

# The Multiple Benefits of Forests

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# Ecosystem services: benefits from ecosystems

- Ecosystem services are the benefits people obtain from ecosystems. These include:
  - **Provisioning goods:** Tangible items with clear monetary value (i.e. timber)
  - **Regulating and supporting services:** benefits arising from the natural function of healthy ecosystems (i.e. climate regulation).
  - **Cultural services**, such as recreational, tourism, aesthetic, and spiritual benefits;

*(Millenium Ecosystem Assessment, 2005)*



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# What environmental benefits are provided by forests?

Forests contribute more than other terrestrial ecosystems in providing provides a complex array of goods and services, that benefits people in different ways:

## IMPORTANT FOREST GOODS

**TIMBER:** Still the most important economic product from most forests of the world.

**FUELWOOD:** A significant part of the world's energy come from biomass.

**NON-WOOD FOREST PRODUCTS:** Includes a wide variety of food, fiber, and medicinal plants, among others.

- In Mongolia, valuable NTFPs include pine nuts, berries, medicinal plants
- In Suriname, Indonesia, 7 out of 8 most valued medicinal species are collected from forests (Van Andel & Havinga, 2008).



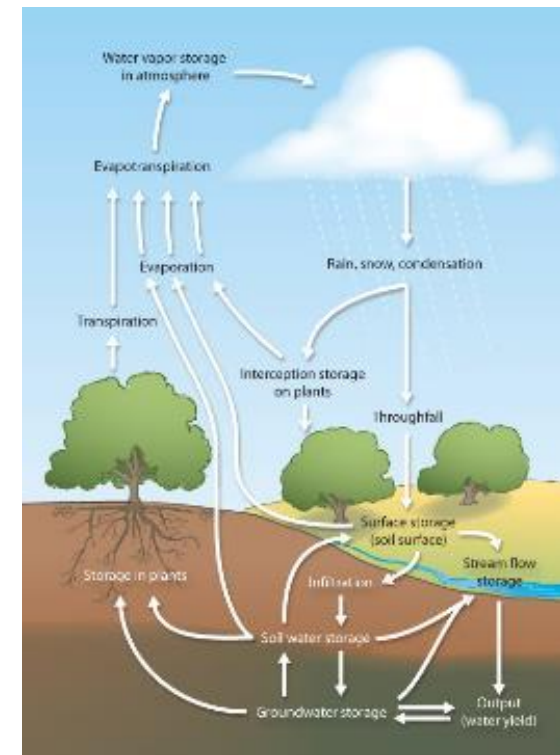
# What environmental benefits are provided by forests?

## ECOSYSTEM SERVICES

Forests provide **hydrological services**, regulating water quality and quantity

Forests are a moisture source for downwind/downstream ecosystems. In the Amazon, 60% of precipitation comes from water transpired by upstream ecosystems (MEA 2005)

- **Aquifer recharge**, by allowing more precipitation to infiltrate in the soil
- Reduce frequency and damage from **flooding** in short steep slopes.





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# What environmental benefits are provided by forests?

## ECOSYSTEM SERVICES

### SOIL EROSION CONTROL

Forests stabilises soil material, increasing soil stability and reducing the potential for landslides.

- **Saxaul forests in Mongolia help to stabilise sand dunes and reduce the effects of sand storms**
- **In Zhangjiajie National Forest Park in China, soil loss was reduced by 2.77 million tons per year due to the existence of forests (Zhao et al., 2009)**



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# What environmental benefits are provided by forests?

## ECOSYSTEM SERVICES

- Forests are are a **carbon sink**: they store carbon and continue to sequester from the atmosphere.
  - As much as 45% of the carbon stored in land is in the world's forests (NASA, 2012)
- Forests provide **climate services**, regulating rainfall and temperatures.
  - Providing shade and shelter
- Forests provide **pollination services** and **pest control**
  - In malaria-prone areas, presence of forest within a 400 m radius reduced the presence of avian malaria (Mendenhall et al., 2013).



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# What are cultural benefits from forests?

**“Non-material cultural, spiritual, religious and recreational values”**

- Forests support (eco-)tourism
  - **Forests and protected areas are often valuable for attracting tourists, e.g. wildlife spotting, bird-watching, hiking, horse-trekking**
- Forests have cultural and spiritual value, e.g. sacred sites, recreation
- Amenity values
  - **Living near to forests secures some benefit in terms of amenity**



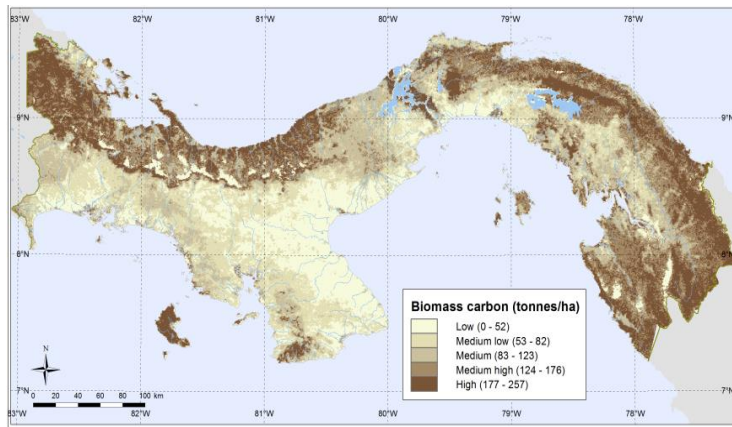


# Multiple benefits vary geographically

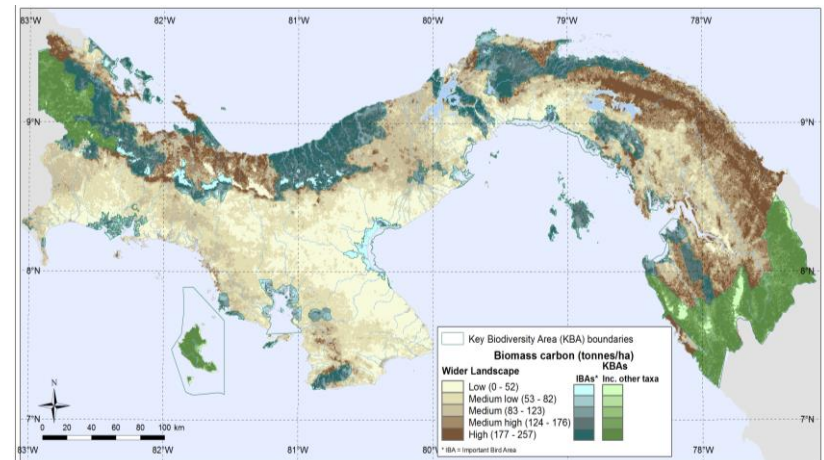
Some areas / forest types are more important than others for providing benefits

For example:  
benefits of forests  
in Panama

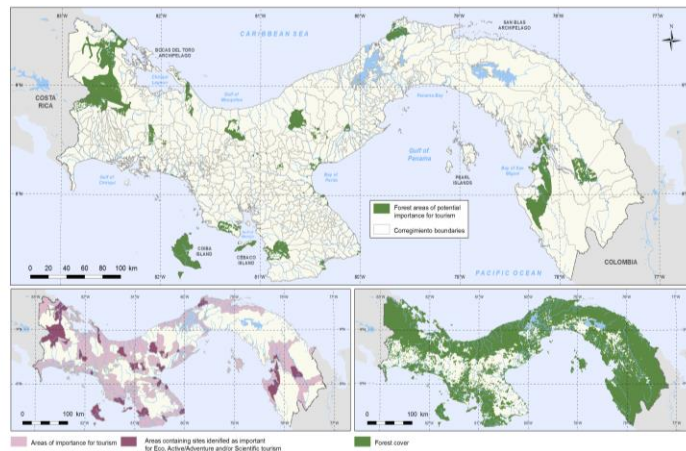
Biomass carbon stocks



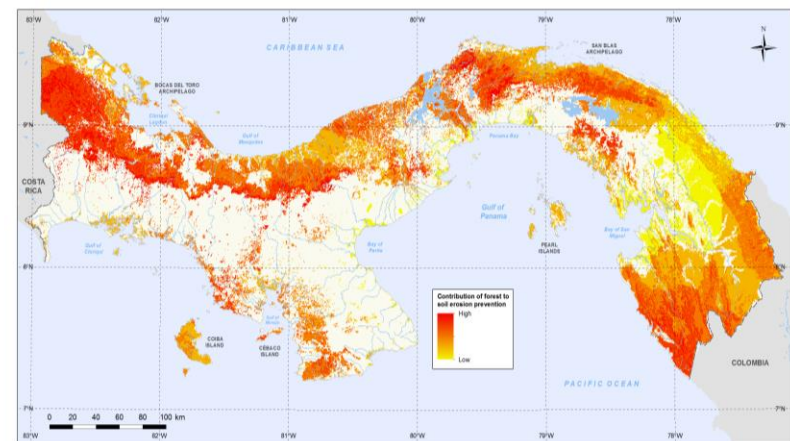
Importance for biodiversity



Importance for tourism



Importance for soil erosion control





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## Summary: multiple benefits from forest

- Forests provide important ecosystem services, which benefit people in a range of ways, including social and environmental
- Important areas for providing these benefits vary across the landscape
- Well-planned REDD+ implementation should enhance these multiple benefits, while reducing risks



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# Thank you!

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