



Leaving no one behind



Climate change and environmental degradation undermine progress achieved

Jak může zvyšující se degradace ŽP (např. CC) vést ke snížení lidského blahobytu?

Top

Climate change: The great civilisation destroyer?

War and unrest, and the collapse of many mighty empires, often followed changes in local climates. Is this more than a coincidence?



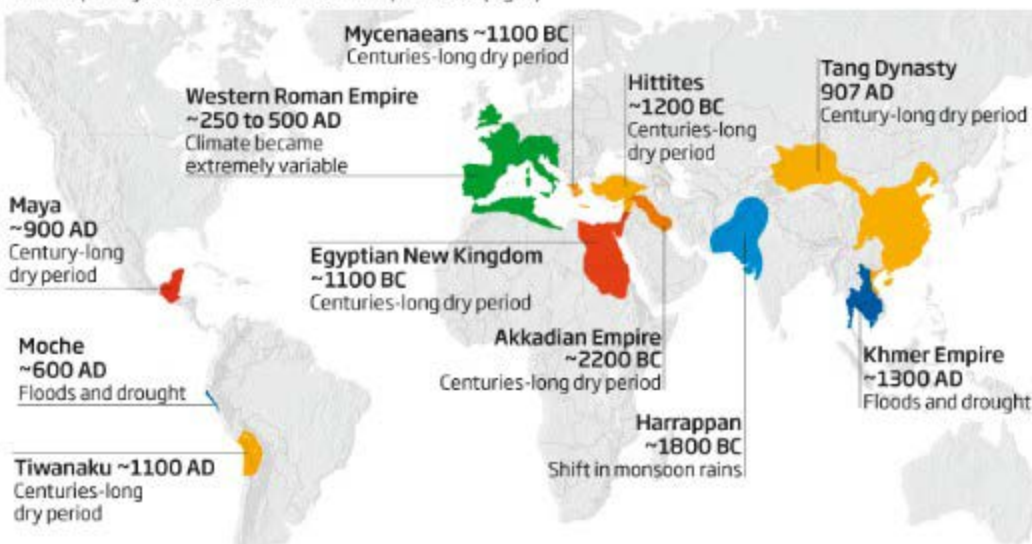
Climate change: The great civilisation destroyer?

War and unrest, and the collapse of many mighty empires, often followed changes in local climates. Is this more than a coincidence?

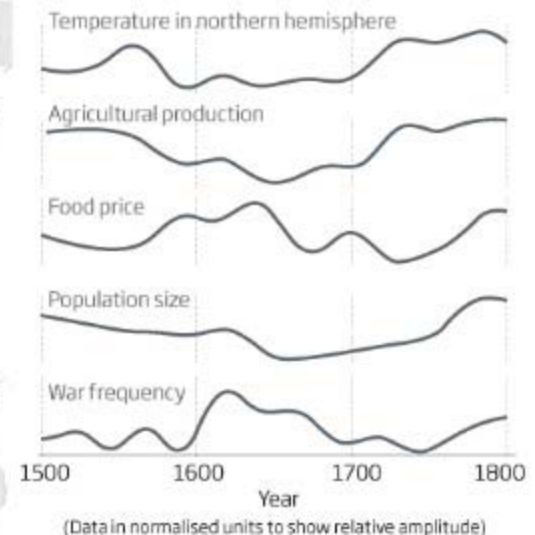


More than coincidence?

The decline and fall of many civilisations coincided with periods of climate change, and there are also correlations between climate change, population size and the frequency of wars, as data from Europe shows (right)



©NewScientist



ZPRÁVY

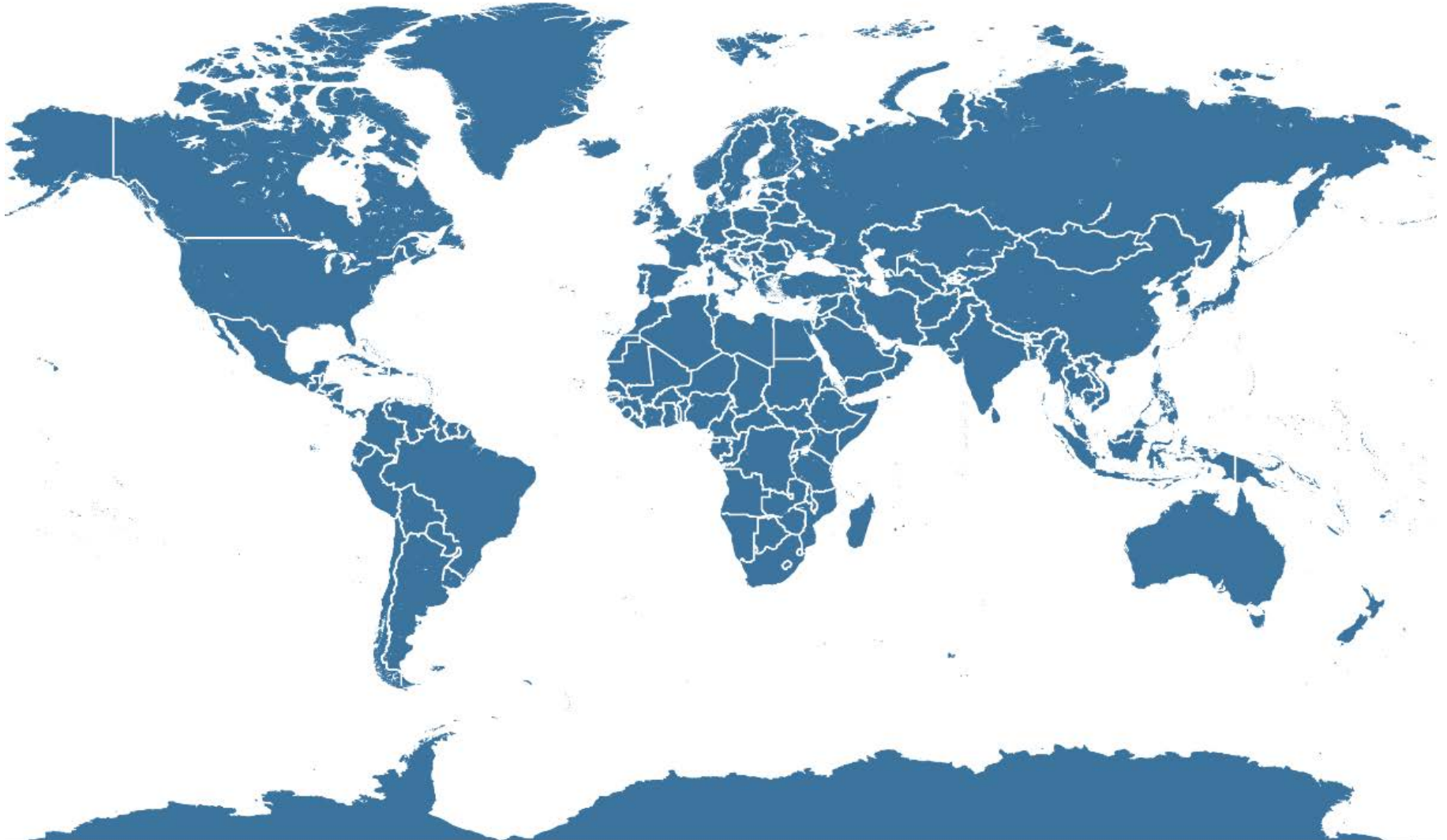
Na Blízkém východě trvá nejhorší sucho za 900 let. Vědci se bojí změn v celém Středomoří

bar 4. března 2016 • 13:50



foto: Pixabay

Kde je Blízký východ?



„Na začátku arabského jara v Egyptě lidé vyšli do ulic mimo jiné kvůli nedostatku chleba. Ten vznikl, když Číňané vykoupili všechnu pšenici. A Číňané vykoupili pšenici, neboť Čína za sebou měla neobvykle suché léto roku 2010. Stejně tak v Sýrii ve městech protestovali farmáři, kteří sem emigrovali ze severozápadu země. Emigrovali, protože je globální oteplování připravilo o obživu.“



The image shows a screenshot of a news article from the website E15.cz. The page layout includes a top navigation bar with the site logo 'E15.cz / Názory' and a search bar. Below the navigation bar, there are several menu items: 'E15.cz', 'Zprávy', 'Praha', 'Názory', 'Finance', and 'Média'. The main content area features the article title 'Timothy Snyder: Muslimský svět je první obětí změn klimatu. Přijdou další „Sýrie“' and a sub-headline 'Světové velmoci svými chybami přispívají k tomu, aby lidstvo zapomnělo lekce, které mu udělil holocaust. Klimatické změny nahrávají tomu, aby se politici opět chopili myšlenky, že my jsme více než oni, varuje americký historik Timothy Snyder.' A photograph of Timothy Snyder is displayed below the text. At the bottom of the article, there is a date '12.10.2015 7:28' and social media sharing icons for Twitter and Google+. A small text block at the very bottom of the page reads: 'Do Prahy jste přijel převzít cenu Nadace Dagmar a Václava Havlových Vize 97. Co pro Vás toto ocenění znamená? Je to pro mě obzvlášť velká pocta, protože tato cena vychází z tradice.'

„Na začátku arabského jara v Egyptě lidé vyšli do ulic mimo jiné kvůli nedostatku chleba. Ten vznikl, když Číňané vykoupili všechnu pšenici. A Číňané vykoupili pšenici, neboť Čína za sebou měla neobvykle suché léto roku 2010. Stejně tak v Sýrii ve městech protestovali farmáři, kteří sem emigrovali ze severozápadu země. Emigrovali, protože je globální oteplování připravilo o obživu.“

HN: A v Turecku?

V Turecku nynější politická krize vznikla z toho, jak naložit s imigranty a jak se postavit ke kolapsu Sýrie. Obojí souvisí s proměnami životního prostředí.“

reklama

E15.cz / **Názory** Kurzy: 22.03

E15.cz Zprávy Praha **Názory** Finance Média E-

Názory | Rozhovory | Komentáře | Analýzy | Reportáže | Profily | Zahraniční tisk | Blogy

E15 > NÁZORY > ROZHOVORY > TIMOTHY SNYDER MUSLIMSKÝ SVĚT JE PRVNÍ...
Timothy Snyder: Muslimský svět je první obětí změn klimatu. Přijdou další „Sýrie“

Světové velmoci svými chybami přispívají k tomu, aby lidstvo zapomnělo lekce, které mu udělil holocaust. Klimatické změny nahrávají tomu, aby se politici opět chopili myšlenky, že my jsme více než oni, varuje americký historik Timothy Snyder. Rozhovor



12.10.2015 7:28 | [Text](#) [G+](#) [e](#)

Do Prahy jste přijel převzít cenu Nadace Dagmar a Václava Havlových Vize 97. Co pro Vás toto ocenění znamená?

Je to pro mě obzvláště velká pocta, protože tato cena vychází z tradice,

Rozhovor [Colours of Ostrava](#) [Snyder Timothy](#) [knižní rozhovor](#) [Pevnost](#) [Etnoart](#) [Turecko](#)

Pučistě v Turecku udělali chybu, že Erdoganovi nesebrali telefon, říká historik Snyder

 **Daněš Konečný** - vedoucí kulturní rubriky | 18. 7. 2016 00:00 (aktualizováno 02:14) | [Kultura](#) | 5

- Na ostravské diskusní fórum Meetingpot o víkendů přijel americký profesor historie na Yaleově univerzitě Timothy Snyder.
- V rozhovoru hovoří o tureckém pokusu o vojenský převrat a tvrdí, že události takzvaného arabského jara měly ekologické příčiny.
- "Podobné incidenty se budou opakovat, jestliže nezabráníme proměně Blízkého východu a severní Afriky v poušť," říká v rozhovoru.



Hostem Colours of Ostrava byl americký historik Timothy Snyder. Debatoval zde mimo jiné s ministrem zahraničí Lubomírem Zouharlem. autor: HN - Štěpán Žeruš

Nemuset o víkendů absolvovat tři vystoupení na debatním fóru Meetingpot, které se konalo v rámci festivalu Colours of Ostrava, americký historik Timothy Snyder by zcela jistě sledoval, jak jdou dějiny. Jako by nestačil brexit a teroristický útok v Nice, teď do toho přijde ještě pokus o vojenský puč v Turecku, říká Snyder v sobotu odpoledne a hned si posteskne, že v Ostravě neměl dost času nejnovější dění nastudovat.

19
Založte si ING Kori
zvíhodněnou saz
[Chci založit](#)



Kdo může za tyto proměny životního prostředí?

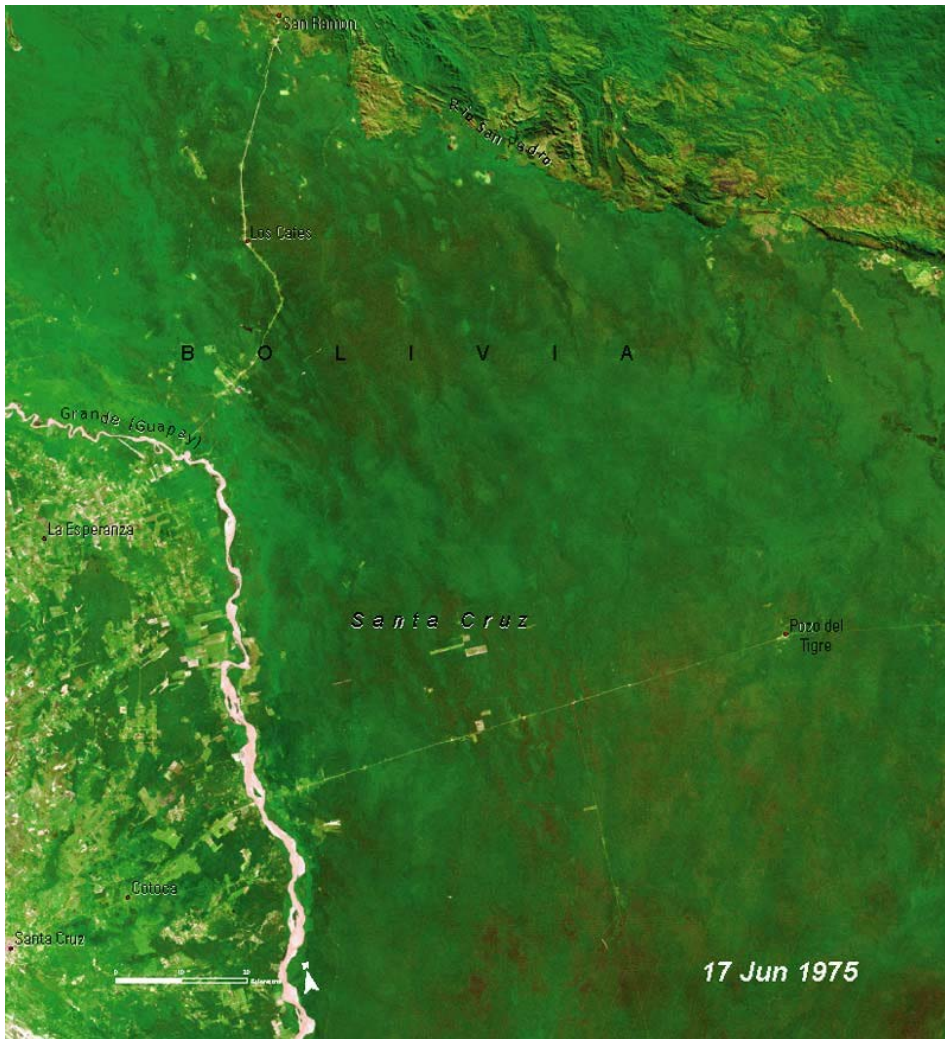


??? 1.7 m velký člověk vs. plocha $128 \cdot 10^{12} \text{ m}^2$???

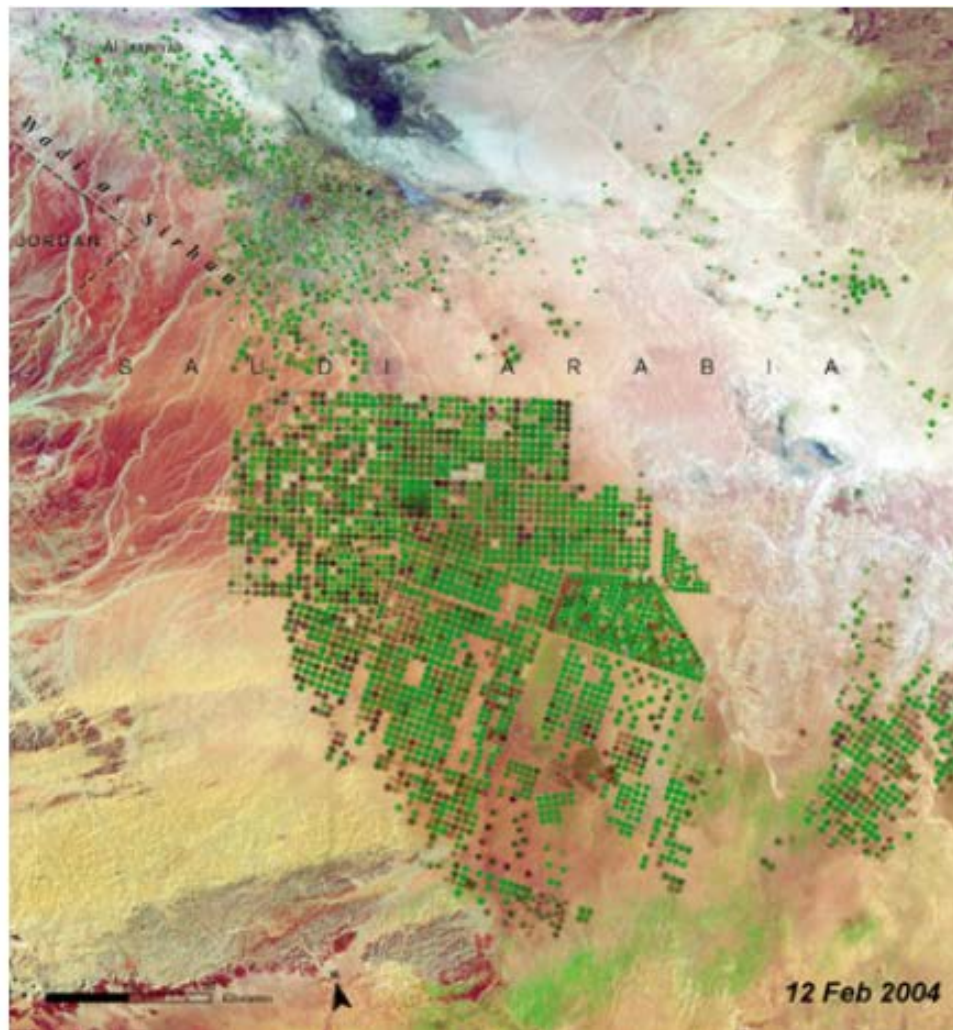
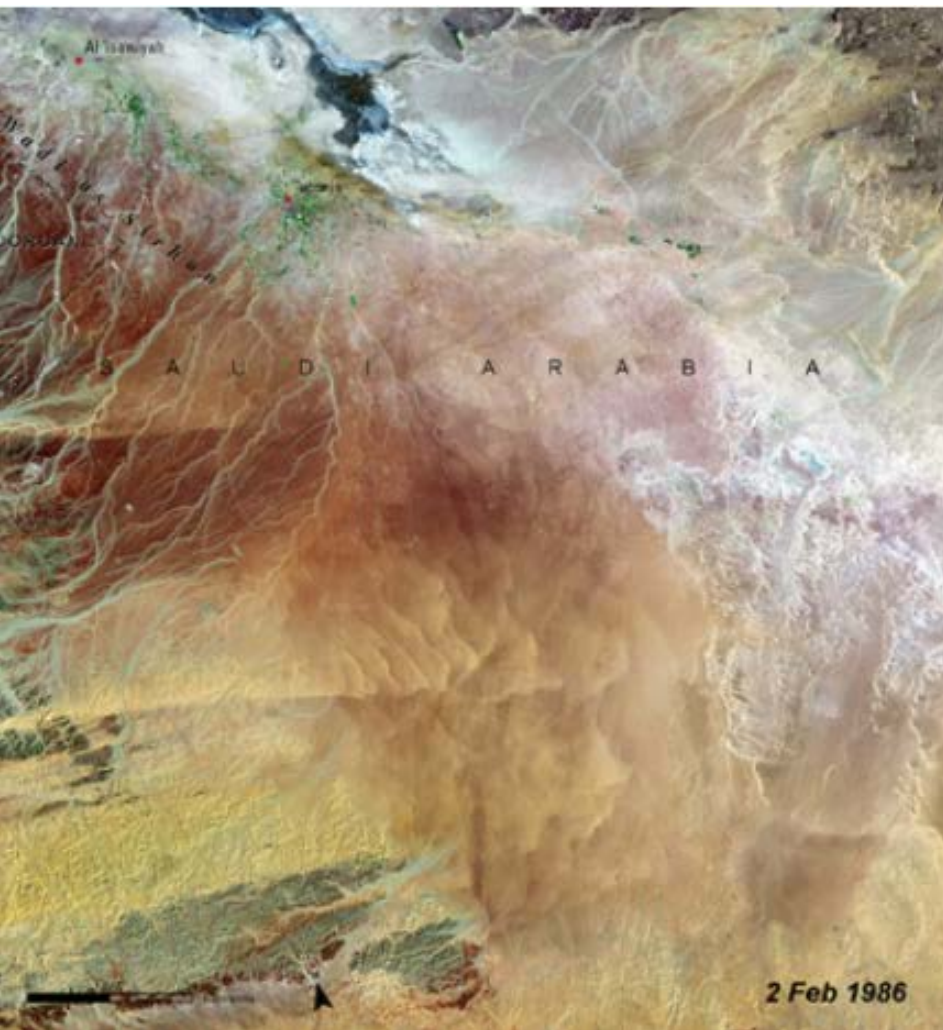




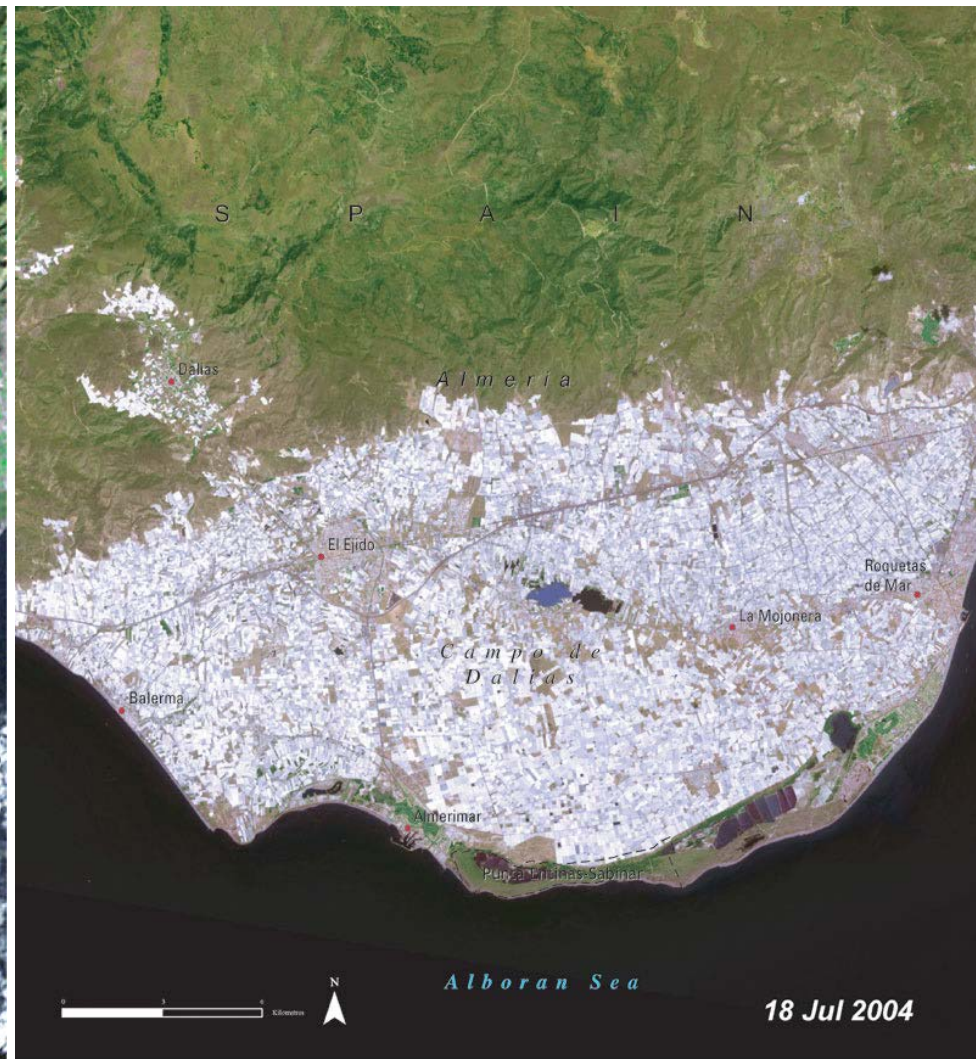
Santa Cruz, Bolívia



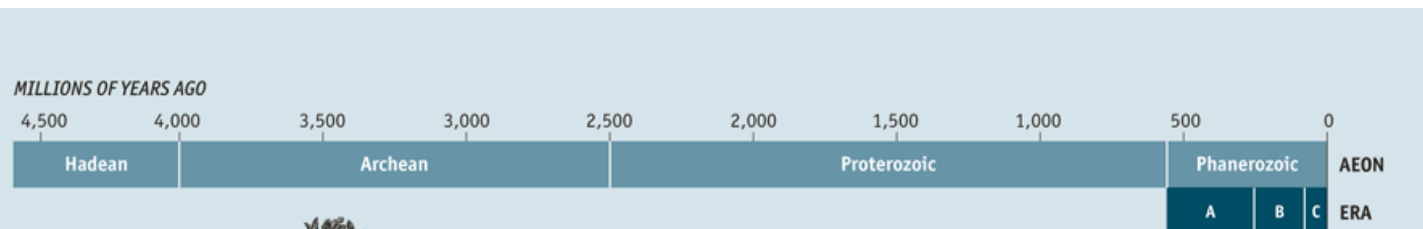
Al'Isawiyah, Saudi Arabia



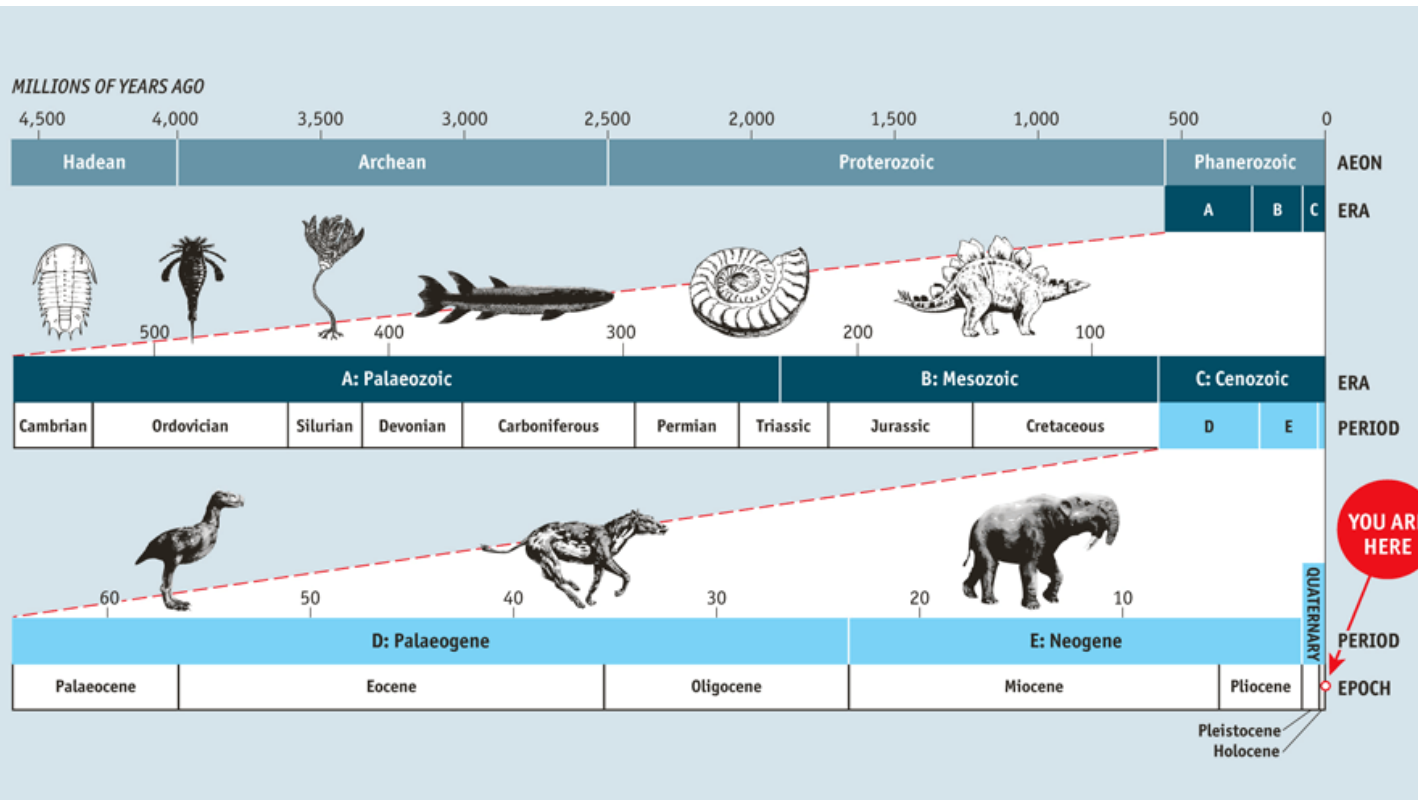
Almeria, Spain



Prahory - čtvrtohory...



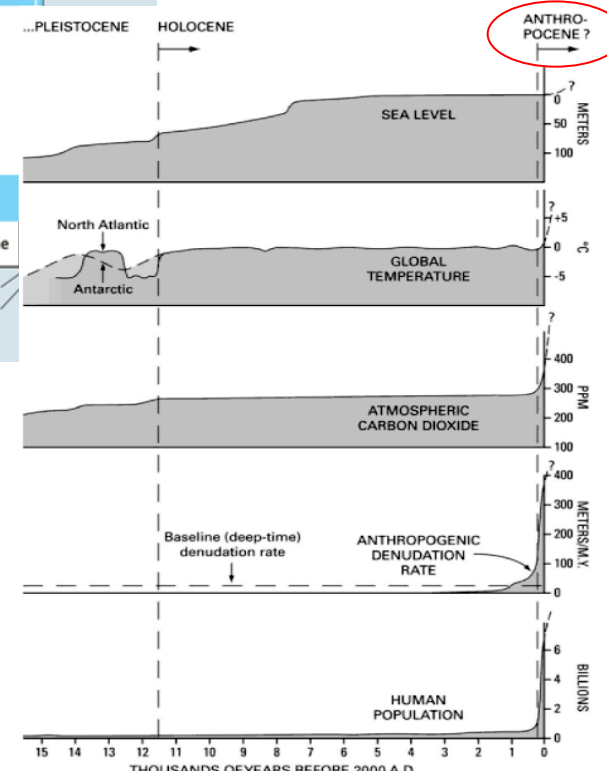
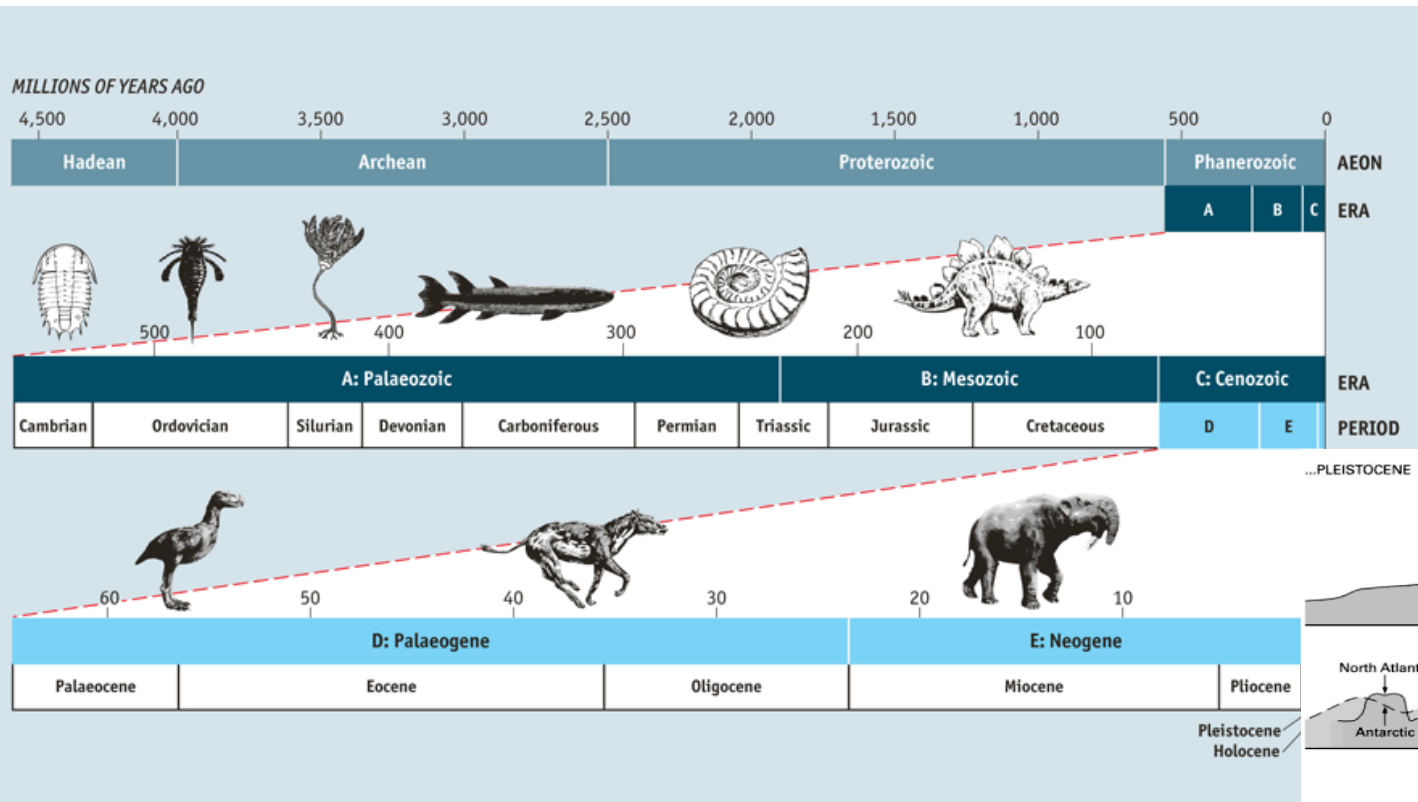
Prahory - čtvrtohory...





Jak se nazývá geologické období, ve kterém ted' žijeme?

Prahory - čtvrtohory...



Geology of mankind

Paul J. Crutzen

For the past three centuries, the effects of humans on the global environment have escalated. Because of these anthropogenic emissions of carbon dioxide, global climate may depart significantly from natural behavior, forcing us to reevaluate our relationship with the planet.

referring to the "anthropozoic era". And in 1926, V. I. Vernadsky acknowledged the increasing impact of mankind: "The direction in which the processes of evolution must proceed, namely towards increasing consciousness and thought, and forms having greater and greater influence on their surroundings." Teilhard de Chardin and

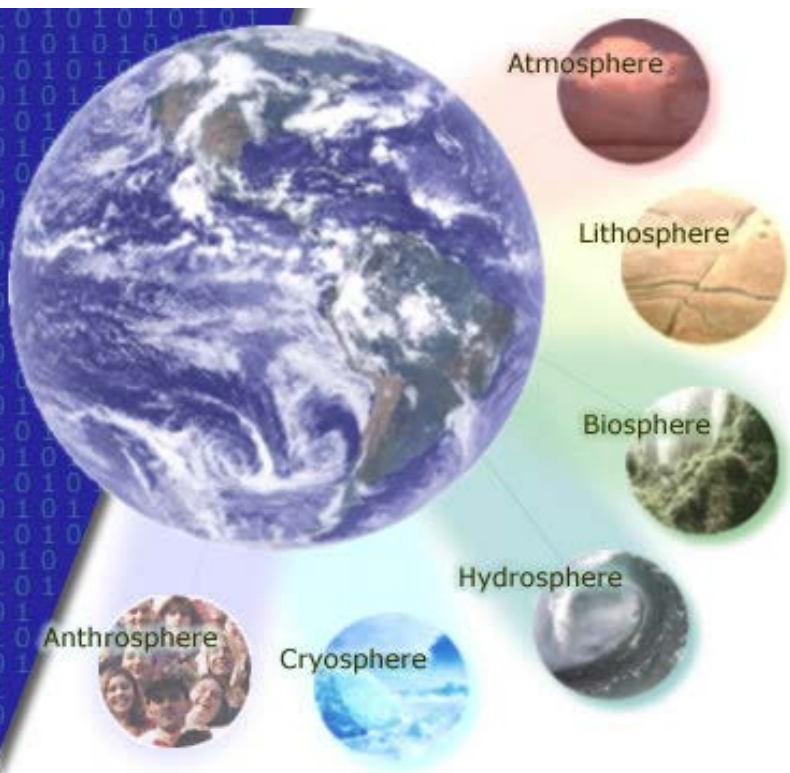
The Anthropocene

The Anthropocene could be said to have started in the late eighteenth century, when analyses of air trapped in polar ice showed the beginning of growing global concentrations of carbon dioxide and methane.

Antropocén



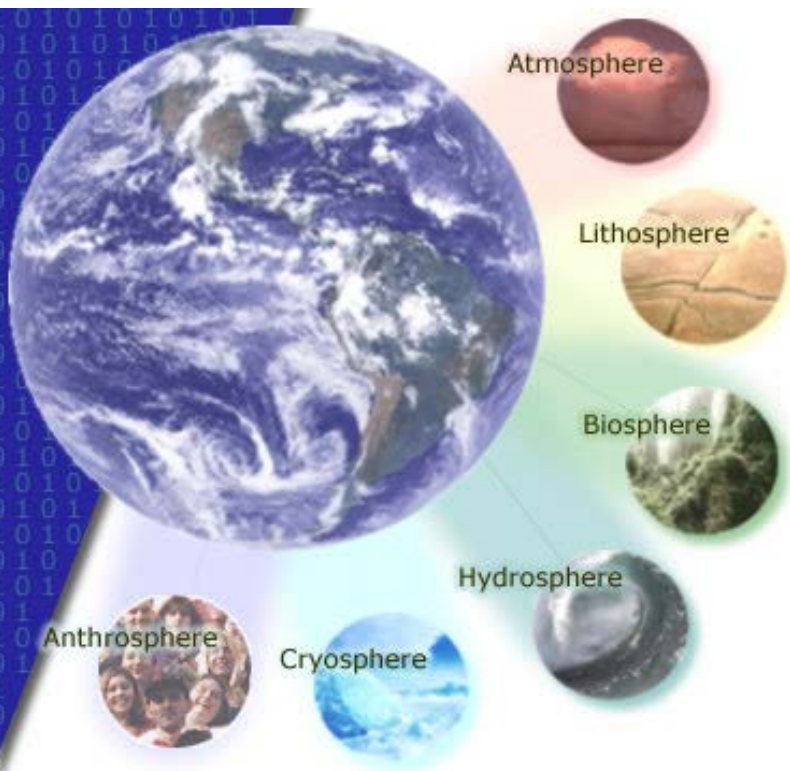
- geologický termín zpopularizovaný P. Crutzenem
- od průmyslové revoluce / WW2 (1/2 18. stol. či 1/2 20. st.?)
- období, kdy člověk začal představovat dominantní sílu měnící stav „Zemského systému“



Antropocén



- geologický termín zpopularizovaný P. Crutzenem
- od průmyslové revoluce / WW2 (1/2 18. stol. či 1/2 20. st.?)
- období, kdy člověk začal představovat dominantní sílu měnící stav „Zemského systému“



Zemský systém – integrované biofyzikálně-socio-ekonomické procesy a interakce mezi hydro-, kryo-, bio-, geo- a antroposférou v prostorovém (od lokálních po globální) a časovém měřítku, jež určují environmentální stav planety v rámci její pozice ve vesmíru.

Co může být považováno za "otisk" aktuálně probíhajícího Antropocénu? Co uvidí budoucí archeolog až za 1.000.000 let bude zkoumat dnešek?

Nobody has responded yet.

Hang tight! Responses are coming in.

Is Earth in a new geological phase thanks to us?

- › 10 November 2014 by [Jan Zalasiewicz](#)
- › Magazine issue [2994](#). [Subscribe and save](#)
- › For similar stories, visit the [Comment and Analysis](#) Topic Guide

It may be time for science to recognise Earth's new era – one shaped by humans. So argues a geologist involved in defining new phases in geological time

WHAT is the legacy that short-lived humanity will leave to an almost eternal Earth? The casual observer might point to tourist sights such as the once mighty city of Angkor, now lying ruined amid the Cambodian jungle, or what survives of the great monuments of ancient Egypt.

They are wonderful, of course, but there is another way to address that question. A little-known working group, part of the International Commission on Stratigraphy, recently met to consider if the human imprint on Earth is now so great, and likely to be detectable for so long, that it deserves to be regarded as a geological epoch in its own right. That would be our real legacy.

Such discussion is not new. George Perkins Marsh, North America's first conservationist, wrote of humans changing the face of the Earth. In 1873 the Italian geologist Antonio Stoppani coined the term *Anthropozoic* – the era in which humans change the course of geological history. Most geologists declared the idea nonsense. The constructions of civilisation may look impressive, they said, but must surely be trivial when set against the collisions of continents and the growth and disappearance of the oceans. When humans disappear, the world will resume its course, and few of our monuments will be left.

But over the past few decades it has become clear that human activities can have geologically far-reaching effects. Science writer Andrew Revkin suggested we were living in what he called the *Anthrocene*; John Curnutt of the US Geological Survey, awed at the transplanting of species across the globe, proposed the *Homogenocene*; marine biologist Daniel Pauly saw the oceans' future as one of slime and jellyfish as a result of overfishing and pollution, and invented the *Myxocene*.

But it was one of the world's most respected scientists, the Nobel-prizewinning atmospheric chemist Paul Crutzen, who proved most influential. He argued that the Holocene, the geological epoch of post-glacial stability in which civilisation arose, had ended and been replaced by the *Anthropocene*, an epoch shaped by humans.

The idea took off. The term was used as if it were a formal epoch. It isn't – but

Marks of the Anthropocene: 7 signs we have made our own epoch



By [Sam Wong](#)

Even if [humanity is long gone](#) in tens of millions of years, there will still be a clear sign of us and the way we lived left preserved in our planet's geological record.

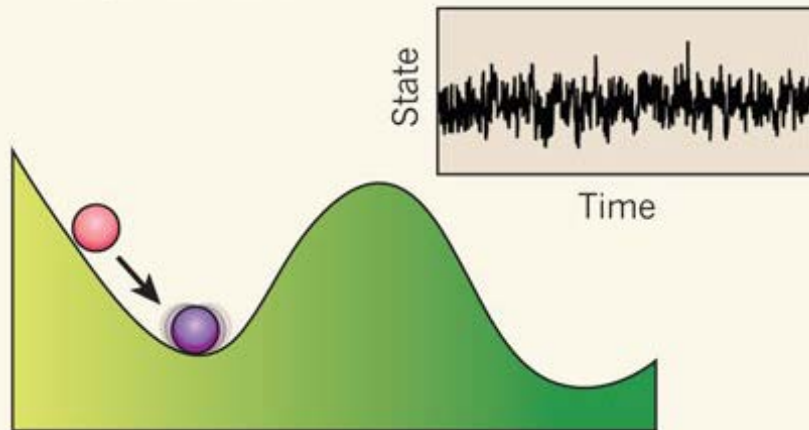
There is now overwhelming evidence that our impact on Earth constitutes its own distinct geological epoch, dating from the middle of the 20th century. Here are the seven signs that will clearly identify the *Anthropocene epoch* for future geologists.

1. Nuclear weapons

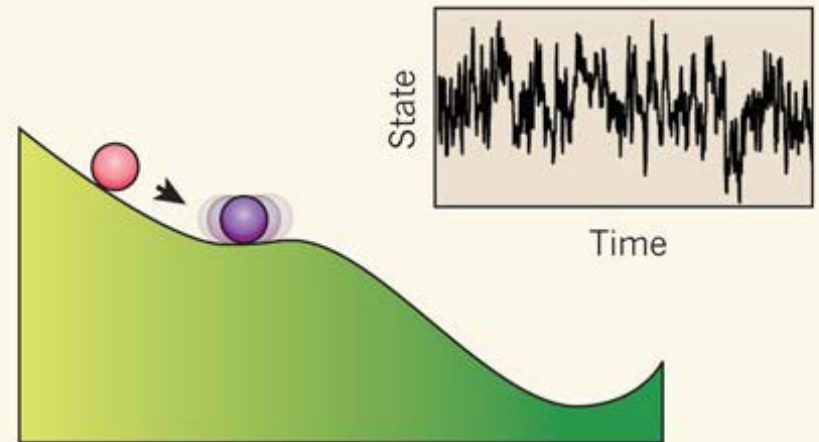
Our war efforts have left their mark on geology. When the first nuclear weapon was detonated on 16 July 1945 in New Mexico, it deposited radionuclides – atoms with excess nuclear energy – across a wide area. Since 1952, more explosive thermonuclear weapons have been tested, leaving a global signature of isotopes such as carbon-14 and plutonium-239.

Proč nás to má zajímat?

a Low risk of transition
High resilience



b High risk of transition
Low resilience



FEATURE

A safe operating space for humanity

Identifying and quantifying planetary boundaries that must not be transgressed could help prevent human activities from causing unacceptable environmental change, argue **Johan Rockström** and colleagues.

Although Earth has undergone many periods of significant environmental change, the planet's environment has been unusually stable for the past 10,000 years¹⁻³. This period of stability — known to geologists as the Holocene — has seen human civilizations arise, develop and thrive. Such stability may now be under threat. Since the Industrial Revolution, a new era has arisen, the Anthropocene⁴, in which human actions have become the main driver of global environmental change⁵. This could see human activities push the Earth system outside the stable environmental state of the Holocene, with consequences that are detrimental or even catastrophic for large parts of the world.

During the Holocene, environmental change occurred naturally and Earth's regulatory capacity maintained the conditions that enabled human development. Regular temperatures, freshwater availability and biogeochemical flows all stayed within a relatively narrow range. Now, largely because of a rapidly growing reliance on fossil fuels and



SUMMARY

- New approach proposed for defining preconditions for human development
- Crossing certain biophysical thresholds could have disastrous consequences for humanity
- Three of nine interlinked planetary boundaries have already been overstepped

industrialized forms of agriculture, human activities have reached a level that could damage the systems that keep Earth in the desirable Holocene state. The result could be irreversible and, in some cases, abrupt environmental change, leading to a state less conducive to human development⁶. Without pressure from humans, the Holocene is expected to continue for at least several thousands of years⁷.

Planetary boundaries

To meet the challenge of maintaining the Holocene state, we propose a framework based on 'planetary boundaries'. These

boundaries define the safe operating space for humanity with respect to the Earth system and are associated with the planet's biophysical subsystems or processes. Although Earth's complex systems sometimes respond smoothly to changing pressures, it seems that this will prove to be the exception rather than the rule. Many subsystems of Earth react in a nonlinear, often abrupt, way, and are particularly sensitive around threshold levels of certain key variables. If these thresholds are crossed, then important subsystems, such as a monsoon system, could shift into a new state, often with deleterious or potentially even disastrous consequences for humans^{8,9}.

Most of these thresholds can be defined by a critical value for one or more control variables, such as carbon dioxide concentration. Not all processes or subsystems on Earth have well-defined thresholds, although human actions that undermine the resilience of such processes or subsystems — for example, land and water degradation — can increase the risk that thresholds will also be crossed in other processes, such as the climate system.

We have tried to identify the Earth-system processes and associated thresholds which, if crossed, could generate unacceptable environmental change. We have found nine such processes for which we believe it is necessary to define planetary boundaries: climate change; rate of biodiversity loss (terrestrial and marine); interference with the nitrogen and phosphorus cycles; stratospheric ozone depletion; ocean acidification; global freshwater use; change in land use; chemical pollution; and atmospheric aerosol loading (see Fig. 1 and Table).

In general, planetary boundaries are values for control variables that are either at a 'safe' distance from thresholds — for processes with evidence of threshold behaviour — or at dangerous levels — for processes without

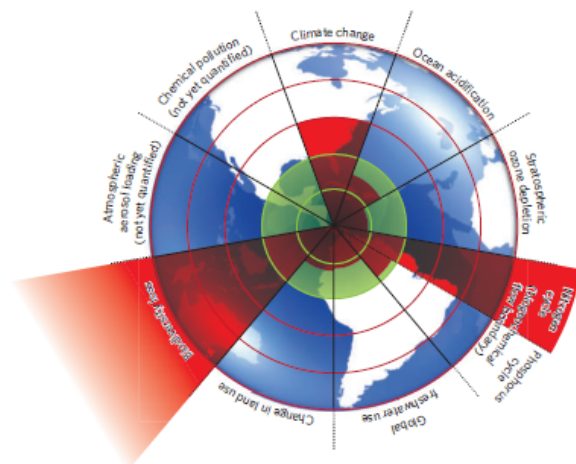



Figure 1 | Beyond the boundary. The inner green shading represents the proposed safe operating space for nine planetary systems. The red wedges represent an estimate of the current position for each variable. The boundaries in three systems (rate of biodiversity loss, climate change and human interference with the nitrogen cycle), have already been exceeded.



A safe operating space for humanity (Rockström et al., 2009)

1a) In which geological period, and when human civilization arise and thrive?

1b) Why the development of our civilization was possible in this period?

1c) What can jeopardize a continuity of our development in the future?

Although Earth has undergone many periods of significant environmental change, the planet's environment has been unusually stable for the past 10,000 years¹⁻³. This period of stability — known to geologists as the Holocene — has seen human civilizations arise, develop and thrive. Such stability may now be under threat. Since the Industrial Revolution, a new era has arisen, the Anthropocene⁴, in which human actions have become the main driver of global environmental change⁵. This could see human activities push the Earth system outside the stable environmental state of the Holocene, with consequences that are detrimental or even catastrophic for large parts of the world.

During the Holocene, environmental change occurred naturally and Earth's regulatory capacity maintained the conditions that enabled human development. Regular temperatures, freshwater availability and biogeochemical flows all stayed within a relatively narrow range. Now, largely because of a rapidly growing reliance on fossil fuels and

industrialized forms of agriculture, human activities have reached a level that could damage the systems that keep Earth in the desirable Holocene state. The result could be irreversible and, in some cases, abrupt environmental change, leading to a state less conducive to human development⁶. Without pressure from humans, the Holocene is expected to continue for at least several thousands of years⁷.



A safe operating space for humanity (Rockström et al., 2009)

2a) What are the “Planetary boundaries” about?

Planetary boundaries

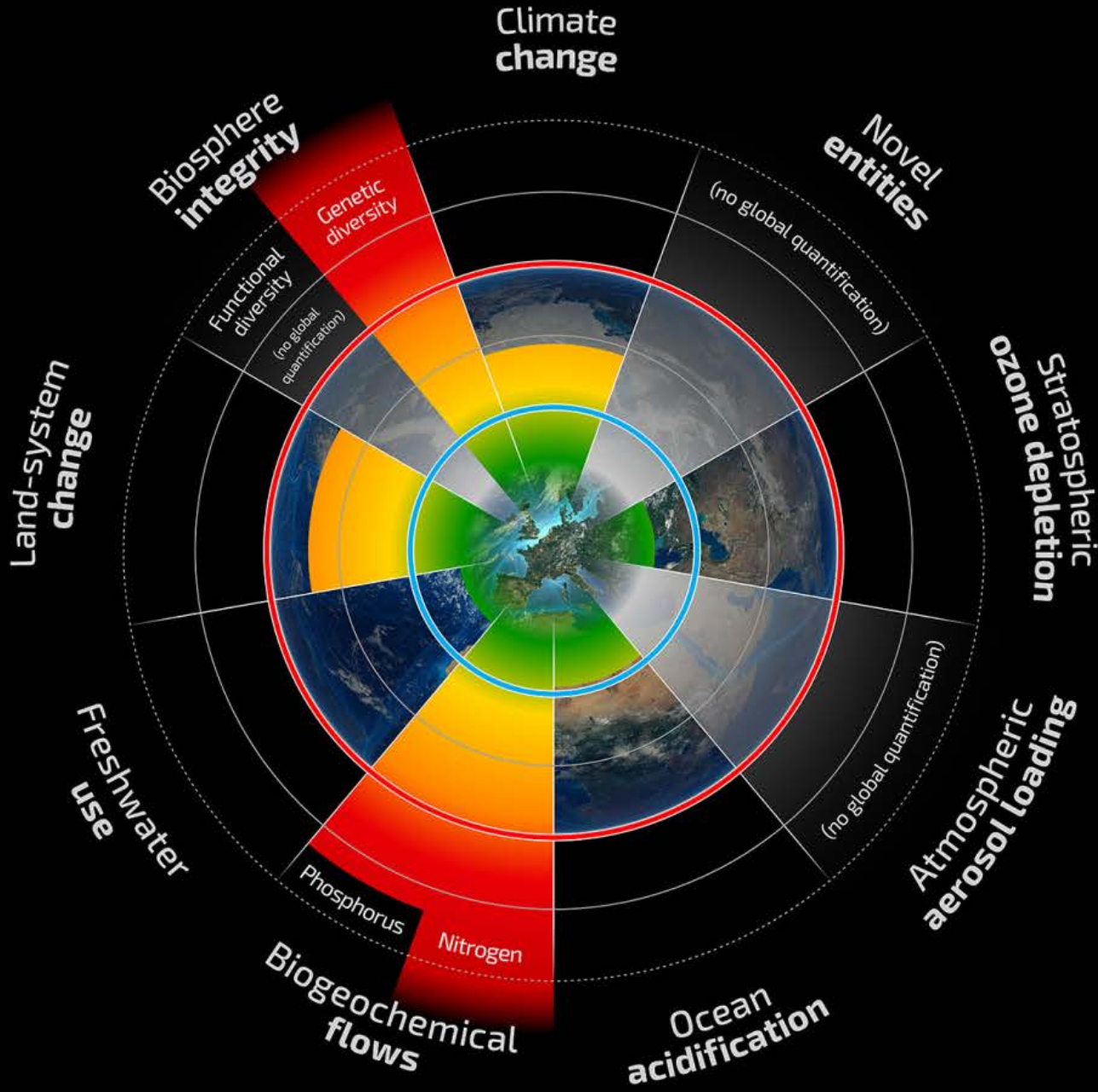
To meet the challenge of maintaining the Holocene state, we propose a framework based on ‘planetary boundaries’. These boundaries define the safe operating space for humanity with respect to the Earth system and are associated with the planet’s biophysical subsystems or processes. Although Earth’s complex systems sometimes respond smoothly to changing pressures, it seems that this will prove to be the exception rather than the rule. Many subsystems of Earth react in a nonlinear, often abrupt, way, and are particularly sensitive around threshold levels of certain key variables. If these thresholds are crossed, then important subsystems, such as a monsoon system, could shift into a new state, often with deleterious or potentially even disastrous consequences for humans^{8,9}.

2b) Which Earth-system processes were identified (9)?

We have tried to identify the Earth-system processes and associated thresholds which, if crossed, could generate unacceptable environmental change. We have found nine such processes for which we believe it is necessary to define planetary boundaries: climate change; rate of biodiversity loss (terrestrial and marine); interference with the nitrogen and phosphorus cycles; stratospheric ozone depletion; ocean acidification; global freshwater use; change in land use; chemical pollution; and atmospheric aerosol loading (see Fig. 1 and Table).

Planetary Boundaries

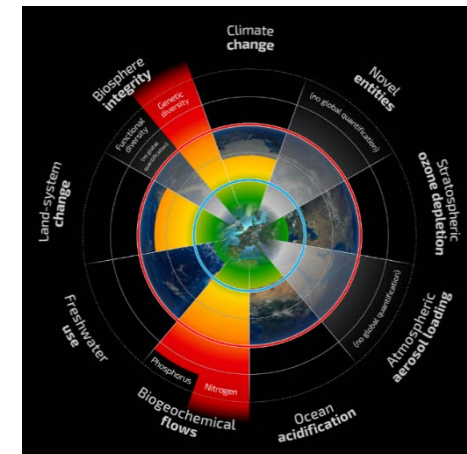
A safe operating space for humanity



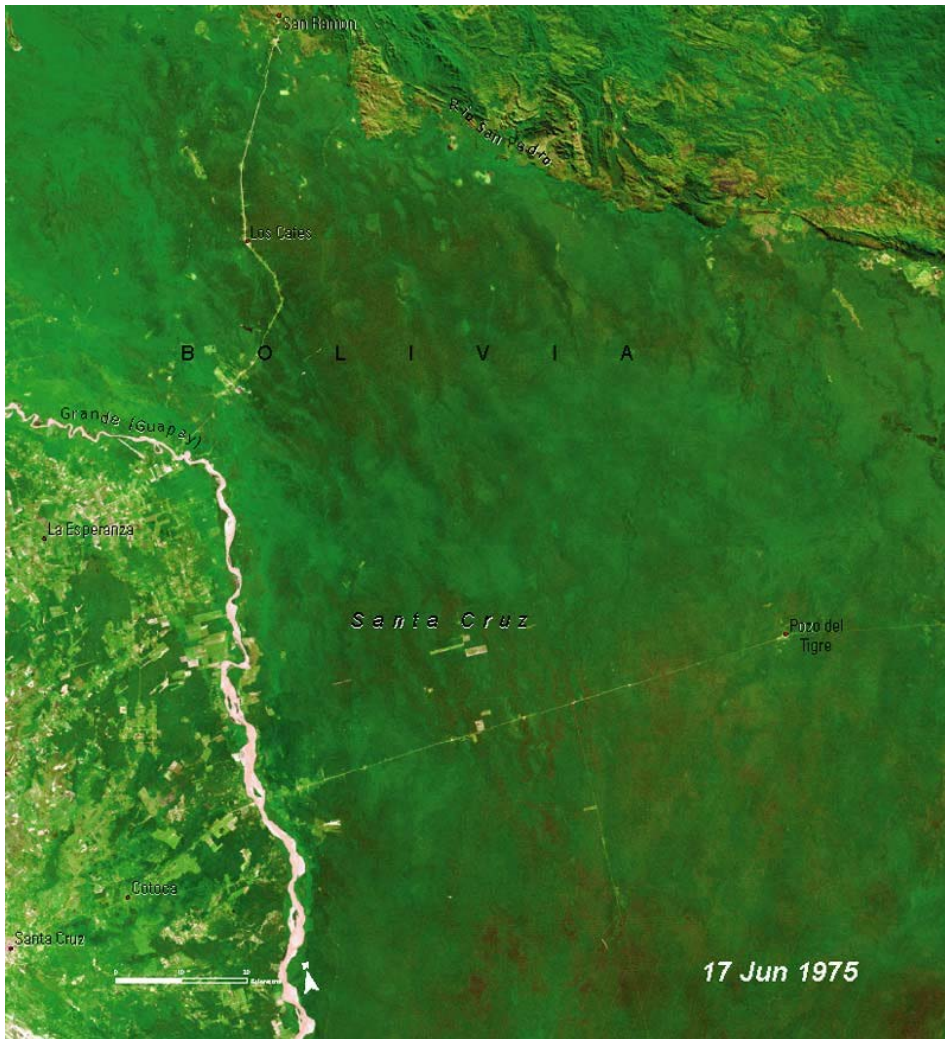
- Beyond zone of uncertainty (high risk)
- In zone of uncertainty (increasing risk)
- Below boundary (safe)
- Boundary not yet quantified

I. Změna využívání krajiny

Earth-system process	Control variable(s)	Planetary boundary (zone of uncertainty)	Current value of control variable
Land-system change (R2009: same)	<i>Global:</i> Area of forested land as % of original forest cover	<i>Global:</i> 75% (75–54%) Values are a weighted average of the three individual biome boundaries and their uncertainty zones	62%
	<i>Biome:</i> Area of forested land as % of potential forest	<i>Biome:</i> Tropical: 85% (85–60%) Temperate: 50% (50–30%) Boreal: 85% (85–60%)	



Santa Cruz, Bolivia





Změna využívání krajiny

- **zemědělství** (především)
- posledních 50 změna na zemědělskou půdu - 0,8 % ročně
- hlavní síla řídící ztrátu **ekosystémových funkcí a služeb** (např. produkce potravin a cyklus vody), ztrátu biodiverzity a podkopává lidský blahobyt a dlouhodobou udržitelnost
- při překročení únosné míry využívání v určitém regionu může dojít k **náhlé změně** charakteru krajiny

Parts of Amazon close to tipping point

› 13:52 05 March 2009 by [Catherine Brahic](#)

› For similar stories, visit the [Endangered Species](#) Topic Guide

The Mato Grosso, the most scarred region of the Amazon rainforest, is teetering on a deforestation "tipping point", and may soon be on a one-way route to becoming a dry and relatively barren savannah.

[Mônica Carneiro Alves Senna](#) and colleagues at the Federal University of Viçosa, Brazil, used computer models to simulate how the Amazon would recover from various amounts of deforestation. Their simulations ranged from a complete wipe-out of the entire forest to a situation where just one fifth of the forest would be removed.

Parts of Amazon close to tipping point

› 13:52 05 Ma
› For similar s

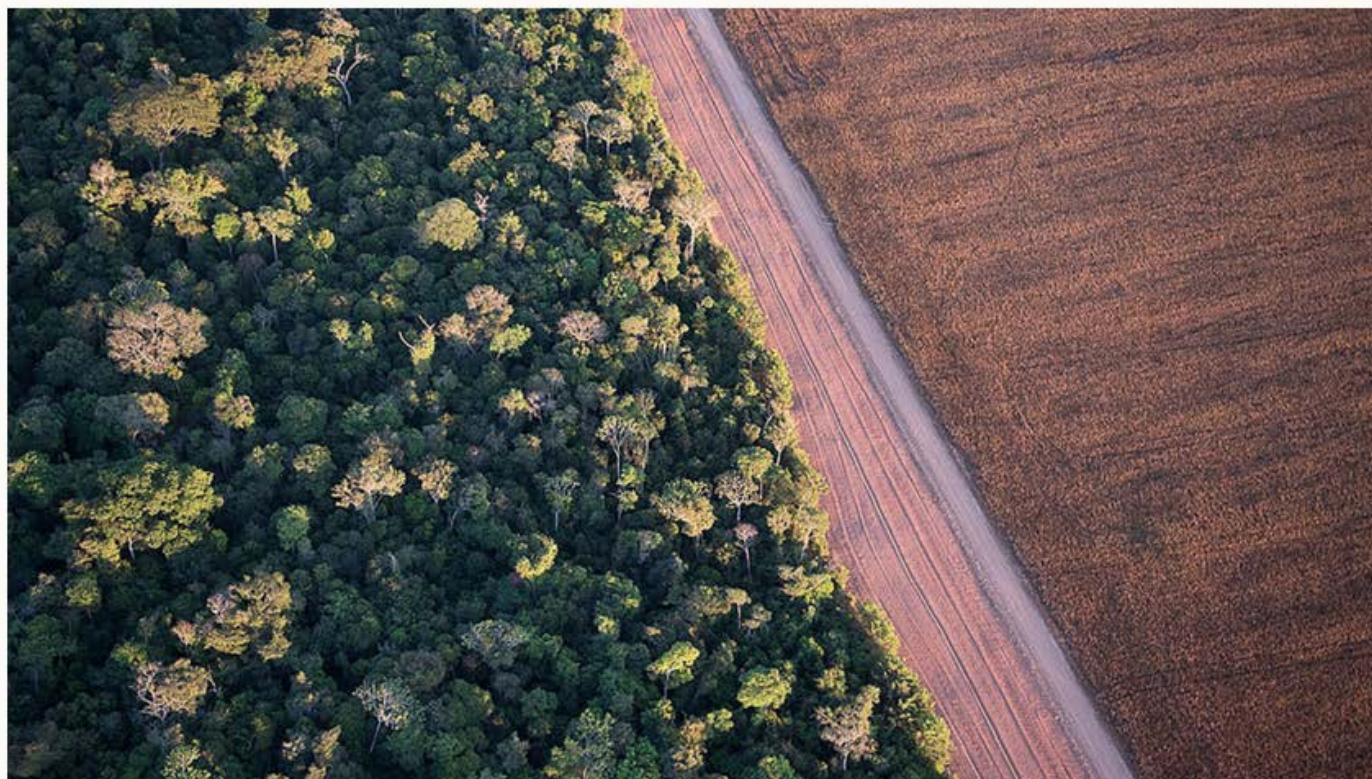
The Mato Gros
teetering on a
route to becom

Mônica Carnei
Viçosa, Brazil
recover from wa
complete wipe
forest would be

YaleEnvironment360

Published at the Yale School of the
Environment

Explore Search About E360



The boundary between Tanguro Farm and the Amazon rainforest in Mato Grosso, Brazil. COURTESY OF CHRIS LINDER

Amazon Watch: What Happens When the Forest Disappears?

At a remote site where the world's largest rainforest abuts land cleared for big agriculture, Brazilian and American scientists are keeping watch for a critical tipping point - the time when the Amazon ceases to be a carbon sink and turns into a source of carbon emissions.

BY FRED PEARCE · OCTOBER 17, 2019

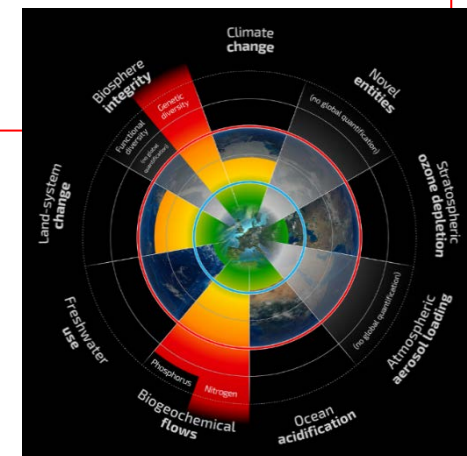
II. Globální spotřeba vody

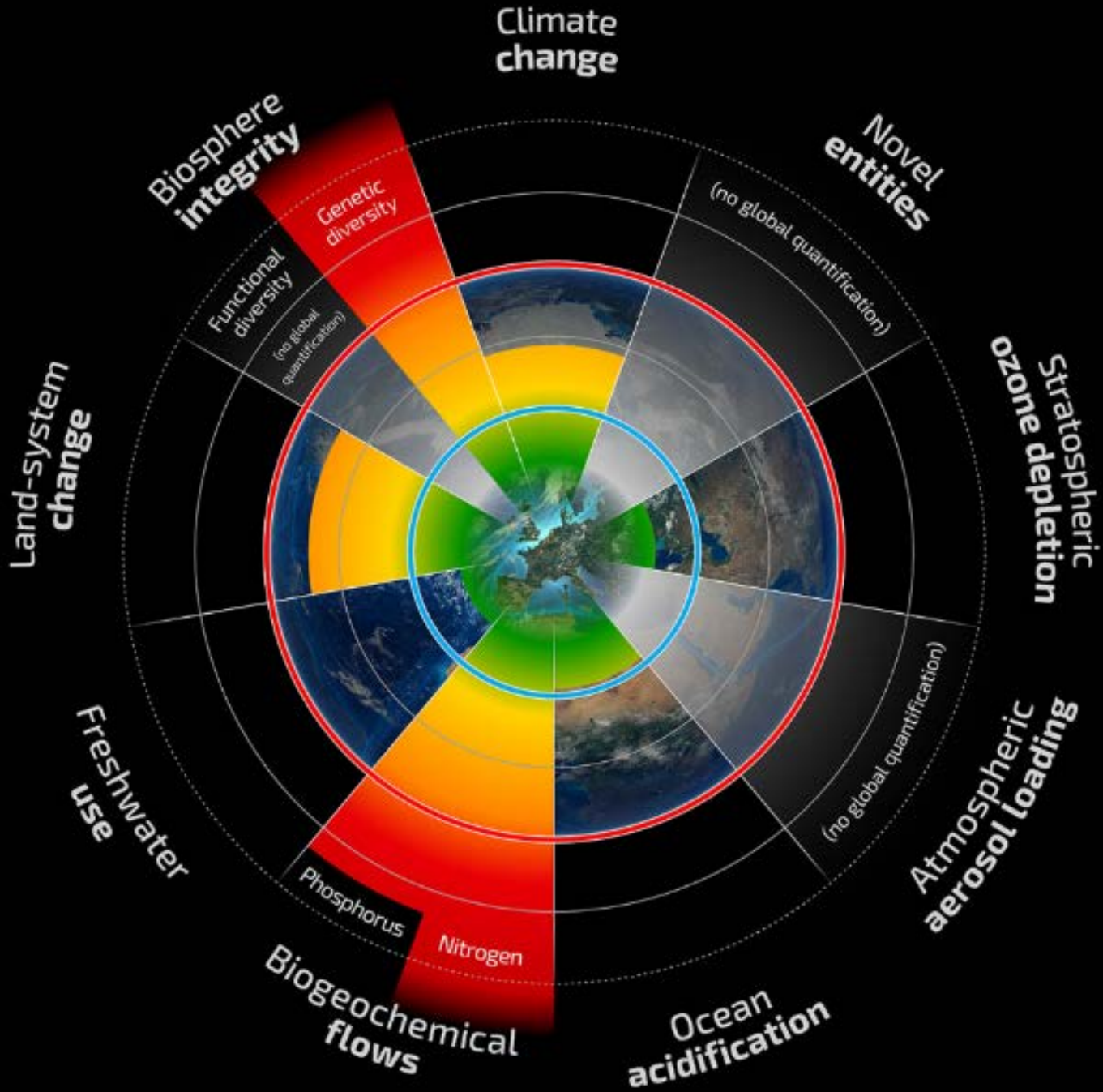
Earth-system process	Control variable(s)	Planetary boundary (zone of uncertainty)	Current value of control variable
Freshwater use (R2009: Global freshwater use)	<p><i>Global:</i> Maximum amount of consumptive blue water use ($\text{km}^3\text{yr}^{-1}$)</p> <p><i>Basin:</i> Blue water withdrawal as % of mean monthly river flow</p>	<p><i>Global:</i> $4000 \text{ km}^3 \text{ yr}^{-1}$ ($4000\text{--}6000 \text{ km}^3 \text{ yr}^{-1}$)</p> <p><i>Basin:</i> Maximum monthly withdrawal as a percentage of mean monthly river flow. For low-flow months: 25% (25–55%); for intermediate-flow months: 30% (30–60%); for high-flow months: 55% (55–85%)</p>	$\sim 2600 \text{ km}^3 \text{ yr}^{-1}$

Boundary: No more than 4000 km^3 of fresh water consumed per year

Current level: 2600 km^3 per year

Diagnosis: Boundary will be approached by mid-century





Nedostatek sladké vody

- člověk je dominantní silou měnící globálně tok vody v řekách
- přibližně 25 % vody z povodí vůbec nedoteče do oceánů
- vážné důsledky pro stav biodiverzity, produkci potravin, zdravotní rizika, snižování pružnosti ter. a aqua. ekosystémů

8 Mighty Rivers Run Dry From Overuse

[Main](#) [About the Freshwater Initiative](#) [Restoring Rivers](#) [Reducing Water Use](#) [News](#) [Videos](#)

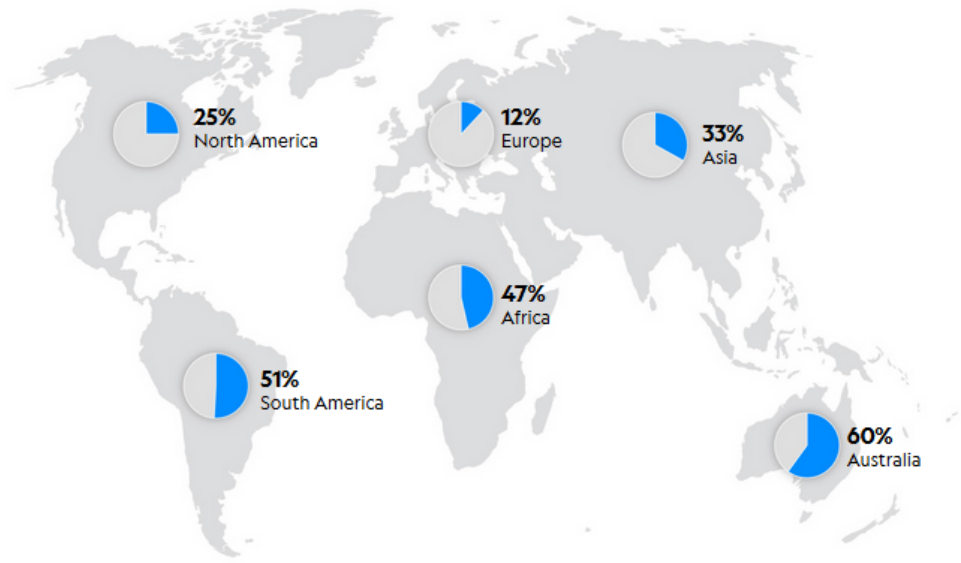




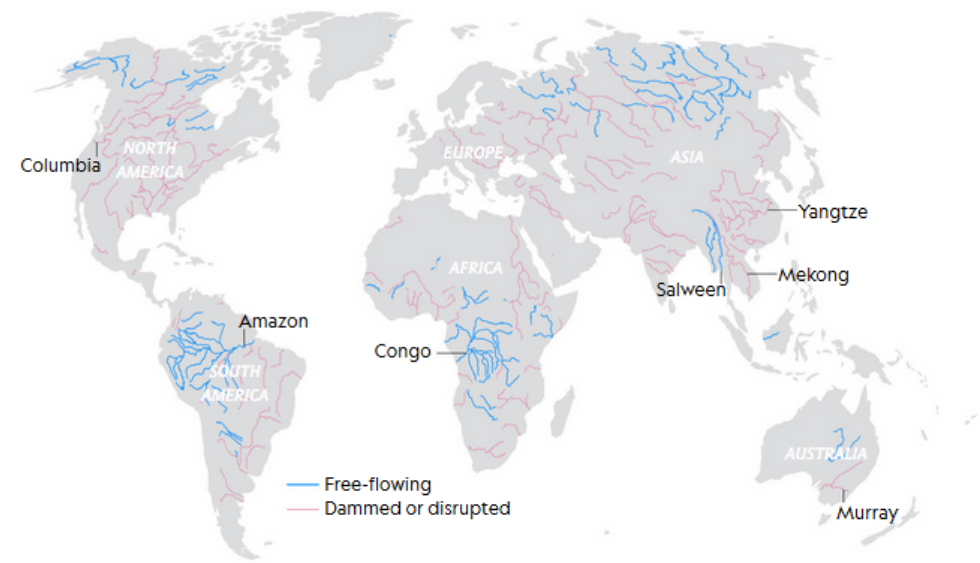
The world's remaining free-flowing rivers

Only 37 percent of world's largest rivers are free of dams or other disruptions. Free-flowing rivers are found primarily in the Amazon and Congo Basins, and in the Arctic.

Percentage of very large rivers (longer than 1,000 km) that remain free-flowing, by continent



Distribution of very large rivers



Aralské Jezero - Kazachstán, Uzbekistán

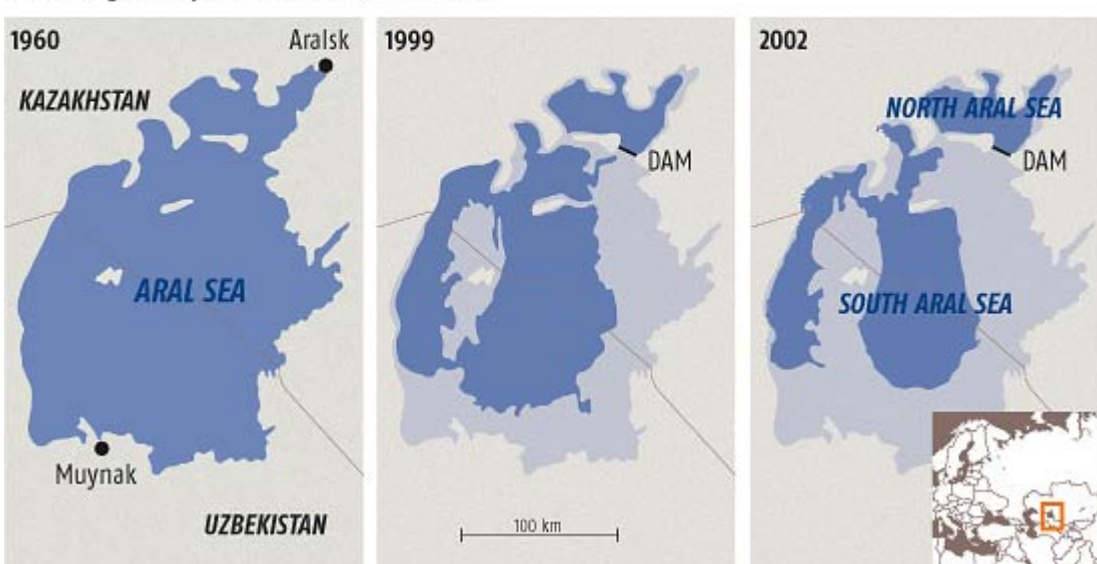


Aralské Jezero

- Kazachstán, Uzbekistán

THE SHRINKING SEA

The changed shape of the Aral Sea since 1960



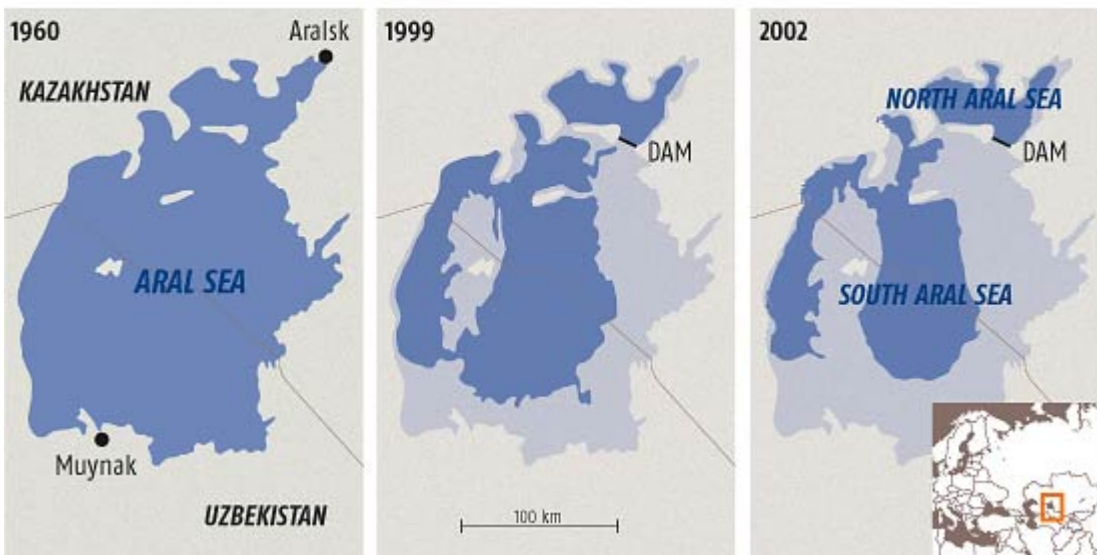
- 2005 postavena přehrada mezi S a J částí
- co následovalo?

Aralské Jezero

- Kazachstán, Uzbekistán

THE SHRINKING SEA

The changed shape of the Aral Sea since 1960

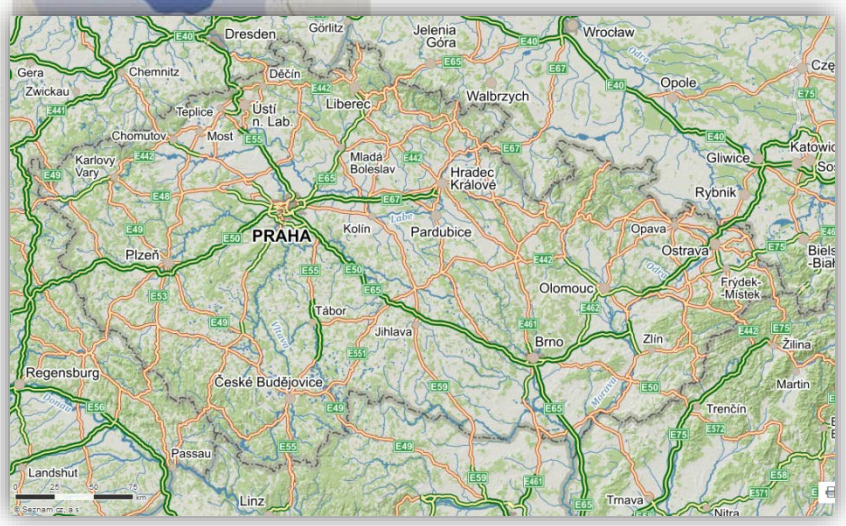
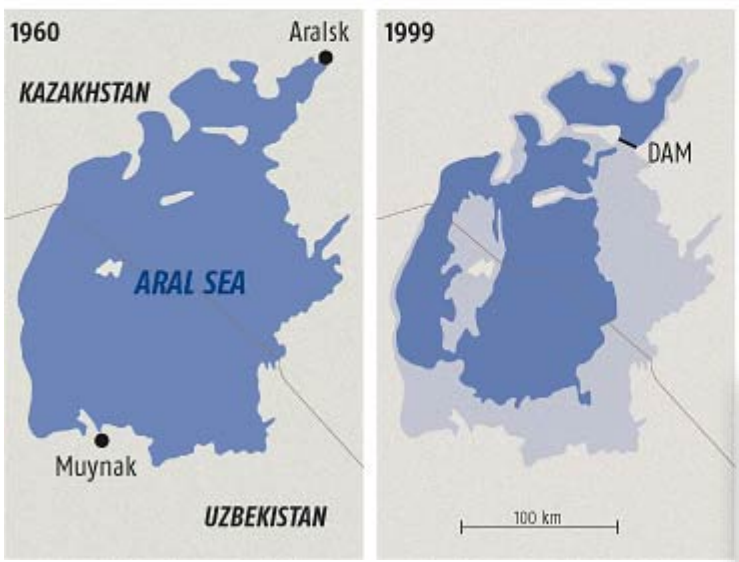


- 2005 postavena přehrada mezi S a J částí
- co následovalo?

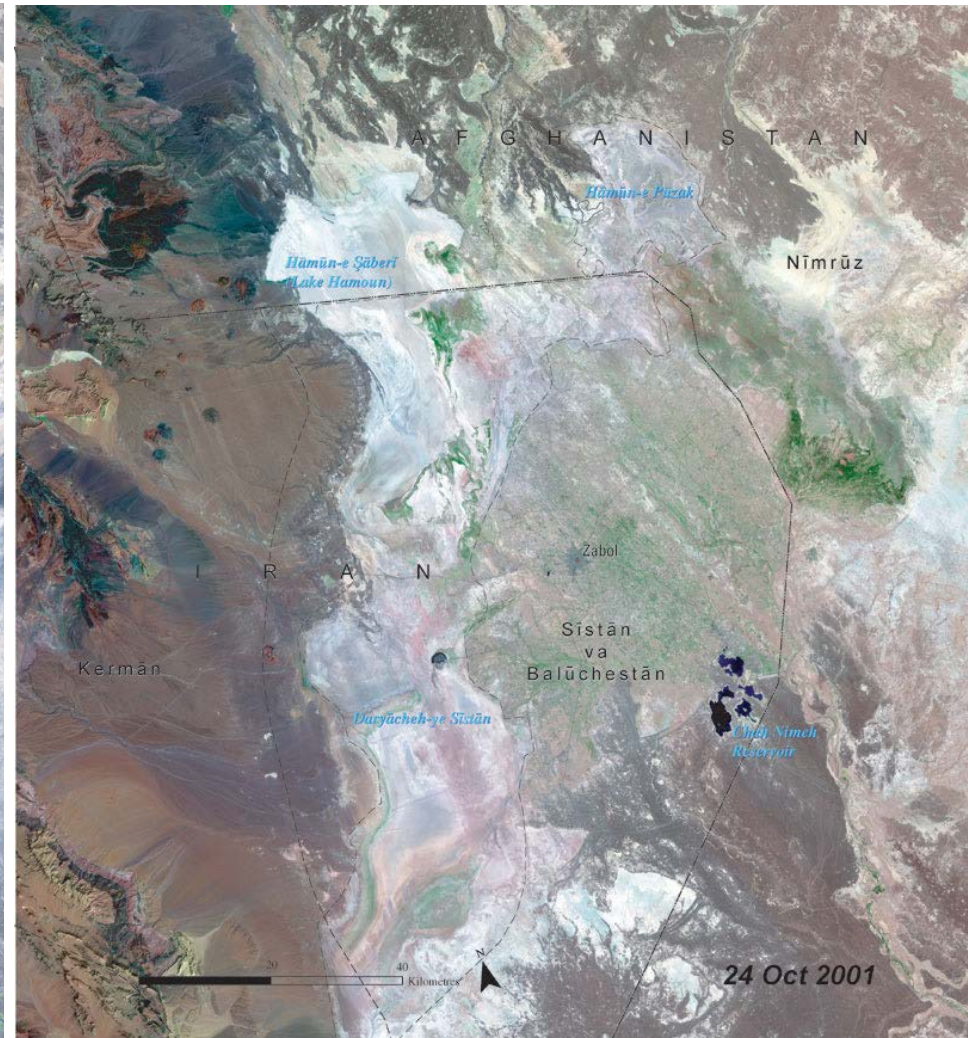
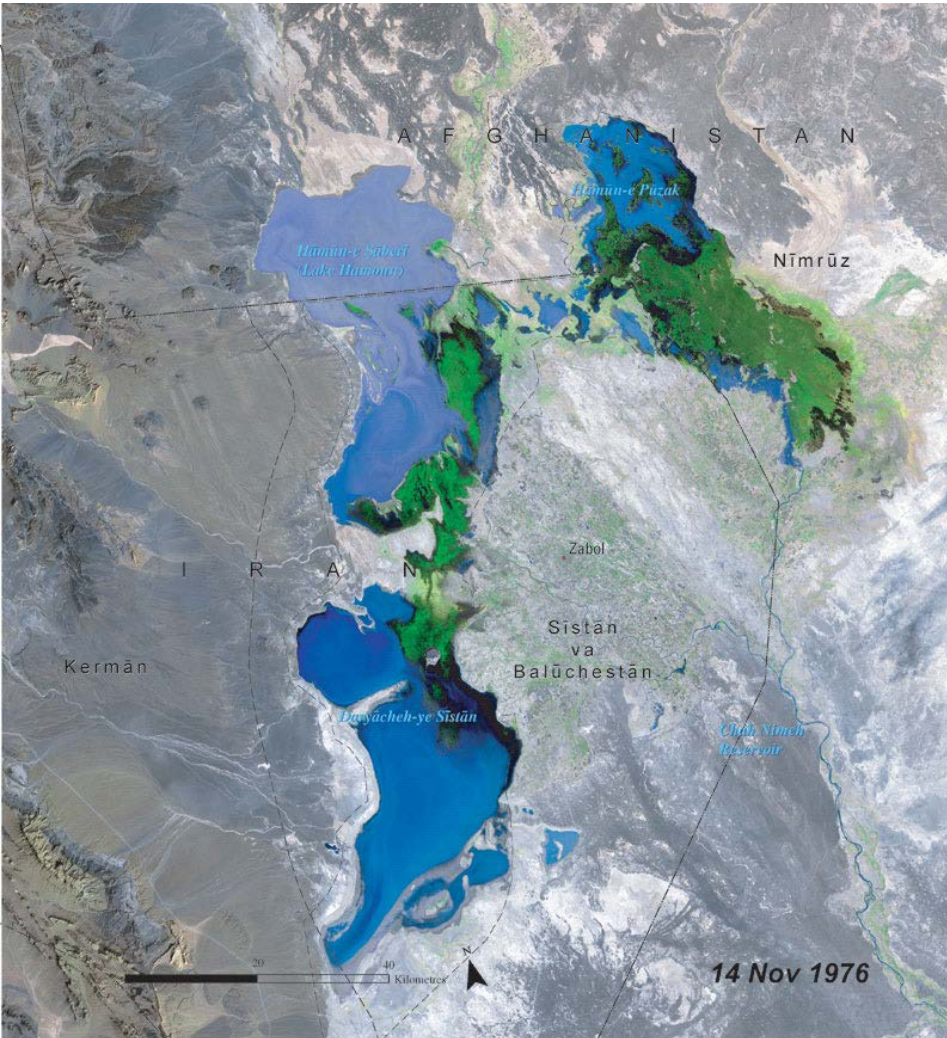
Aralské Jezero

THE SHRINKING SEA

The changed shape of the Aral Sea since 1960



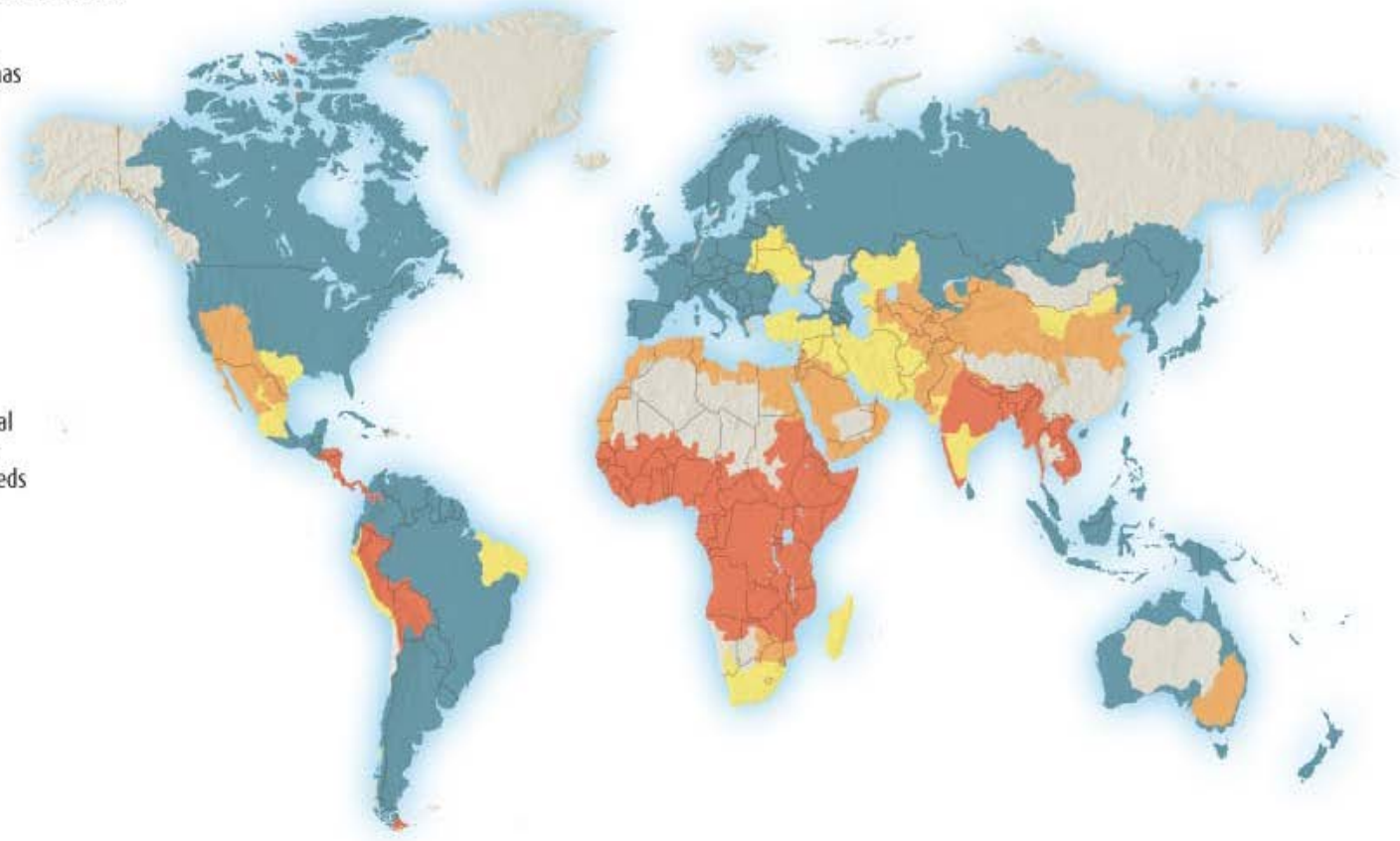
Lake Hamoun – Irán, Afghánistán



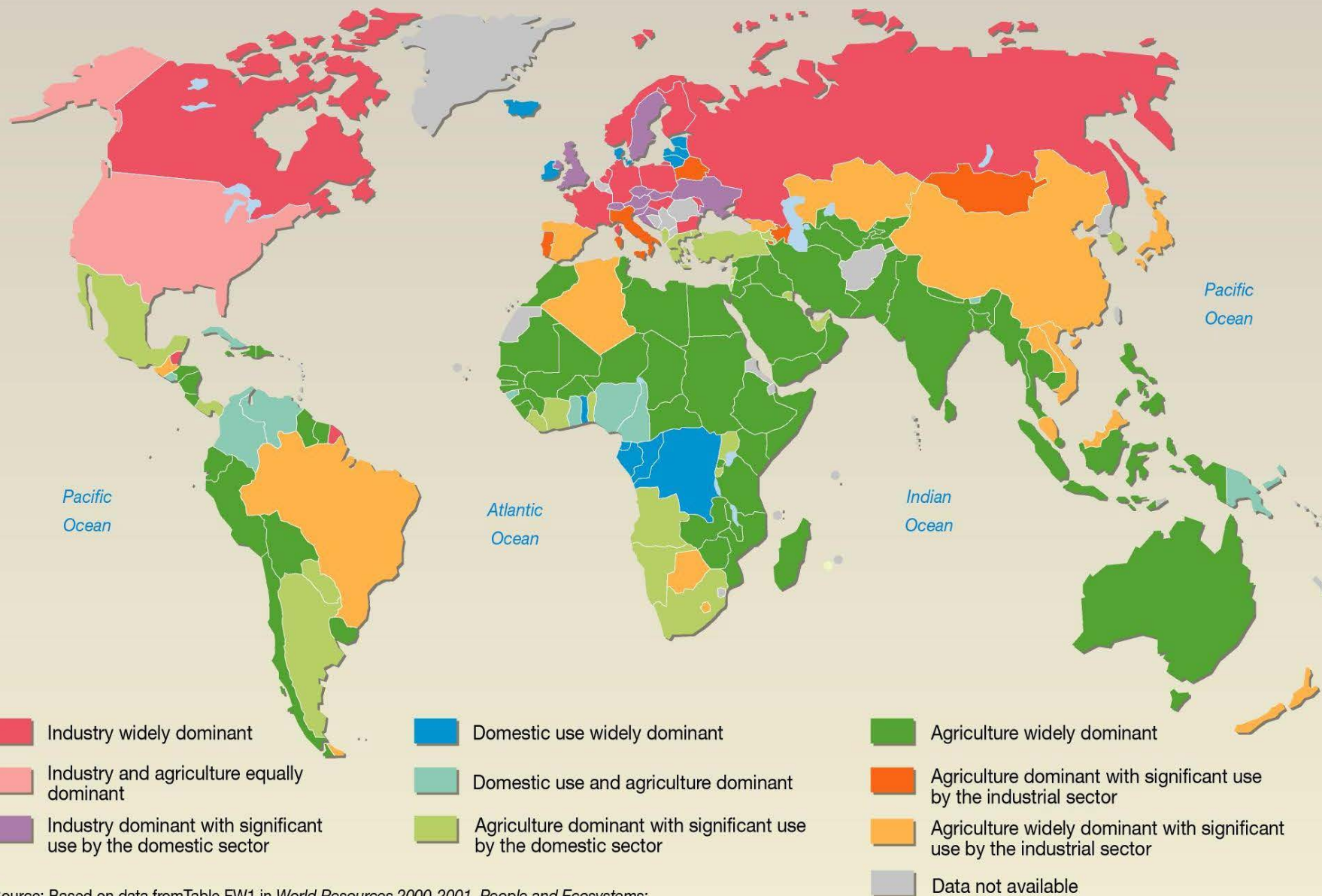
Oblasti a příčiny nedostatku vody

Areas around the globe suffering from depleted water resources

- Physical water scarcity**
Water resource development is approaching or has exceeded sustainable limits. More than 75% of river flow is extracted for agriculture
- Approaching physical water scarcity**
More than 60% of river flow is extracted. These areas will experience physical water scarcity in the near future
- Economic water scarcity**
Limited access to water even though natural local supplies are available to meet human demands. Less than 25% of water extracted for human needs
- Little or no water scarcity**
Abundant water resources relative to use, with less than 25% of water extracted for human purposes
- Not estimated**



Odvětví spotřeby vody



Source: Based on data from Table FW1 in *World Resources 2000-2001, People and Ecosystems: The Fraying Web of Life*, World Resources Institute (WRI), Washington DC, 2000.



**Napište jednu informaci, která vás dnes
nejvíce zaujala či překvapila.**