

# Landscapes and Landforms

## A Geomorphic Understanding

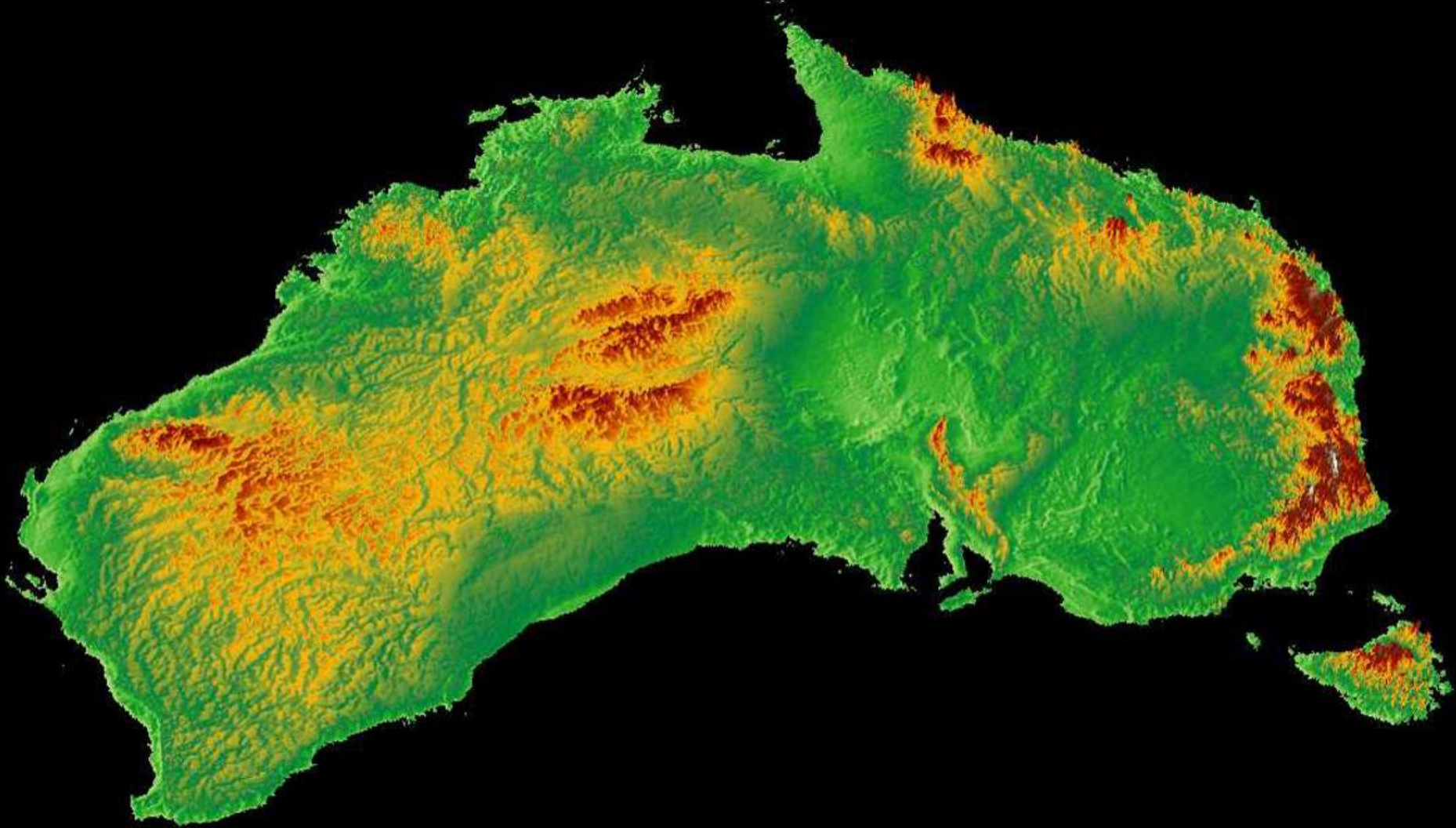
Presentation 4A - 11 to 11.50am - Paul Batten



why should we focus our studies?  
clarity of understanding









# YELLOWSTONE NATIONAL PARK









# Some info about me

Senior Geography teacher - HSC stuff

GTA - PD and syllabus

PhD in Geography

- thesis on Mapping Landscapes
- an undergrad focus  
on geomorphology



# In this presentation ...

1. That intro on a *geomorphic approach*
2. The syllabus and the *geomorphic approach*
3. Understanding *Landscapes and Landforms*
4. A little on *learning activities*







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Landscapes are melting pots. They are the combination of different entities, of different relationships, of different perceptions (Winchester *et al.*, 2003; Luz, 2000; Lee, 2000, p.5; Bender, 1993, p.1-4; Meinig, 1979, p.1-5; Tuan, 1974, p.74). This thesis argues that the mapping of landscapes should embrace this idea of a melting pot, rather than hide from it.

# Language

The term landscape has a specific definition in the discipline of geomorphology: landscape refers to the physical configuration of the continuous land-surface (after Tuttle, 1970). Interestingly, this definition can also be attributed to ‘topography’ (Macquarie Essential Dictionary, 1999). There are relationships between this geomorphic definition of landscape (as further discussed in *Chapter 2*) and the broader definition introduced above (and further developed in *Chapter 3*). At the very least, both versions reflect an integration of complex features. So as to avoid confusion, however, the term ‘landscape topography’ will be used to distinguish it from the more general sense of landscape used in the thesis overall.



“Topography is an important concern because it is a base layer on which biophysical and human processes occur (Brierley and Fryirs, 1997; Pike, 1995a).”

“Landscape topography is important because it is a template on which other landscape processes occur.”





What does the syllabus encourage?

Landscape topography?

OR

landscape broadly understood?



## Landscapes and landforms

Students:

- investigate different landscapes and the **geomorphic processes** that create distinctive landforms, for example: (ACHGK048, ACHGK050)
  - identification of a variety of landscapes and landforms **M VR**
  - explanation of geomorphic processes that create landforms eg weathering, erosion, deposition, tectonic activity **VR** 🎓
  - examination of ONE landscape and its distinctive landforms **F** 🖥️



# Valuing

*“Students explore landscapes and landforms using examples from Australia and throughout the world.*

*They explain processes that create landscapes and shape individual landforms and they describe the value of landscapes and landforms to different people.”*

# Stay true to the focus

## Value of landscapes and landforms

Students:

- investigate the aesthetic, cultural, spiritual and economic value of landscapes and landforms for people, including Aboriginal and Torres Strait Islander Peoples, for example: (ACHGK049) 🖐️
  - explanation of the aesthetic value of landscapes and landforms to culture and identity 🖐️ 🌐
  - description of the cultural and spiritual value of landscapes or landforms in different places **VR** 🖐️ 🌐 🚫
  - identification of how a landscape can have economic value for different people ★

# Degradation, management, hazard - surely now?

*“Students examine issues of **landscape degradation** and ways to **manage** and protect landscapes and **landforms**.”*

*“Students also investigate a natural hazard associated with landscapes and people’s responses to that hazard.”*

# Examples

## Landscape management and protection










Students:

- investigate ways people, including Aboriginal and Torres Strait Islander Peoples, manage and protect landscapes, for example: (ACHGK052) 🖐️ 🌱
  - description of the nature and extent of landscape protection across a range of scales eg locally protected places, national parks, world heritage listing **M** 🌱 🎓
  - examination of management and protection strategies for ONE landscape **F** 🌱
  - assessment of the contribution of Aboriginal and Torres Strait Islander Peoples' knowledge to the use and management of an Australian landscape or landform 🖐️ 🌱 ⚙️

# Final part of syllabus

## Geomorphic hazard

Students:

- investigate ONE contemporary geomorphic hazard including causes, impacts and responses, for example: (ACHGK053)
  - description of the spatial distribution of the disaster **M**   
  - explanation of geomorphic processes causing the disaster and its impacts **VR** 
  - examination of the responses of individuals, groups and government to the impact of the disaster  
  - discussion of management strategies to reduce the future impact of similar hazard events including the role of technology in monitoring and predicting geomorphic hazards   



# National Curriculum

‘Landforms and Landscapes’ focuses on investigating ...

**geomorphology**

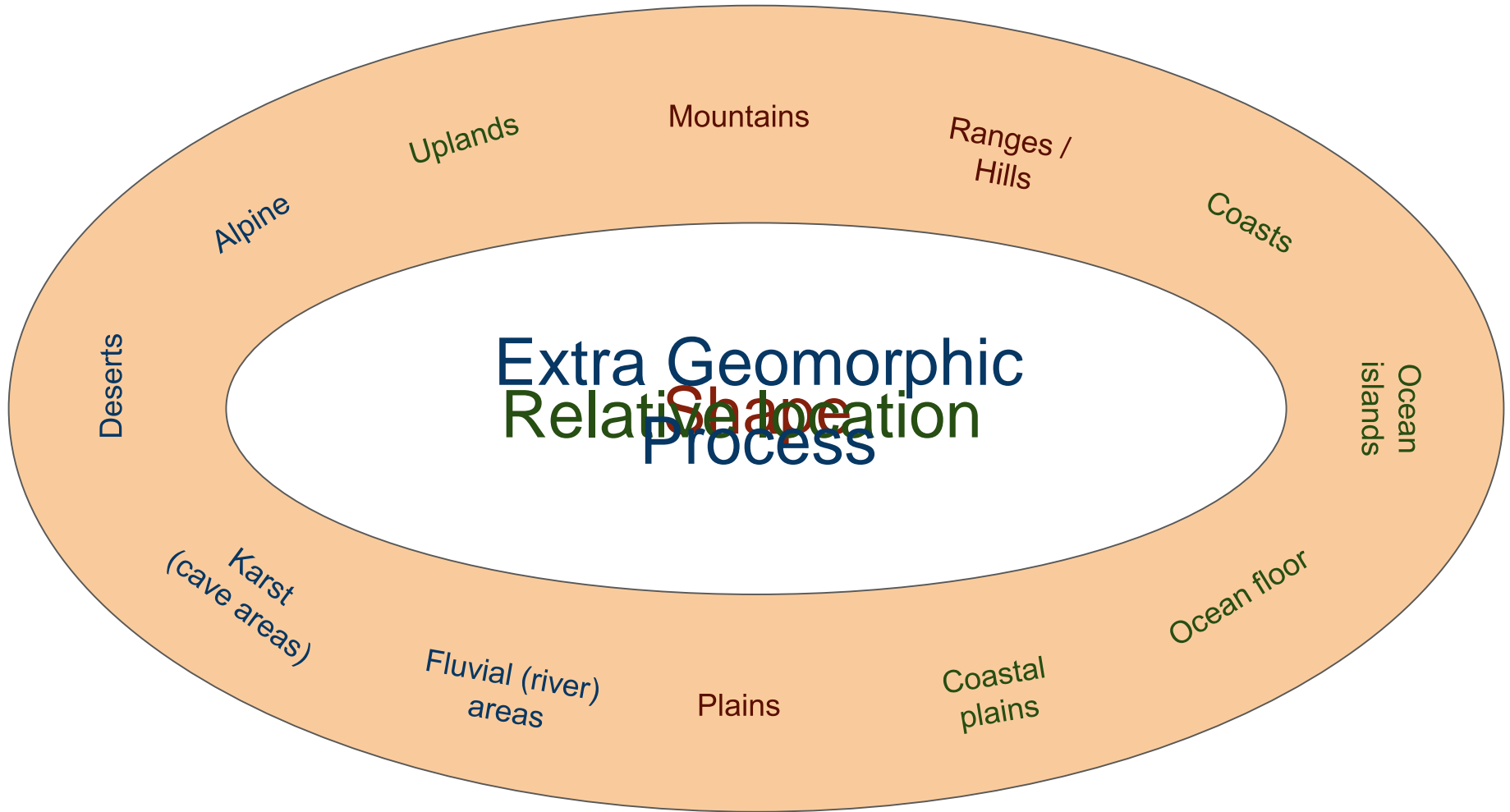


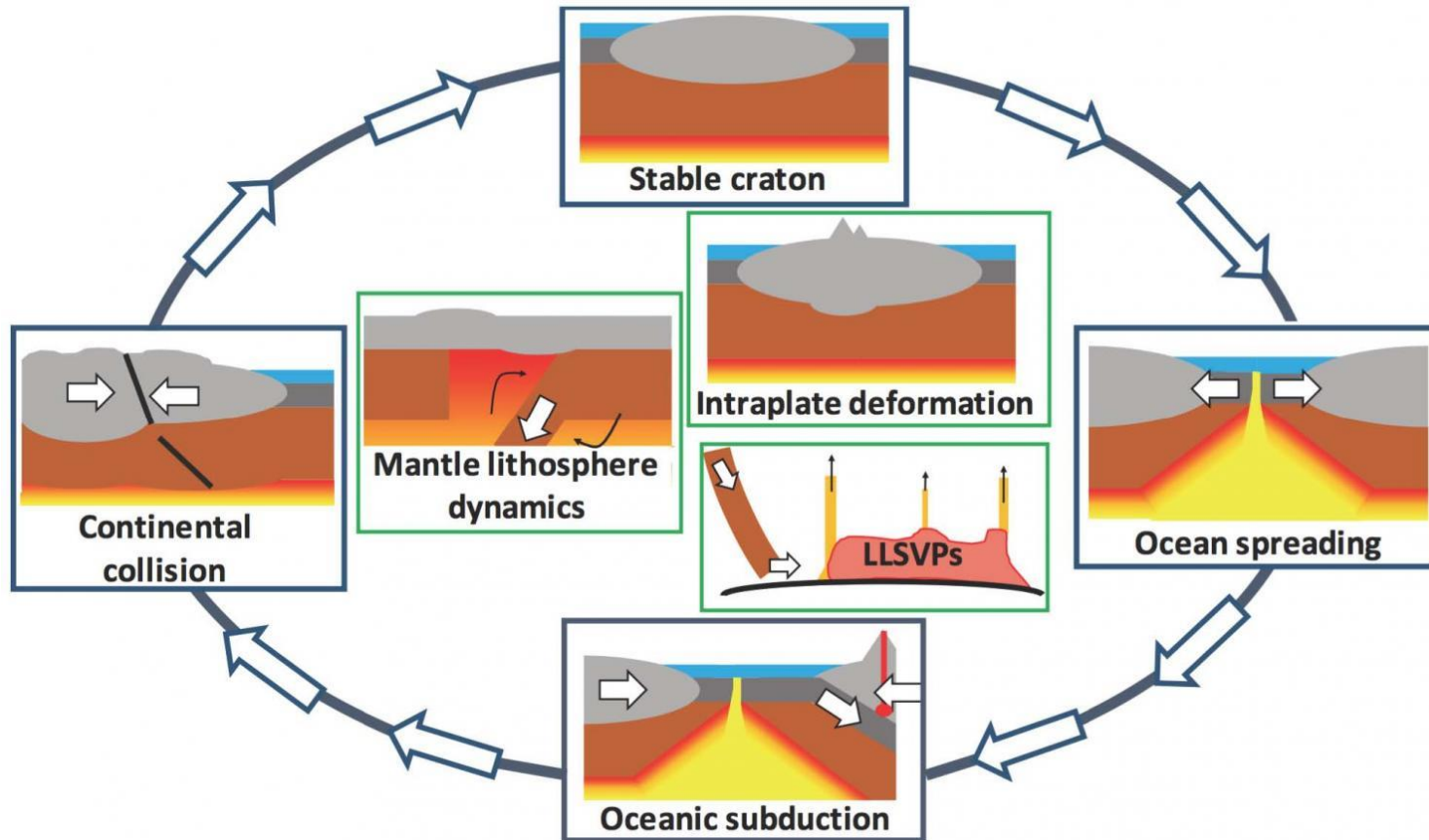




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# FORCE

Internal/  
Endogenic  
Force

External/  
Exogenic Force

{The Forces & the Agents are Interchangeably used}

**Fluvial Force**  
(Running  
Water)

**Aeolian Force**  
(Wind)

**Glacial Force**  
(Snow)

**Coastal  
Waves**

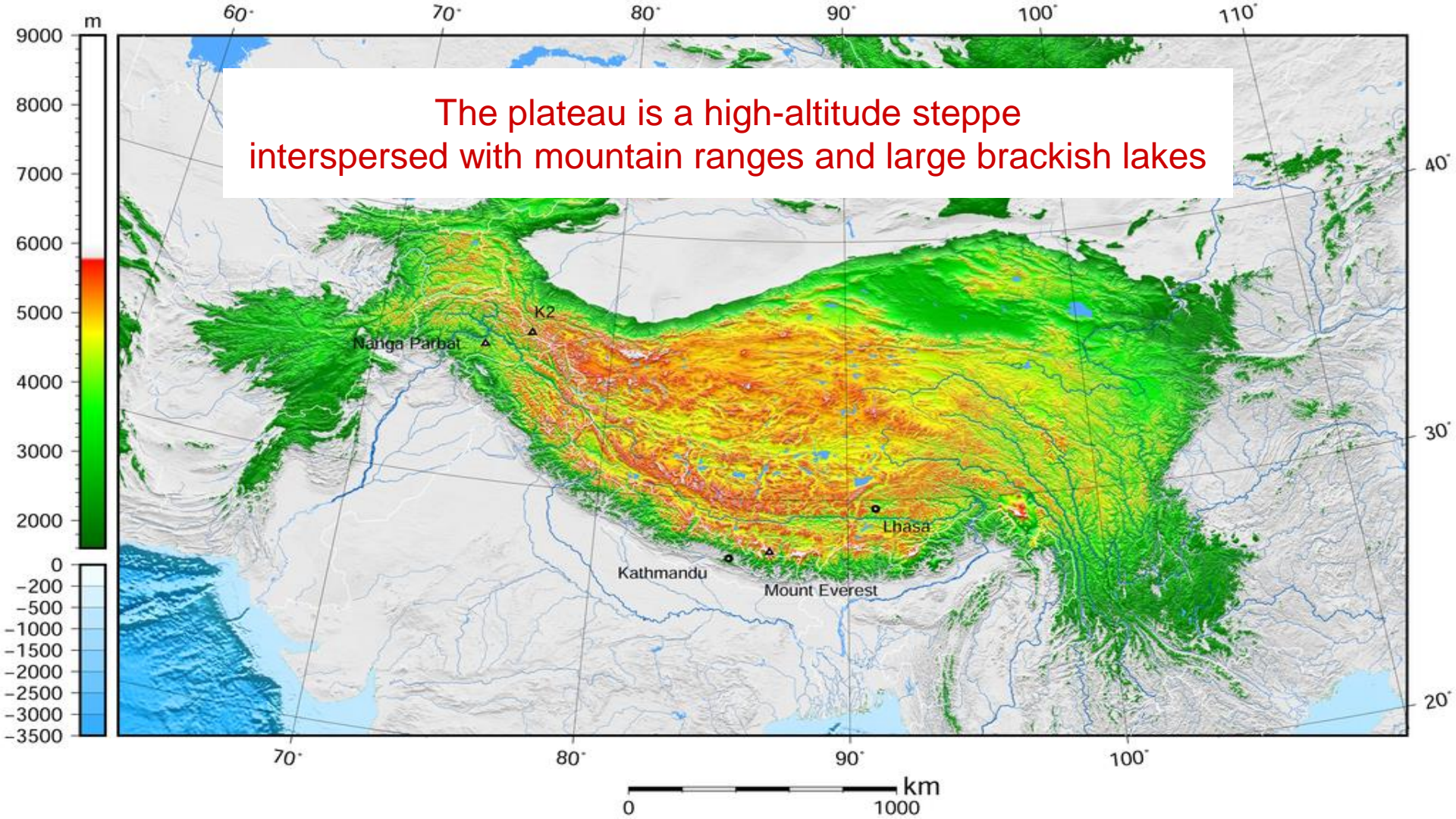
**Underground  
Water**  
(Karst  
Topography)

**Limestone  
Regions & Under  
Humid Condition**





The plateau is a high-altitude steppe interspersed with mountain ranges and large brackish lakes







Arlit  
Akokan RN25

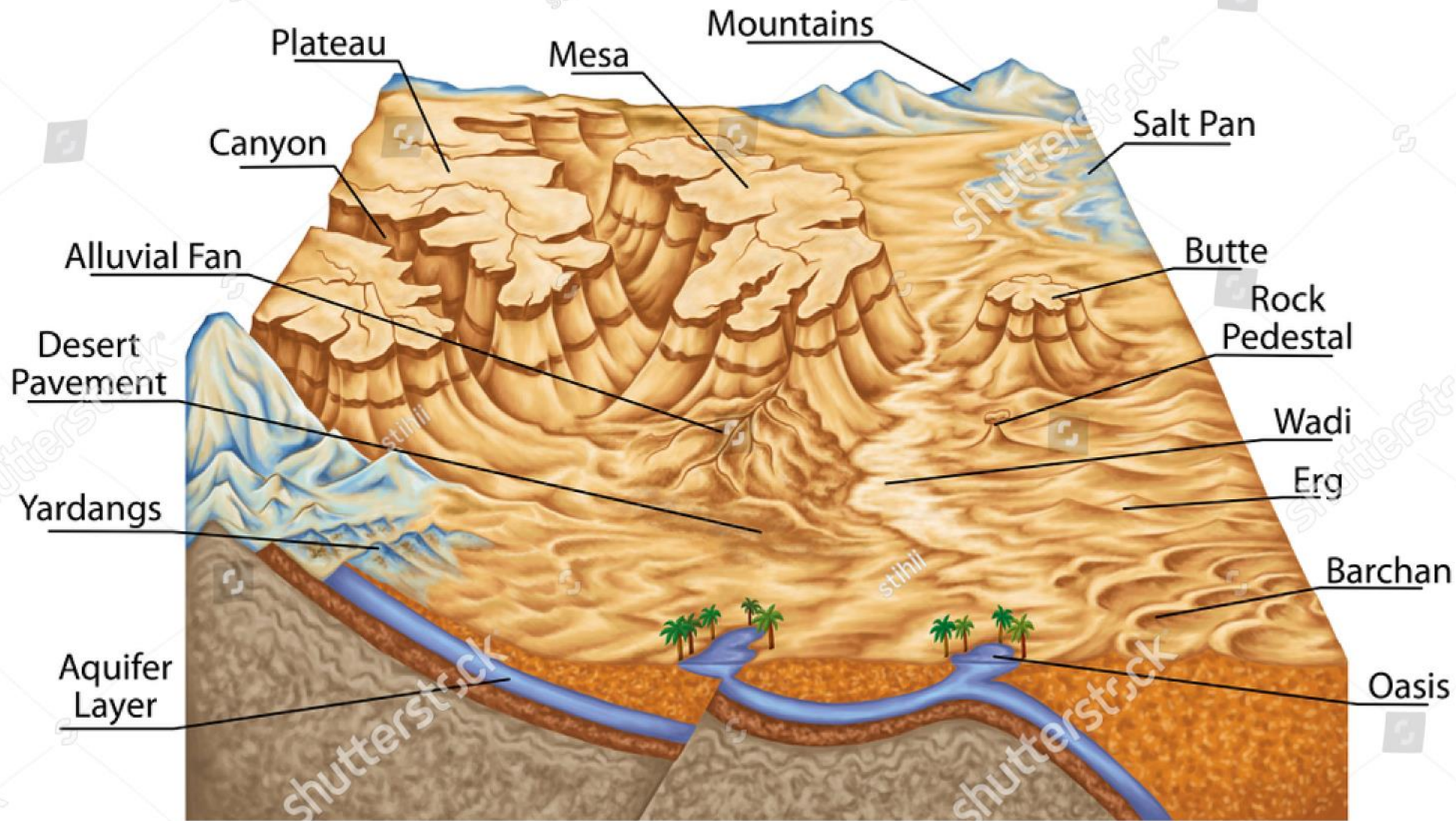
Gougaram

Assodé

Air Mountains

Dannet

Tilmia



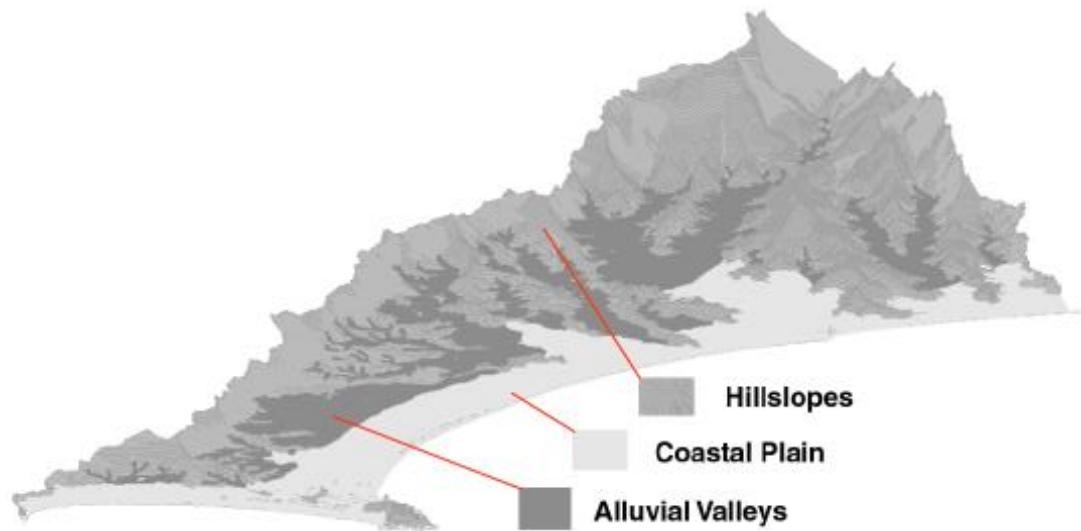
# What are landscapes?

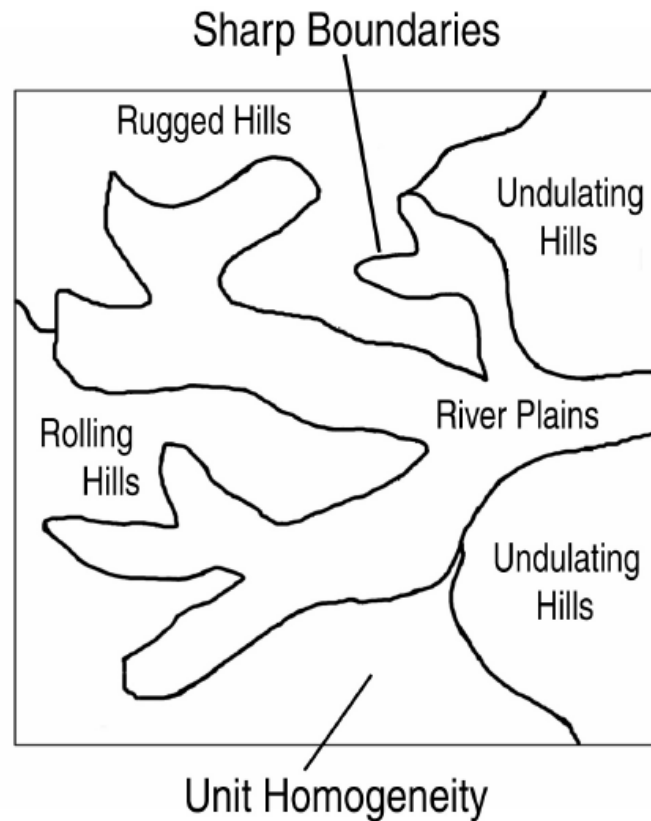
## Landscapes and landforms

Students:

- investigate different landscapes and the geomorphic processes that create distinctive landforms, for example: (ACHGK048, ACHGK050)
  - identification of a variety of landscapes and landforms **M VR**
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  - examination of **ONE landscape and its distinctive landforms** **F** 🖥️







**Figure 2.1: A conceptual demonstration of a ‘classification’ landscape-mapping style. This style uses double crisp classification — sharp boundaries and unit homogeneity. This mapping technique has been criticised for lacking physical meaning, and being overly subjective.**

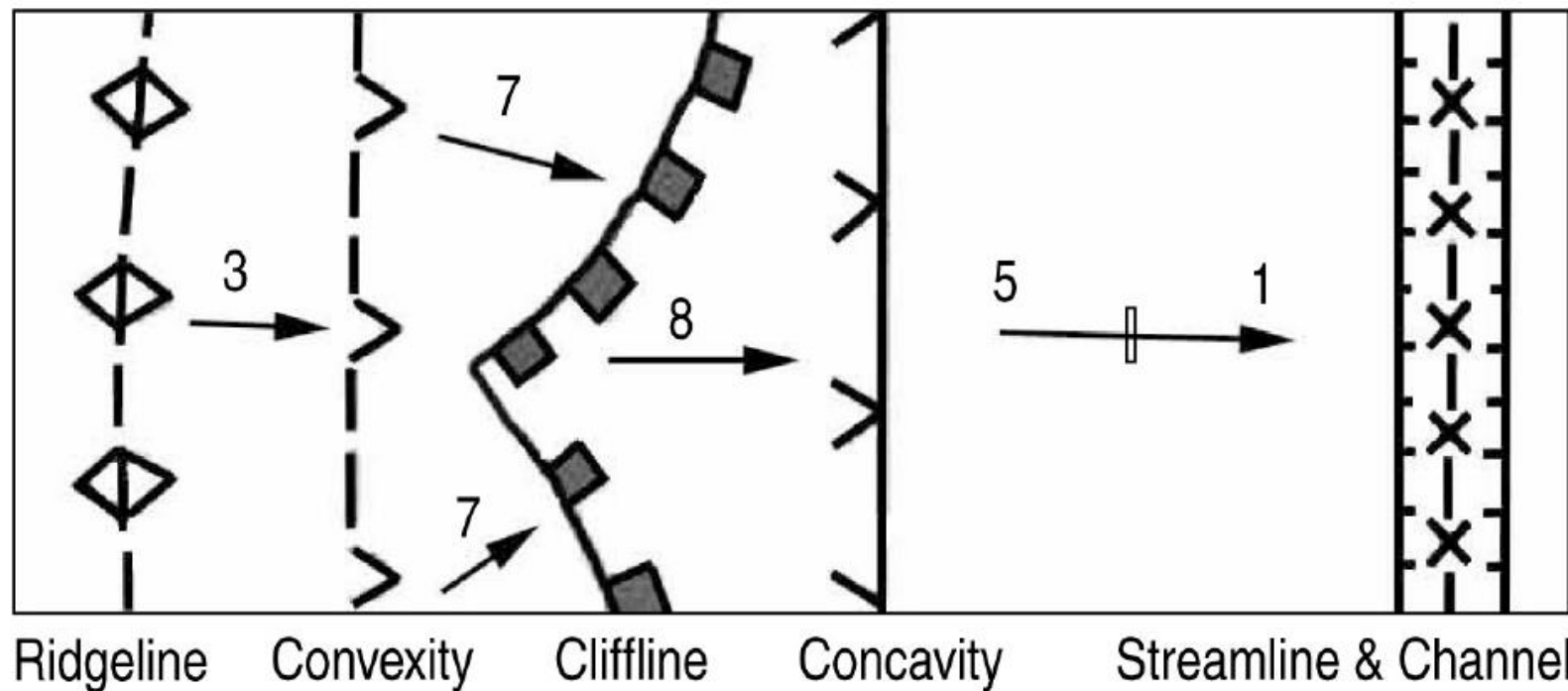




Lot  
214

**DEPOSIT TAKEN**

1,196m<sup>2</sup>



Note: Arrows point down hill; numbers are angle of slope in degrees.






**Figure 2.2: A conceptual demonstration of a ‘combination’ landscape-mapping style, demonstrating the subjective identification of salient features, together with the use of landscape tiles (after Gardiner and Dackombe, 1983).**





## Changing landscapes

Students:

- investigate the human causes and effects of landscape degradation, for example: (ACHGK051)
  - identification of the ways people utilise and change landscapes **VR** 
  - description of the impact of a range of human activities on landscapes **GS VR**  
  - examination of ONE type of landscape degradation including its spatial distribution, causes and impact **M F**  



# Degradation

Definition - the reduction in capability of an area

Landforms, might be due to:

- erosion (hillslope, gully, river, coastal, wind),
- dams (weirs, irrigation channels),
- urbanisation / development - e.g. roads, roofs, channels

the result is geomorphic processes are altered

# erosion (hillslope, gully)



A degraded hillslope near Glen Alice that has been fenced off and replanted with native species.



# erosion (river, coastal, wind)

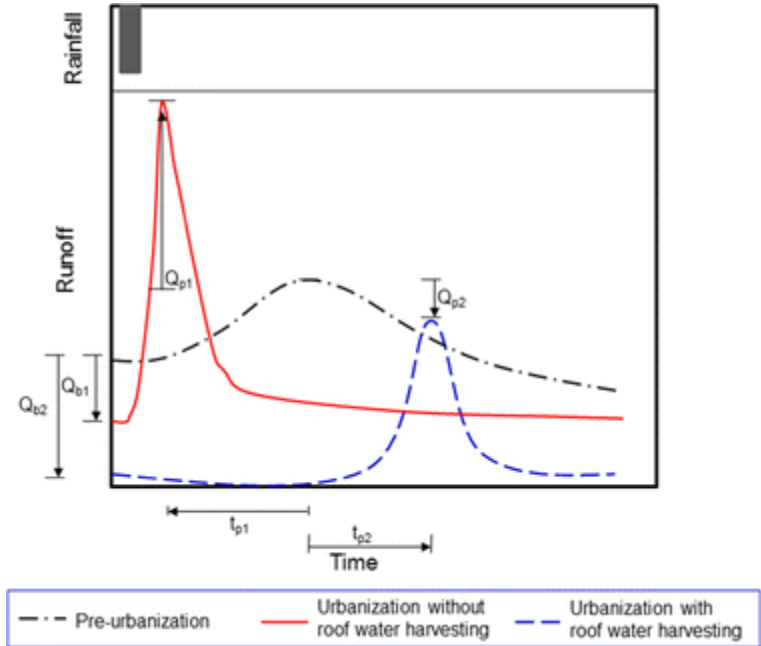


# dams (weirs, irrigation channels)





# urbanisation / development - e.g. roads, roofs



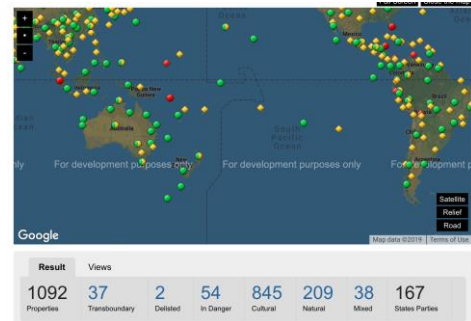
# urbanisation / development - e.g. channels





# Some Student Activity Ideas

- i. Photos of landscapes and landforms, identifying them
- ii. Diagrams - *Match It* activities
- iii. World Heritage sites, what landscapes/landforms, why valued, link to aesthetics, or spiritual
- iv. *Google My Maps* pinned images and descriptions
- v. Topographic mapping and contours; skills incl. slope, aspect, relief
- vi. *Charades* natural hazard edition



# Student Assessment

Hazards are a good option (newspaper article, documentary, etc.)

but not the only one

E.g. *The Amazing Race* UNESCO edition

TV script with visuals

Challenge themes based on location





## ROADBLOCK



### Who Shoots and Scores?

A Roadblock is a task that *only 1 team member may perform. One team member must do this challenge, and the other must do the next roadblock.*

The one team member who you choose to perform this ROADBLOCK must **SKATE** out to the center of the ice and get a hockey stick. If you have taken your skates off, you must put them back on. If your team chose not to complete the first task and have already served the 12 minute penalty, you may perform this task without skates. This task can only be done by one team at a time. If another team is performing this task, you must wait in line.

There will be 5 pucks lined up on the blue line. You must shoot the pucks at the goal until you score one. If you fail to make one after 5 shots, you must wait in line behind other racers before you can try again. Once you score a goal, you will receive your next clue.

Hint: The next roadblock might require strong lungs

## ROAD BLOCK



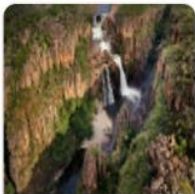
### Who thinks he can fly?

Two team members must work together to fold a paper airplane and fly it onto the marked target on the beach.

# UNESCO World Heritage



Great Barrier Reef



Kakadu National Park



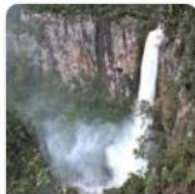
Tasmanian Wilderness World Herita...



Wet Tropics of Queensland



Lord Howe Island



Gondwana Rainforests



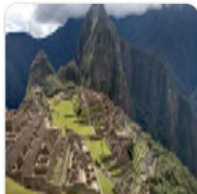
Shark Bay



Fraser Island



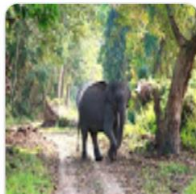
Greater Blue Mountains Area



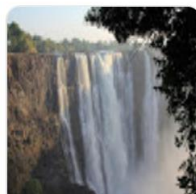
Machu Picchu



Naracoorte Caves National Park



Manas National Park



Victoria Falls



Yellowstone National Park



Parque Nacional Los Glaciares



Salonga National Park



Plitvice Lakes National Park



Tropical Rainforest Heritage of ...



(vii)

to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

(viii)

to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;



## Global Strategy

Criteria

Upstream Process

Tentative Lists

World Heritage List Nominations

World Heritage List

New Inscribed Properties

Interactive Map

World Heritage in Danger

The List in Danger

Success Stories

Donate Now

Donate now and help preserve World Heritage sites

Search the List

Search

Advanced v

## Los Glaciares National Park

[Description](#)
[Maps](#)
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## Los Glaciares National Park

The Los Glaciares National Park is an area of exceptional natural beauty, with rugged, towering mountains and numerous glacial lakes, including Lake Argentino, which is 160 km long. At its farthest end, three glaciers meet to dump their effluvia into the milky grey glacial water, launching massive igloo icebergs into the lake with thunderous splashes.

Description is available under license CC-BY-SA IGO 3.0

 Argentina

Santa Cruz

S50 0 0 W73 14 57 984

Date of inscription: 1981

Criteria: (v)(vii)

Property : 726,927 ha

Ref.: 145

[English](#)
[French](#)
[Arabic](#)
[Chinese](#)
[Russian](#)
[Spanish](#)
[Japanese](#)
[Dutch](#)


Los Glaciares National Park (Argentina) © Philipp Schinz


[Media](#)
[Links](#)

State of Conservation (SOC) by year

1986 - 1985

# Outstanding Universal Value

## Brief synthesis

Los Glaciares National Park is located in the Southwest of Santa Cruz Province in the Argentine part of Patagonia. Comprised of a National Park and a National Reserve it has a total surface area of 600,000 hectares. Los Glaciares owes its name to the numerous glaciers covering roughly half of the World Heritage property. Many of these glaciers are fed by the massive South Patagonian Ice Field, the most extensive South American relict of the glaciological processes of the Quaternary Period. In addition, there are impressive glaciers independent of the main ice field. The property therefore constitutes a massive freshwater reservoir.

The Upsala, Onelli and Perito Moreno Glaciers calve into the icy and milky waters of the huge Lake Argentino, which is partly included in the property. The most striking sight is the famous Perito Moreno Glacier. This large glacier blocks a narrow channel formed by Lake Argentino thereby raising the water level temporarily. This in turn causes regular thunderous ruptures of the glacier tongue into the lake.

**Criterion (vii) :** Los Glaciares National Park is embedded into the enchanted and remote mountain landscape of the Patagonian Andes shared by Argentina and Chile. Dominated by rugged granite peaks exceeding 3000 m.a.s.l. the landscape is modelled by massive, ongoing glaciations. About half of the large property is covered by numerous glaciers, many of which belong to South America's largest ice field. Despite the name's focus on the impressive glaciers there is a remarkable landscape diversity encompassing a large altitudinal gradient of more than 3000 metres and very diverse ecosystems.

The glaciers feed the huge mountain lakes of Viedma and Argentino. The overwhelming beauty of the landscape is epitomized where the Perito Moreno Glacier meets Lake Argentino. The vast front of the slowly and constantly moving glacier, up to 60 metres high, regularly calves bluish icebergs into the waters of Lake Argentino, an audiovisual spectacle attracting visitors from all over the world.

**Criterion (viii) :** Los Glaciares National Park is an excellent example of the significant process of glaciation, as well as of geological, geomorphic and physiographic phenomena caused by the ongoing advance and retreat of the glaciations that took place during the Pleistocene epoch in the Quaternary period, and the neoglaciations corresponding to the current epoch or Holocene. These events have modelled – and continue to model the landscape of the area and may be recognised by the lacustrine basins of glacial origin, the moraine systems deposited on the plateaux, or by more recent systems pertaining to the current valleys, and, the many large glacier tongues fed by the Ice Fields of the Andes. The property also provides fertile ground for scientific research on climate change.

## Protection and management requirements

The property has an impressively long formal conservation history going back to 1937. Los Glaciares National Park is a state-owned unit of the National System of Protected Areas in Argentina (Law No. 22.351 dealing with the National Park Administration), and it was created in 1937 when Law No. 13.895 was enacted, while National Law No. 19.292 of 1971 established the current limits, including the division of the area into a National Park and a National Reserve. Most of the territory of the Magallanes Peninsula, in which the Perito Moreno Glacier is located, is a Provincial Nature Reserve serving as a buffer zone of the property.

The property has specialised administrative and technical staff and park rangers. There is also a fire brigade and support park rangers. While the Superintendence and main administrative office operates in the small town of El Calafate, there are additional units distributed across the property. The Regional Technical Office Patagonia provides professional, scientific and technical assistance.

Management is guided by a preliminary management plan (approved in 1997 by Resolution N° 162). It will require continuous review and updating in response to emerging demands. Since 2002, Los Glaciares National Park established a local Advisory Council bringing together national, provincial and municipal entities, non-governmental organizations, the Chamber of Commerce, the Association of Tourist Guides and a Scout Group among others stakeholders. This Council has an advisory role to the management of Los Glaciares National Park.

While tourism is localized and many parts of the property can only be accessed by mountaineers and climbers there are seasonally crowded areas in the property requiring careful public use planning. The Public Use programme has been updated to fulfil the Restructuring Plan for the Moreno Glacier Sector, due to the increase in tourism and to the fact that it has the most appealing values for visitors. This restructuring included road improvements, planning of visits through a new walkway system, services for visitors, such as restaurants and toilets, in order to improve the property protection and the quality of the visit.

Historically, overgrazing is among the biggest human impacts, in some areas to this day. The management addresses this through agreements for the conversion of cattle-raising farms to touristic uses. Feral cattle remain in two uninhabited areas, Avellaneda Peninsula and Onelli Bay, and will eventually have to be removed. The latter is part of a programme to control alien invasive species. Other noteworthy introduced species include the European Hare and trout species in the lakes and streams.

Forest fires have likewise had a strong impact in the past leading to the degradation and even destruction of large areas within the property. Removal of livestock and fire prevention will help restoration.

The continuation and consolidation of the Research and Monitoring Programme are required, which include the project to conserve the Huemul Deer, one of the most remarkable species of the park. The latter is a longstanding project with a history of more than two decades and is conducted jointly with neighbouring Chile.

# ACT IT OUT!

## A GAME OF CHARADES



Landslide  
Rockfall  
Slope failure  
Solifluction  
Mudflow  
Sinkhole  
Eruption  
Lahar  
Subsidence

Earthquake  
Tsunami  
Flood  
Avalanche  
Coastal erosion  
East-coast low  
King tide  
Storm surge  
Soil liquefaction  
River erosion  
Meander

Destruction  
Disaster  
Devastation  
Catastrophe  
Magnitude  
Fault  
Crater  
Phenomenon

Emergency  
Reponse  
Rescue  
Prevention  
Prediction  
Evacuation





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Any Qs / Comments?

