GEOHERITAGE AND UNESCO GLOBAL GEOPARKS

Dr. Asier Hilario Orús
Chair, International Commission on Geoheritage. IUGS
Global Geoparks Network Advisory Committee
Senior evaluator UNESCO Global Geoparks
Basque Coast UNESCO Global Geopark

Geoparkea
Euskal Kostaldea - Costa Vasca

Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura
United Nations Educational, Scientific and Cultural Organization
Costa Vasca Geoparque mundial de la UNESCO
Basque Coast UNESCO Global Geopark

IUGS
International Union of Geological Sciences

GLOBAL GEOPARKS NETWORK

United Nations
Educational, Scientific and
Cultural Organization

World Heritage
Convention

252 natural sites
93 sites related to Earth Sciences.
51 Countries

United Nations
Educational, Scientific and
Cultural Organization

UNESCO
Global
Geoparks

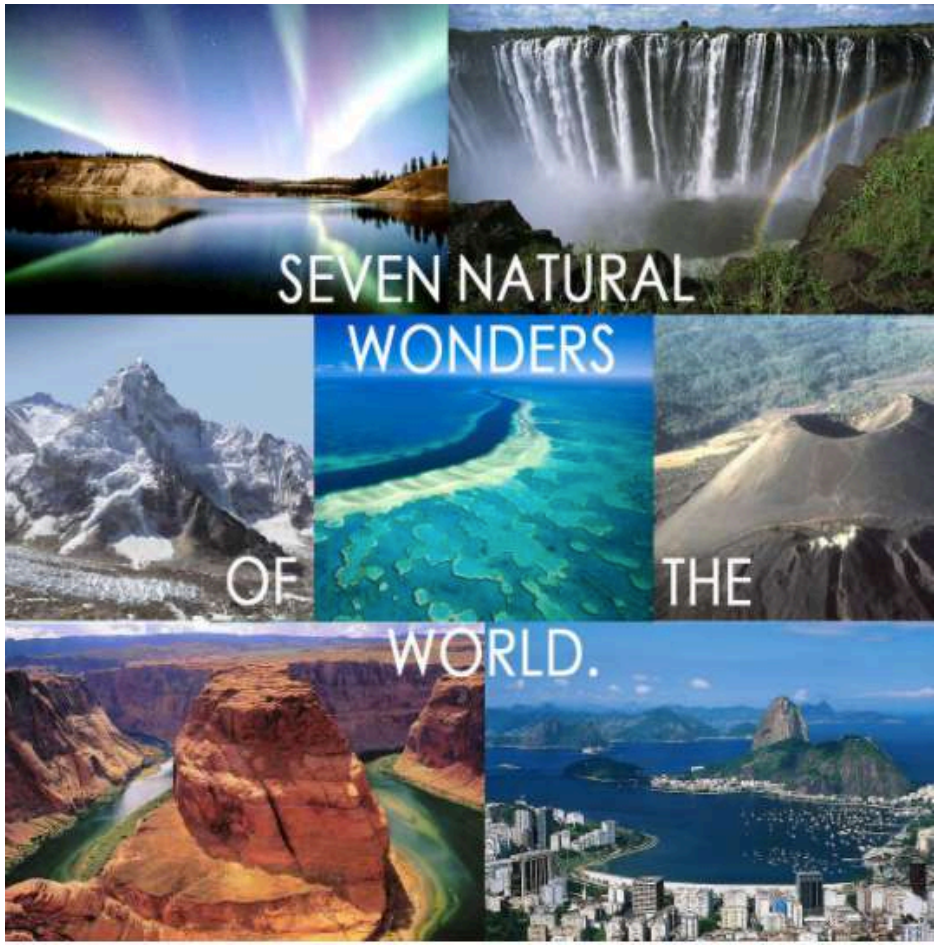
161 UNESCO Global Geoparks
44 Countries

GEOHERITAGE AND UNESCO GLOBAL GEOPARKS

Why are we talking about Geoheritage and Geoconservation?

As long as I live, I´ll hear waterfalls and birds and winds sing. I´ll interpret the rocks, learn the language of flood, storm, and avalanche. I´ll acquaint myself with glaciers and wild gardens, and get as near to the heart of the world as I can”

John Muir (1838-1914)



1.- Mount Everest (Nepal)

2.- Harbour Rio de Janeiro (Brazil)

3.- Great Barrier Reef (Australia)

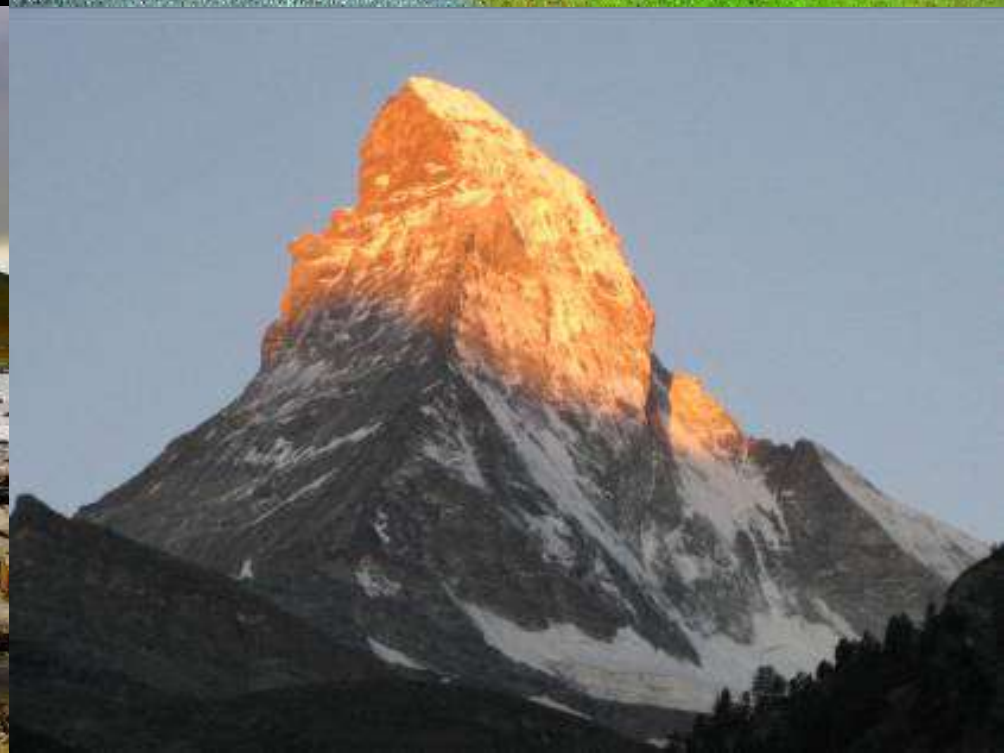
4.- Victoria falls (Zimbawe)

5.- Paricutin Volcano (Mexico)

6.- Grand Canyon (USA)

7.- Northen lights

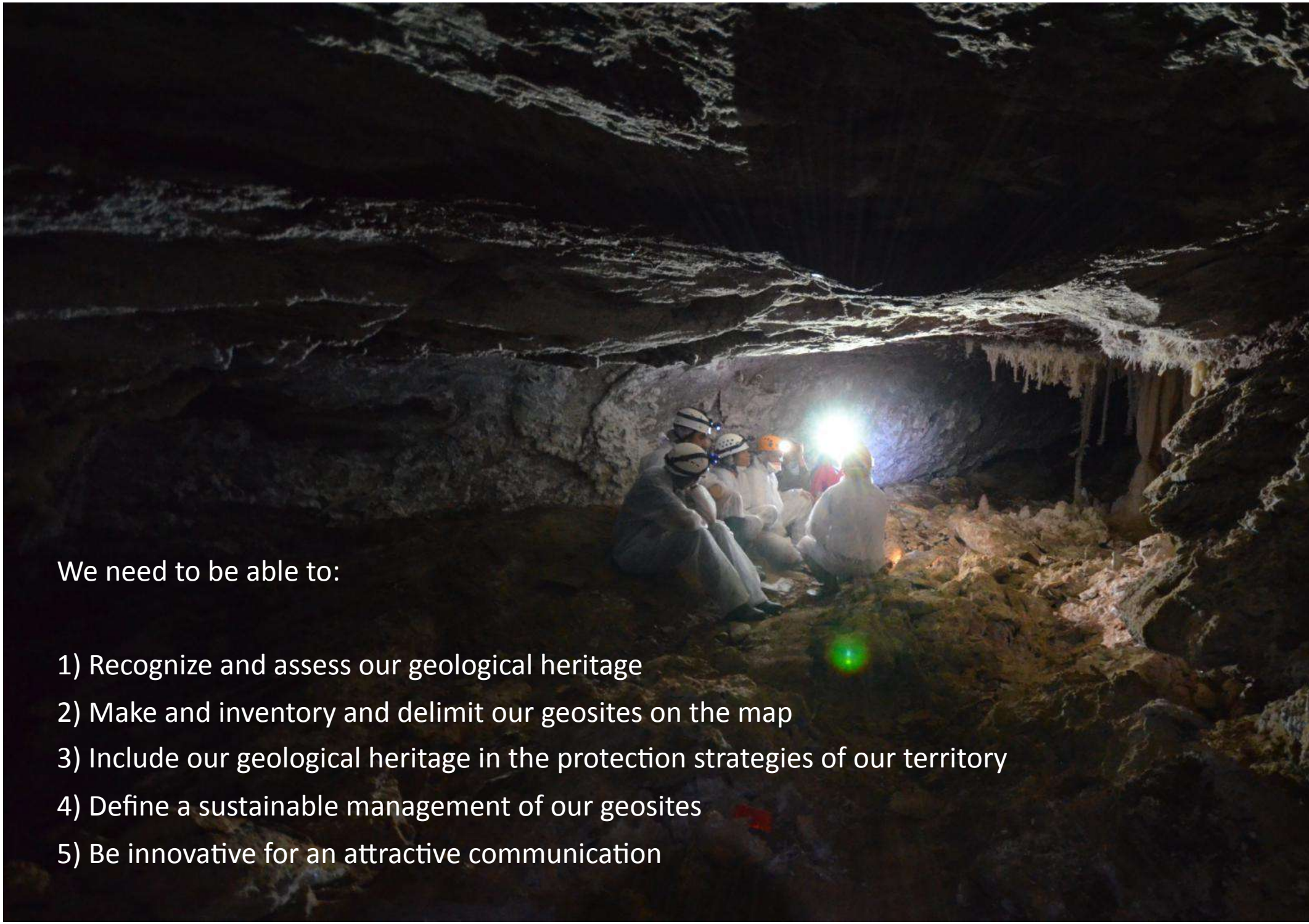
WORLD CLASS TOURISTIC DESTINATIONS



Why are we talking about Geoheritage and Geoconservation?

1) **Conservation**: Because it is part of our natural heritage that we must protect for future generations. It is the memory of the Earth.

3) **Using:** Because Geotourism and Geo-education represent a great opportunity to empower local communities, strengthen local economies and foster sustainable development. We can offer surprising experiences!

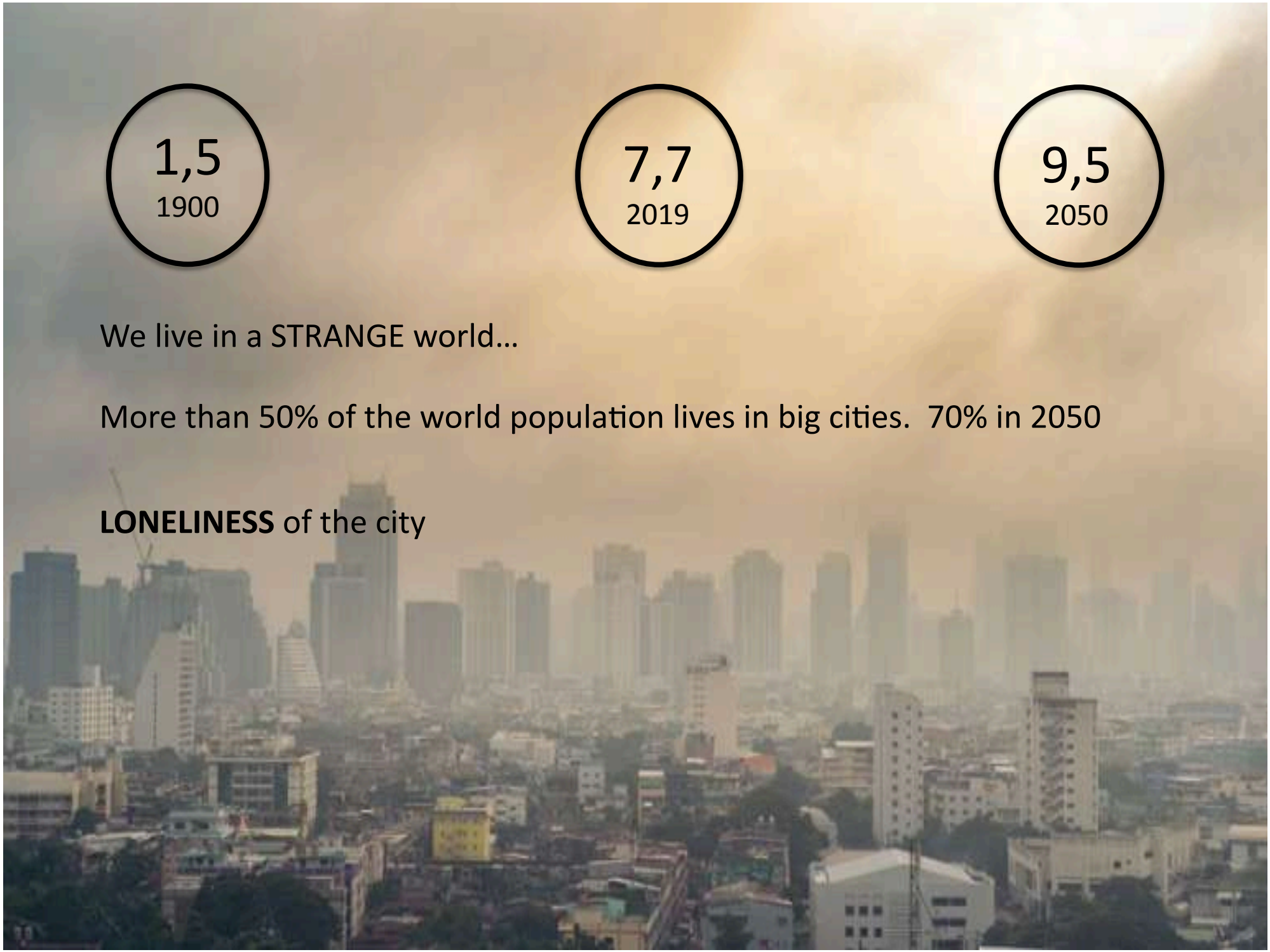


We need to be able to:

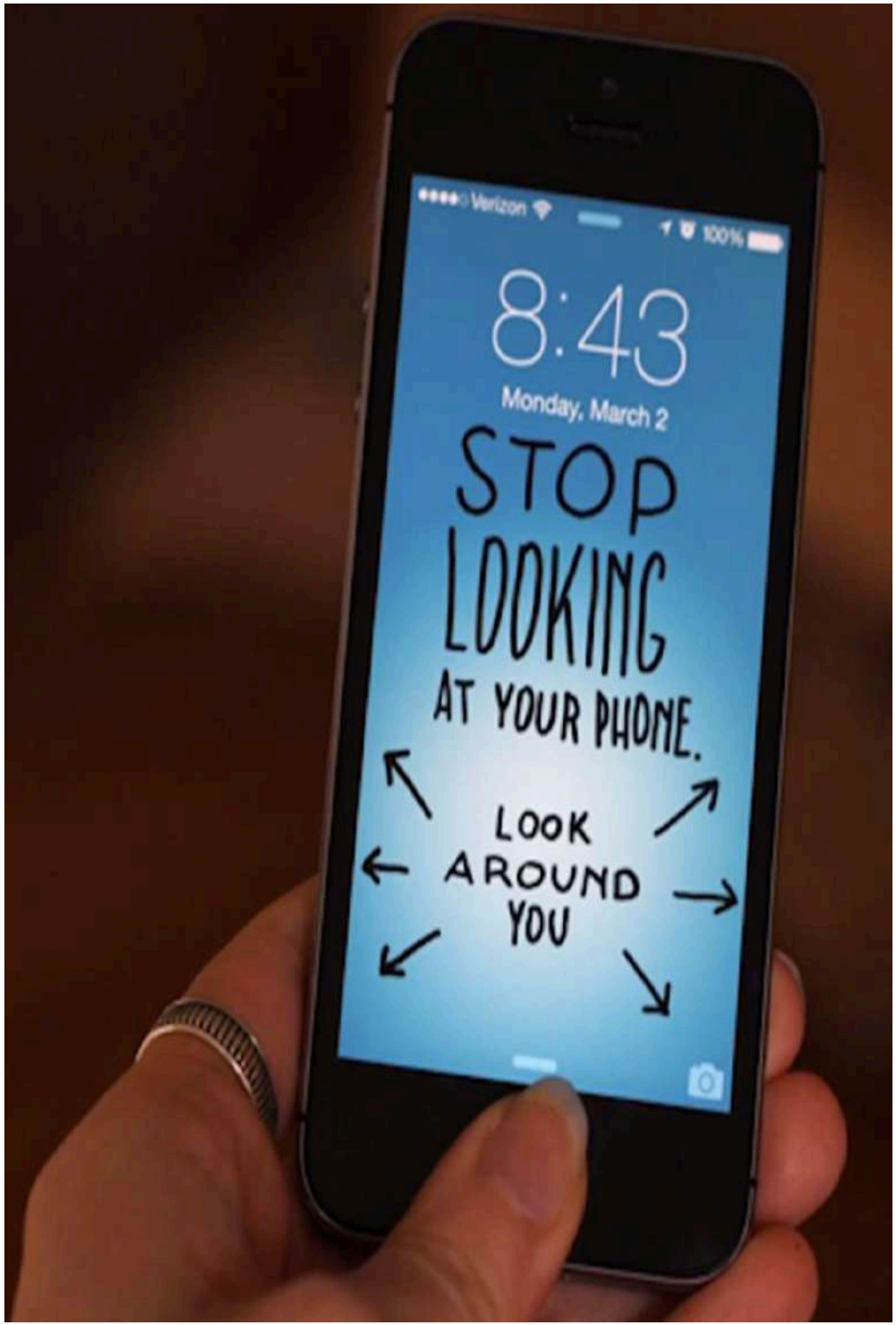
1) Recognize and assess our geological heritage
2) Make and inventory and delimit our geosites on the map
3) Include our geological heritage in the protection strategies of our territory
4) Define a sustainable management of our geosites
5) Be innovative for an attractive communication

Why are Geoparks so successful?


We live in a BEAUTIFUL world…

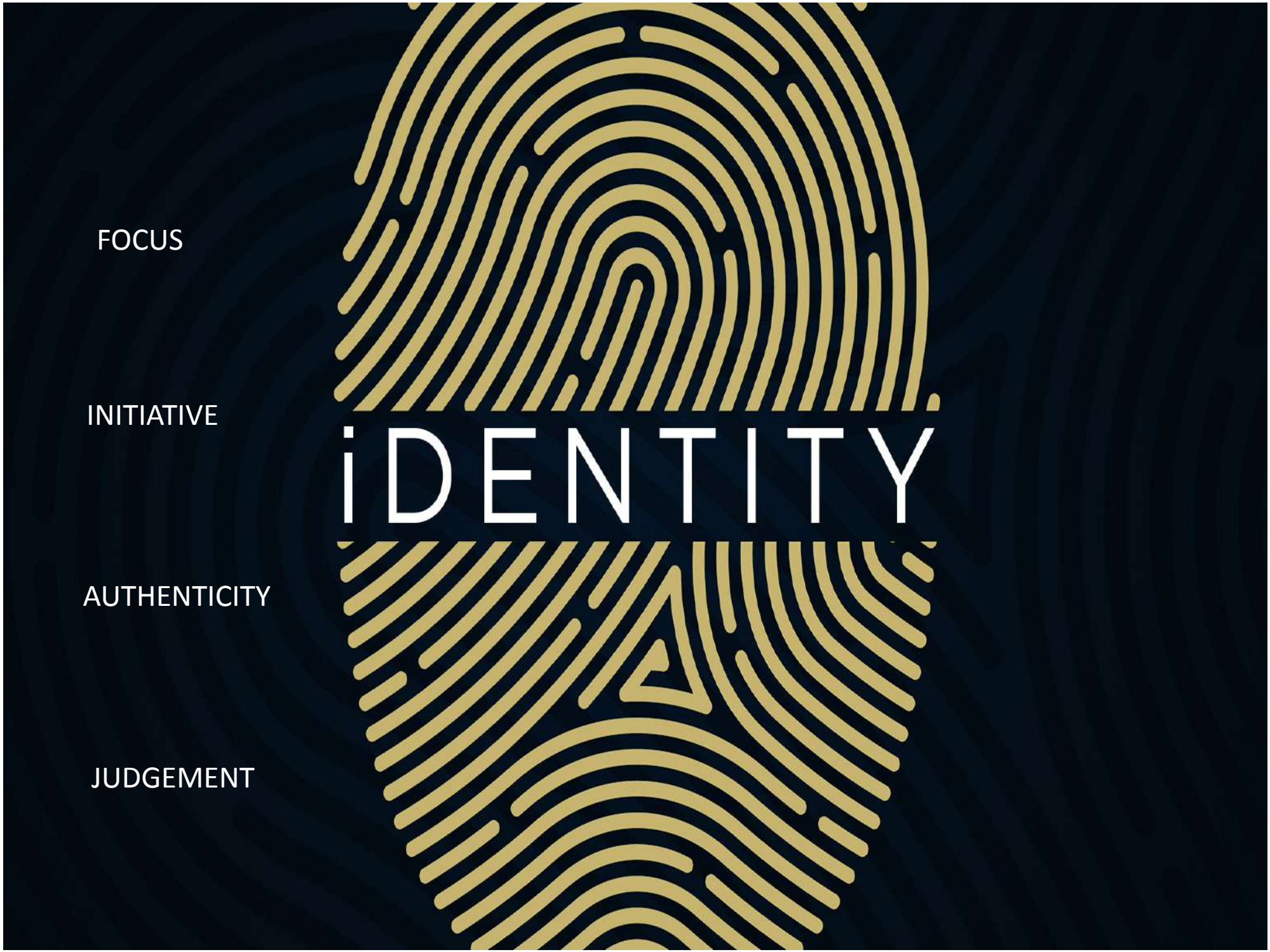

1,5
1900
7,7
2019
9,5
2050
We live in a STRANGE world…
More than 50% of the world population lives in big cities. 70% in 2050
LONELINESS of the city

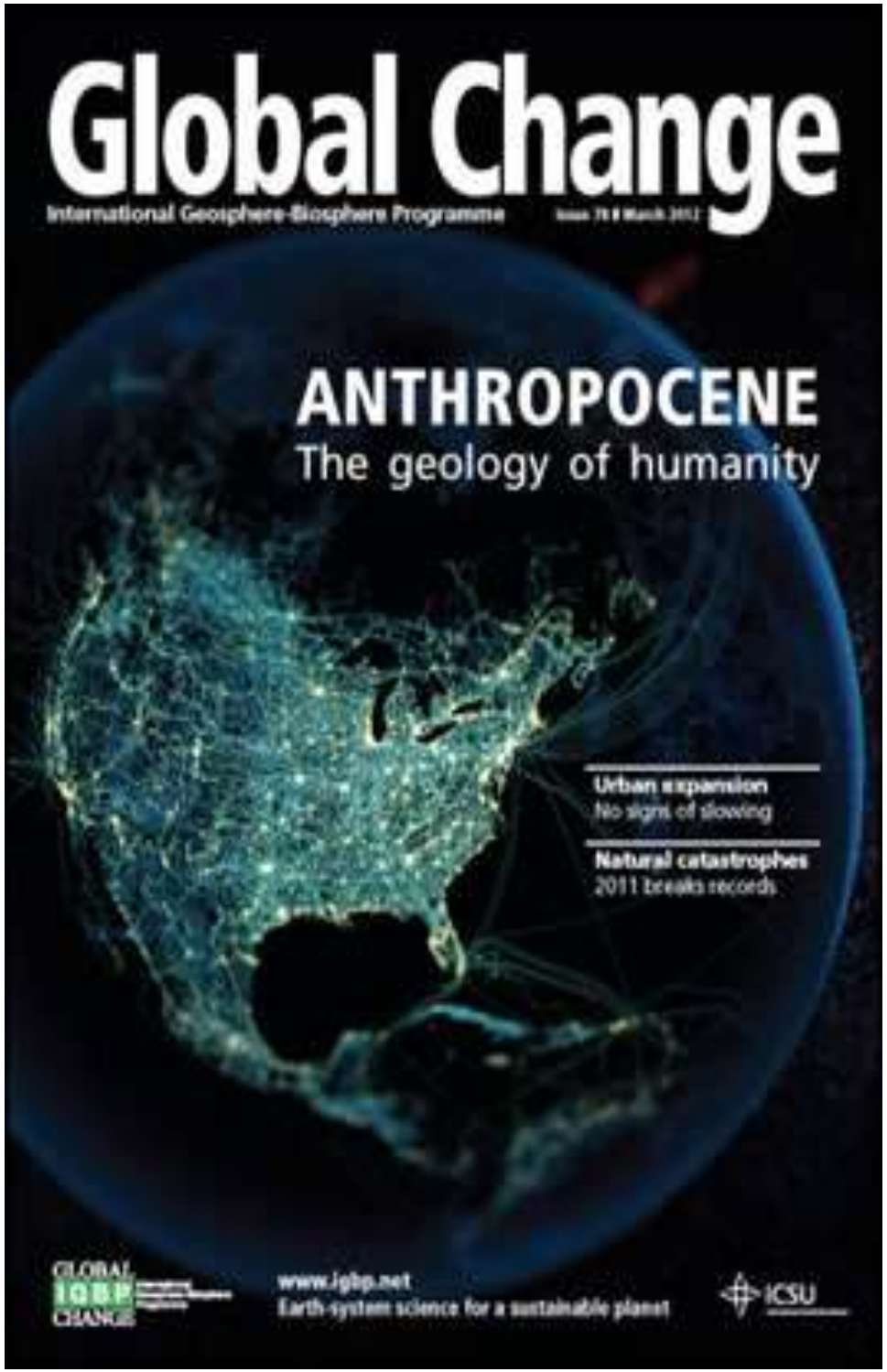
Where is this?


Verizon
100%
8:43
Monday, March 2
STOP
LOOKING
AT YOUR PHONE.
LOOK
AROUND
YOU


FRIENDS – NO FRIENDS


INFORMATION – NO INFORMATION


FOCUS
INITIATIVE
iDENTITY
AUTHENTICITY
JUDGEMENT



INTERNATIONAL CHRONOSTRATIGRAPHIC CHART

IUGS www.stratigraphy.org International Commission on Stratigraphy v 2014/02

Eonothem / Eon | Erathem / Era | System / Period | Series / Epoch | Stage / Age | GSSP | numerical age (Ma)

Phanerozoic
- Cenozoic
  - Quaternary
    - Holocene — present — 0.0117
    - Pleistocene — Upper — 0.126
    - Pleistocene — Middle — 0.781
    - Pleistocene — Calabrian — 1.80
    - Pleistocene — Gelasian — 2.58
  - Neogene
    - Pliocene — Piacenzian — 3.600
    - Pliocene — Zanclean — 5.333
    - Miocene — Messinian — 7.246
    - Miocene — Tortonian — 11.62
    - Miocene — Serravallian — 13.82
    - Miocene — Langhian — 15.97
    - Miocene — Burdigalian — 20.44
    - Miocene — Aquitanian — 23.03
  - Paleogene
    - Oligocene — Chattian — 28.1
    - Oligocene — Rupelian — 33.9
    - Eocene — Priabonian — 38.0
    - Eocene — Bartonian — 41.3
    - Eocene — Lutetian — 47.8
    - Eocene — Ypresian — 56.0
    - Paleocene — Thanetian — 59.2
    - Paleocene — Selandian — 61.6
    - Paleocene — Danian — 66.0
- Mesozoic
  - Cretaceous
    - Upper — Maastrichtian — 72.1 ±0.2
    - Upper — Campanian — 83.6 ±0.2
    - Upper — Santonian — 86.3 ±0.5
    - Upper — Coniacian — 89.8 ±0.3
    - Upper — Turonian — 93.9
    - Upper — Cenomanian — 100.5
    - Lower — Albian — ~113.0
    - Lower — Aptian — ~125.0
    - Lower — Barremian — ~129.4
    - Lower — Hauterivian — ~132.9
    - Lower — Valanginian — ~139.8
    - Lower — Berriasian — ~145.0

Phanerozoic
- Mesozoic
  - Jurassic
    - Upper — Tithonian — 152.1 ±0.9
    - Upper — Kimmeridgian — 157.3 ±1.0
    - Upper — Oxfordian — 163.5 ±1.0
    - Middle — Callovian — 166.1 ±1.2
    - Middle — Bathonian — 168.3 ±1.3
    - Middle — Bajocian — 170.3 ±1.4
    - Middle — Aalenian — 174.1 ±1.0
    - Lower — Toarcian — 182.7 ±0.7
    - Lower — Pliensbachian — 190.8 ±1.0
    - Lower — Sinemurian — 199.3 ±0.3
    - Lower — Hettangian — 201.3 ±0.2
  - Triassic
    - Upper — Rhaetian — ~208.5
    - Upper — Norian — ~227
    - Upper — Carnian — ~237
    - Middle — Ladinian — ~242
    - Middle — Anisian — 247.2
    - Lower — Olenekian — 251.2
    - Lower — Induan — 252.17 ±0.06
  - Permian
    - Lopingian — Changhsingian — 254.14 ±0.07
    - Lopingian — Wuchiapingian — 259.8 ±0.4
    - Guadalupian — Capitanian — 265.1 ±0.4
    - Guadalupian — Wordian — 268.8 ±0.5
    - Guadalupian — Roadian — 272.3 ±0.5
    - Cisuralian — Kungurian — 283.5 ±0.6
    - Cisuralian — Artinskian — 290.1 ±0.26
    - Cisuralian — Sakmarian — 295.0 ±0.18
    - Cisuralian — Asselian — 298.9 ±0.15
- Paleozoic
  - Carboniferous
    - Pennsylvanian — Upper — Gzhelian — 303.7 ±0.1
    - Pennsylvanian — Upper — Kasimovian — 307.0 ±0.1
    - Pennsylvanian — Middle — Moscovian — 315.2 ±0.2
    - Pennsylvanian — Lower — Bashkirian — 323.2 ±0.4
    - Mississippian — Upper — Serpukhovian — 330.9 ±0.2
    - Mississippian — Middle — Visean — 346.7 ±0.4
    - Mississippian — Lower — Tournaisian — 358.9 ±0.4

Phanerozoic
- Paleozoic
  - Devonian
    - Upper — Famennian — 372.2 ±1.6
    - Upper — Frasnian — 382.7 ±1.6
    - Middle — Givetian — 387.7 ±0.8
    - Middle — Eifelian — 393.3 ±1.2
    - Lower — Emsian — 407.6 ±2.6
    - Lower — Pragian — 410.8 ±2.8
    - Lower — Lochkovian — 419.2 ±3.2
  - Silurian
    - Pridoli — 423.0 ±2.3
    - Ludlow — Ludfordian — 425.6 ±0.9
    - Ludlow — Gorstian — 427.4 ±0.5
    - Wenlock — Homerian — 430.5 ±0.7
    - Wenlock — Sheinwoodian — 433.4 ±0.8
    - Llandovery — Telychian — 438.5 ±1.1
    - Llandovery — Aeronian — 440.8 ±1.2
    - Llandovery — Rhuddanian — 443.4 ±1.5
  - Ordovician
    - Upper — Hirnantian — 445.2 ±1.4
    - Upper — Katian — 453.0 ±0.7
    - Upper — Sandbian — 458.4 ±0.9
    - Middle — Darriwilian — 467.3 ±1.1
    - Middle — Dapingian — 470.0 ±1.4
    - Lower — Floian — 477.7 ±1.4
    - Lower — Tremadocian — 485.4 ±1.9
  - Cambrian
    - Furongian — Stage 10 — ~489.5
    - Furongian — Jiangshanian — ~494
    - Furongian — Paibian — ~497
    - Series 3 — Guzhangian — ~500.5
    - Series 3 — Drumian — ~504.5
    - Series 3 — Stage 5 — ~509
    - Series 2 — Stage 4 — ~514
    - Series 2 — Stage 3 — ~521
    - Terreneuvian — Stage 2 — ~528
    - Terreneuvian — Fortunian — 541.0 ±1.0

Precambrian

Eonothem / Eon	Erathem / Era	System / Period	numerical age (Ma)
Proterozoic	Neoproterozoic	Ediacaran	~541.0 ±1.0
		Cryogenian	~635
		Tonian	850
	Mesoproterozoic	Stenian	1000
		Ectasian	1200
		Calymmian	1400
	Paleoproterozoic	Statherian	1600
		Orosirian	1800
		Rhyacian	2050
		Siderian	2300
Archean	Neoarchean		2500
	Mesoarchean		2800
	Paleoarchean		3200
	Eoarchean		3600
	Hadean		4000
			~4600

Units of all ranks are in the process of being defined by Global Boundary Stratotype Section and Points (GSSP) for their lower boundaries, including those of the Archean and Proterozoic, long defined by Global Standard Stratigraphic Ages (GSSA). Charts and detailed information on ratified GSSPs are available at the website http://www.stratigraphy.org. The URL to this chart is found below.

Numerical ages are subject to revision and do not define units in the Phanerozoic and the Ediacaran; only GSSPs do. For boundaries in the Phanerozoic without ratified GSSPs or without constrained numerical ages, an approximate numerical age (~) is provided.

Numerical ages for all systems except Lower Pleistocene, Permian, Triassic, Cretaceous and Precambrian are taken from "A Geologic Time Scale 2012" by Gradstein et al. (2012); those for the Lower Pleistocene, Permian, Triassic and Cretaceous were provided by the relevant ICS subcommissions.

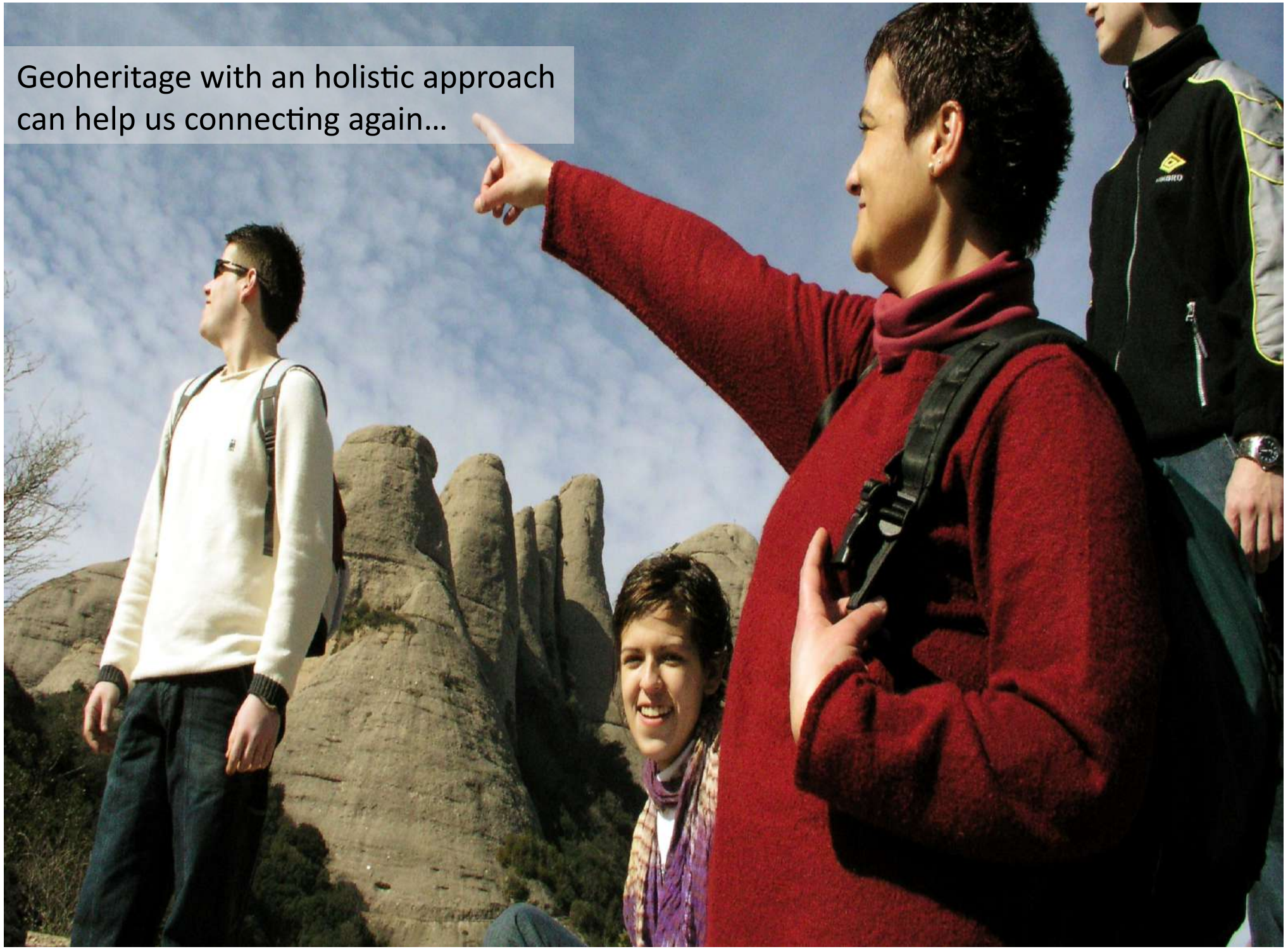
Coloring follows the Commission for the Geological Map of the World (http://www.ccgm.org)

Chart drafted by K.M. Cohen, S.C. Finney, P.L. Gibbard (c) International Commission on Stratigraphy, February 2014

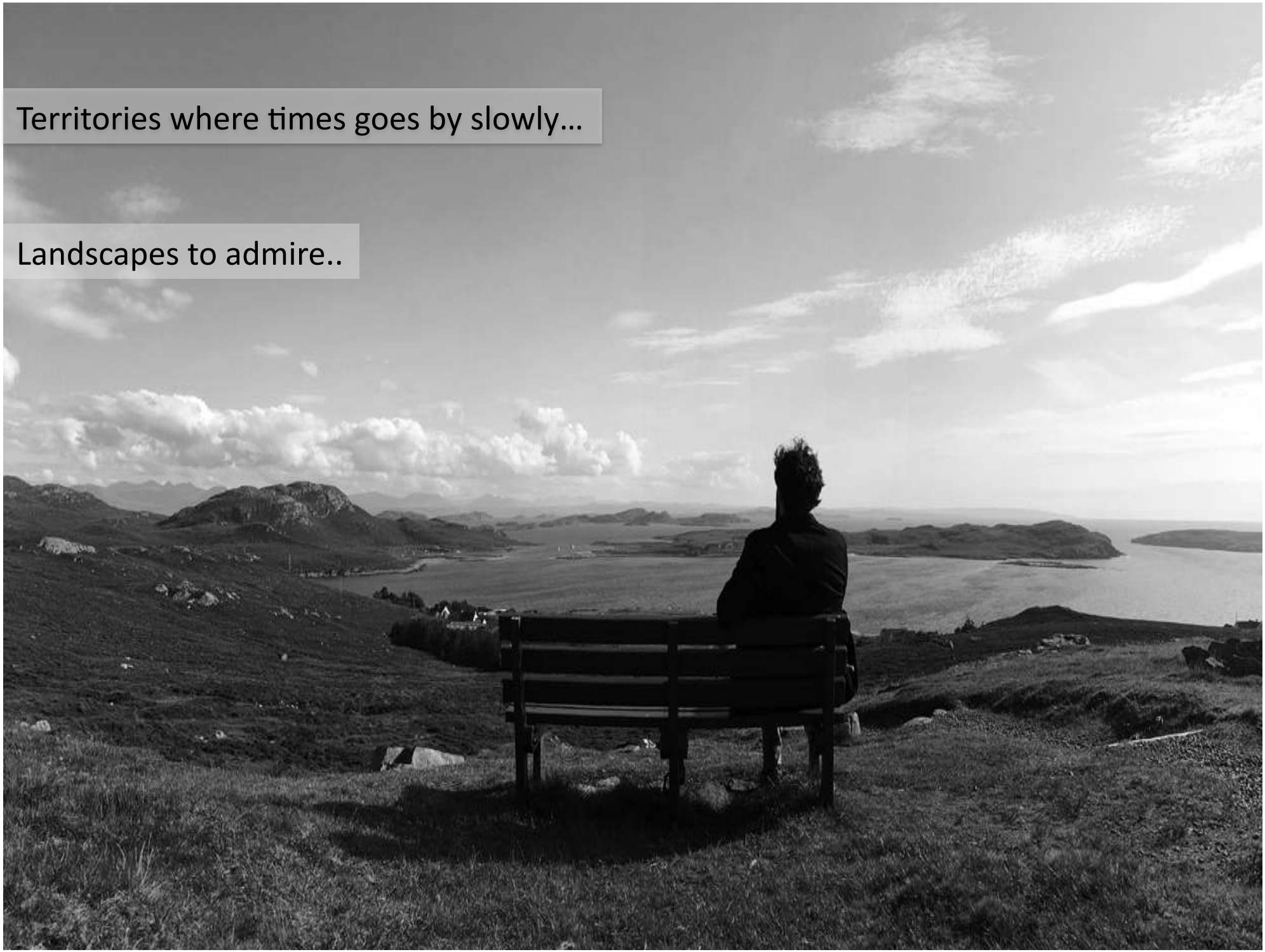
To cite: Cohen, K.M., Finney, S.C., Gibbard, P.L. & Fan, J.-X. (2013; updated) The ICS International Chronostratigraphic Chart. Episodes 36: 199-204.

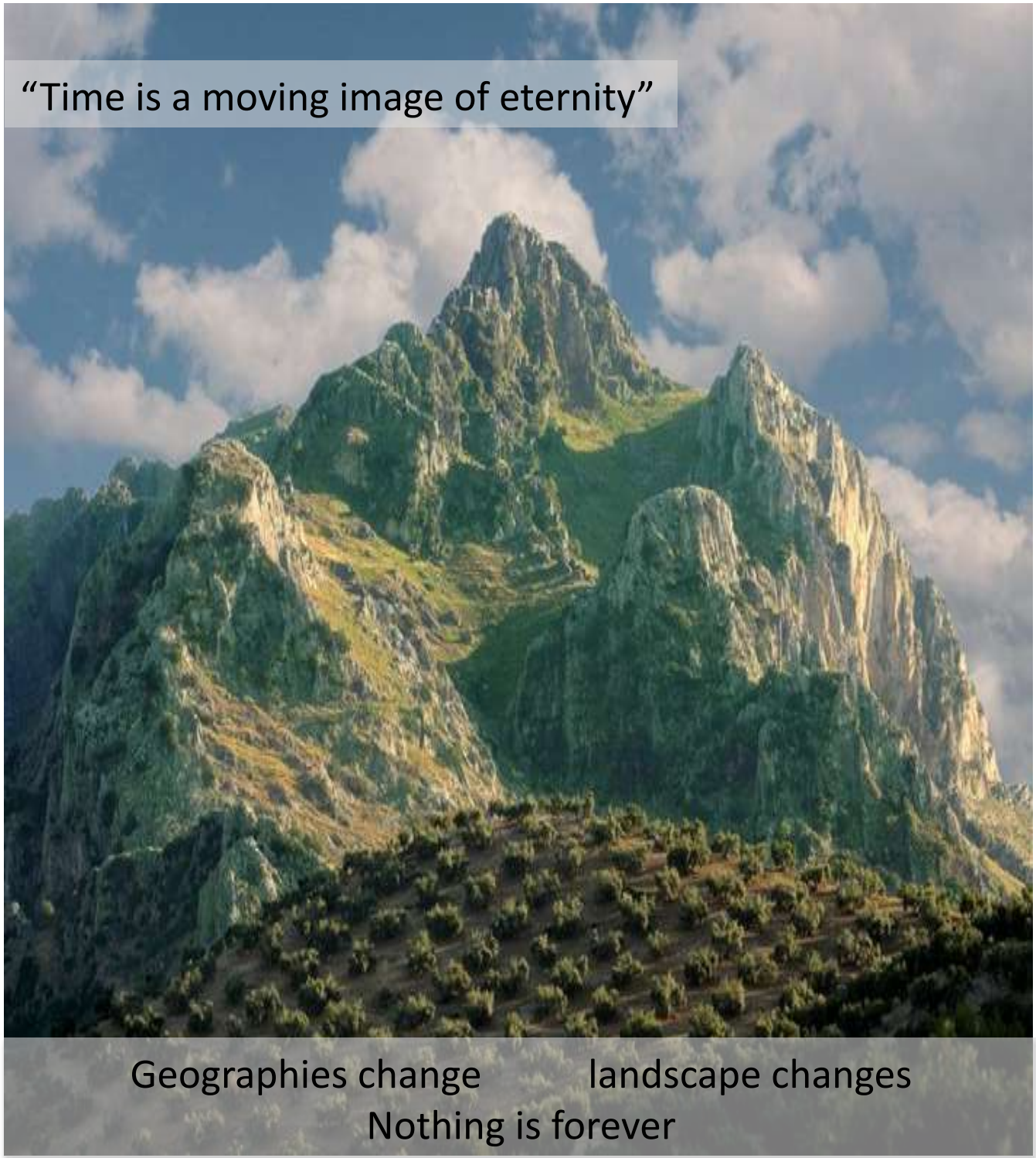
URL: http://www.stratigraphy.org/ICSchart/ChronostratChart2014-02.pdf


Loosing connection with our mother Earth…

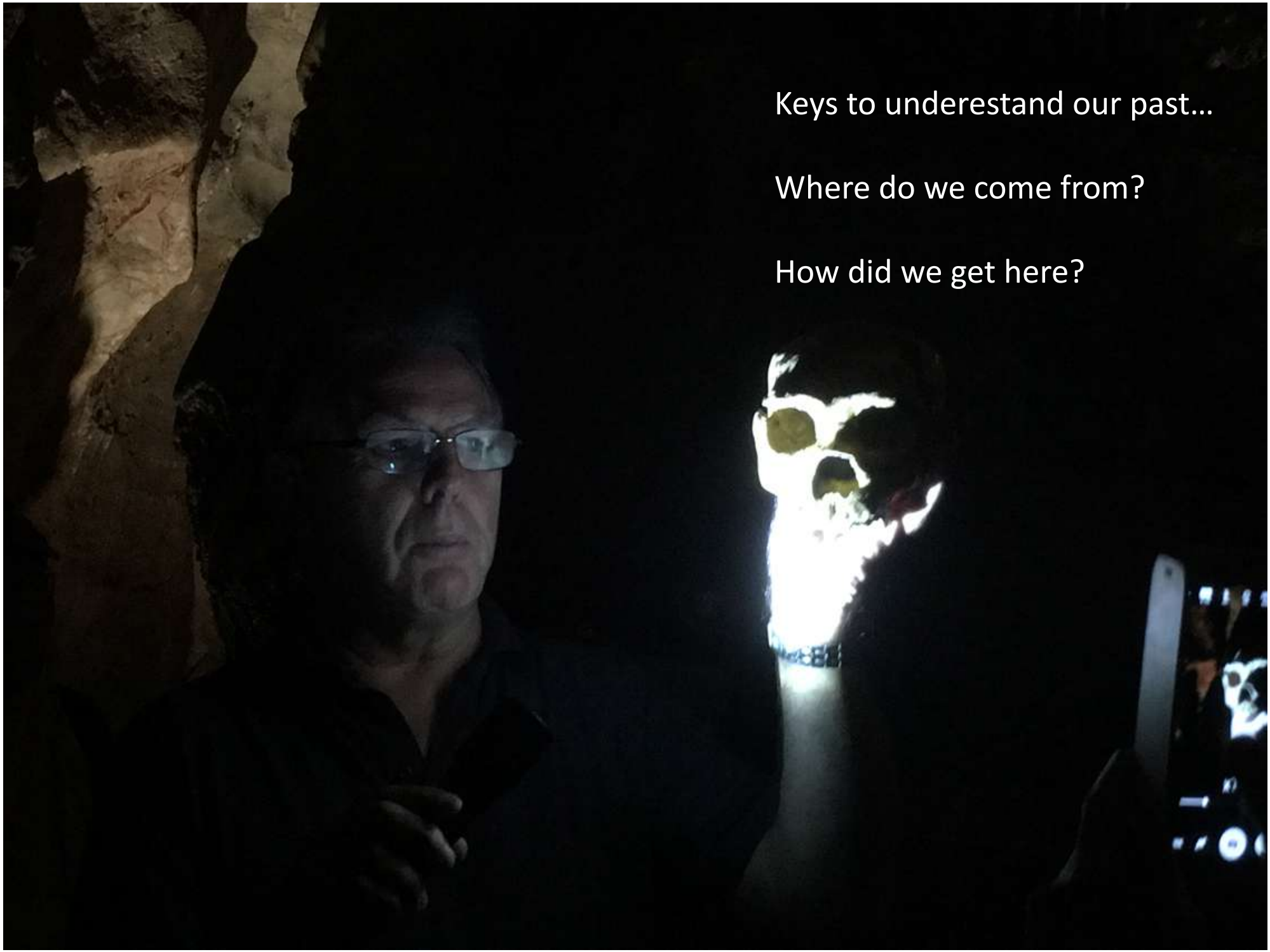

Geoheritage with an holistic approach
can help us connecting again…


The memory of the Earth. Deep time
Javier Carballo


Territories where times goes by slowly…
Landscapes to admire..


“Time is a moving image of eternity”
Geographies change landscape changes
Nothing is forever


It is only a matter of time


Keys to underestand our past…
Where do we come from?
How did we get here?


Laboratories for Climate Change…


History of life
Big catastrophes
Big opportunities…


We live in a dynamic Earth…


Territories to explore…

…. But there are many more reasons

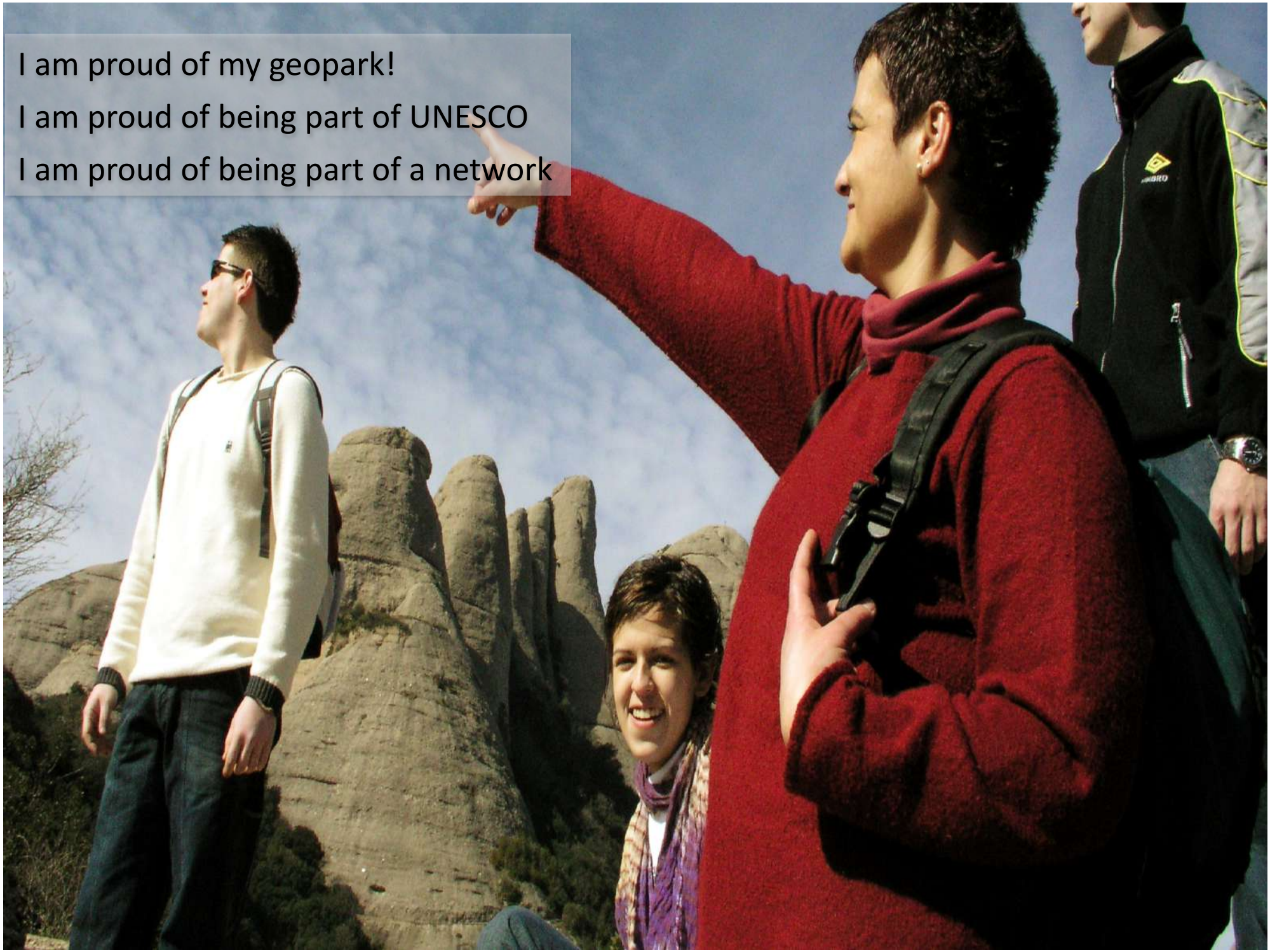

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS


Territories of science and conservation…


Territories of education…
…territories with future


Territories with people
Territories for the people…


Ongoing training, intense courses…..


I am proud of my geopark!
I am proud of being part of UNESCO
I am proud of being part of a network


Territories of passion…

IUGS
International Union of Geological Sciences

What is the role of the IUGS?

What is the role of the scientific community?

1 Collaborate with all the international associations, organizations and programs where geological knowledge is needed (world Heritage, IUCN, UGGP, NATURAL MUSEUMS…) to help them to identify and assess the geological heritage. W need to be able to work in bigger and multidisciplinary work-teams.

.- International geological significance (UGGP)

.- Outstanding examples representing major stages of earth history, including the record of life, significant on-going geological processes in the development of landforms or significant geomorphic or physiographic features. (World Heritage Convention, criterion VIII)

2 We must develop our own proactive program of indentifying, documenting and proposing sites and collections of international recognition by IUGS:

.- Global Geosite program

.- Global Collection program

.- Global Heritage Stone resources

IUGS
International Union of Geological Sciences

INTERNATIONAL COMMISSION ON GEOHERITAGE (ICG)

Asier Hilario

Angela Ehling

Juana Vegas

Zhang Jianping

SUBCOMMISSION ON GEOHERITAGE SITES AND COLLECTIONS

Benjamin van Wyk de Vries

Ezzoura Errami

SUBCOMMISSION ON GEOHERITAGE STONES

Gurmeet Kaur

Victor Cardenes

https://www.iugs.org/commissions

MAIN GOALS OF THE INTERNATIONAL COMMISION ON GEOHERITAGE (IUGS)

The expectation of the IUGS Executive Committee is that the Commission will come to be the global leader in Geoheritage activities.

Organizational goals:

1) Clarification and recruitment of voting members for all sub-commissions with a regular geographical distribution

2) Definition of statutes and guidelines for the ICG

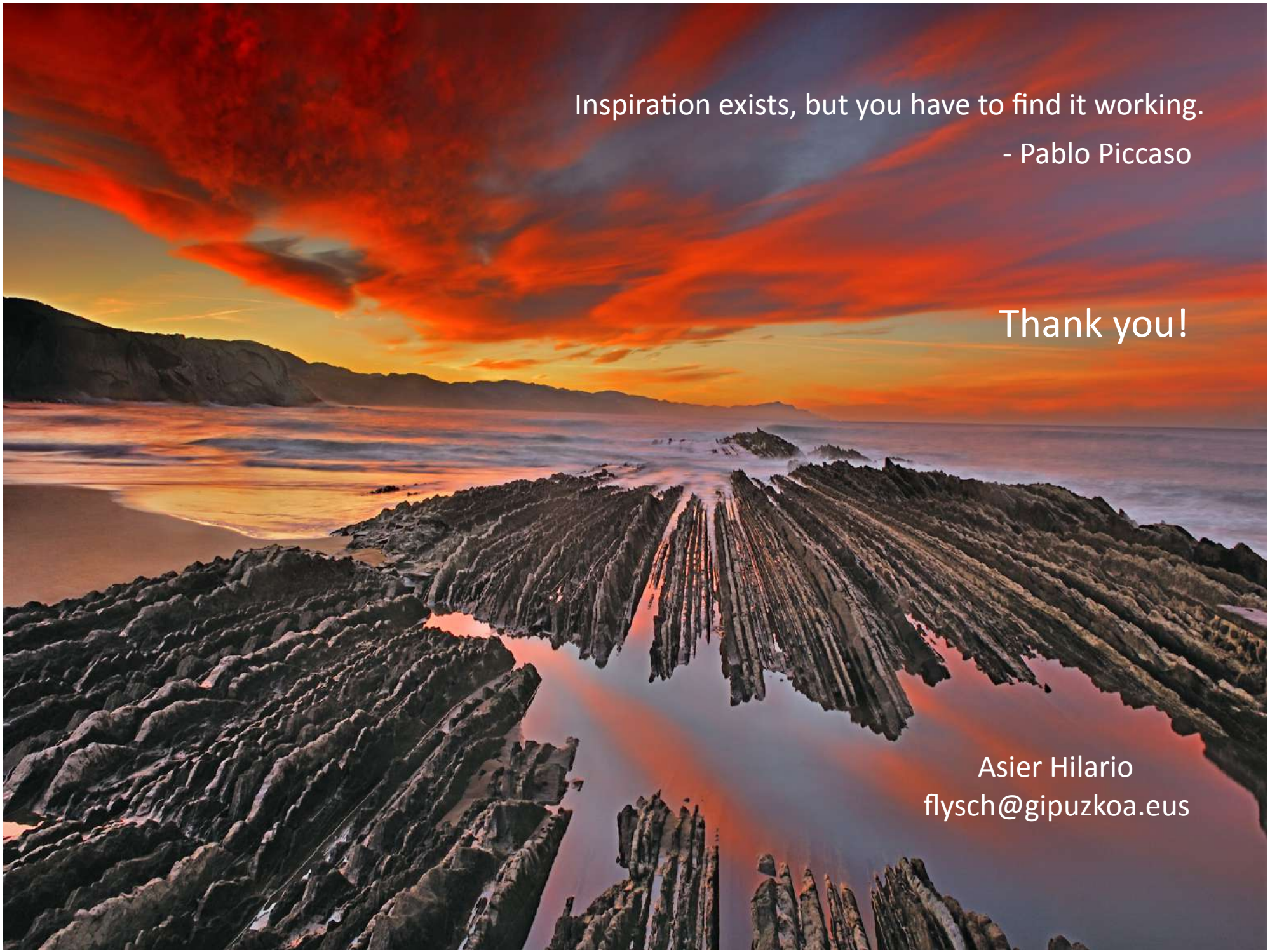
3) Coordination among different sub-commission and working groups within a common strategy of the ICG

Operational goals:

1) Definition of clear criteria and protocols to define geoheritage sites of global significance as well as museum collections and heritage stones for official IUGS recognition.

2) Strengthening the relationship between IUGS and UNESCO Global GeoparkS with and effective desktop assessment and other activities.

3) Improvement of the visibility of IUGS linked to Geoheritage initiatives worldwide.


Inspiration exists, but you have to find it working.
- Pablo Piccaso
Thank you!
Asier Hilario
flysch@gipuzkoa.eus