

Geofuture

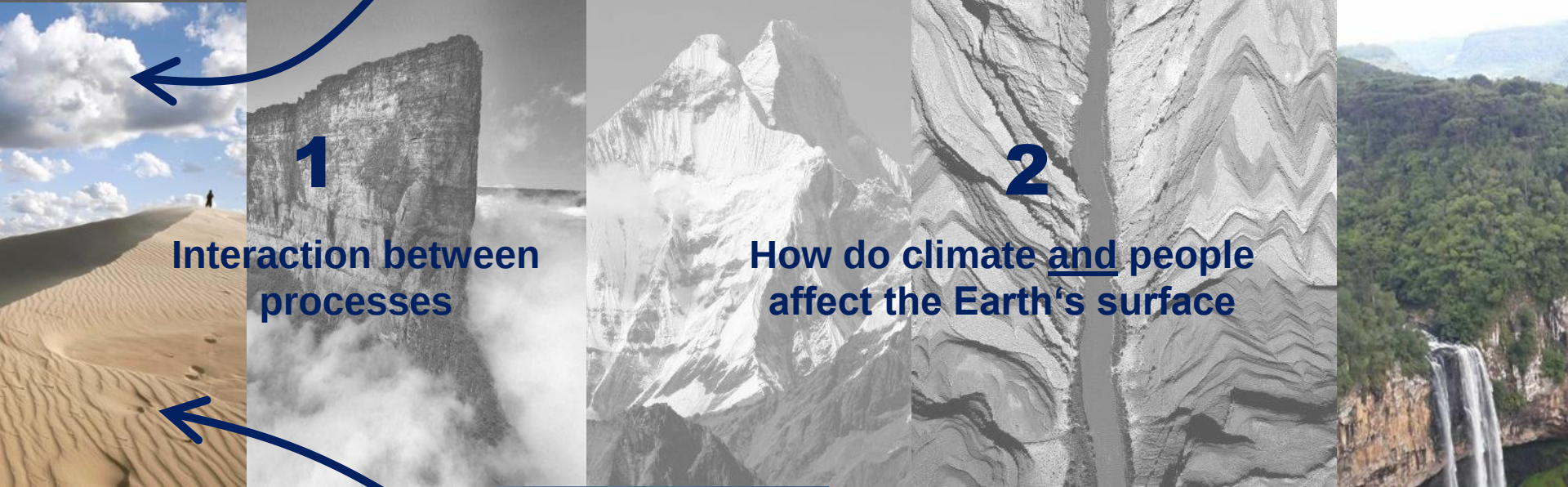
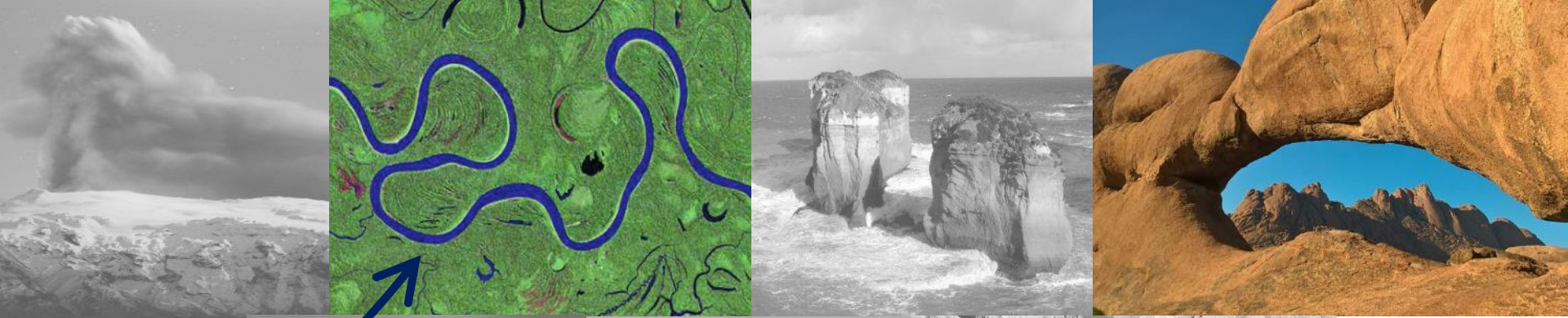
Physical landscapes and the geosphere in the future?

Dr Alissa Flatley
ACNA4007 – Physical Landscape and the Geosphere



Prifysgol Cymru
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University of Wales
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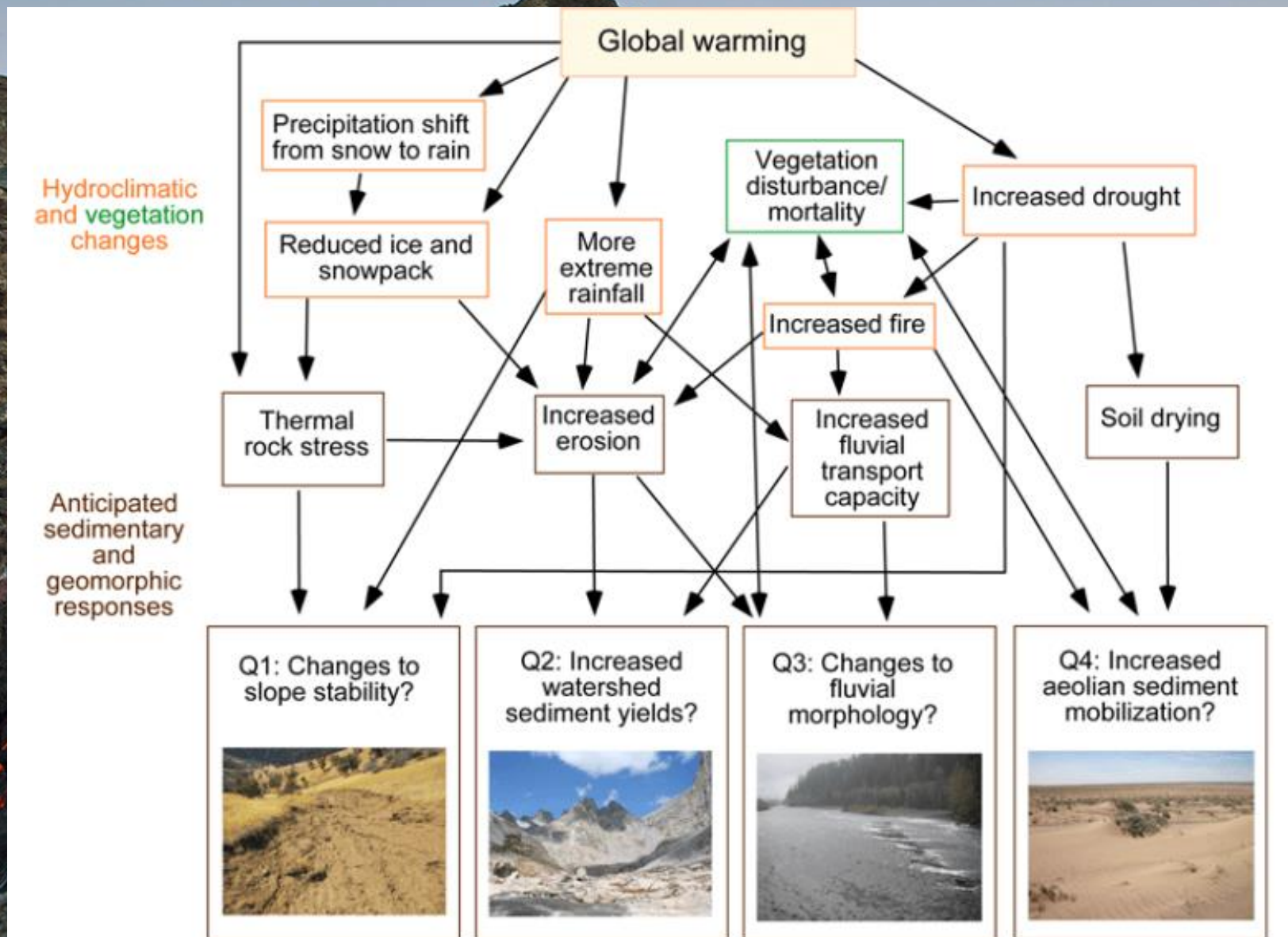


1
Interaction between
processes

2
How do climate and people
affect the Earth's surface



Changes to Landscape Processes



Geosphere of the future

Reminder: What is the geosphere?



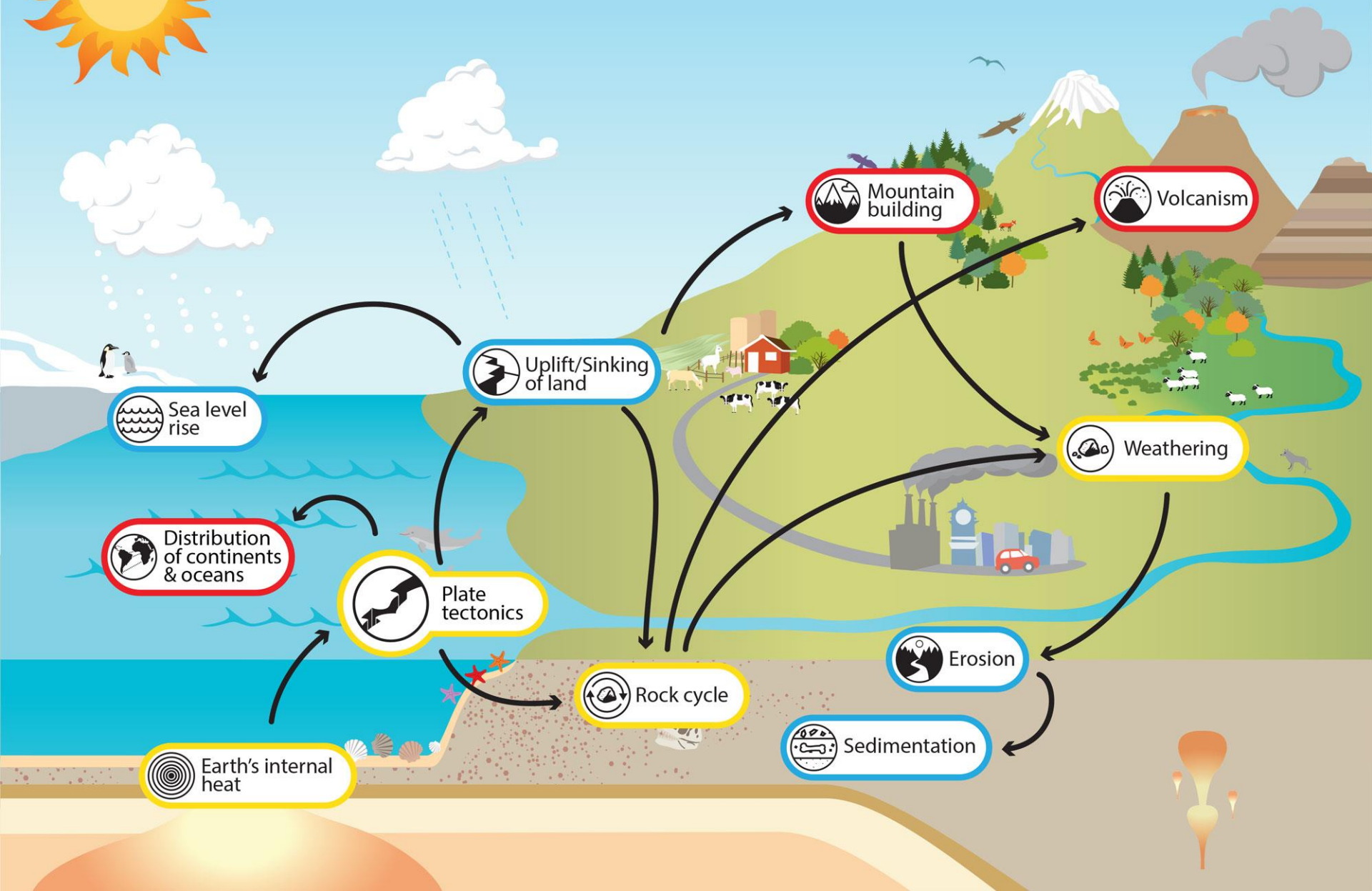
Reminder: What is the geosphere?

WHAT IS THE GEOSPHERE?

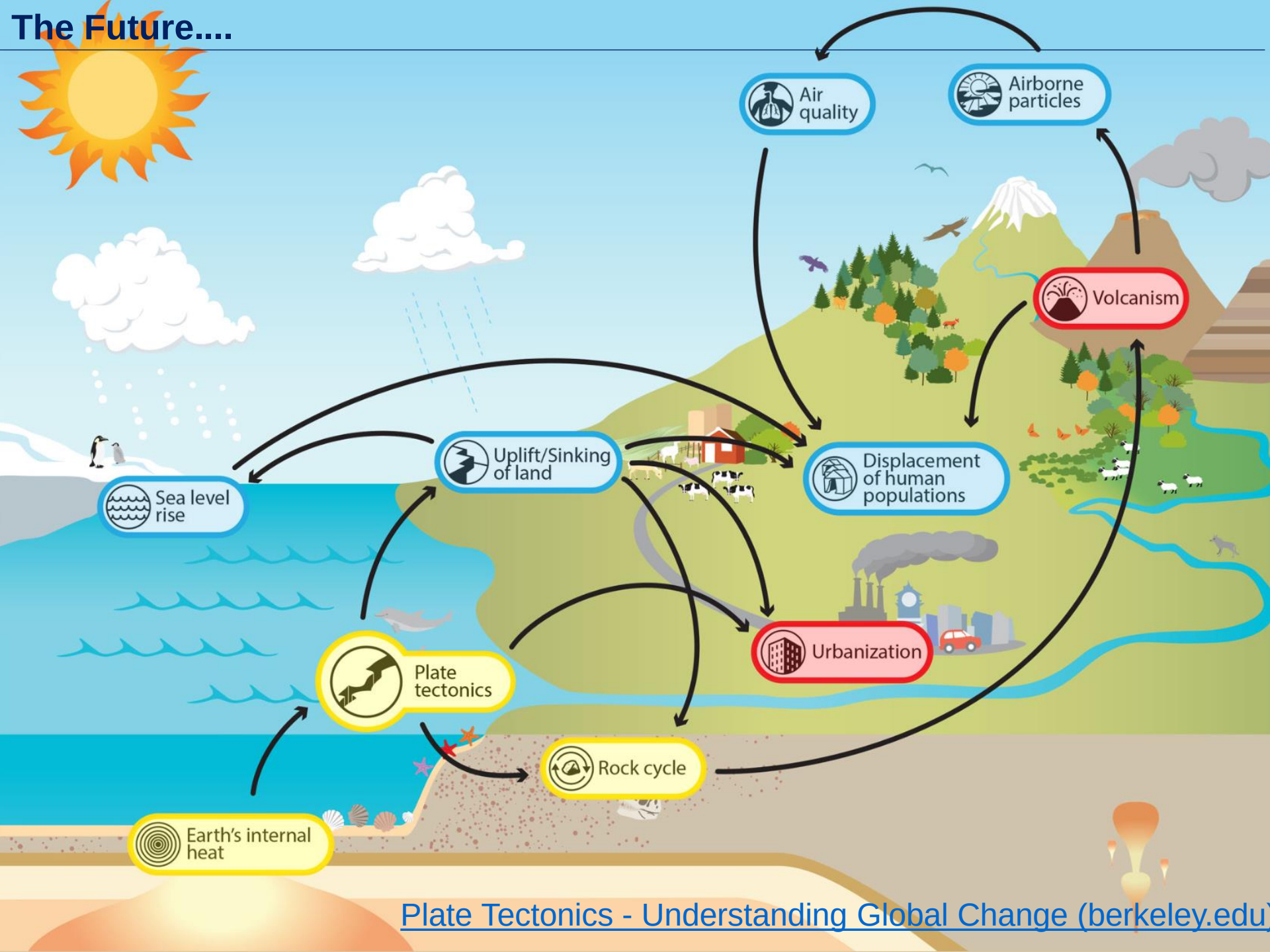


Geosphere of the future

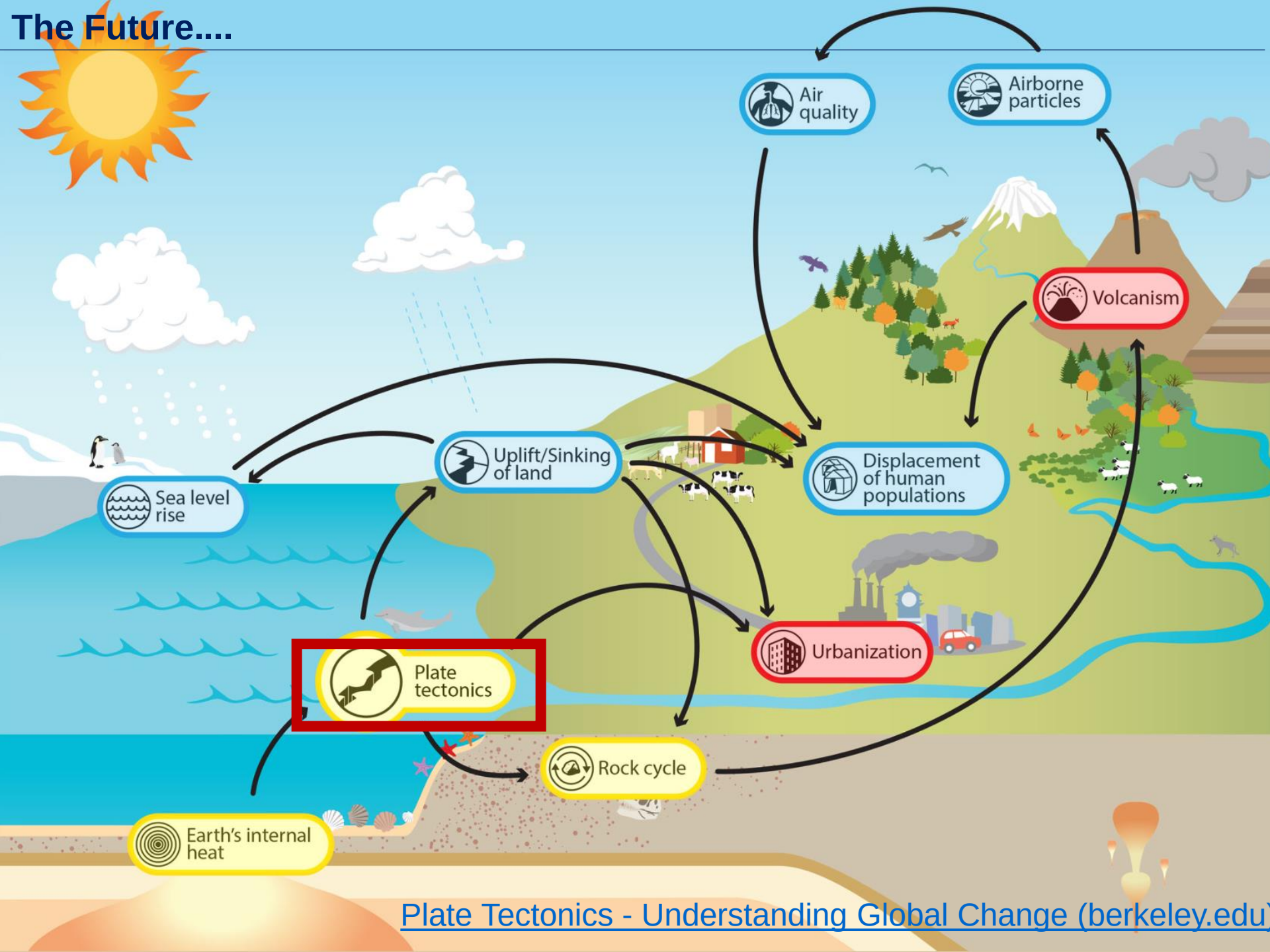
[Plate Tectonics - Understanding Global Change \(berkeley.edu\)](https://www.berkeley.edu/)



The Future....



The Future....



Geosphere of the future

Changes we know about

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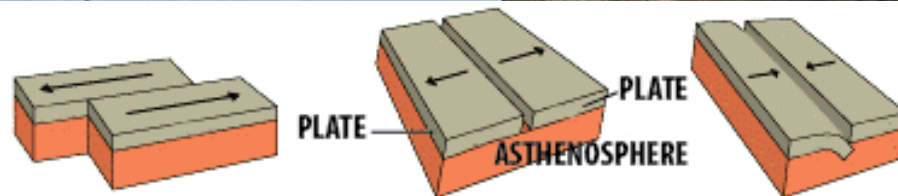
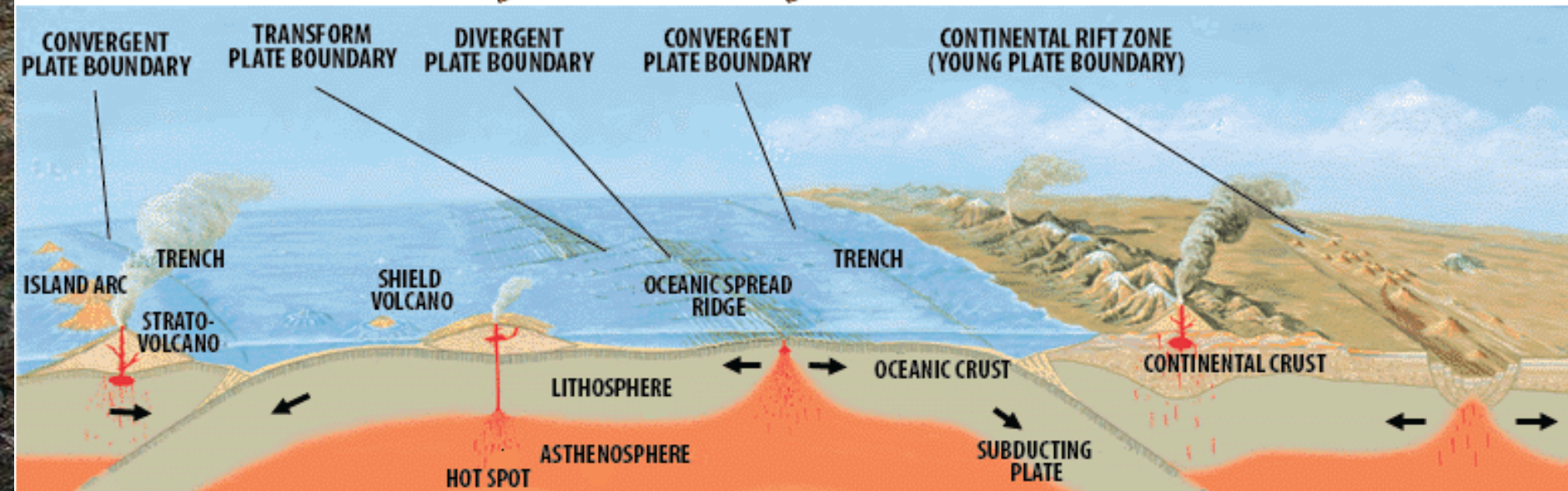


PLATE BOUNDARIES



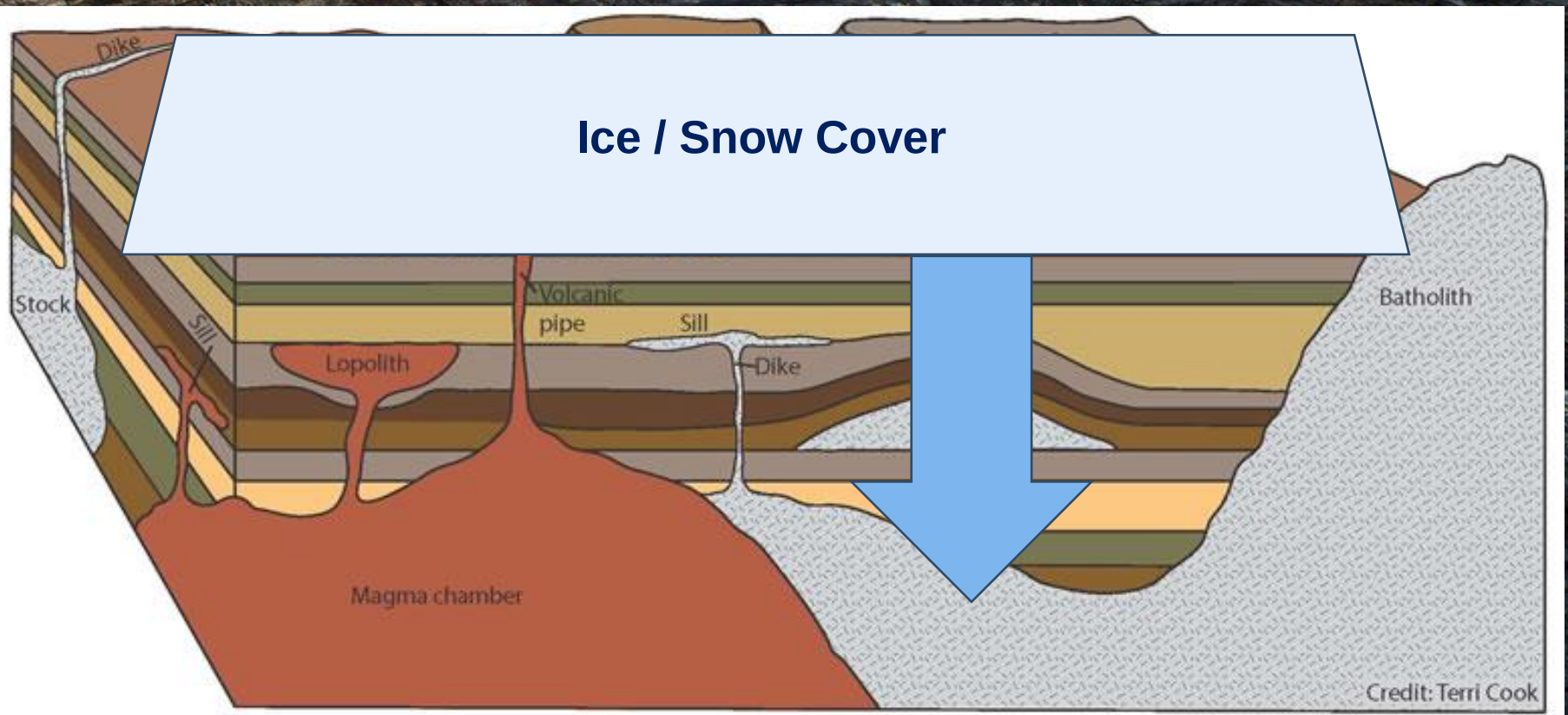
The growing frequency of climate change–related hazards such as wildfires, floods, landslides, and drought increases the chances that they will coincide in space and time with **volcanic eruptions**.

[Earth's tectonic plates have doubled their speed | New Scientist](https://www.newscientist.com/article/earth-s-tectonic-plates-have-doubled-their-speed/)

Geosphere of the future

[Iceland: Is climate change causing more eruptions? | PreventionWeb](#)

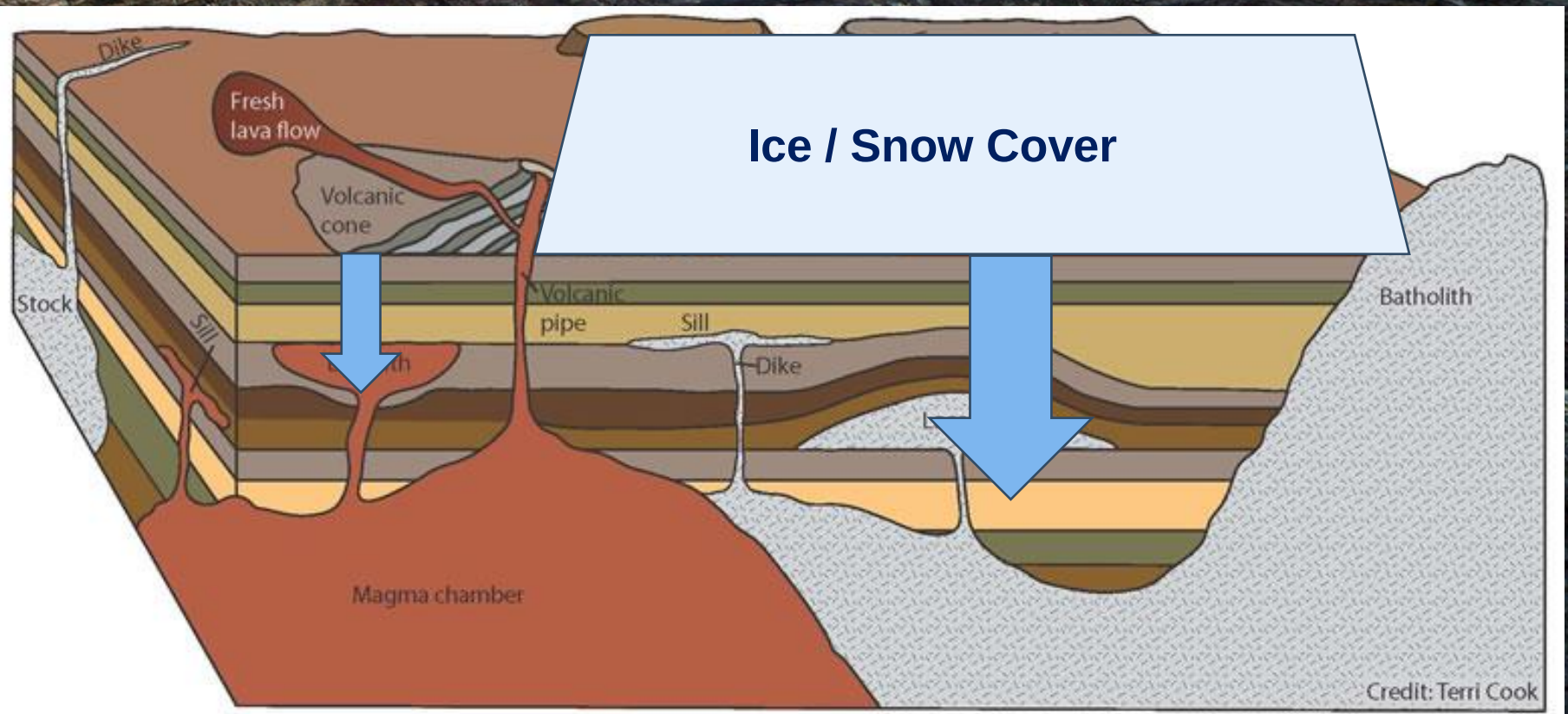
The average eruption rates were found to be up to 100 times higher after the end of the last glacial period, compared to the earlier colder glacial period.



Geosphere of the future

[Iceland: Is climate change causing more eruptions? | PreventionWeb](#)

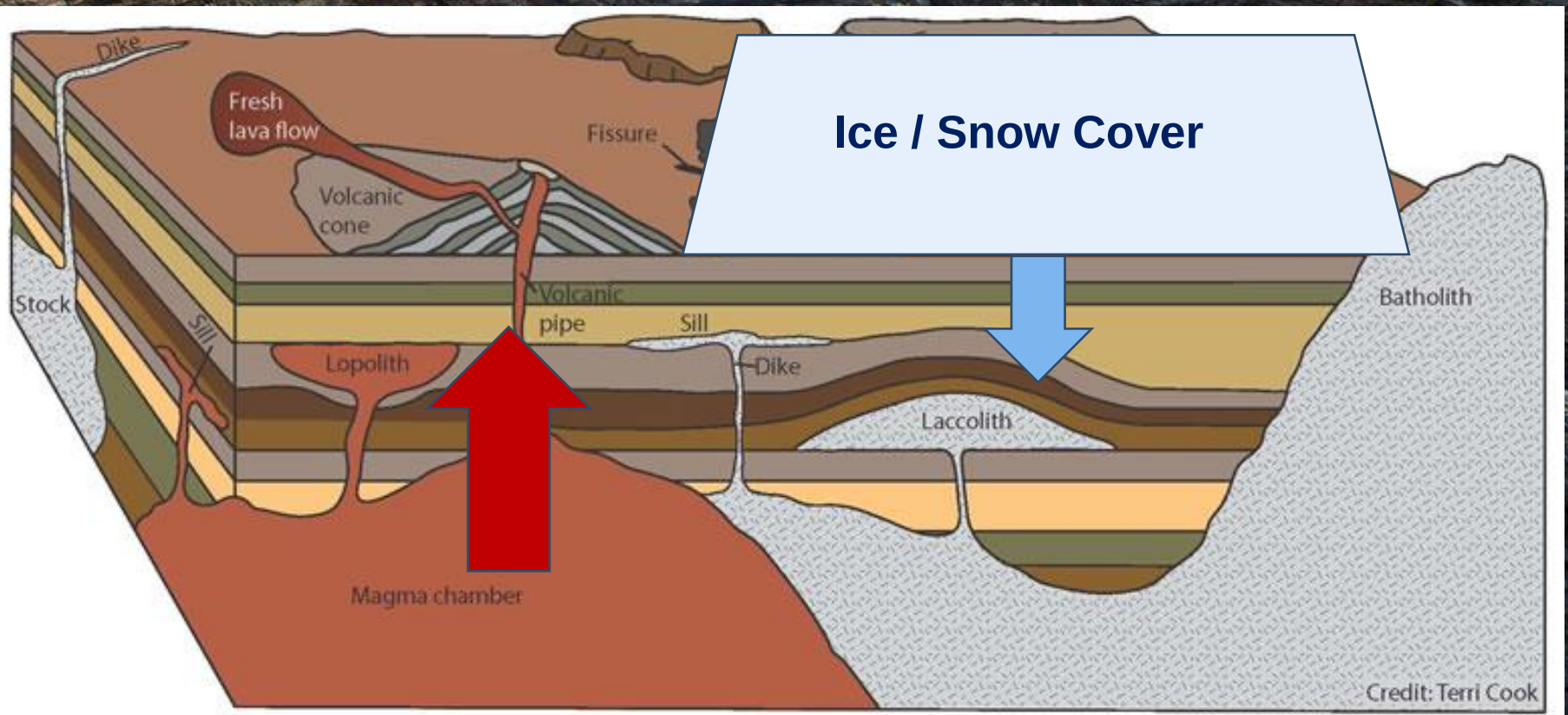
As glaciers and ice sheets melt, pressure is taken off Earth's surface and there are changes in the forces (stress) acting on rocks within the crust and upper mantle.



Geosphere of the future

[Iceland: Is climate change causing more eruptions? | PreventionWeb](#)

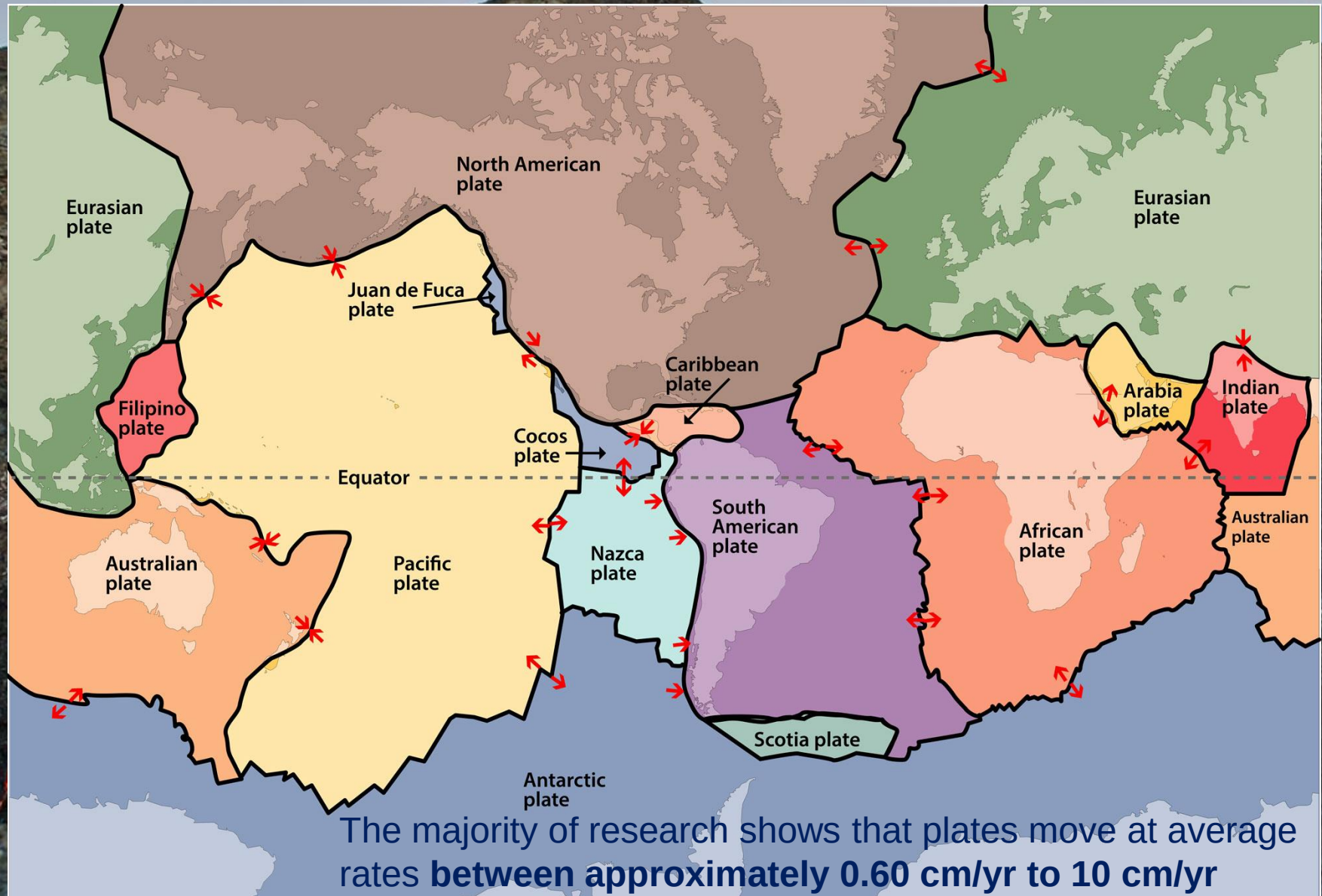
This can lead to more molten rock, or “magma”, being produced in the mantle – which can feed more eruptions. The changes can also affect where and how magma is stored in the crust, and can make it easier for magma to reach the surface.



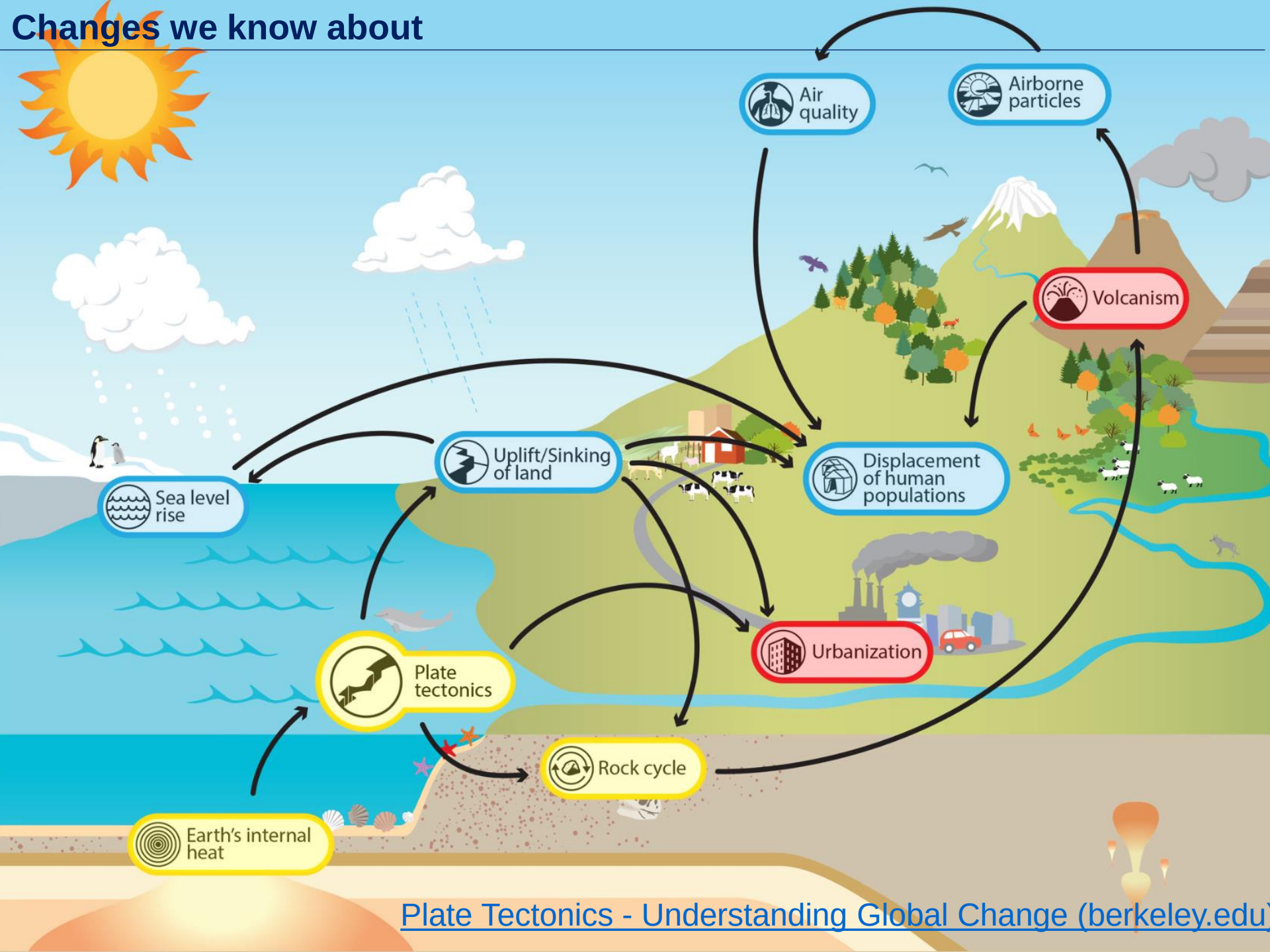
Geosphere of the future

Changes we know about

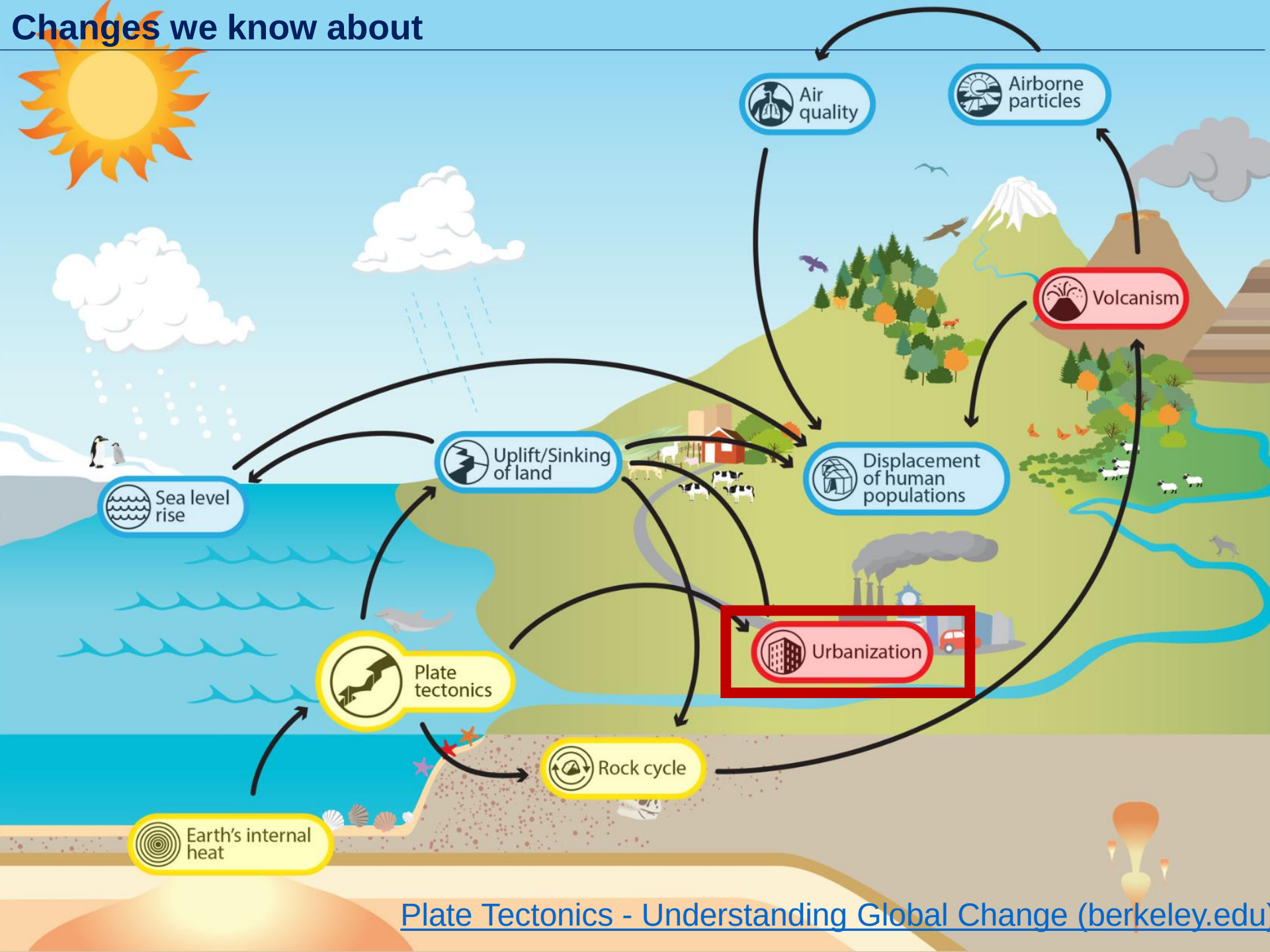
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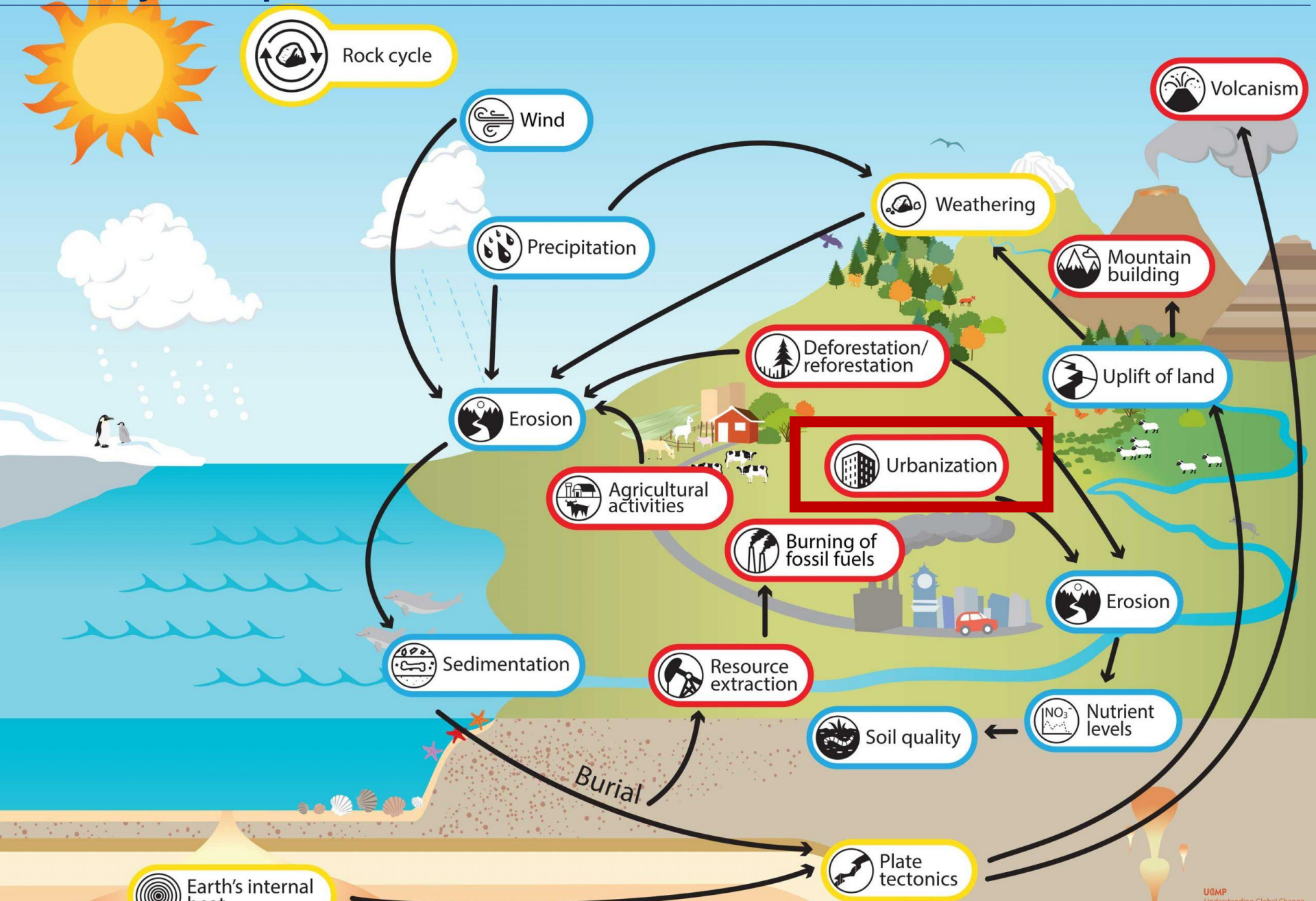
Changes we know about

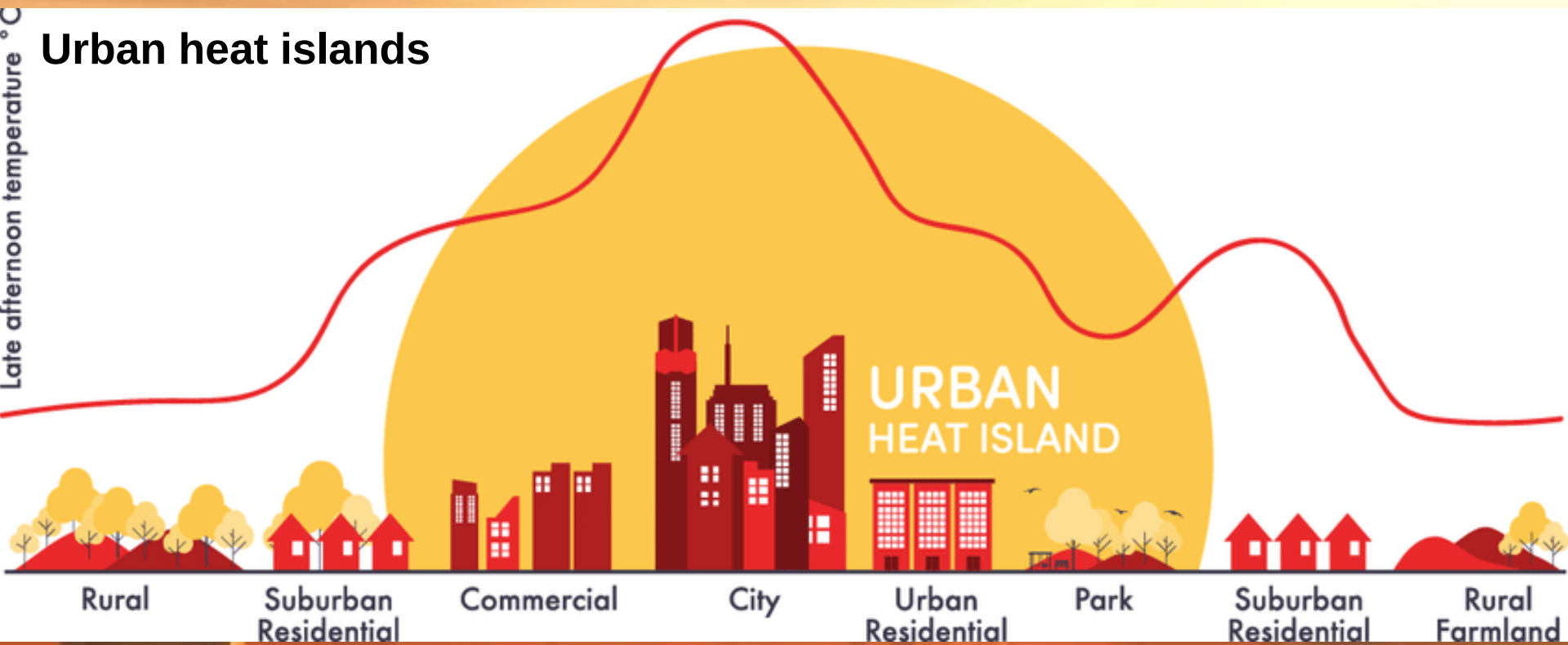


Changes we know about

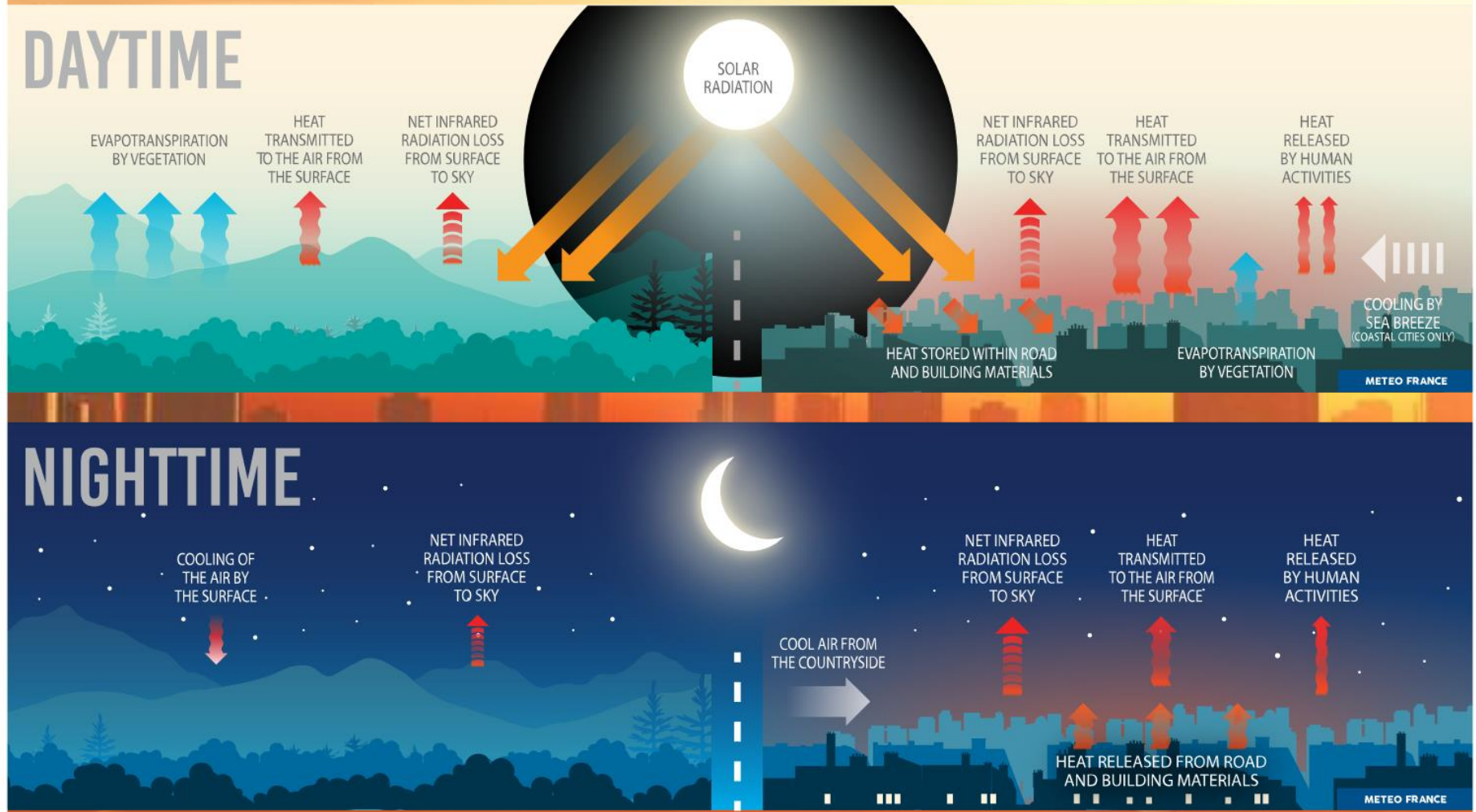


Rock Cycle Impacts





The highs and lows of urban heat islands



SOURCE: V. MASSON *ET AL* / *AR ENVIRONMENT AND RESOURCES* 2020

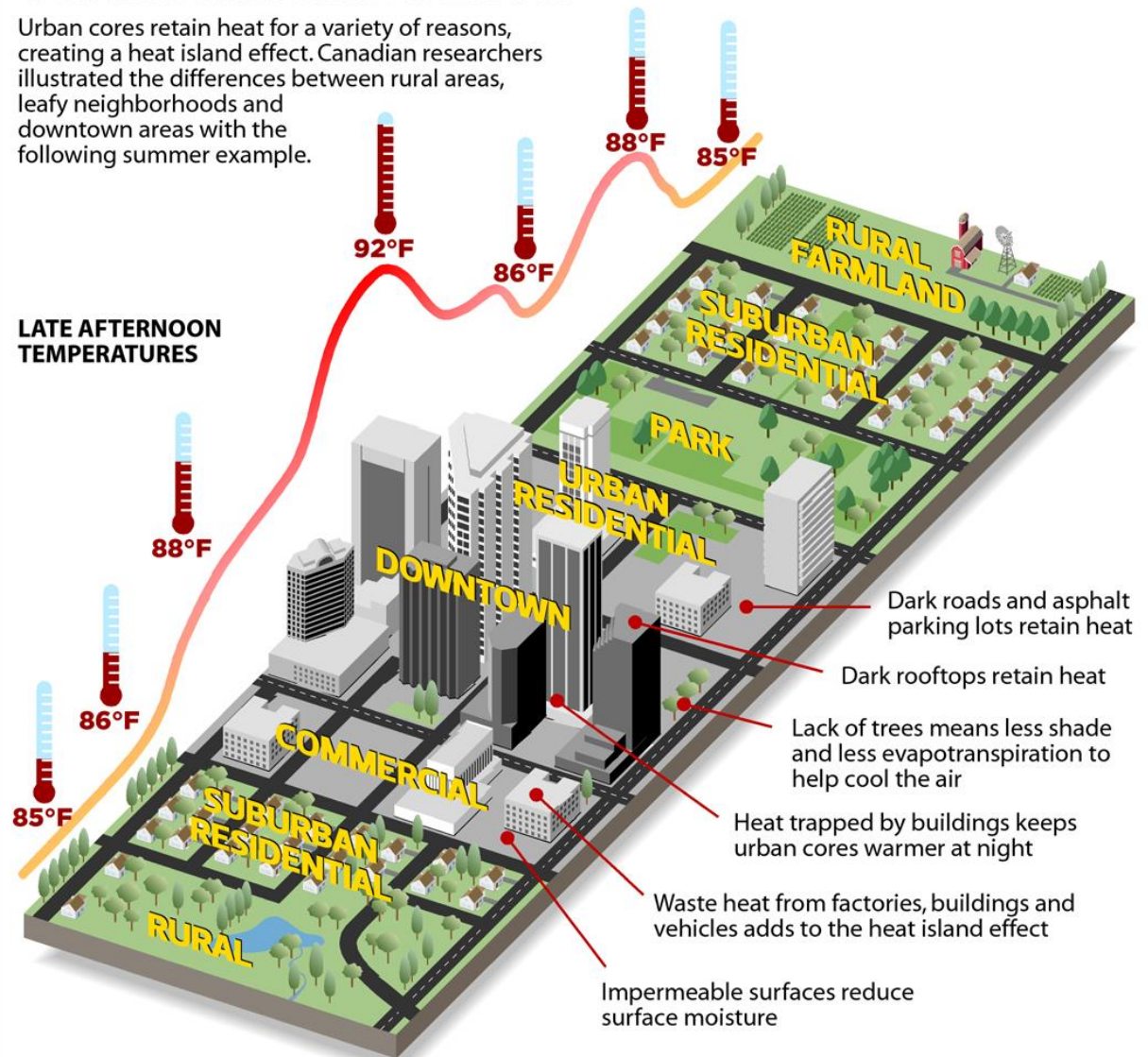
FIGURE REPRODUCED WITH PERMISSION FROM MÉTÉO-FRANCE 2020; © MÉTÉO-FRANCE

KNOWABLE MAGAZINE

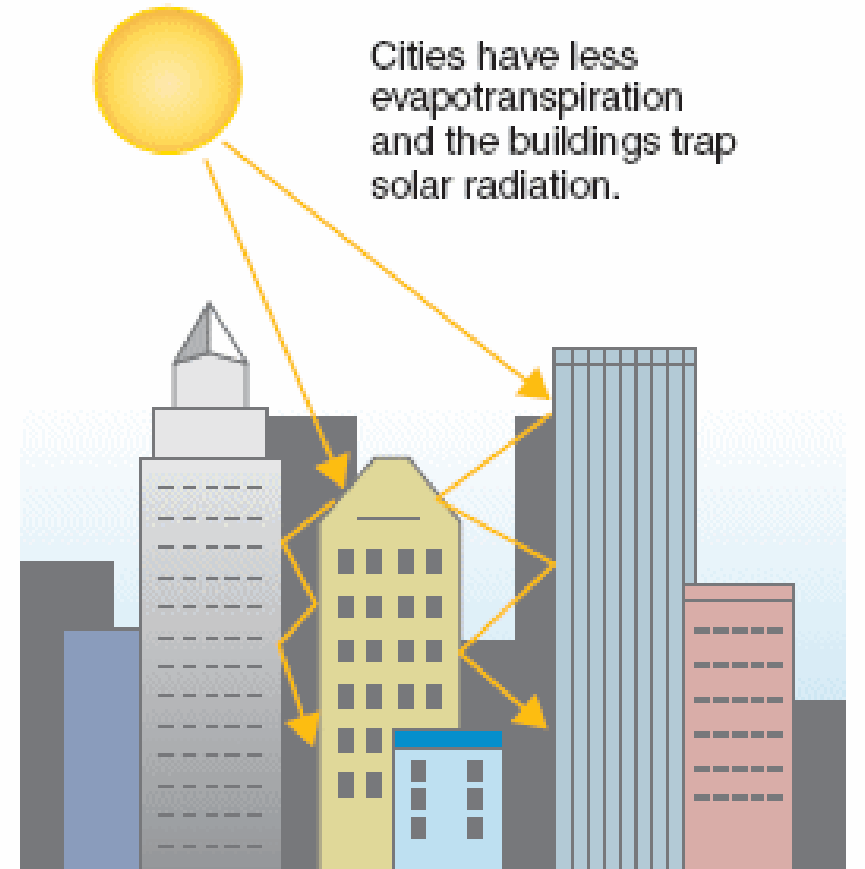
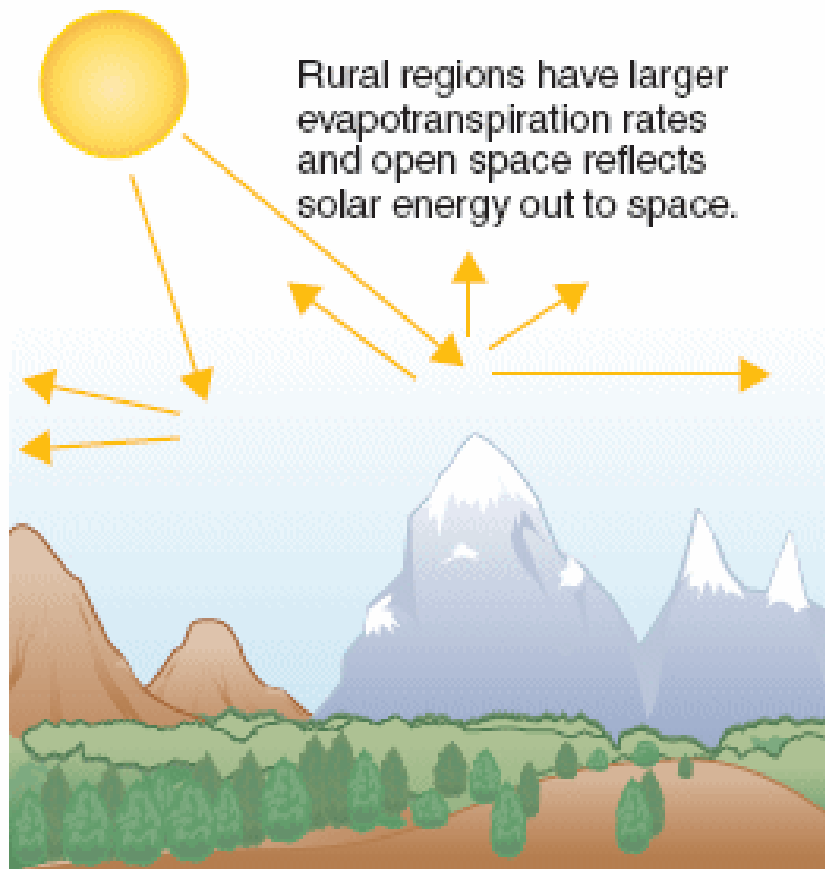
Urban heat islands

Urban Heat Island Effect

Urban cores retain heat for a variety of reasons, creating a heat island effect. Canadian researchers illustrated the differences between rural areas, leafy neighborhoods and downtown areas with the following summer example.



Urban heat islands



Meso Scale

- Local Winds

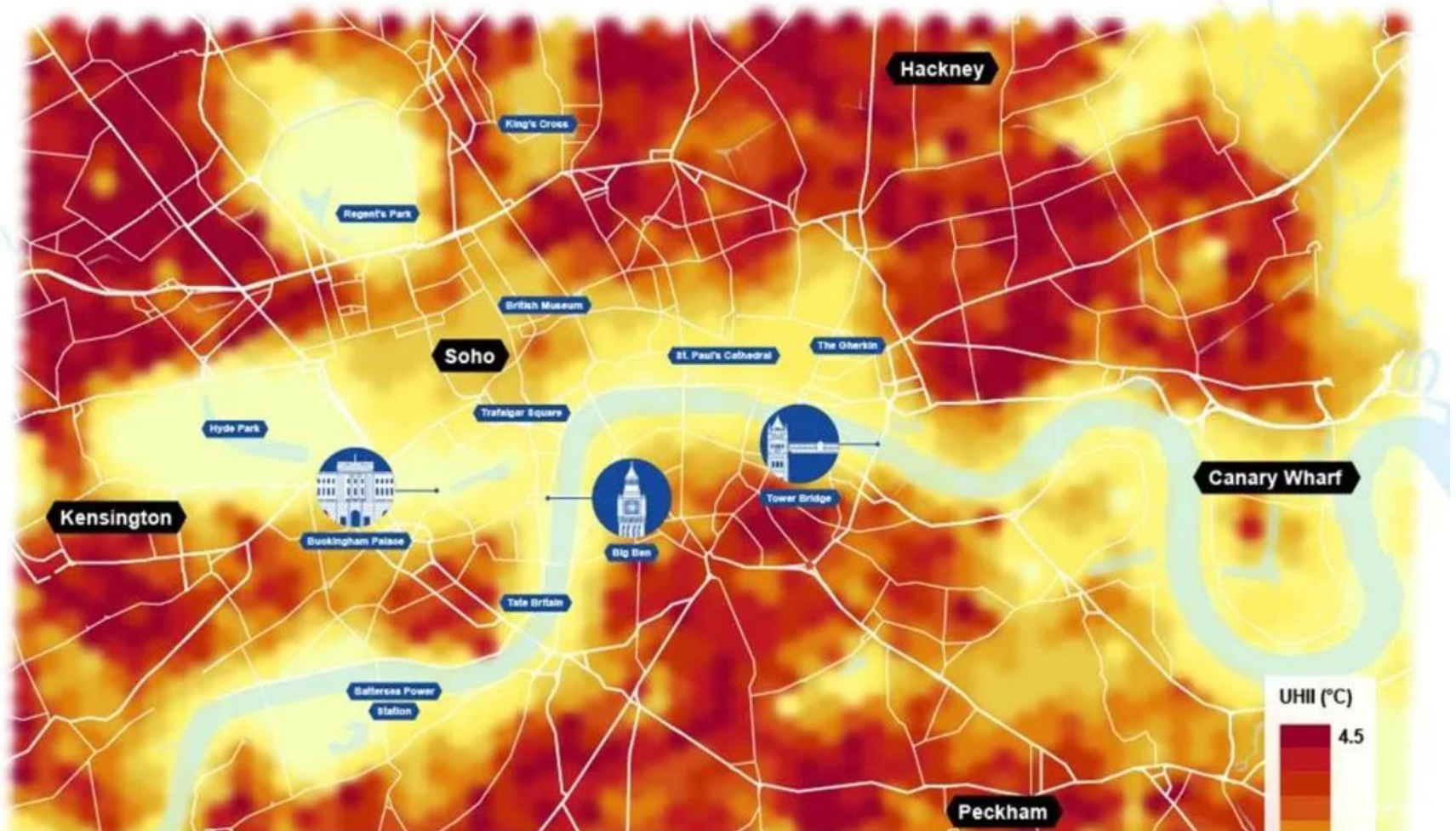
Micro Scale

- Urban Climates

1. Albedo effect. (Heat retaining (non-reflective) and emitting properties of building materials)
2. The lack of vegetation within towns and cities means that less light is intercepted, less evapotranspiration, thus less vapour is released (which naturally cools air surrounding vegetation).
3. Canyon Geometry Traps heat
4. Venturi effect: Buildings change wind velocity
5. Temperature Inversion

Urban heat islands

London's most extreme urban heat island "hot spot" compared to five other global cities in new survey - Arup



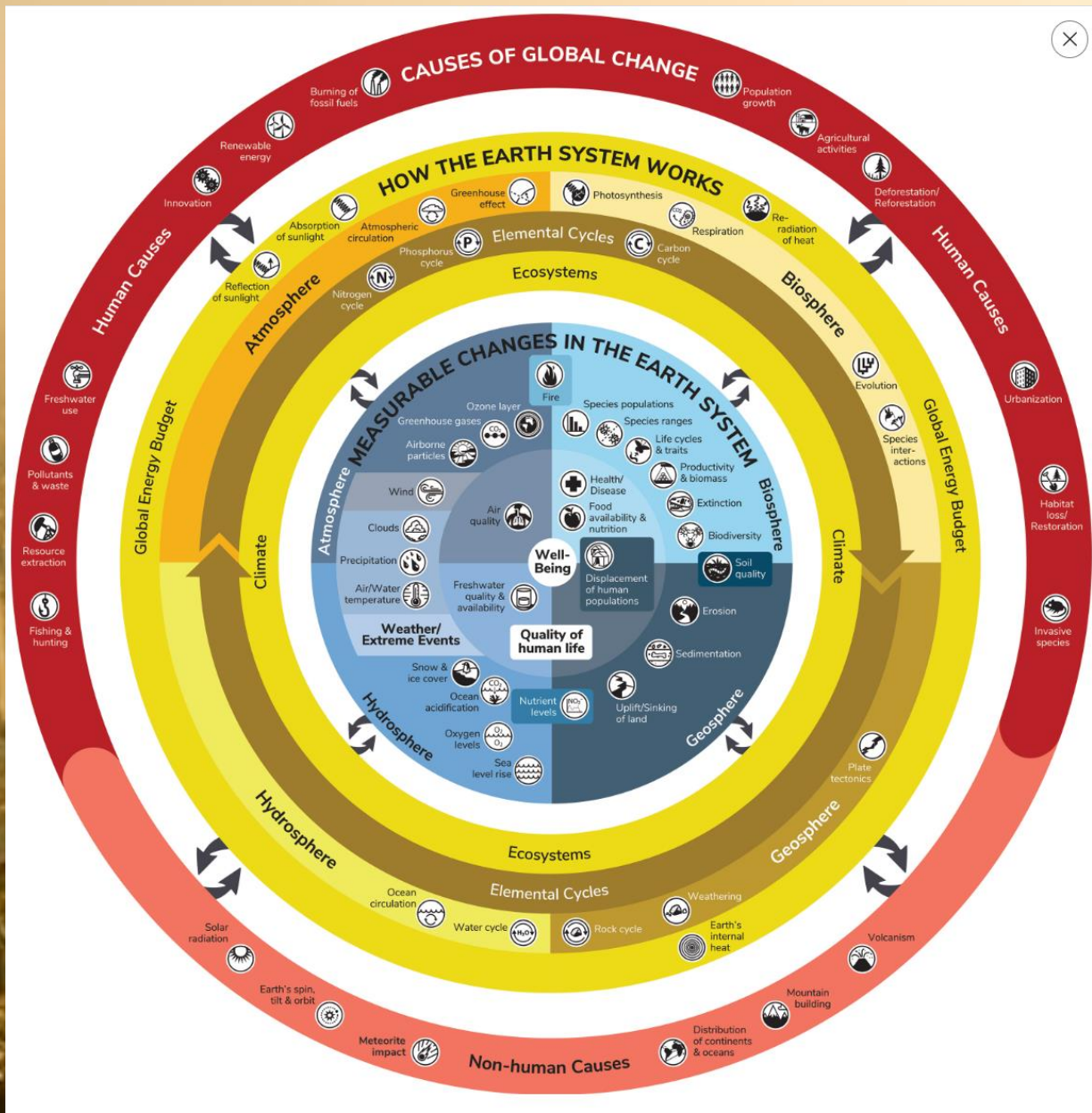
The results show temperatures of London's survey area were 4.5°C hotter than rural surroundings.

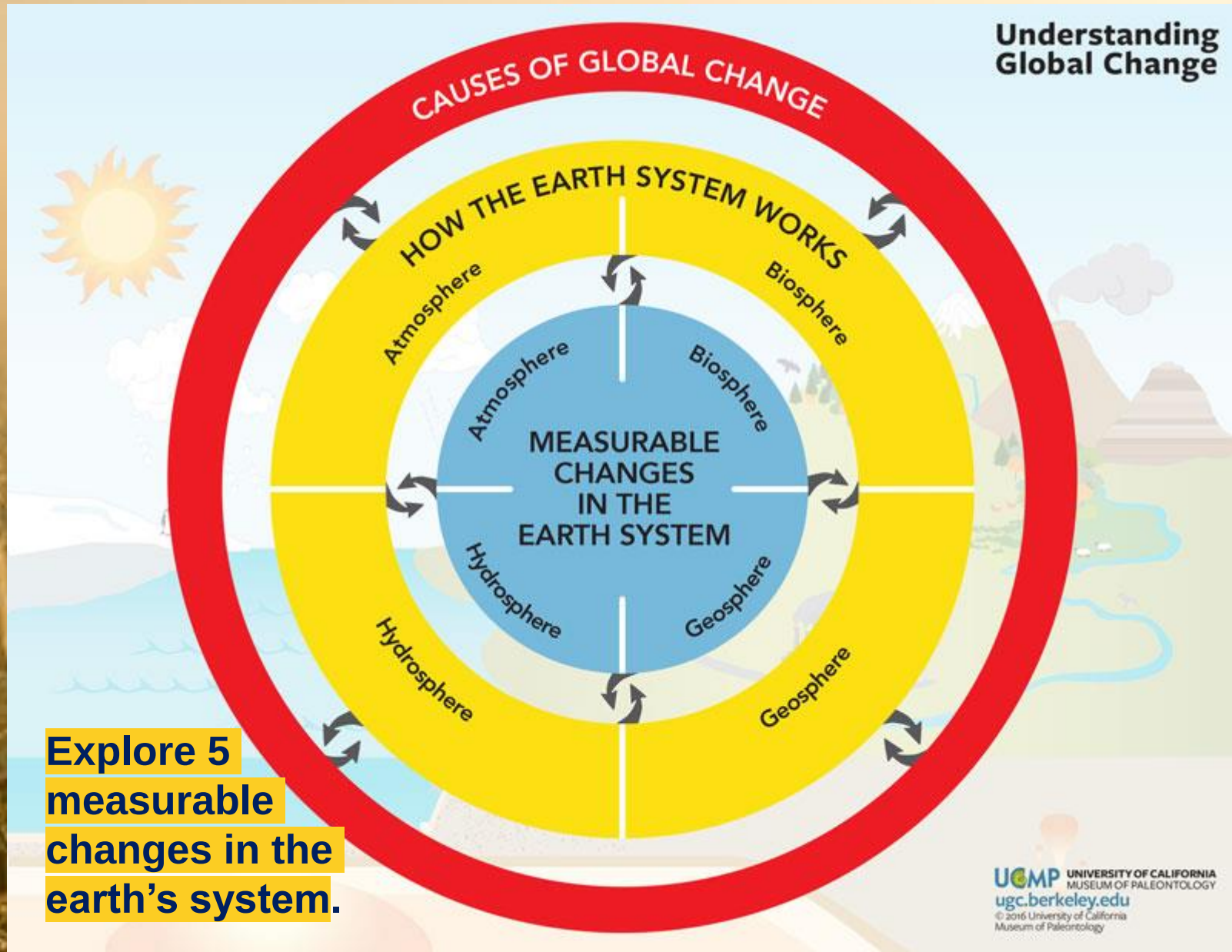
Click on the icons and words in the infographic to learn more about global change processes and phenomena, or continue your exploration on the **CAUSES OF GLOBAL CHANGE**, **HOW THE EARTH SYSTEM WORKS**, and **MEASURABLE CHANGES** pages.

- [Understanding Global Change Infographic - Understanding Global Change \(berkeley.edu\)](#)



Geosphere of the future





2 minutes...



Course Recap

Physical Landscapes and the Geosphere



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Course aims...

Aim: Upon the successful completion of this module, you should be able to: express an understanding of Earth systems and their influence on the environment, establish an understanding of the physical processes that influence the environment & complete practical fieldwork on a selected physical landscape.

Why is that important... ?

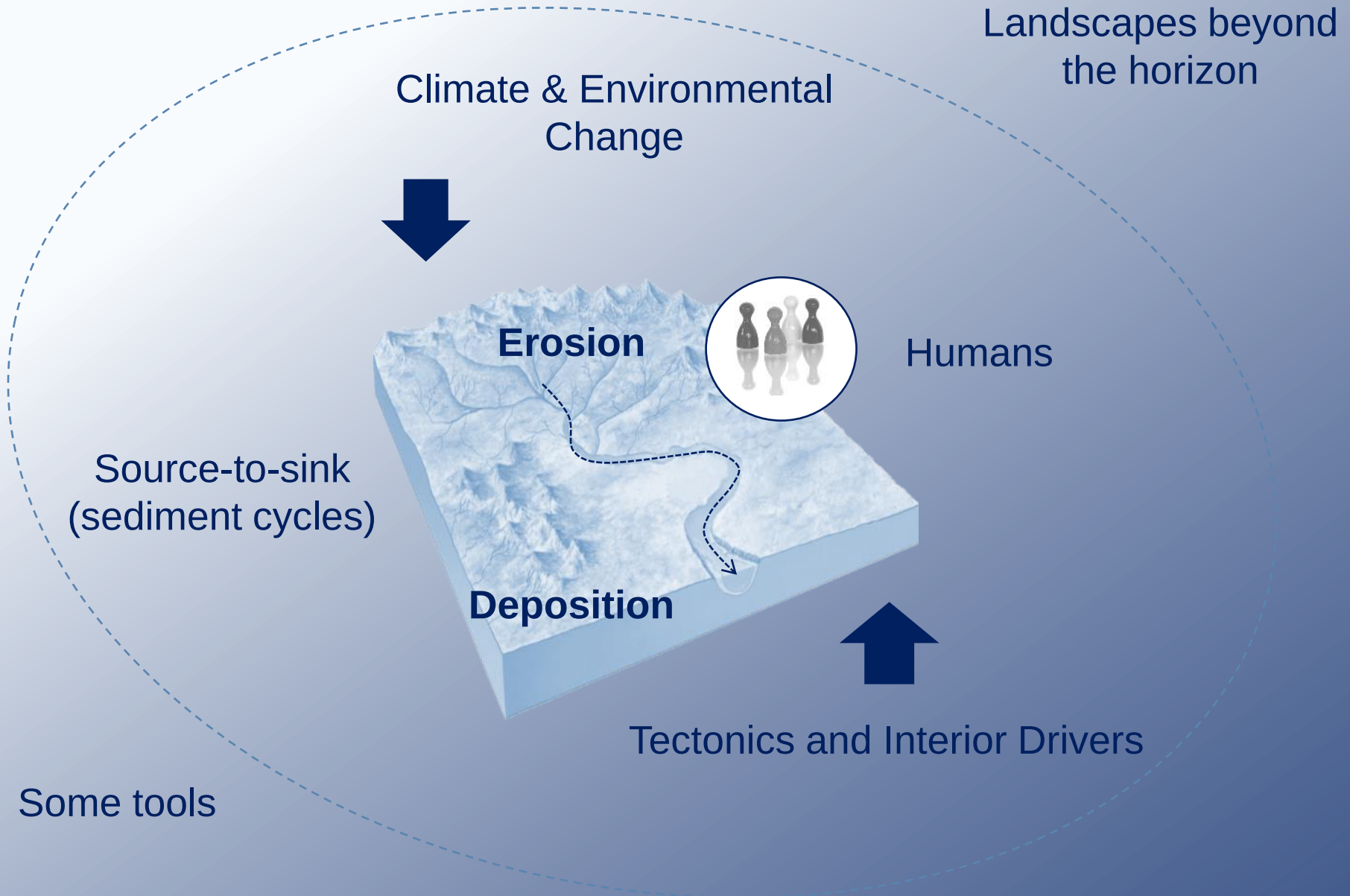


We all live on Earth surface...



Landscapes are „great“ – global and diverse !!

Course themes...



Answer all questions in the exam

First part: Shorter answer questions:

For example:

Name the landform

Draw a diagram of.....

Match the landform description with the landform name...

Second Part: 1 longer answer question (50pts)

[Course: Physical Landscape and the Geosphere \(ACNA4007\)](#)
[\(uwtsd.ac.uk\)](#)