

Greenhouse Gas Emissions in Mangrove Wetlands of the Caño Martín Peña



Rose M. Martin¹, Cathleen Wigand², Autumn Oczkowski², Alana Hanson², Emily Santos¹ & Evelyn Huertas³

¹Oak Ridge Institute for Science and Education, EPA Atlantic Ecology Division

²EPA Atlantic Ecology Division

³EPA Region 2

The Greenhouse Effect



Some energy is reflected back out to space

Earth's surface is heated by the sun and radiates the heat back out towards space

Solar energy from the sun passes through the atmosphere

Greenhouse gases in the atmosphere trap some of the heat



Mangrove wetlands store carbon

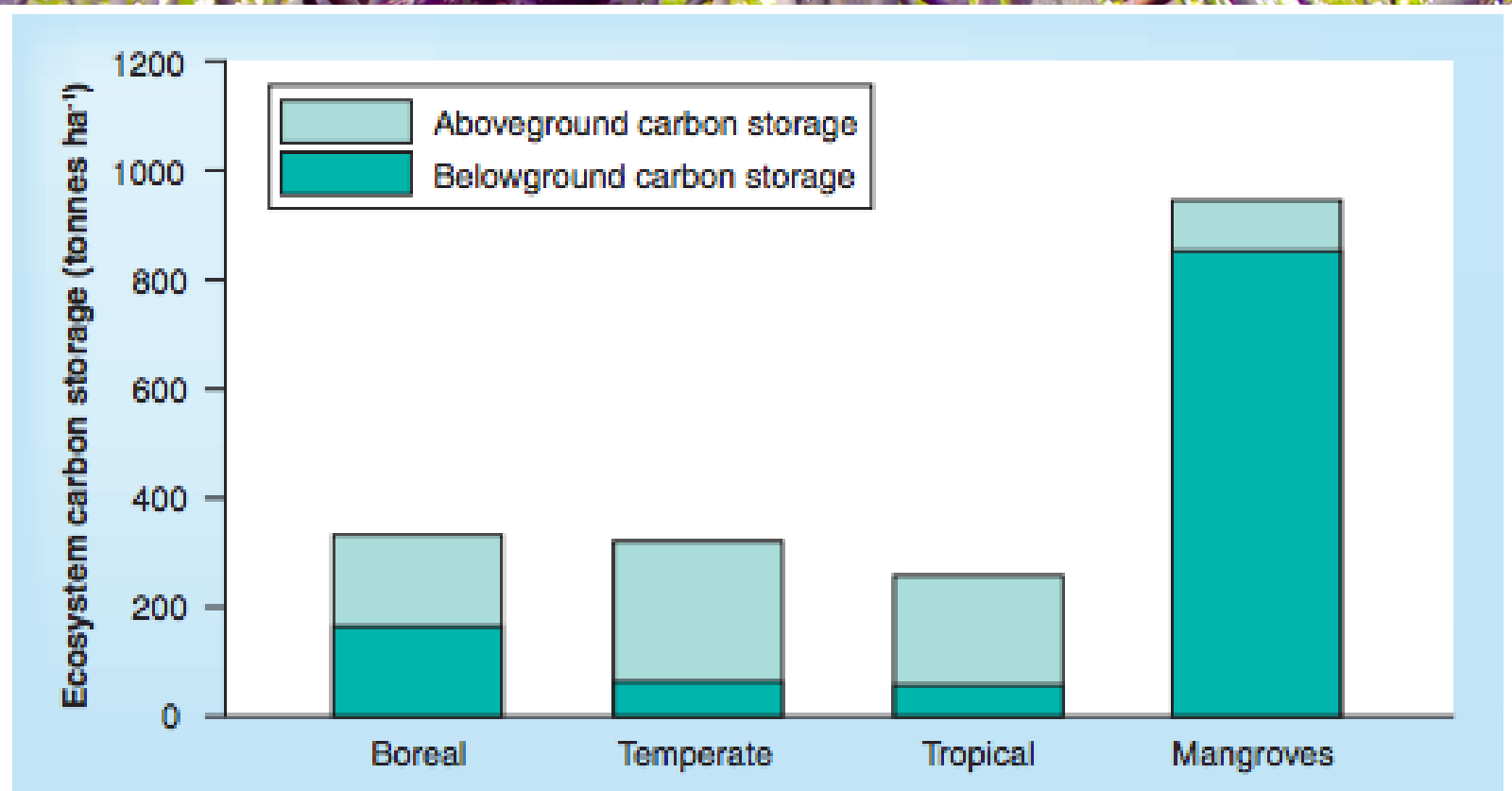


Figure 1. Differences in whole-ecosystem carbon stocks among boreal, temperate and tropical terrestrial forests, and subtropical and tropical mangrove forests.

Reprinted with permission from Macmillan Publishers Ltd: *Nature Geoscience* [21] © (2011).

Mangrove data taken from supplementary data [102] in [21], and [48,50–54].

Human activity can cause mangrove wetlands to lose carbon to the atmosphere

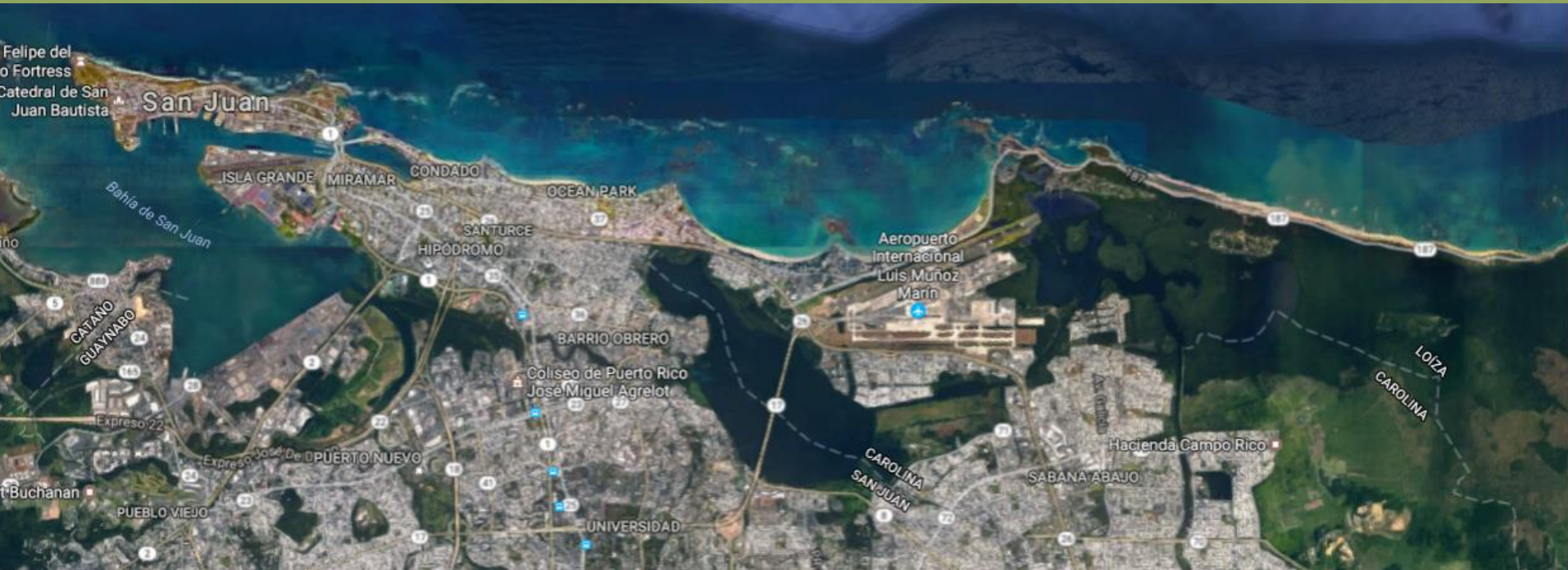


The image shows a mangrove wetland with several young mangrove trees. Two white, cloud-like shapes are superimposed on the scene, each containing a chemical formula. Below each cloud is a large orange arrow pointing upwards towards the cloud. The left cloud contains the formula CH₄ and the right cloud contains the formula CO₂. The background is a dense thicket of mangrove plants with their characteristic prop roots visible in the dark, silty soil.

CH_4

CO_2

Urban impacts in the San Juan Bay Estuary



How well are San Juan Bay Estuary mangrove wetlands trapping and storing carbon?



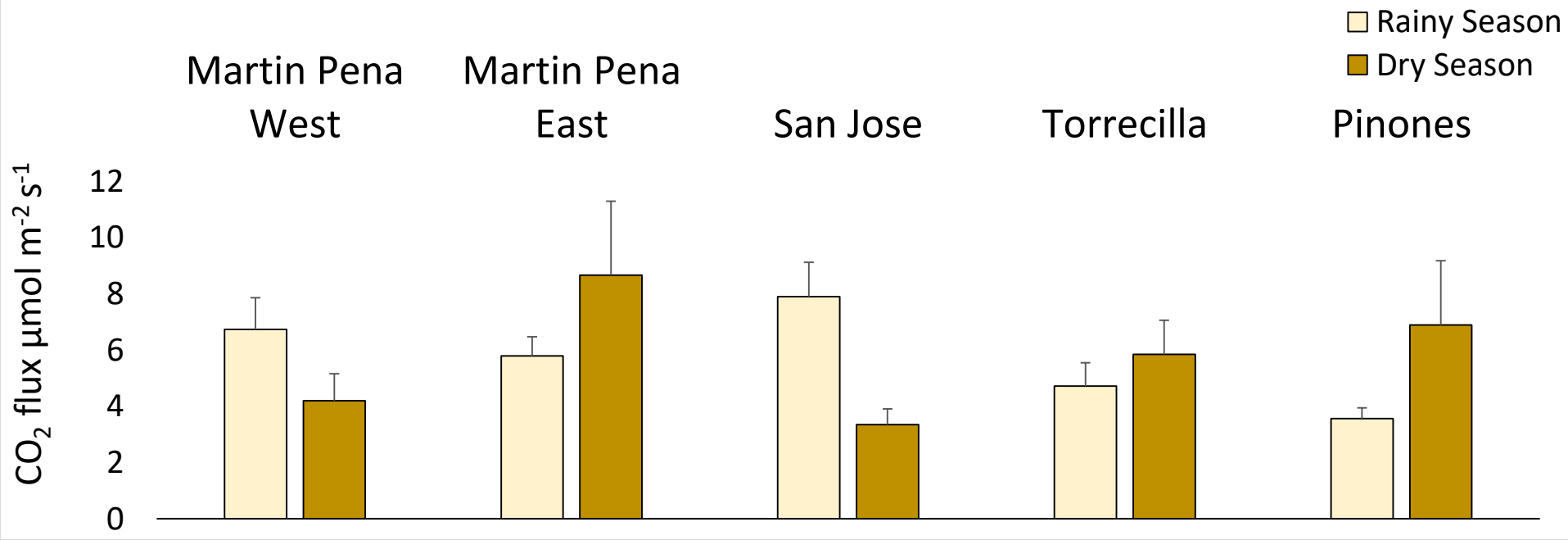
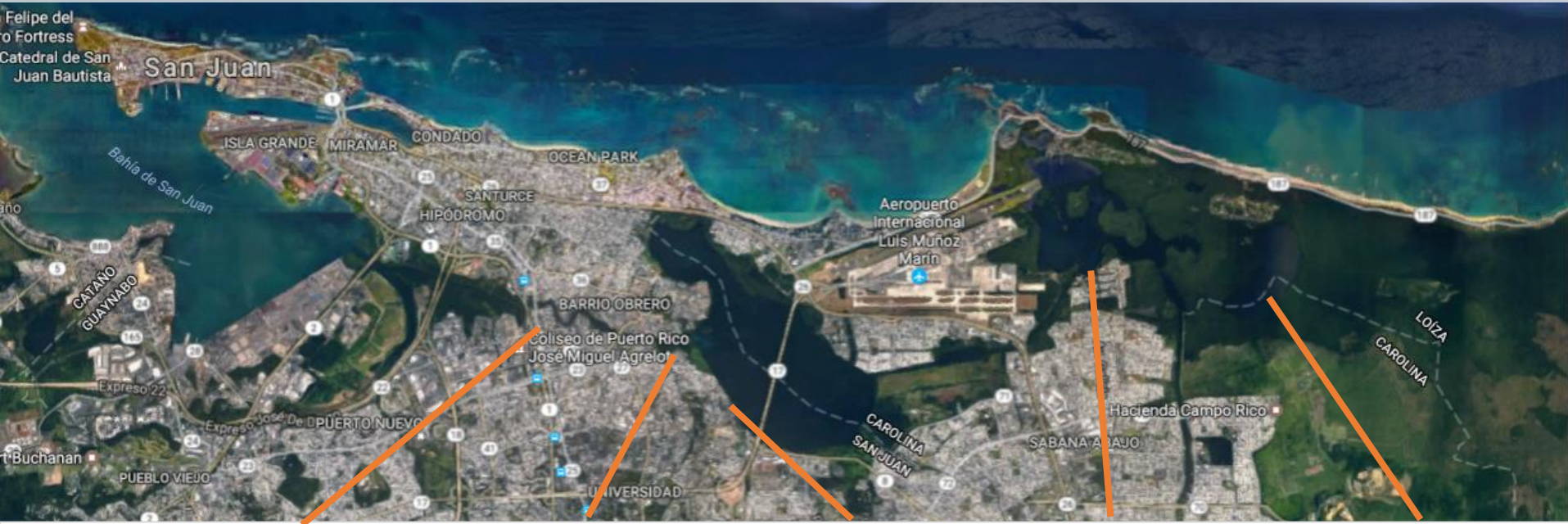
Step 1: Measure greenhouse gas fluxes



Tool: Greenhouse gas analyzer (Picarro Labs)



Carbon Dioxide



Methane



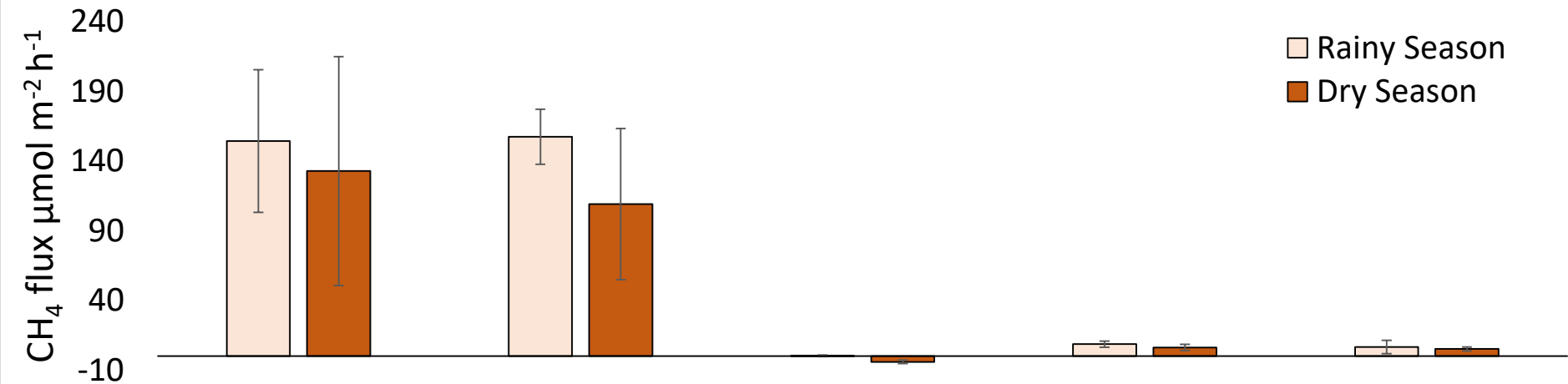
Martin Pena
West

Martin Pena
East

San Jose

Torrecilla

Pinones



What's next?



Acknowledgements



Research conducted as part of EPA SHC 2.61

Site Access and Communications: Proyecto ENLACE del Cano Martín Pena, Melba Ayala, Estrella Santiago Perez

Boat Captains: Gillian, Frankie, Manny

Field Assistants: Katelyn Szura, Natalie Giro, Fabiola Robles Juarbe, Ben Branoff, Pablo A. Mendez Lazaro, Steve Balogh

