Comparing the effectiveness of conservation instruments in the Colombian Andes biodiversity hotspot
Colombian Andes

• Hotspot for threatened species
• Hotspot of public investments in conservation of private lands
  • 1993 law: sub-national governments have to spend 1% of their budget on land acquisitions for conservation (LAC). Extent & impacts: unknown.
• Recently: promotion of payments for environmental services as a substitute for land acquisitions
• Question: which intervention type is more effective in conserving forest habitat for threatened species?
Challenge 1: reliable observation of change in forest types in a cloudy, hilly geography
• Objective: wall-to-wall maps of forest type and disturbance history (~1990 - 2020)

• Forests to be mapped according to disturbance history and forest type
  • Natural vs. planted
  • "Primary" vs. secondary/disturbed
  • Dry seasonal vs. evergreen

• Time series approaches to change detection
  • CCDC, CODED, LandTrendr
  • Extend Landsat-based methodologies to Sentinel 1 & 2
Challenge 2: inference of causal impact of interventions from observational data

- Quasi-experimental matching
  - Identify parcels that have been subject to land acquisitions or payments for environmental services
  - Find spatial units that have not been subject to either intervention, but that were “as similar as possible” to the treatment group before the intervention occurred (artificial control group)
    - Possible thanks to the public release of Colombia’s cadaster
  - Estimate intervention impacts from the difference in forest type change in both groups
Building the first database of Colombia’s publicly-financed land acquisitions & payments for environmental services (n≈8000)

Metapopulation modeling to infer contributions of avoided change in forest types for the conservation of threatened species
Thank you!

Christoph Nolte$^1$
Paulo Arévalo$^1$
Eric Bullock$^2$
Ana Reboredo Segovia$^1$