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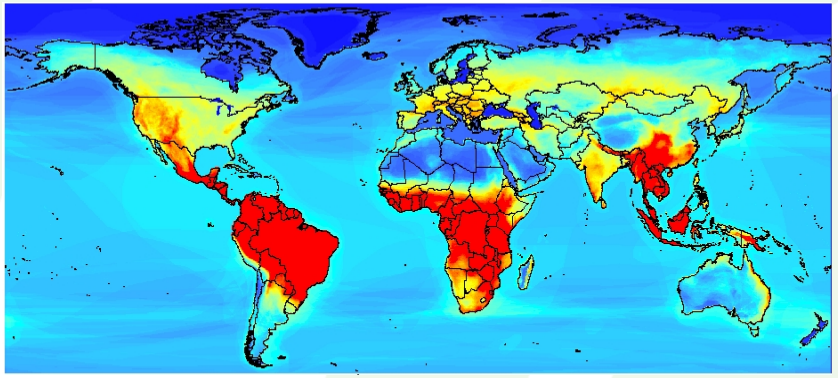
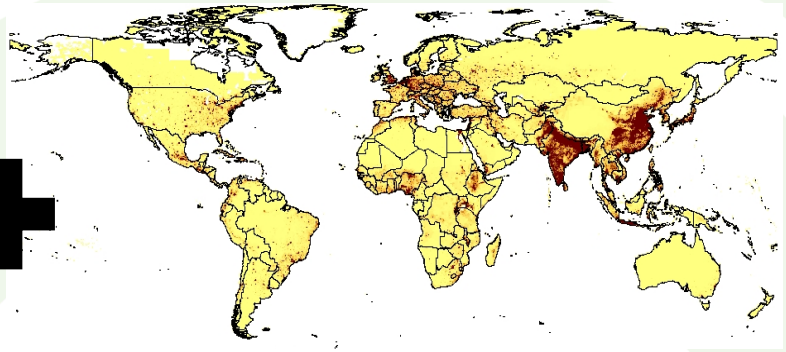
Deep Forest

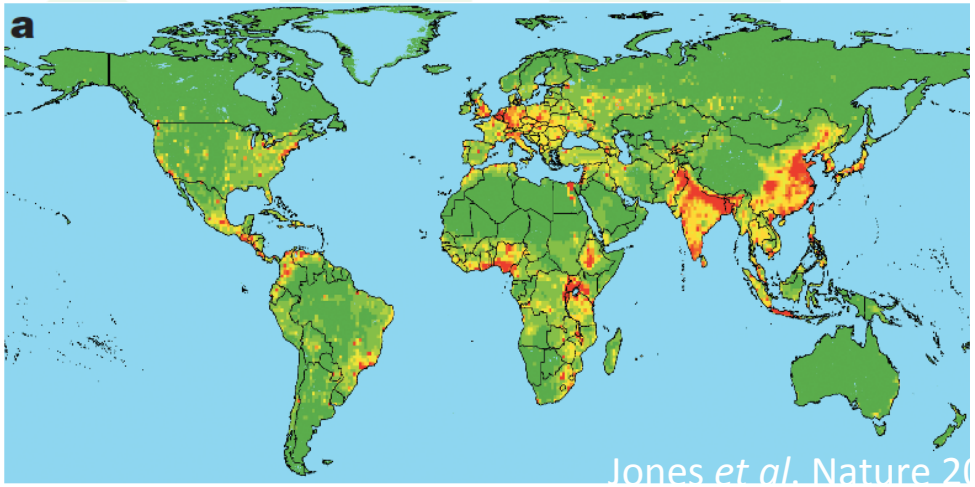
Local conservation.
Global health.



Mammal Diversity



Human Population Density



Jones *et al.* Nature 2(

- People + wildlife
- Pathogen emergence

Examples:

- Ebola
- HIV/AIDS
- SARS

Global health.

Global emerging disease ‘hotspots’

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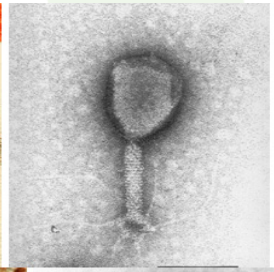
Deforestation is a major threat to global biodiversity

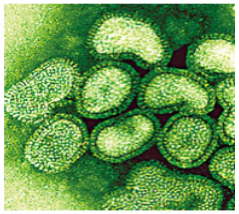
Correlates of zoonotic disease emergence events:

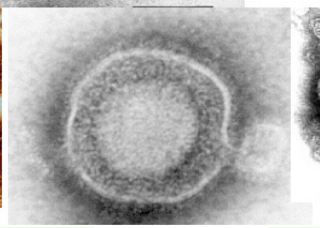
- Human population density
- Biodiversity

Deforestation in Brazil

Local conservation.
Global health.







DEEP FOREST

A test of the mechanisms underlying disease emergence

1. How many viruses are out there?
2. What animals carry them?
3. How are people involved (interfaces)?
4. How can we stop them emerging?
5. Conservation benefits

Viral diversity
Biodiversity
Ecosystem use
People

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DEEP FOREST

- **Viral diversity**
- **Biodiversity**
- **Ecosystem use**
- **People**

Non-human
Human

Inform
EPT, EPT2

GOAL: understand the effects of biodiversity, human behavior and land-use change on infectious disease emergence in humans

Global health.

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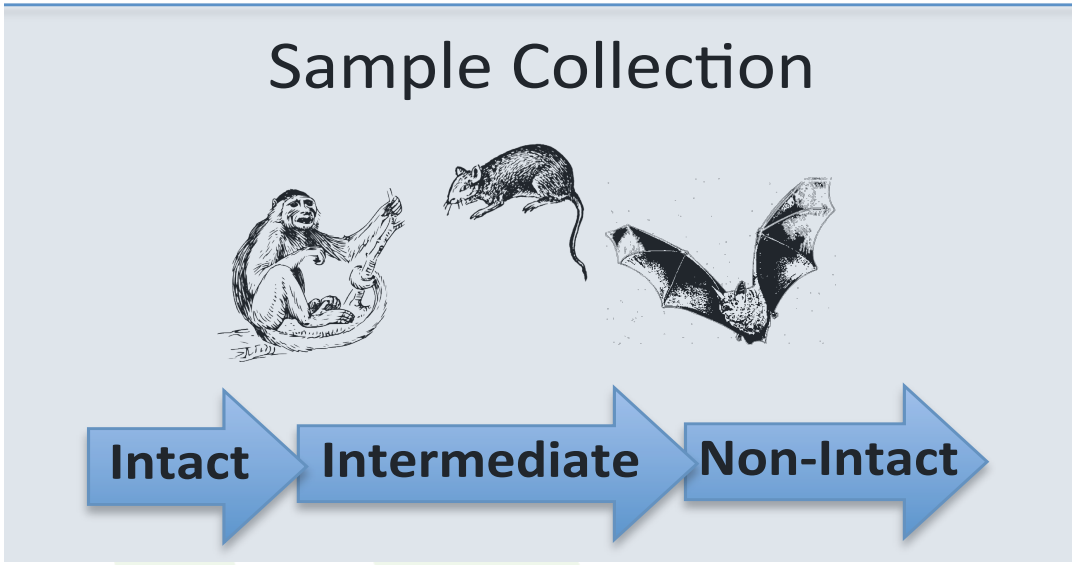
DEEP FOREST SAMPLING: Non-human



Land-use development gradient

Local conservation.
Global health.

3 sites on 3 continents:

- **SOUTH AMERICA (Brazil)**
  - Amazon near Manaus
- **AFRICA (Uganda)**
  - Bwindi Impenetrable Forest
- **ASIA (Malaysia)**
  - Maliau 'Lost' Basin, Borneo

3 wildlife groups

Primates
Rodents
Bats

These groups comprise ~70% of global mammal biodiversity

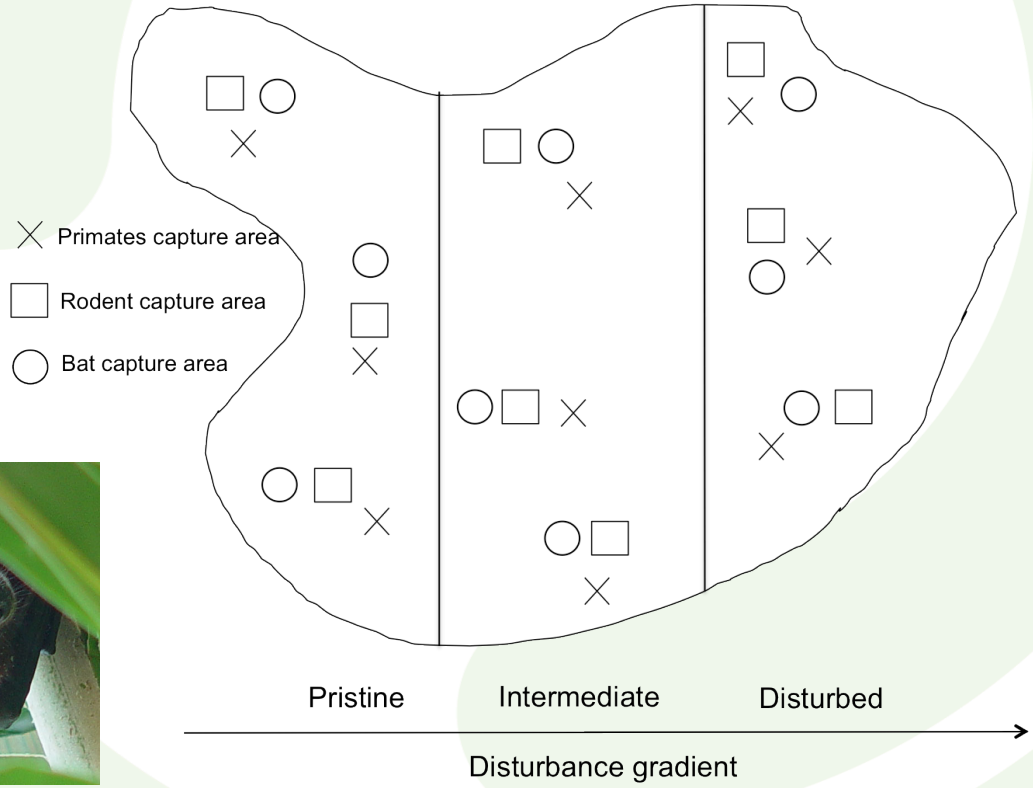
LDI 1 LDI 4 LDI 10

Sampling regime:

- Each gradient sampled seasonally (twice a year)
- For rodents and bats each site sampled 5 days

3 land-use types:

Pristine forest
Fragmented habitats
Rural urban centers



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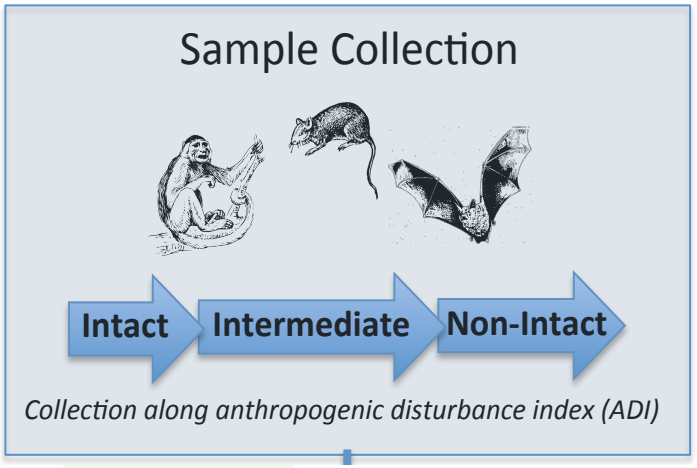

Cutting edge technologies for viral discovery

Local conservation.
Global health.

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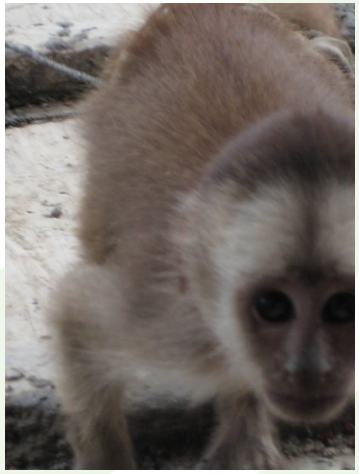
- **DEEP FOREST SAMPLING: DFHC (Human-contact surveys)**

Objective:

- Characterize human activities across land-use gradient
- Identify potential routes of transmission
- Quantify types and frequency of human-wildlife contact.



Local conservation.
Global health.

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Brazil: Amazon basin

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Progress:

- Brazil – sites selected, wildlife sampling begun
- Malaysia – sites selected
  - DF wildlife health team selected
  - 2 sampling trips Proboscis monkeys
- Uganda
  - sites selected, team assembled

Local conservation.
Global health.

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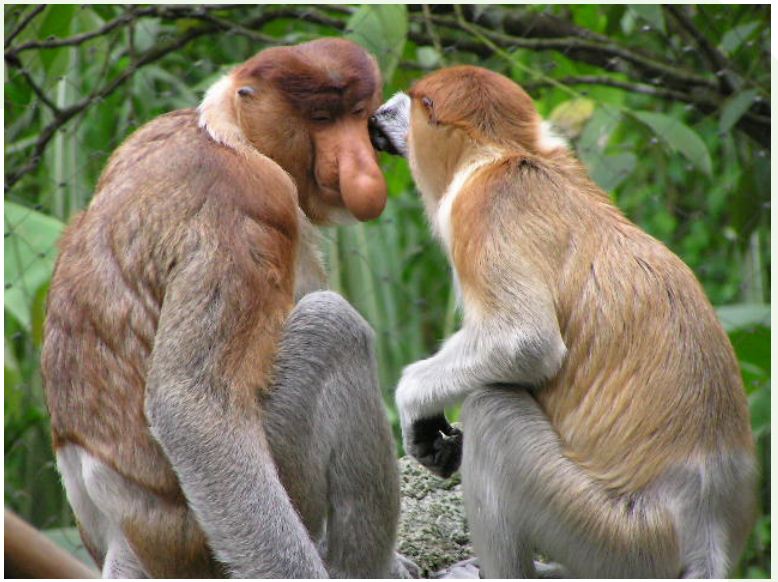

- **Expected outcomes after 2 years**
- Non human:
  - Data on biodiversity
  - Data on viral diversity
  - New virus discoveries
- Human:
  - Data on human behavior, land-use and wildlife contact
  - Identify high risk groups
  - Identify high risk behaviors/ ‘interfaces’

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- Conservation benefits
  - Impacts of land-use change on biodiversity
  - Human behaviour and land-use change
  - Potential to inform conservation management
  - Partners – ICB II, FMVZ – VPS - USP, Projeto Sauim de Coleira - UFAM

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- Economic X Social development X Ecosystem

  Brasil and Belo Monte

Local conservation
Global health.

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- “Nature’s goods and services are the ultimate foundations of life and health, even tough in modern societies this fundamental dependency may be indirect, displaced in space and time, and therefore poorly recognized. “ (Director General WHO) – in Ecohealth Research in Practice – D. Charron.

Local conservation.
Global health.