

Biogeography. Lecture 30

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Outline

Biogeography of the World

- Biogeography of Indo-Pacific region

- The basics of island biogeography

- Biogeography of Australian region

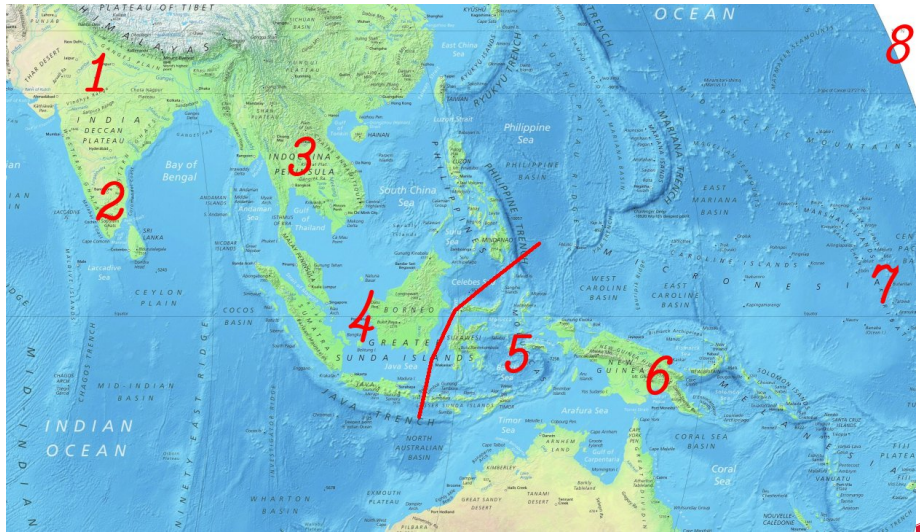


Biogeography of the World

Biogeography of Indo-Pacific region



Indo-Pacific: biogeographical regions and Wallace line



Indo-Pacific: 8 biogeographical regions

1. North India
2. Deccan Plateau and South India
3. Sundaland: Indochina
4. Sundaland: Malay archipelago
5. Wallacea
6. New Guinea and Melanesia
7. Coral Pacific Islands
8. Volcanic Pacific Islands



Indo-Pacific regions: key features

1. **North India:** Asian lions (*Panthera leo persica*) and tigers (*Panthera tigris*)
 2. **Deccan Plateau and South India:** the most “African” fauna outside of Africa, e.g., Asian elephant (*Elephas maximus*) (smaller ears and less skinny), Indian rhinoceros (*Rhinoceros unicornis*) and multiple species of antelopes like gazelles (*Gazella gazella*); also, many “true” Asian elements like king cobra (*Ophiophagus hannah*), the largest venomous snake.
 3. **Indochina:** domestication center of many animals like cattle (e.g., wild gaur *Bos gaurus*) and chicken, Red Junglefowl (*Gallus gallus*). Terrestrial leeches (Haemadipsidae).
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4. **Malay archipelago:** one of the most species-rich regions of the World. Unique animals: orangutans (*Pongo pygmaeus* and *Pongo abelii*), gibbons (family Hylobatidae), flying lemurs (order Dermoptera), flying lizards (*Draco volans*) and even flying frogs (*Rhacophorus*)! Hornbills (family Bucerotidae, substitute of South American toucans) and scaly anteaters (order Pholidota) are common with African biota. Lots of epiphytes (e.g., orchids) but no bromeliads. Pitcher vine *Nepenthes* (some in symbiosis with tree shrews, order Scandentia) is also specific to the region. Famous island Krakatoa exploded in 1883 is located here, between Java and Sumatra.
 5. **Wallacea:** border between Sundaland and Sahul; islands which have never been connected with Asia (some of them like Sulawesi are disputable) and therefore “steppstones to Australia”. Most famous is Komodo, the island of Komodo dragon (*Varanus komodoensis*), the largest terrestrial reptile (up to 3.1 m)
 6. **New Guinea and Melanesia:** have multiple Australian elements like echidna (*Zaglossus*) but also placental mammals (like Muridae, mice) and endemic groups (like birds of paradise, family Paradisaeidae).
 7. **Coral Pacific Islands:** very poor soils and consequently poor biota
 8. **Volcanic Pacific Islands like Hawaii:** recently radiated flora and ornithofauna (like Hawaiian honeycreepers, Drepanididae) and relatively poor terrestrial fauna.



Summary for Indo-Pacific

- ▶ Geological “puzzle”, region with extremely complex history
- ▶ Humid and rich
- ▶ Numerous borders (like Wallace line) and connections (like Madagascar / Indonesia disjunctions)



Biogeography of the World

The basics of island biogeography

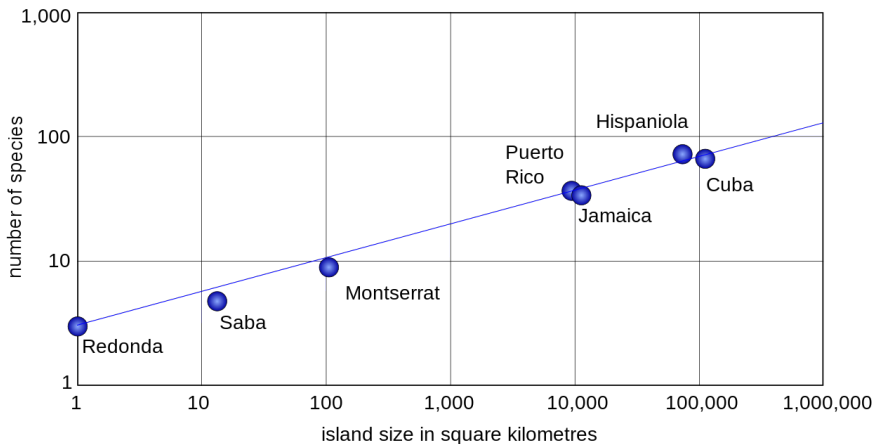


The basics of island biogeography

- ▶ Immigration and extinction
- ▶ Distance effect
- ▶ Species-area curve and the effect of island size



Species-logarea line for reptiles and amphibians in Caribbean

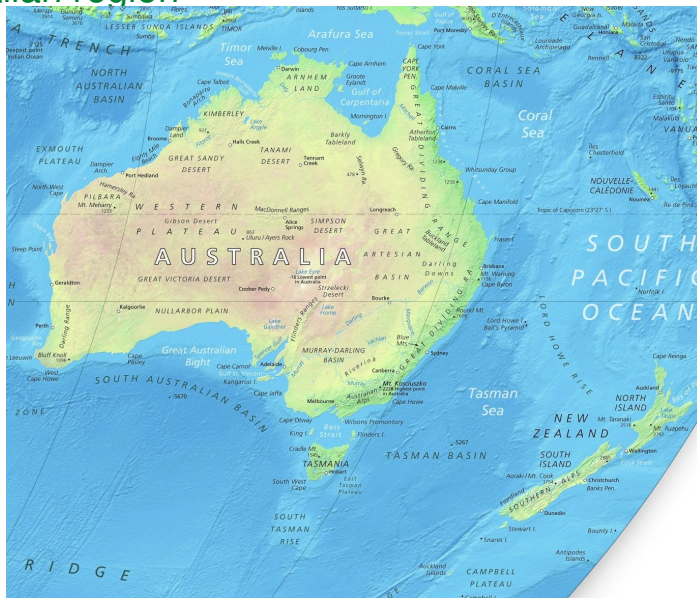


Biogeography of the World

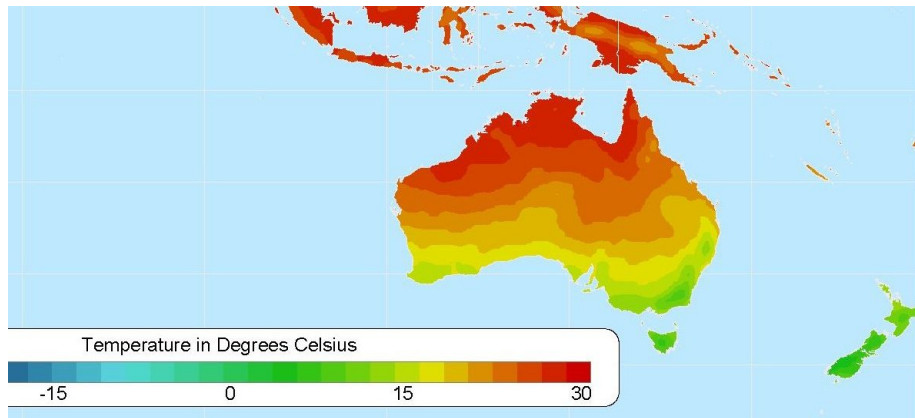
Biogeography of Australian region



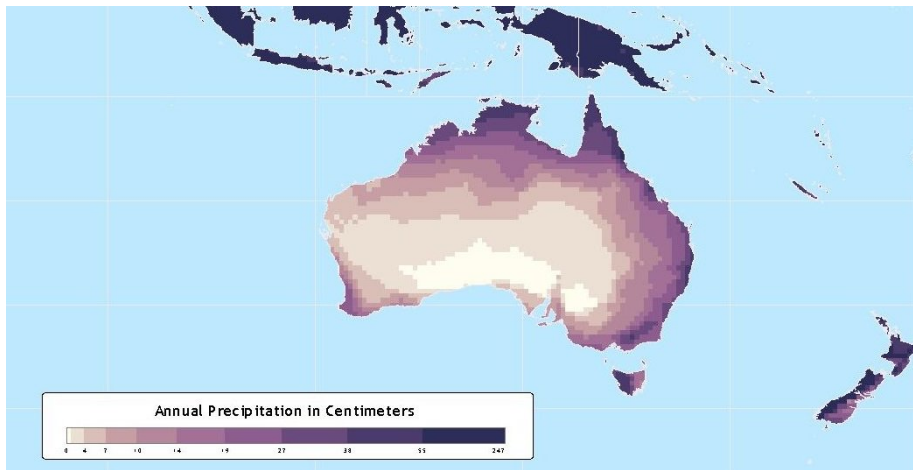
Australian region



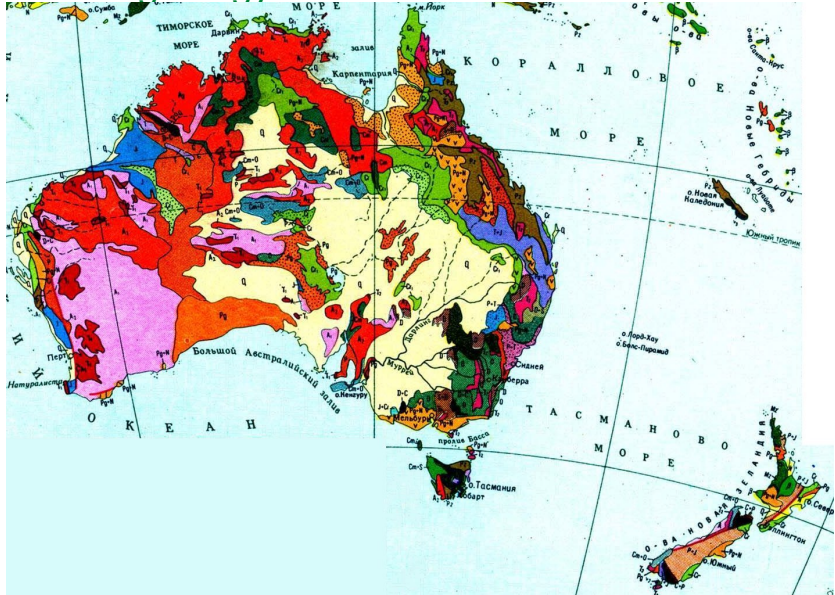
Australia: temperatures



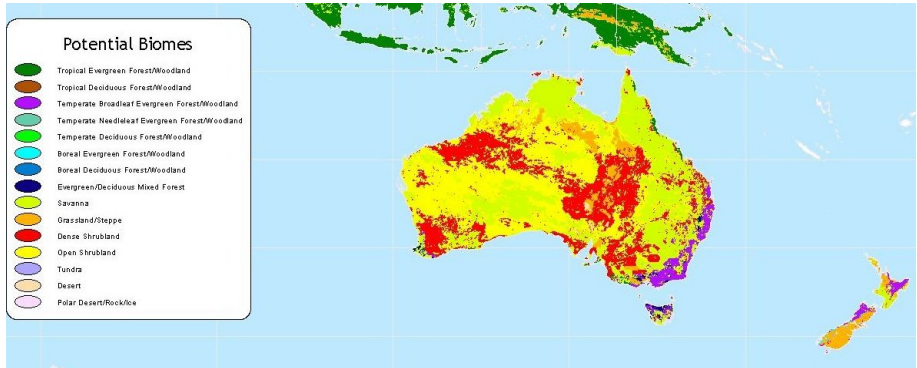
Australia: precipitation



Australian geology



Australia: potential biomes

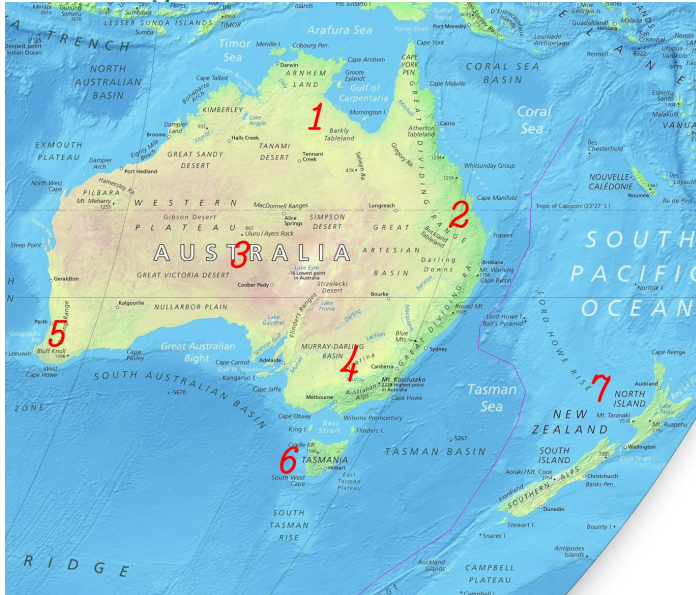


Australian: 7 biogeographical regions

1. Tropical North
2. Tropical East: Queensland
3. Desert Center
4. Australian core: South and Southeast
5. Australian Southwest
6. Tasmania
7. Zealandia, partly submerged microcontinent: New Zealand, Lord Howe and New Caledonia



Australian: 7 regions



Thin line is a border of Zealandia
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For Further Reading



Sundaland.

<http://en.wikipedia.org/wiki/Sundaland>



Oceania.

<http://en.wikipedia.org/wiki/Oceania>



A. Shipunov. *Biogeography*. 2014—onwards.

http://ashipunov.info/shipunov/school/biol_330



A. Shipunov. *Introduction to Biogeography and Tropical Biology*. 2017—onwards.

http://ashipunov.info/shipunov/school/biol_330/intr_biogeogr_trop_biol/intr_biogeogr_trop_biol.pdf



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