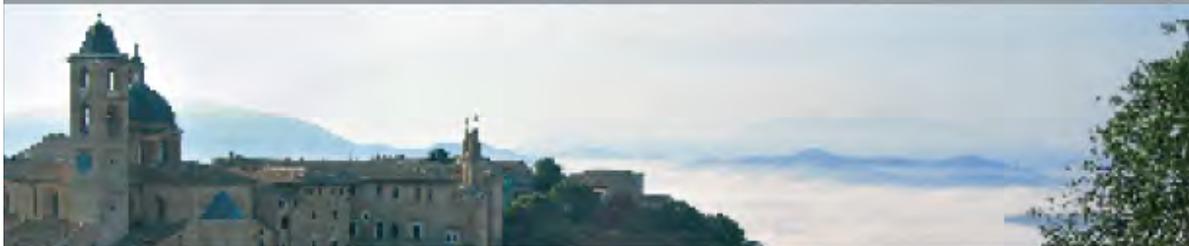


Photo credits: Background Stadium Thomas Faivre-Duboz,  
forest taken from H.-D. Viktor Boehm (global carbon project),  
Photo montage by Alan Belward, Joint Research Centre





# 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 ( $\text{CH}_4$ ) and carbon monoxide ( $\text{CO}$ ), which are long-lived gases, and nitrogen oxides ( $\text{NO}_x$ ) 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  $\text{CH}_4$ ,  $\text{CO}$  and NMVOC emissions (ca. 25 % for  $\text{CH}_4$ , 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  $\text{NO}_x$ .

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

1. Yes. Reductions of  $\text{NO}_x$  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  $\text{NO}_x$ , NMVOC,  $\text{CH}_4$  and  $\text{CO}$  also in other regions in the northern hemisphere.

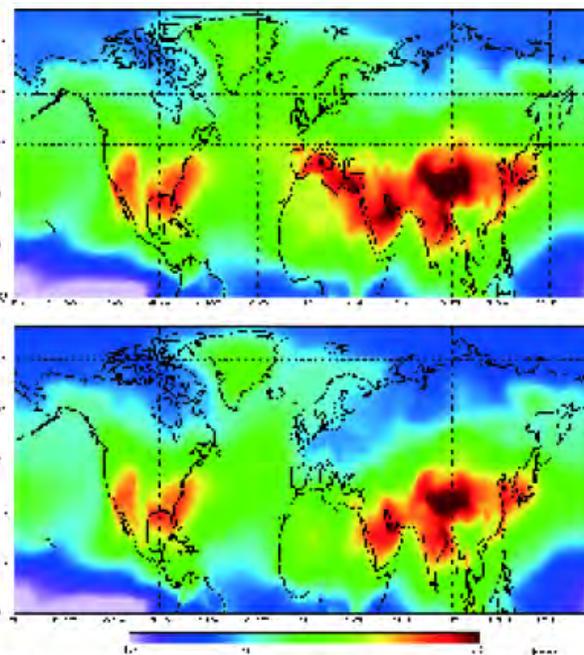
# Make it short!

## 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 ( $\text{O}_3$ ) 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 ( $\text{NO}$ ), ozone is reduced largely due to reaction of  $\text{NO}$  with  $\text{O}_3$ .

It is important to notice that ozone is the third most important anthropogenic greenhouse gas after carbon dioxide ( $\text{CO}_2$ ) and methane ( $\text{CH}_4$ ).



**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)



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# 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:

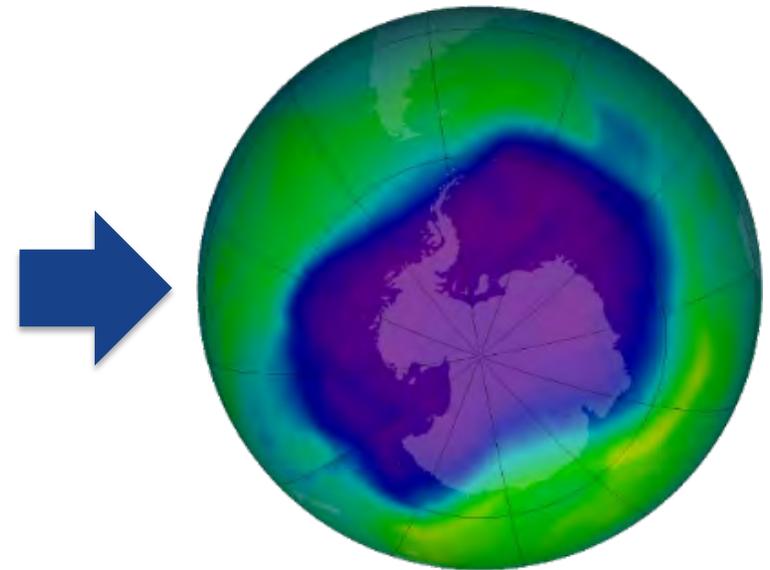
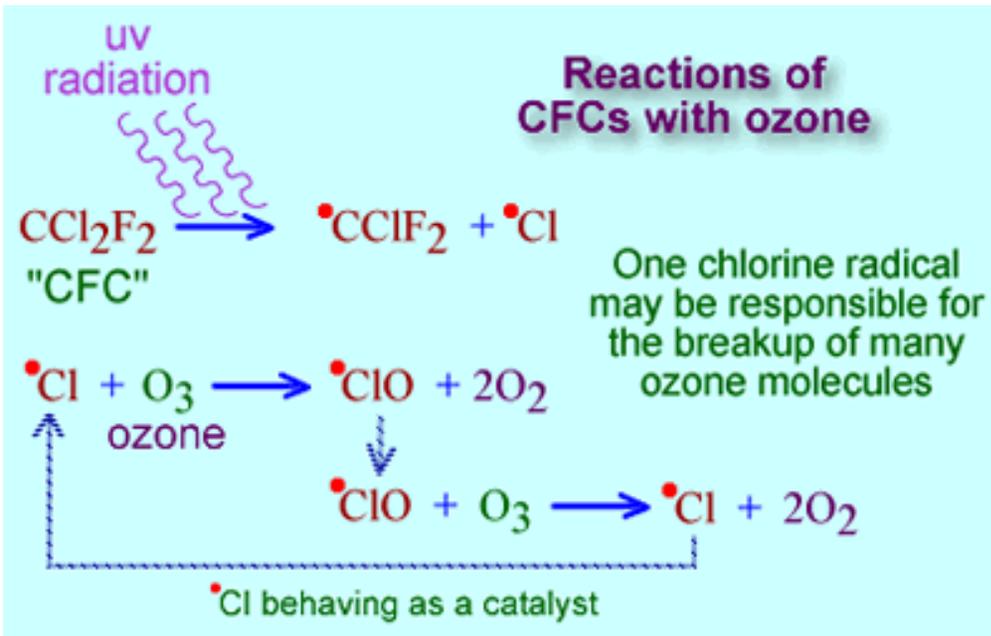
the existence of  
initially, as such a step is  
experiments.

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

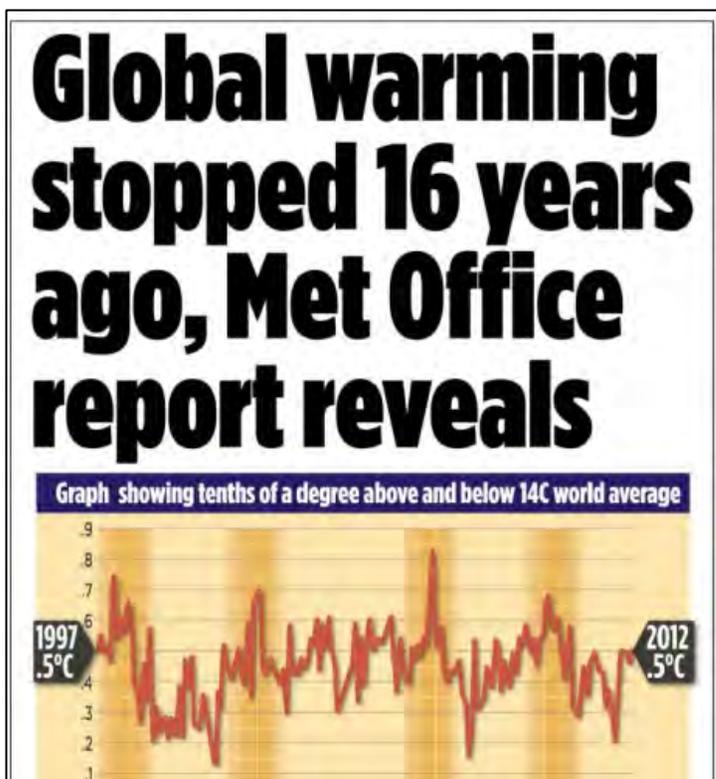
the scientists agreed it  
contributes to, and interacts  
as do not reveal who  
during the "no-threshold"  
effects are exhibited by  
exposures to EDCs will  
threshold, they say.

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

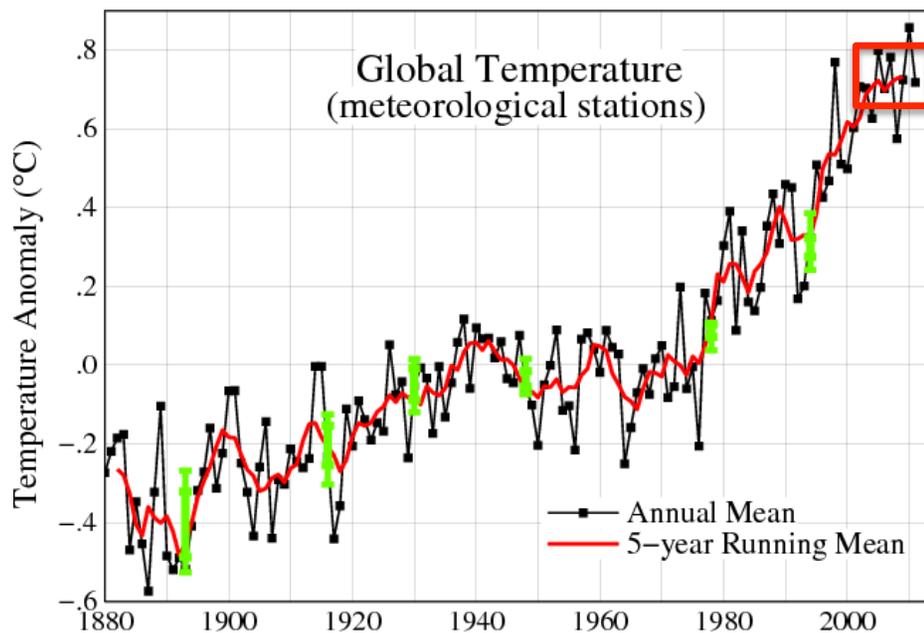
Source: greener-industry.org.uk



# Raise your voice when science is being misused!



Daily Mail, 13 Oct 2012



Source: Goddard Institute for Space Studies



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# 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](#)<sup>1</sup> 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

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

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.



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# Science Media Centers are booming



Science Media Centre  
*where science meets 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

working with us

about us

publications

international smcs

cc

aus

SMC

australian science media centre



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*



SCIENCE MEDIA  
CENTRE OF CANADA



CENTRE CANADIEN  
SCIENCE ET MÉDIAS

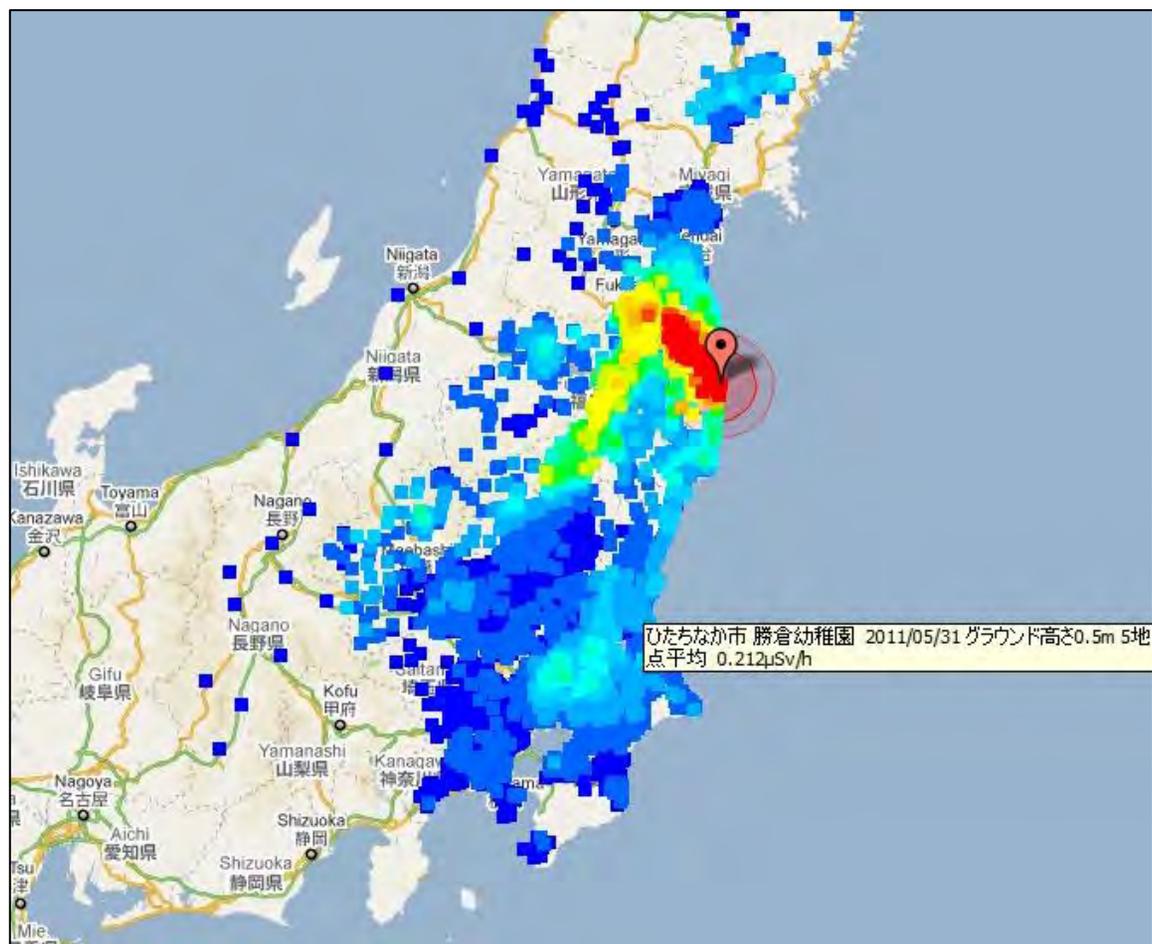


science  
media center  
germany



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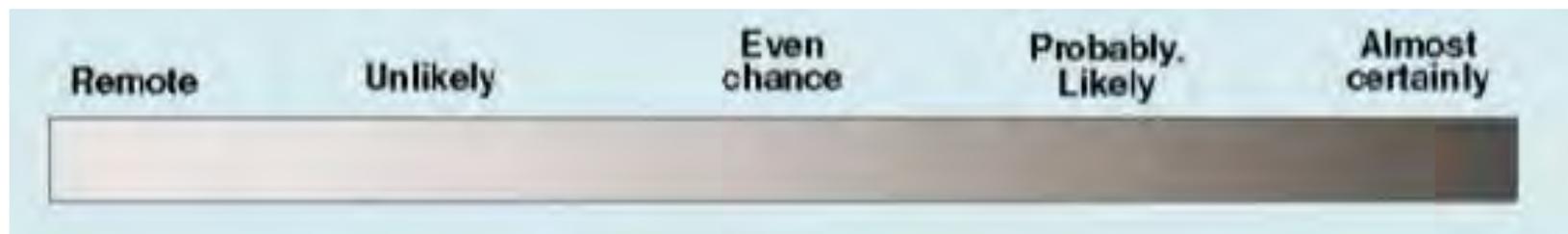
# Not all messages will be politically convenient



## Communicate uncertainty by using words and images rather than numbers

**"I am taking a  
shot in the dark  
here"**

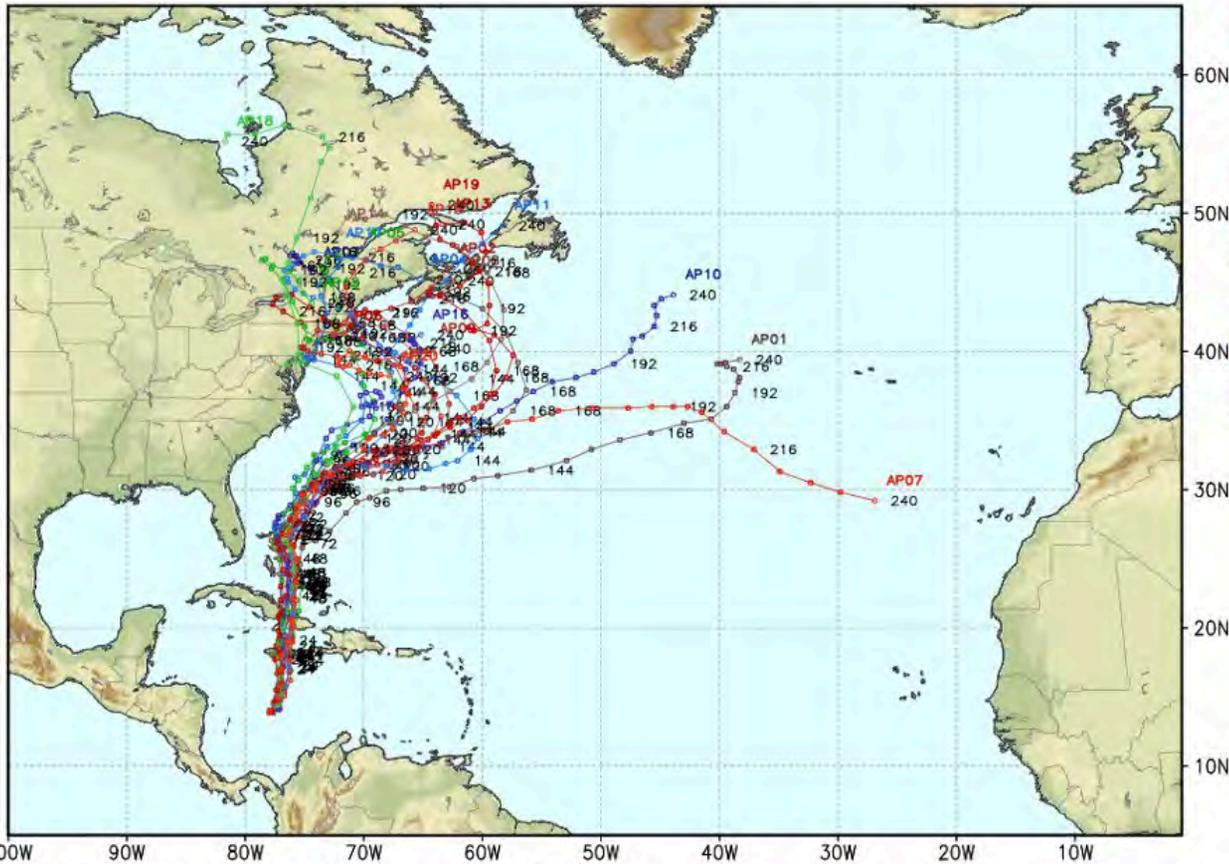
**"I am almost certain,  
but there are still a  
few remaining doubts  
to clear up"**



# Uncertainty can be visualized

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

Track Models



- AP01
- AP02
- AP03
- AP04
- AP05
- AP06
- AP07
- AP08
- AP09
- AP10
- AP11
- AP12
- AP13
- AP14
- AP15
- AP16
- AP17
- AP18
- AP19
- AP20

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**

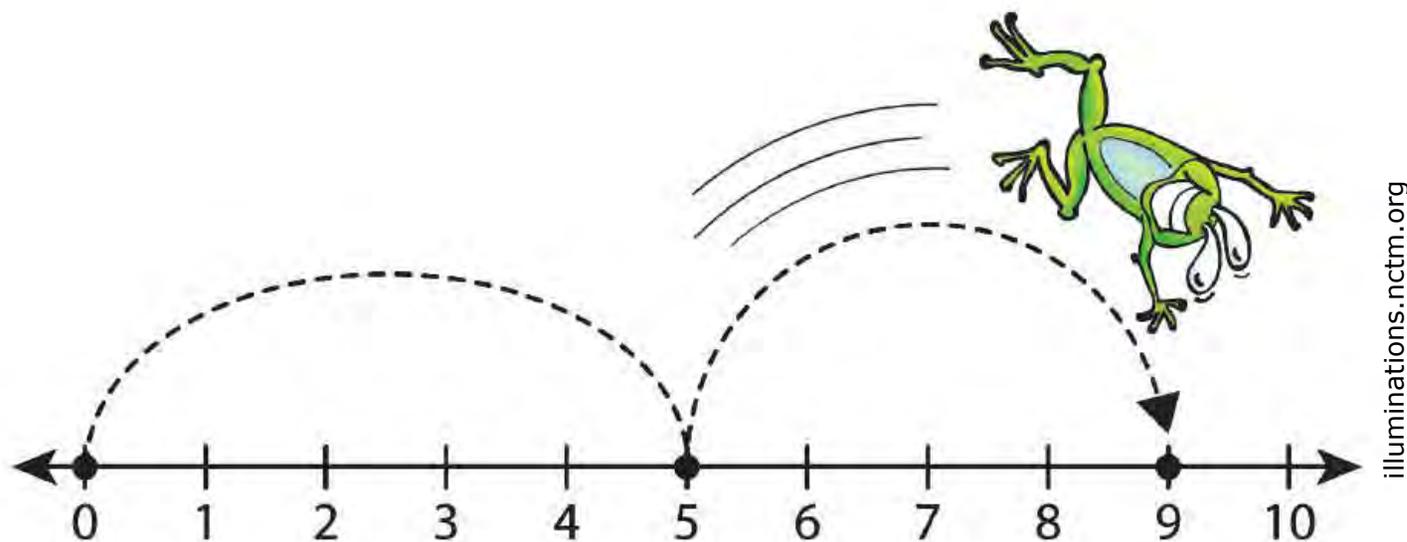


## People actually like numbers

	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!**

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# What do you see here?



We have observed a new  
boson with a mass of

**$125.3 \pm 0.6 \text{ GeV}$**

at

**$4.9 \sigma$**  significance

CERN, 4 July 2012



# 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**



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# Soil is dirty, but not sexy



ashleigh-educationjourney.com





# Why is **SOIL** precious?





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# Soil underpins our planet's life support systems





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# Soil provides ecosystem services



[fordhamsustainability.wordpress.com](http://fordhamsustainability.wordpress.com)





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# Soil plays an important role in the global climate system



# 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?**





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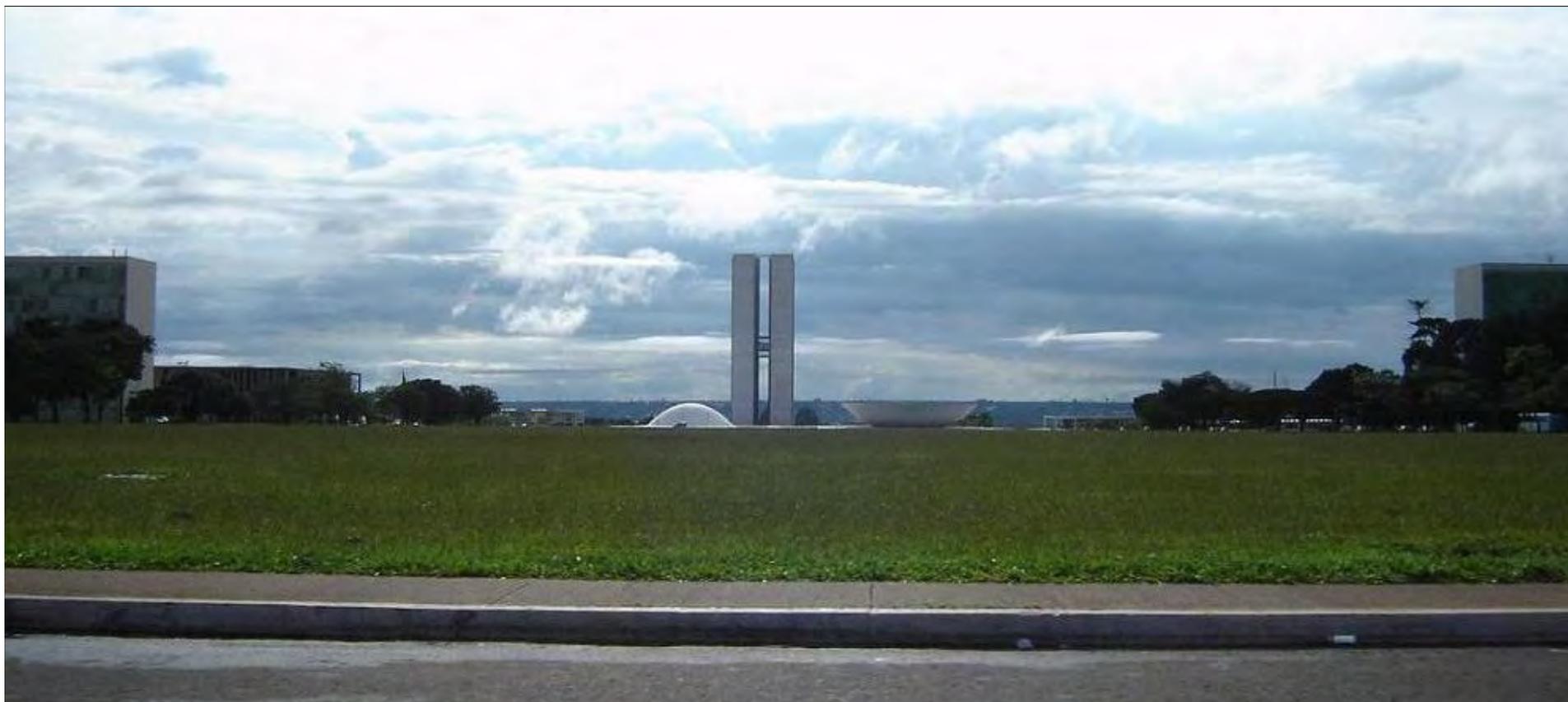
# Most people live in urban environments





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**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





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## Use ambassadors!

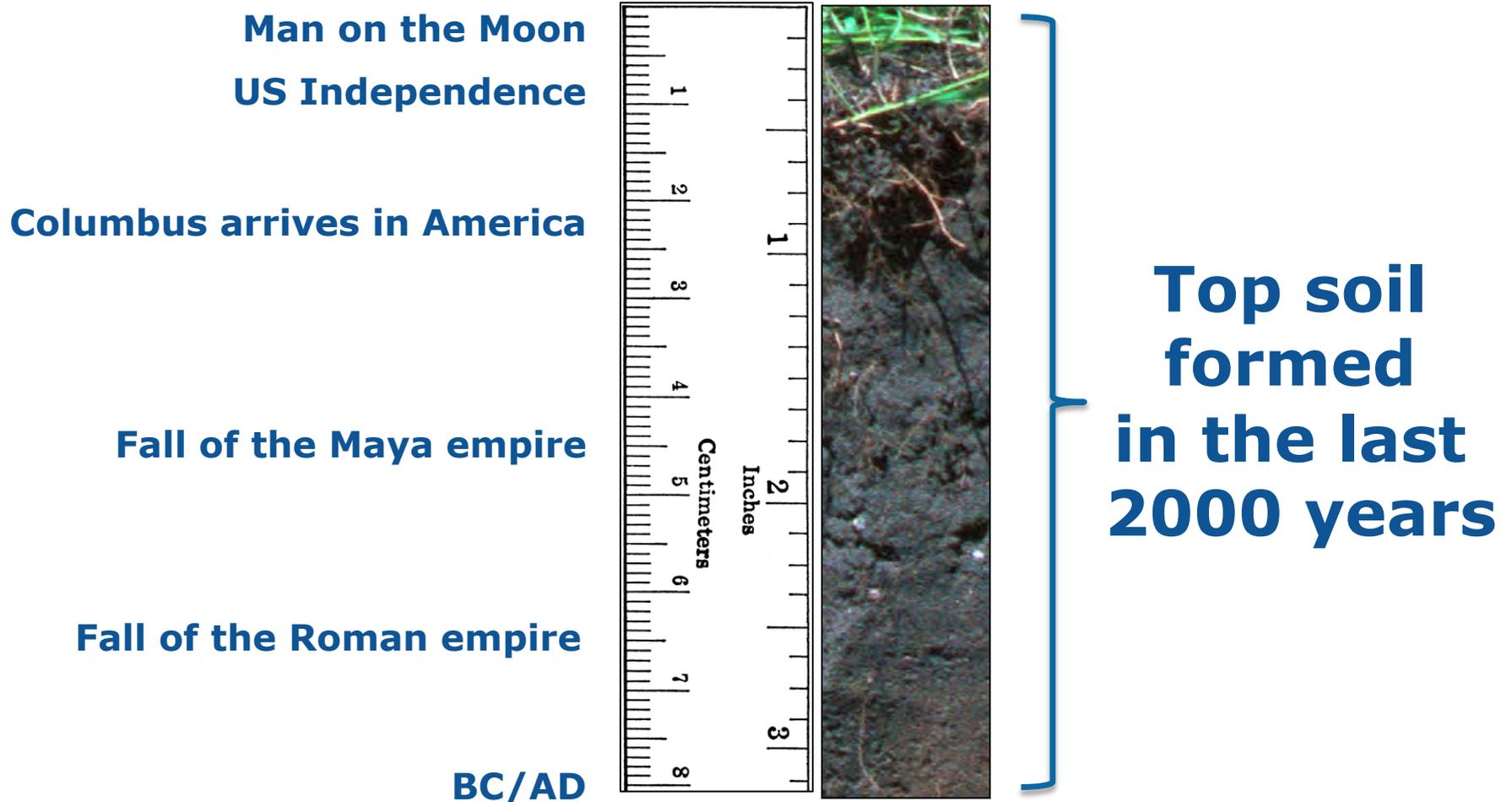




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# Soil builds up over millenia



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



**Say why it concerns YOU!**





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**Thank you for your attention!**

