An aerial photograph showing a vast expanse of water dotted with numerous small, densely forested islands. The islands vary in size and shape, creating a complex pattern across the landscape. A few larger landmasses are visible in the background. The water is a deep blue, and the sky above is filled with white and grey clouds.

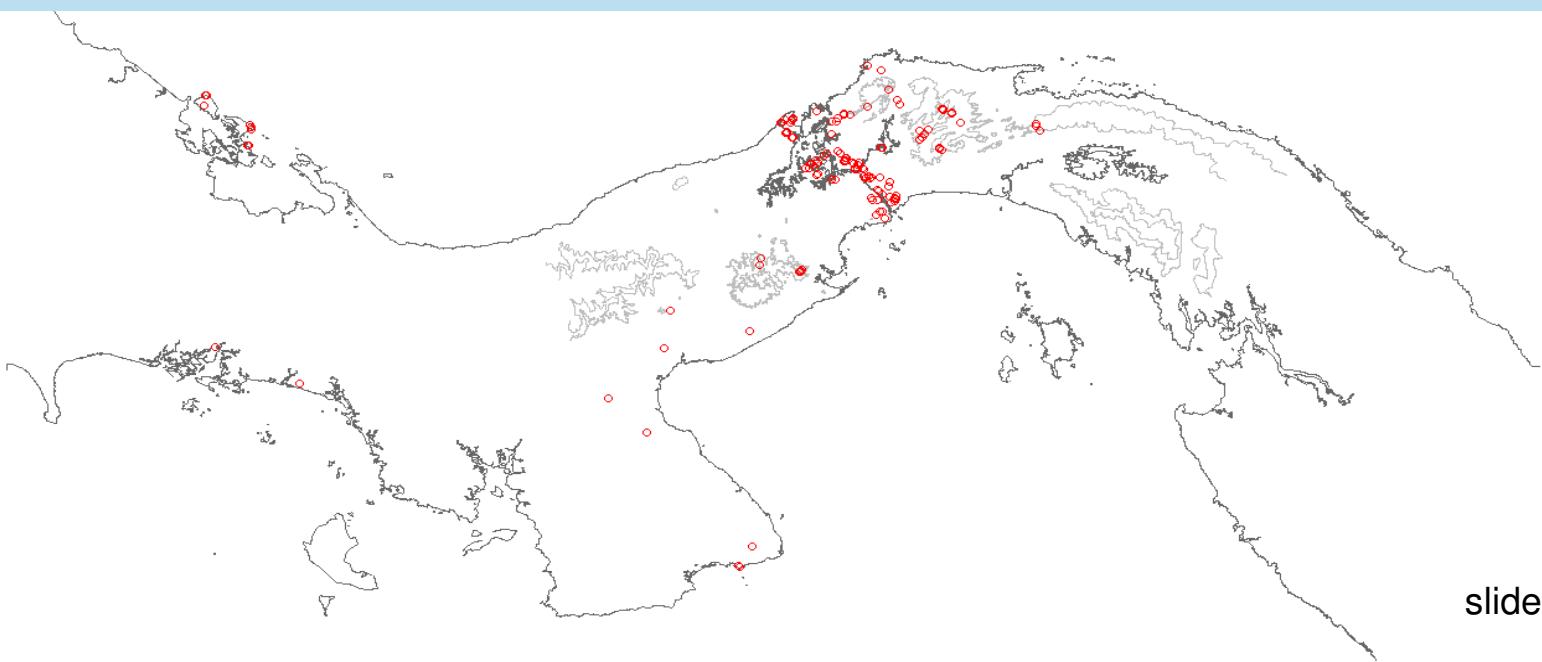
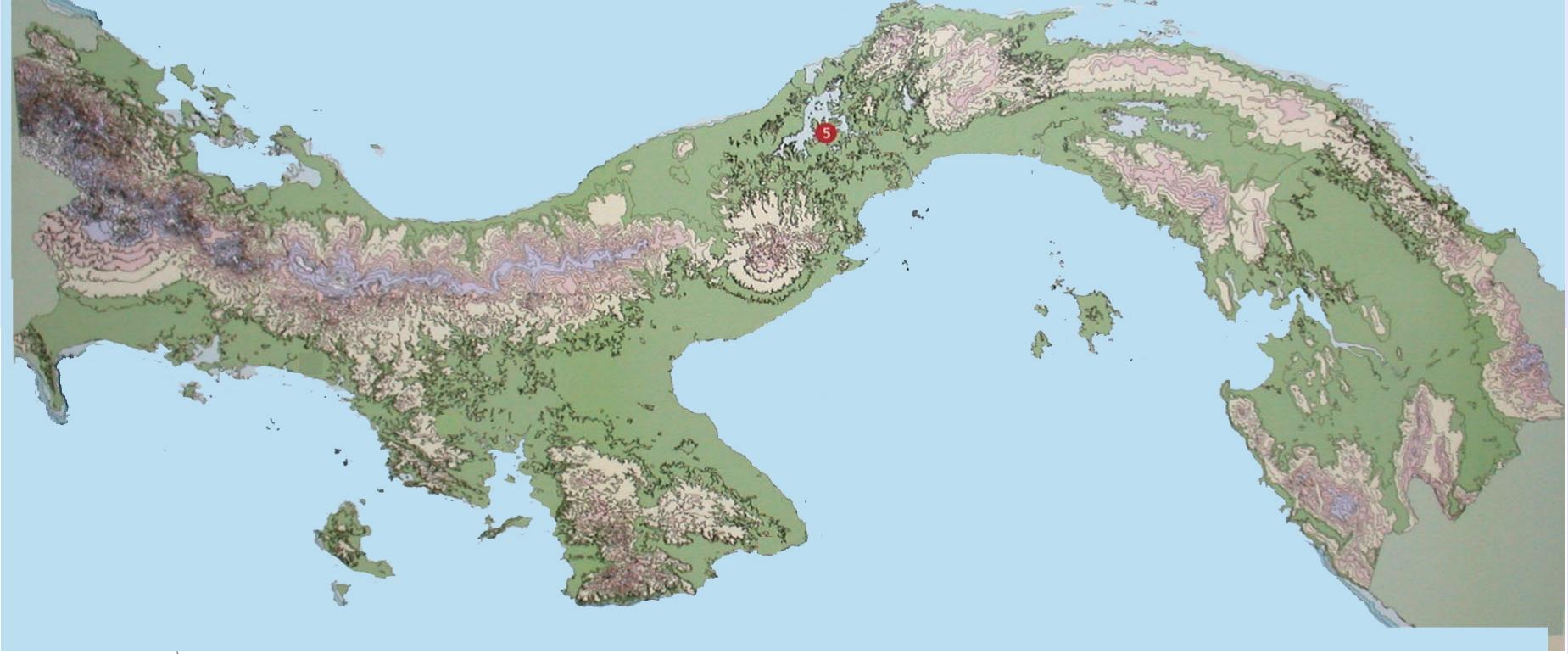
Beta-diversity in Panama

Nordforsk PhD Summer School
July-August 2008

Richard Condit

Central America and the Caribbean





slide 1 vert

Similarity-distance (Science 2002)

fraction species shared

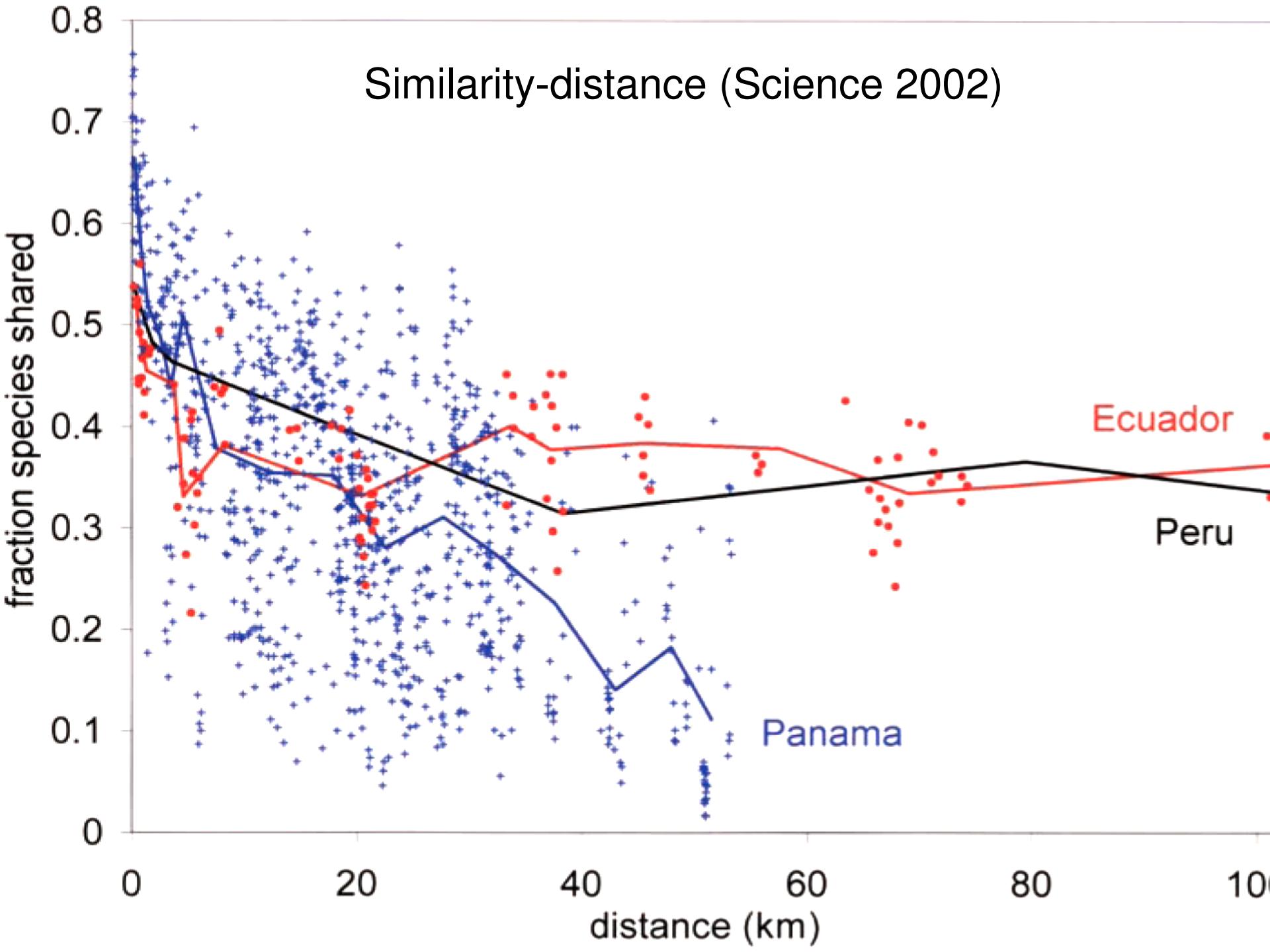
0 20 40 60 80 100

distance (km)

Ecuador

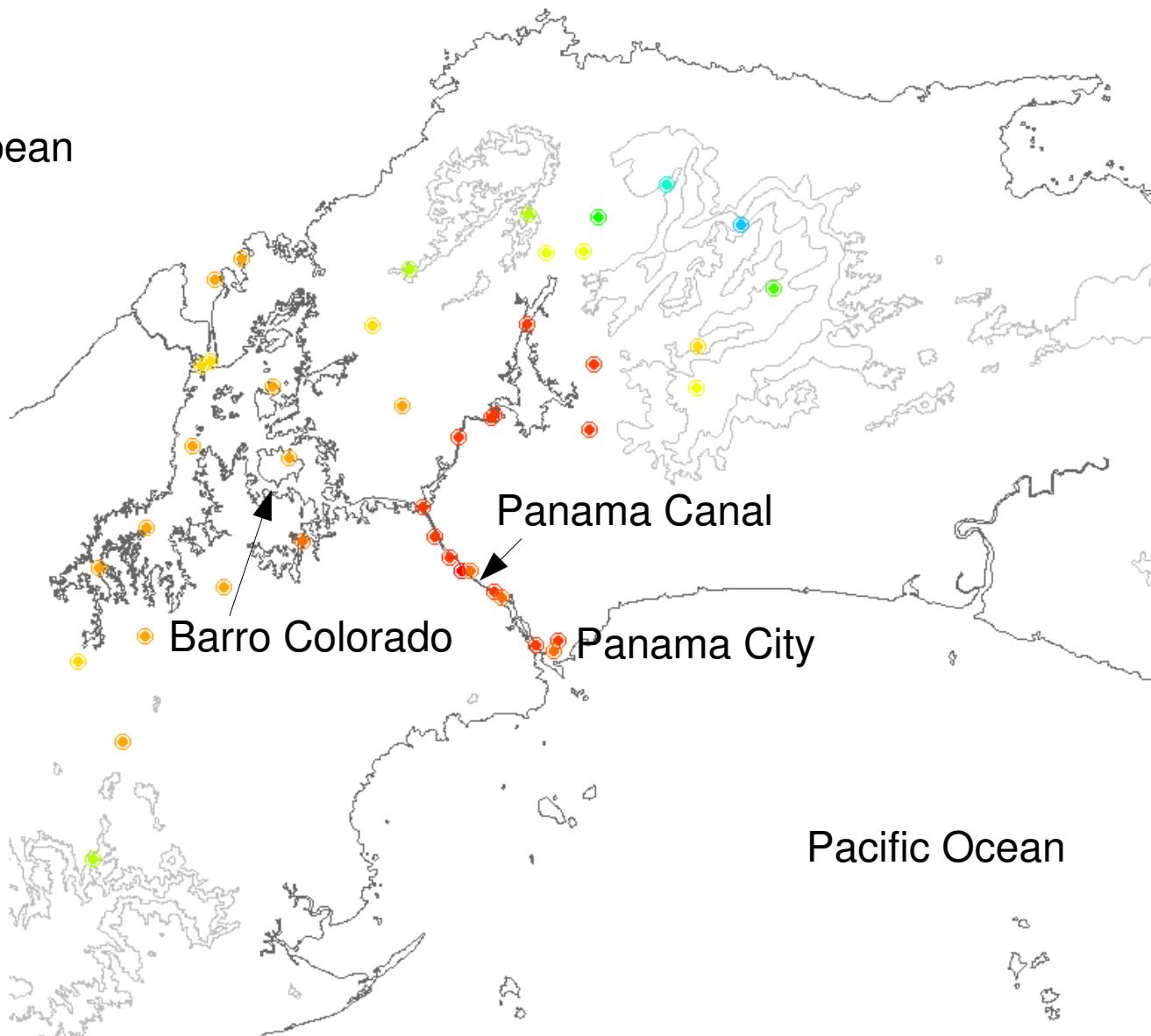
Peru

Panama



Panama Canal Authority rainfall gauges 3-100 year records

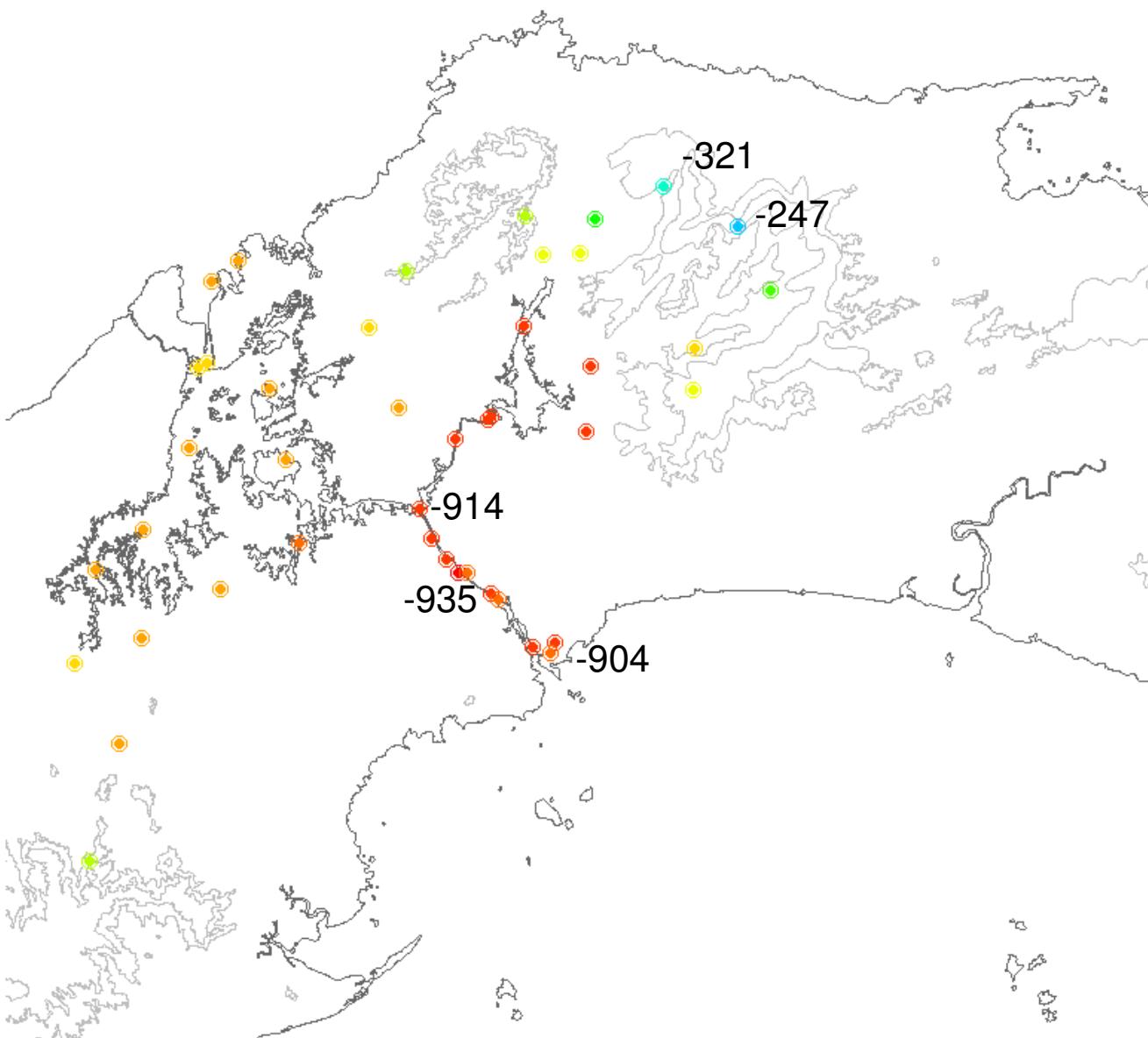
Caribbean



Pacific Ocean

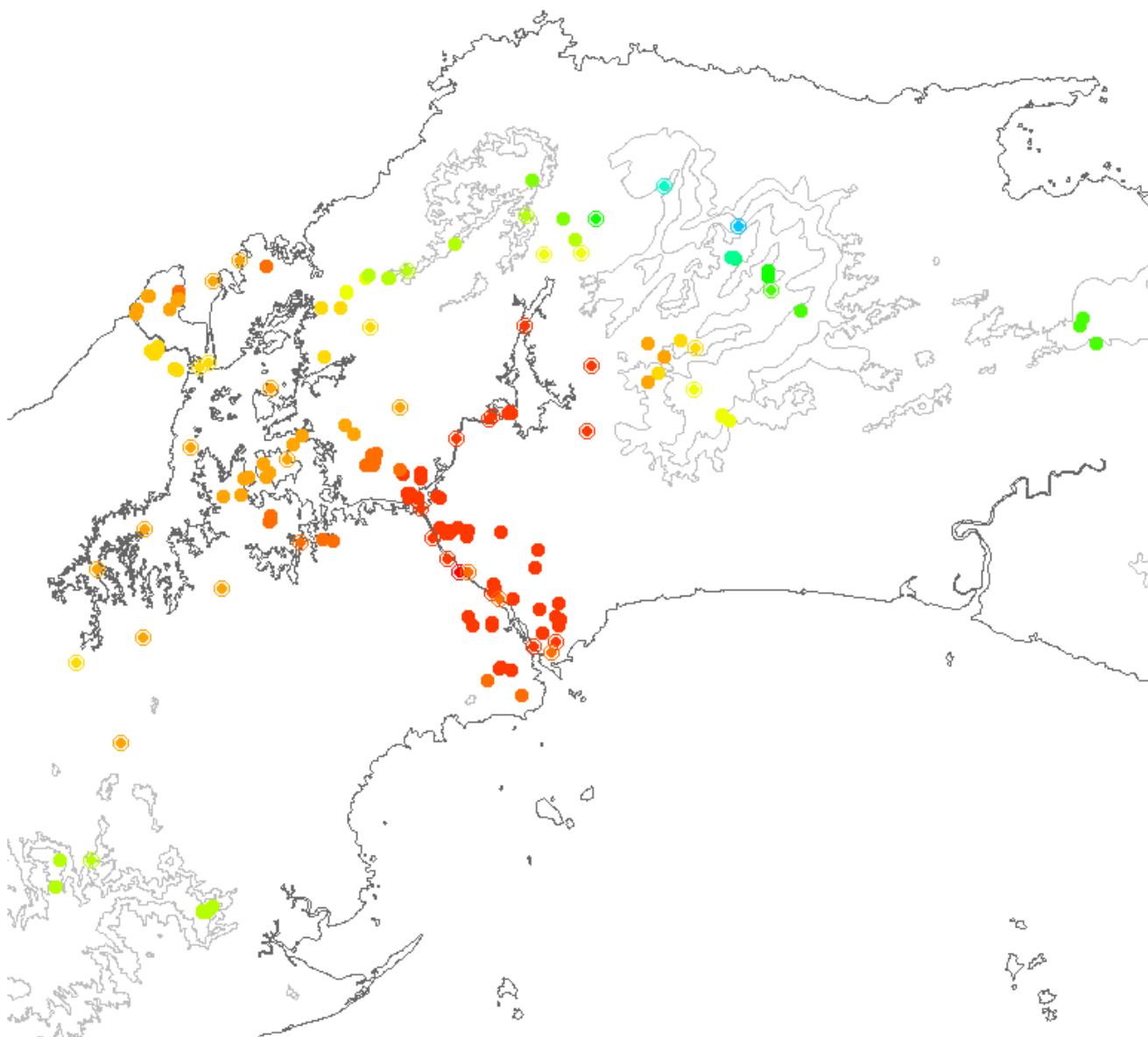
Panama Canal Authority rainfall gauges

Dry season intensity



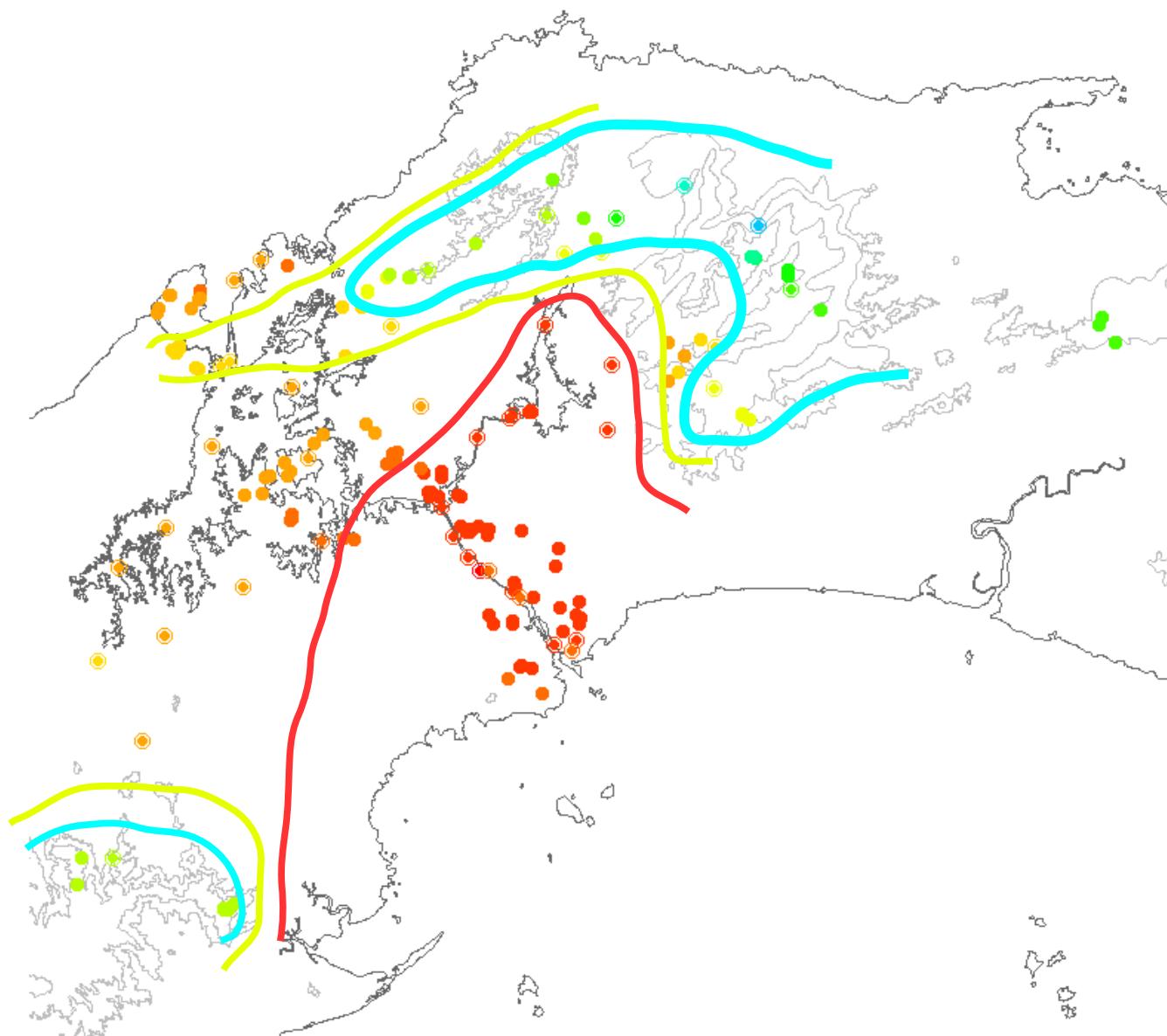
Tree inventories

Estimated dry season intensity at each



Tree inventories

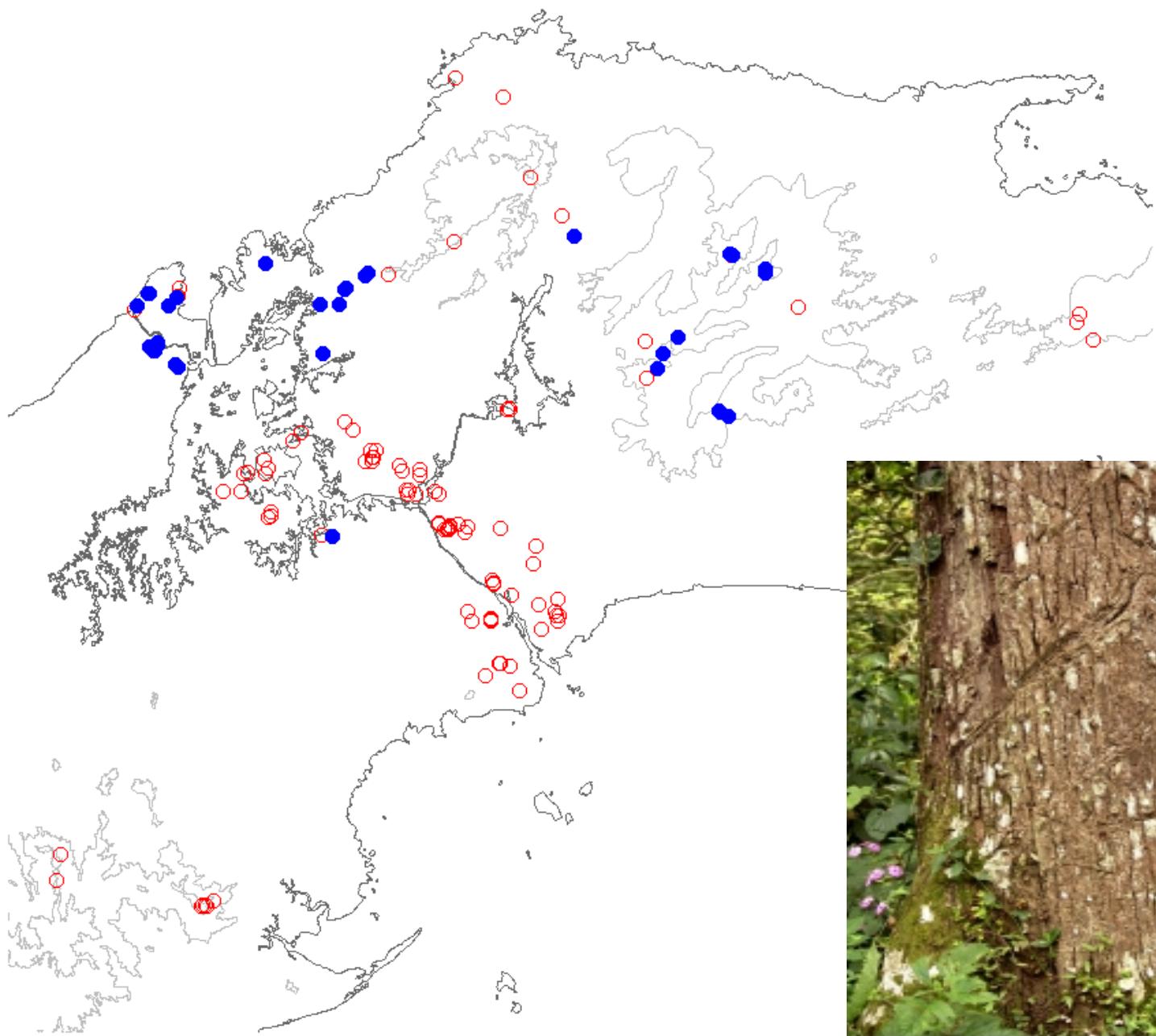
Estimated dry season intensity at each



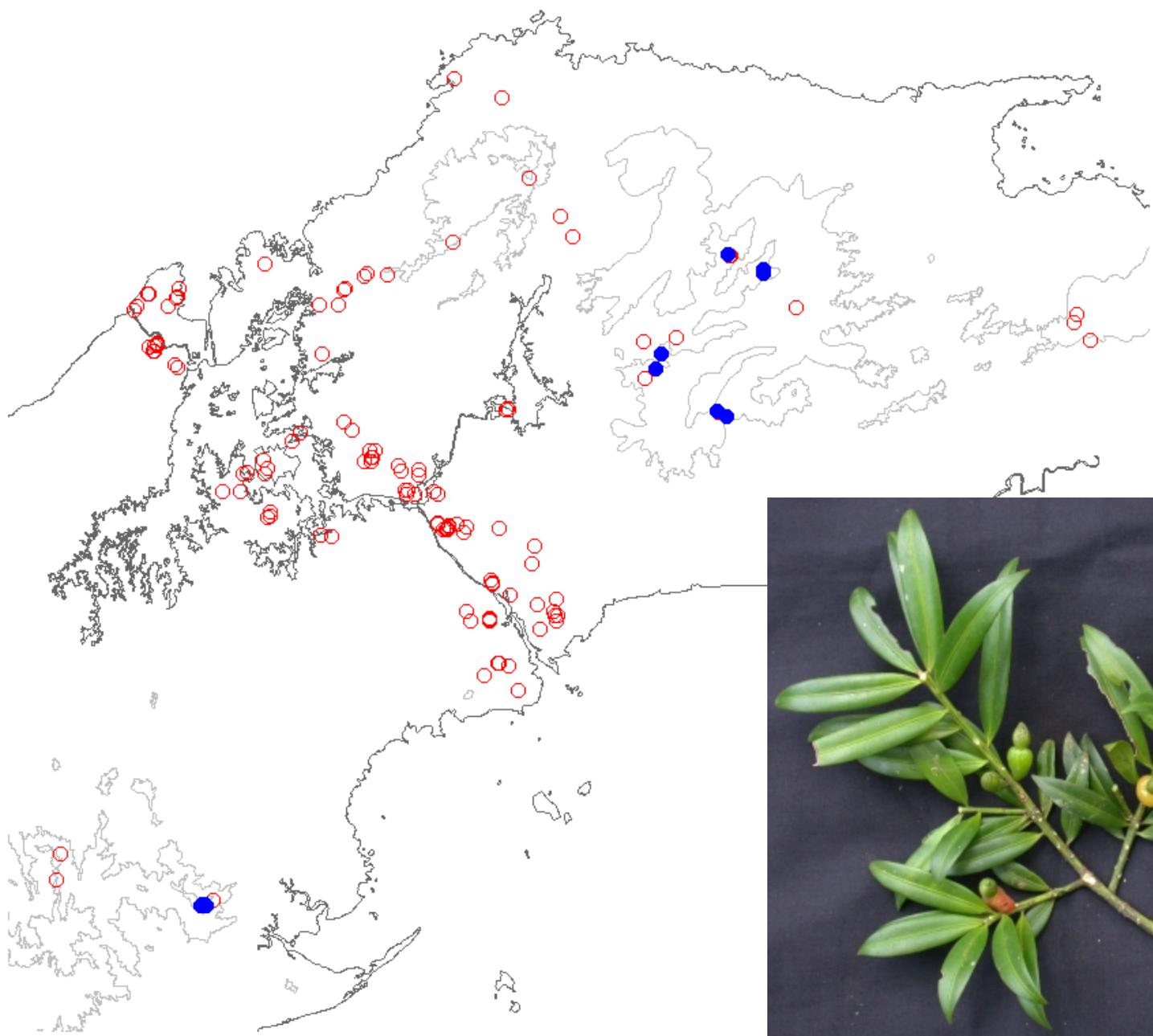
Tree distribution and dry season



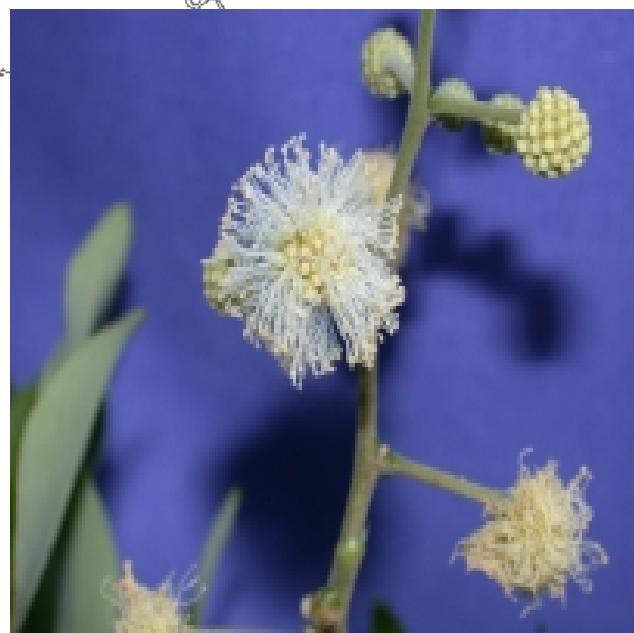
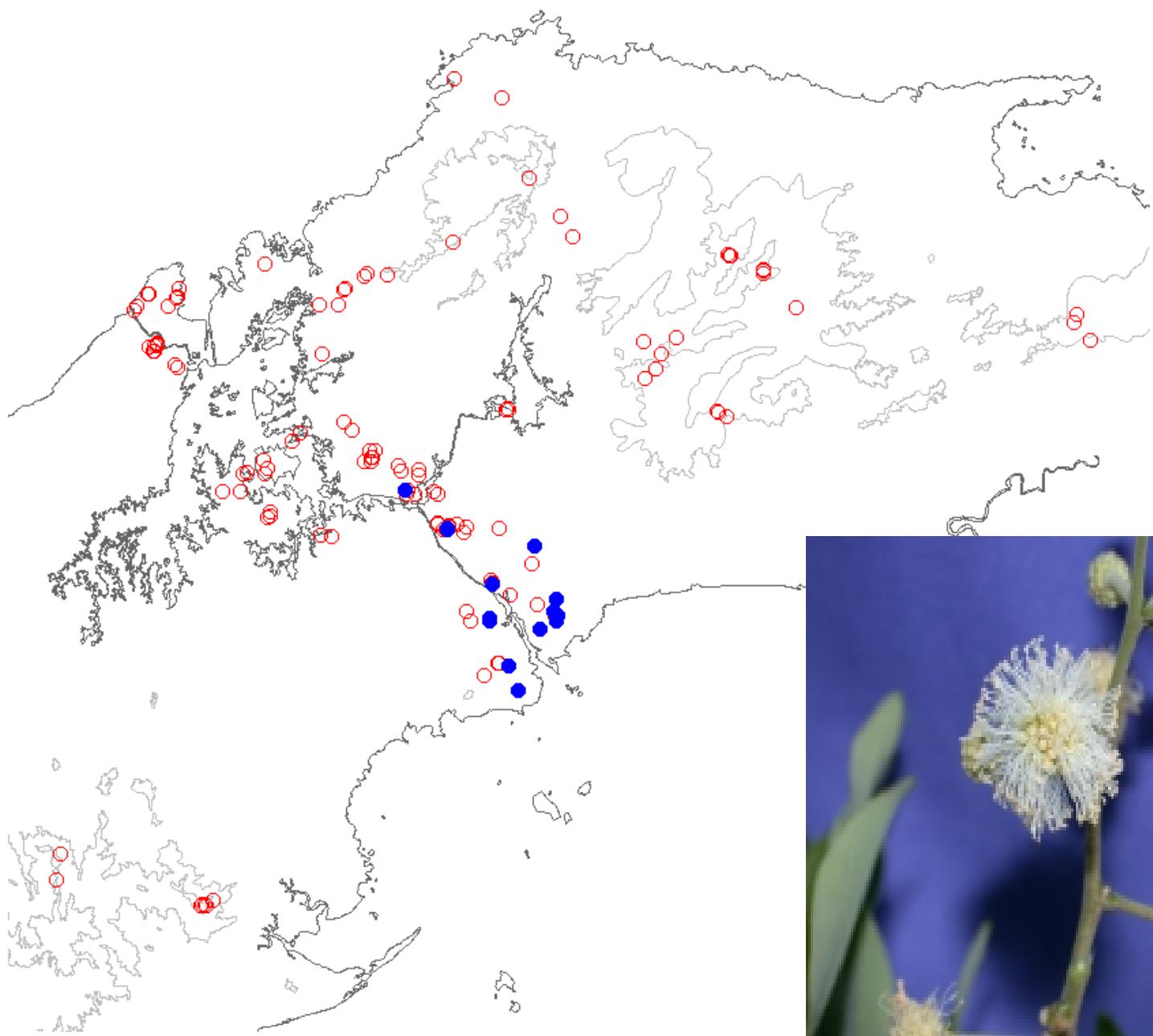
Manilkara bidentata plots and inventories



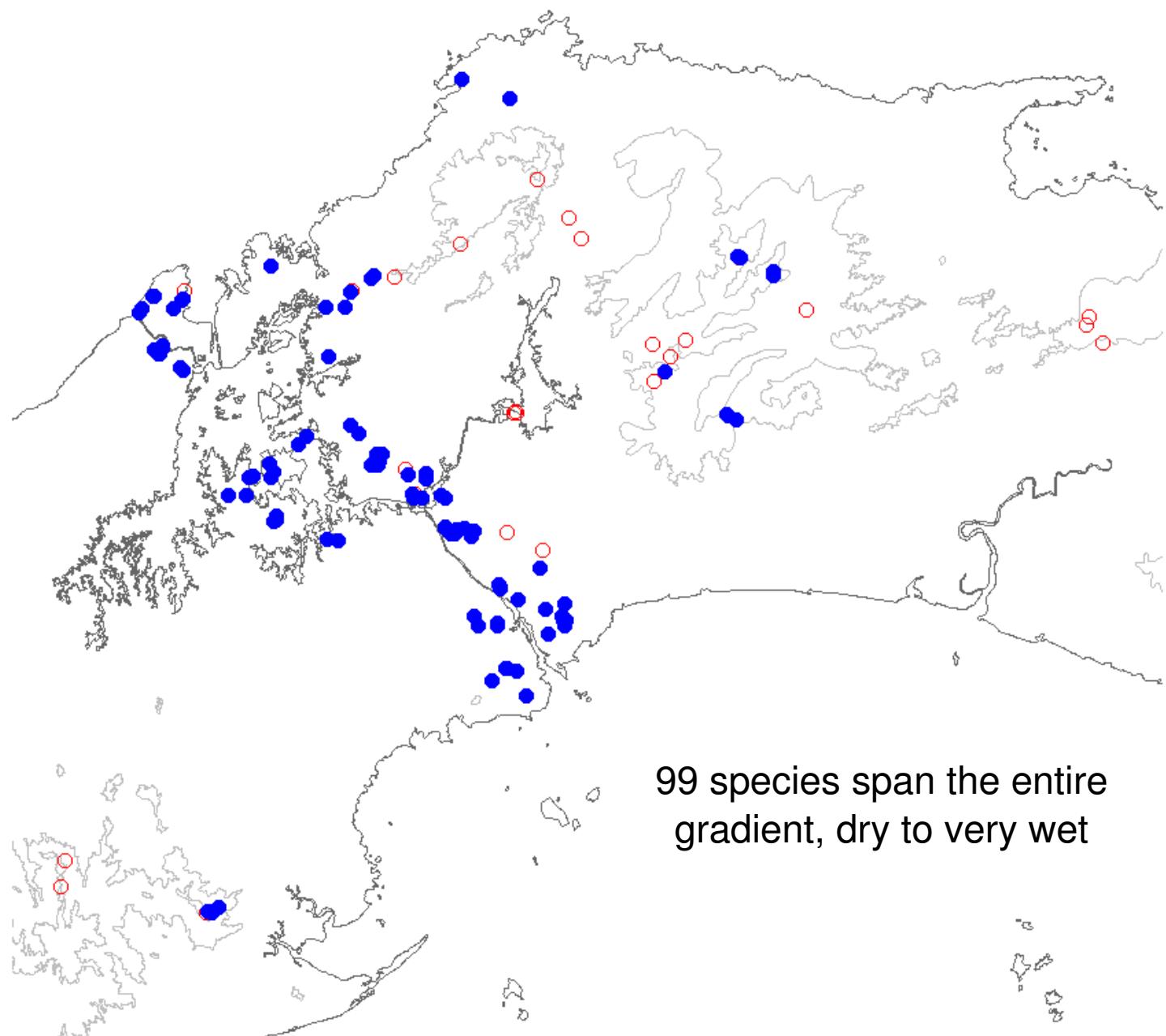
Podocarpus guatemalensis plots and inventories



Albizia adinocephala plots and inventories



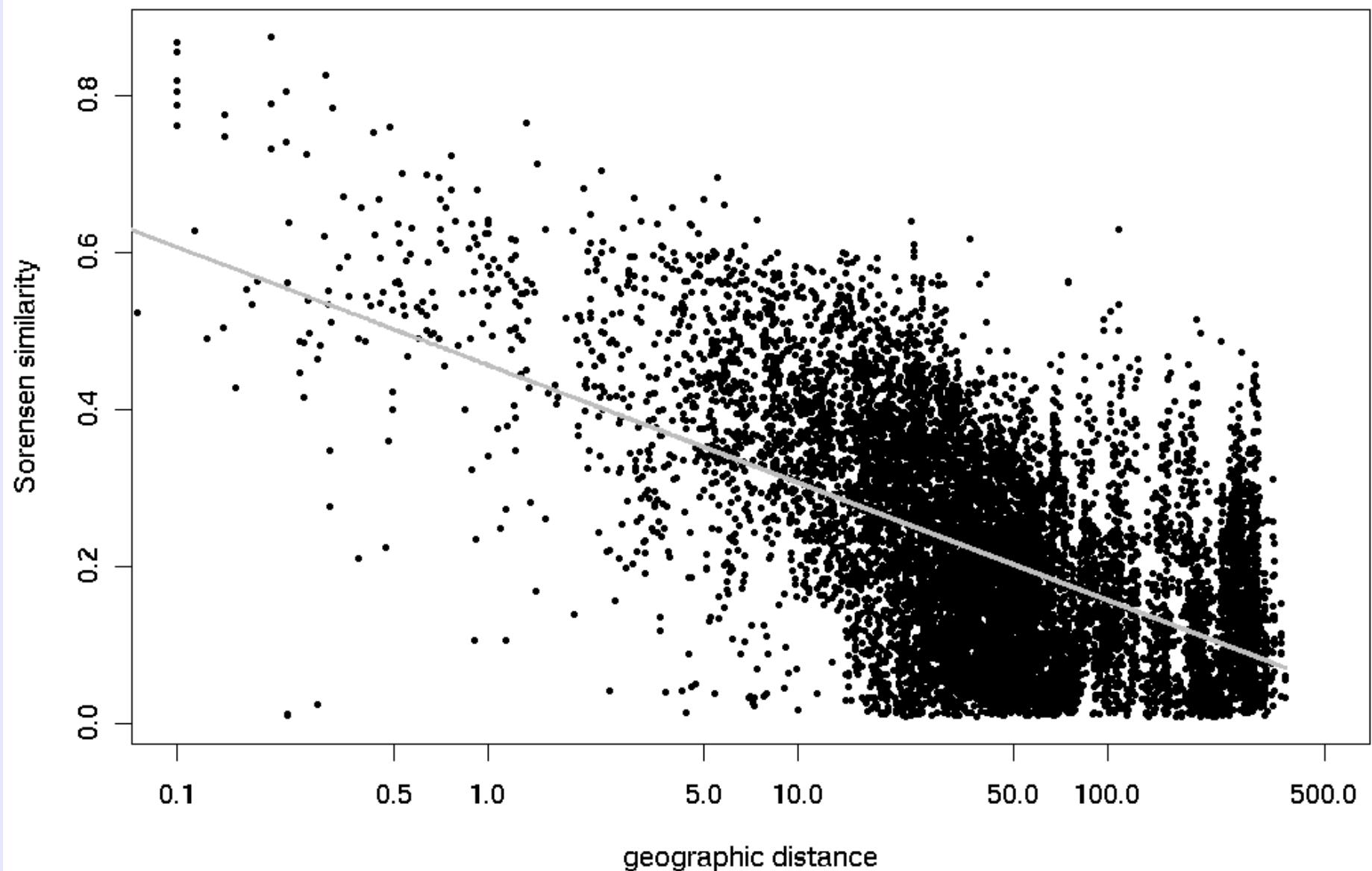
Lacistema aggregatum plots and inventories

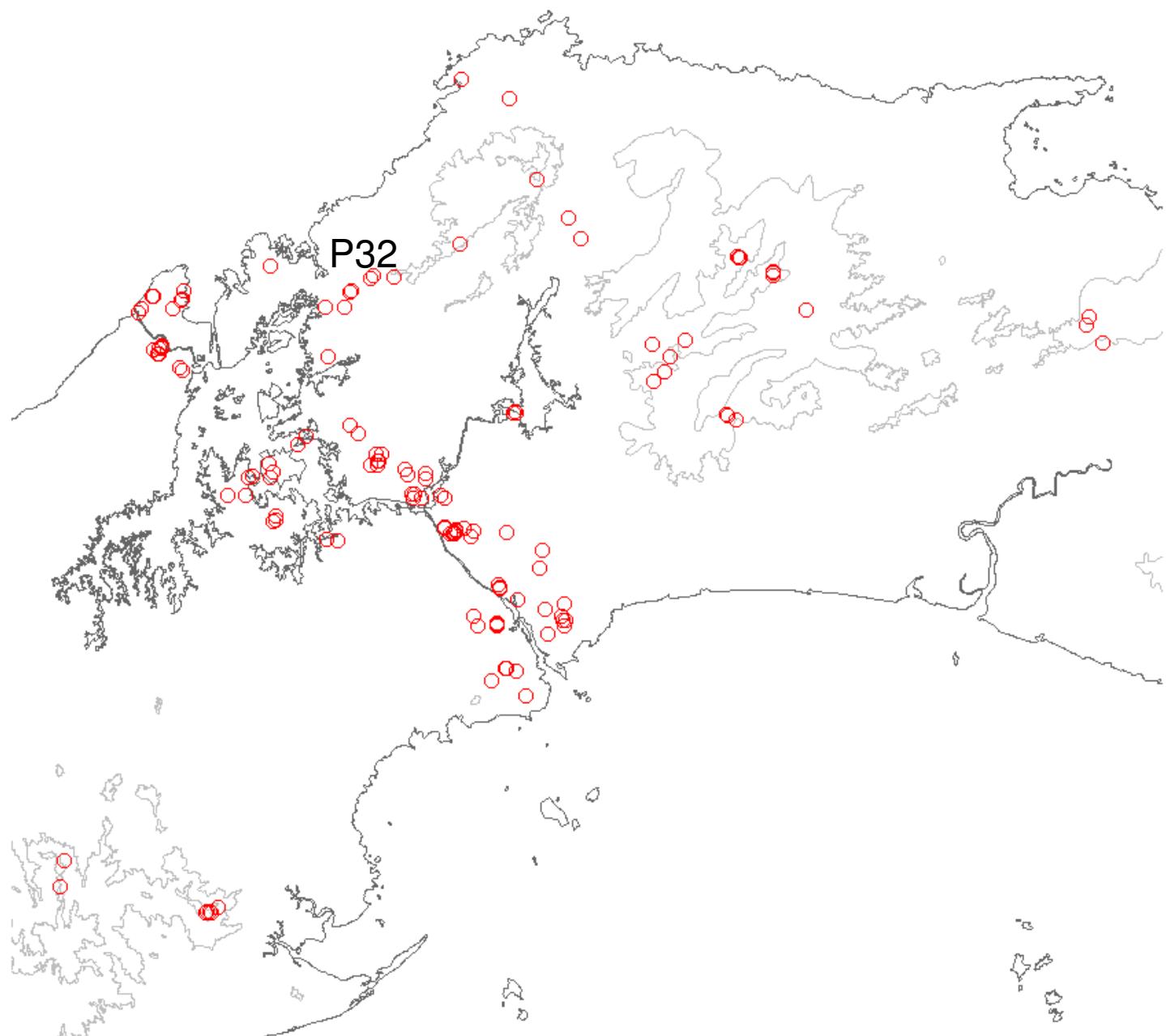


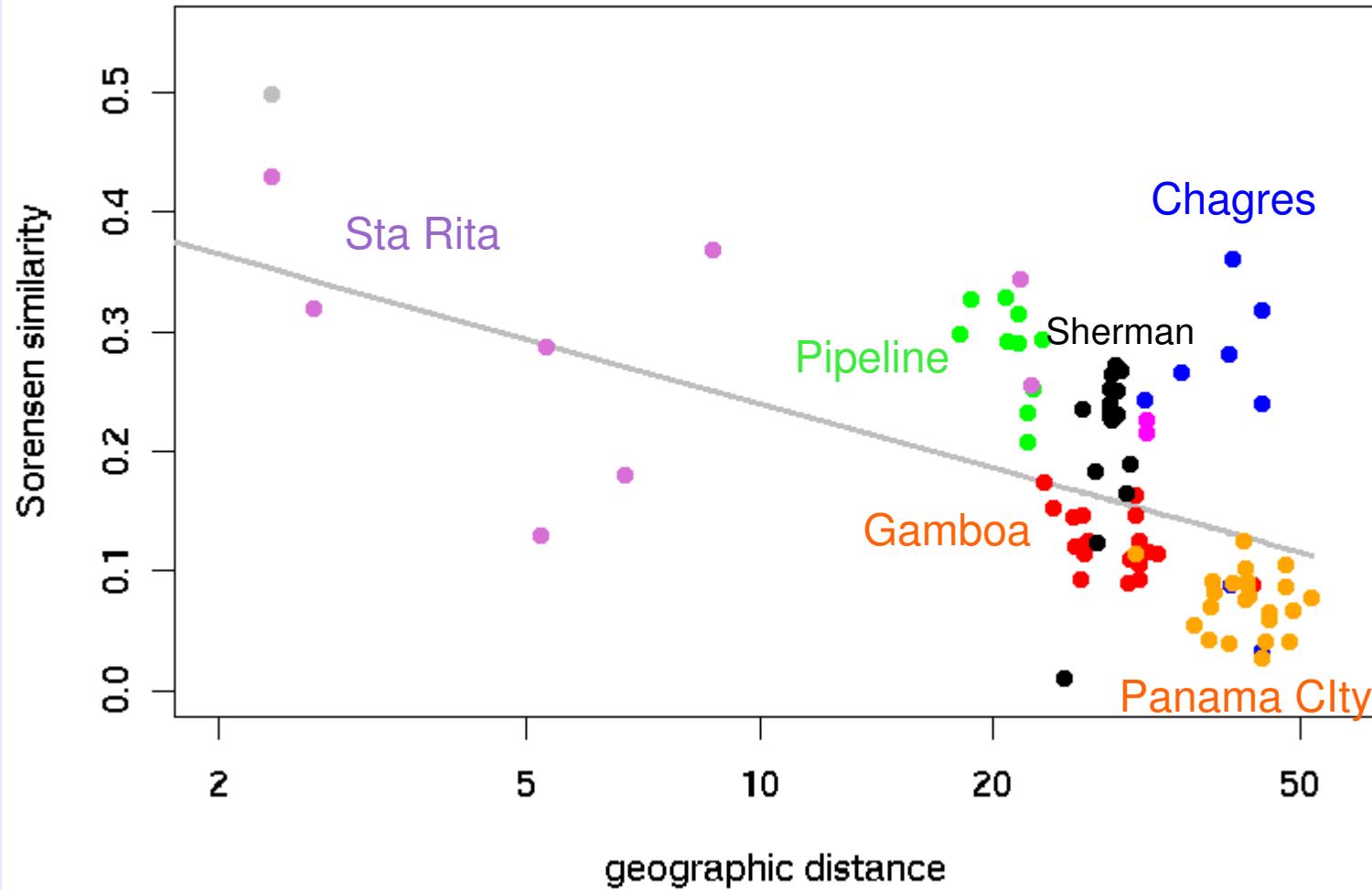
Dissecting beta-diversity

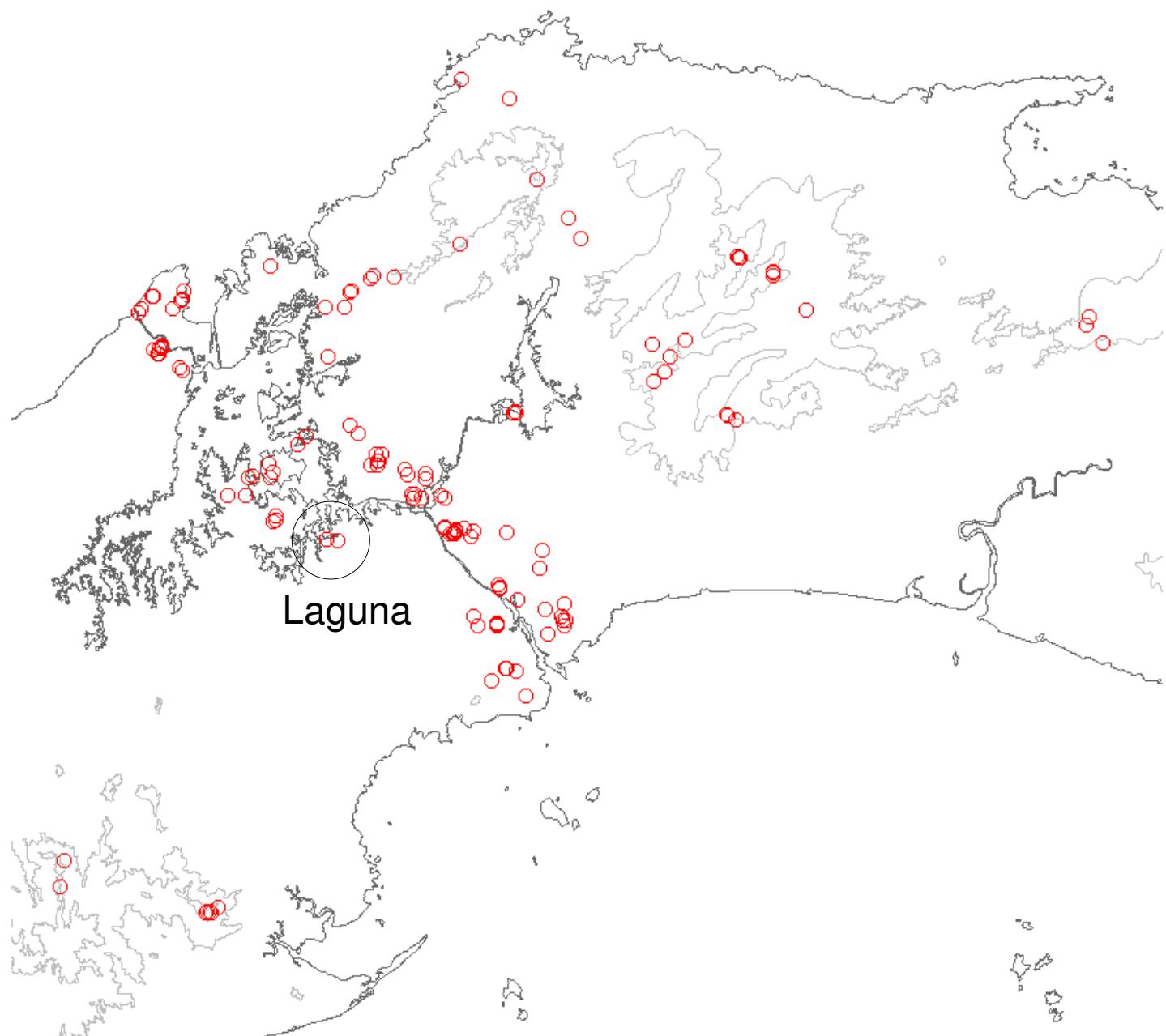


Similarity decay with geographic distance
155 tree plots and inventories in Panama

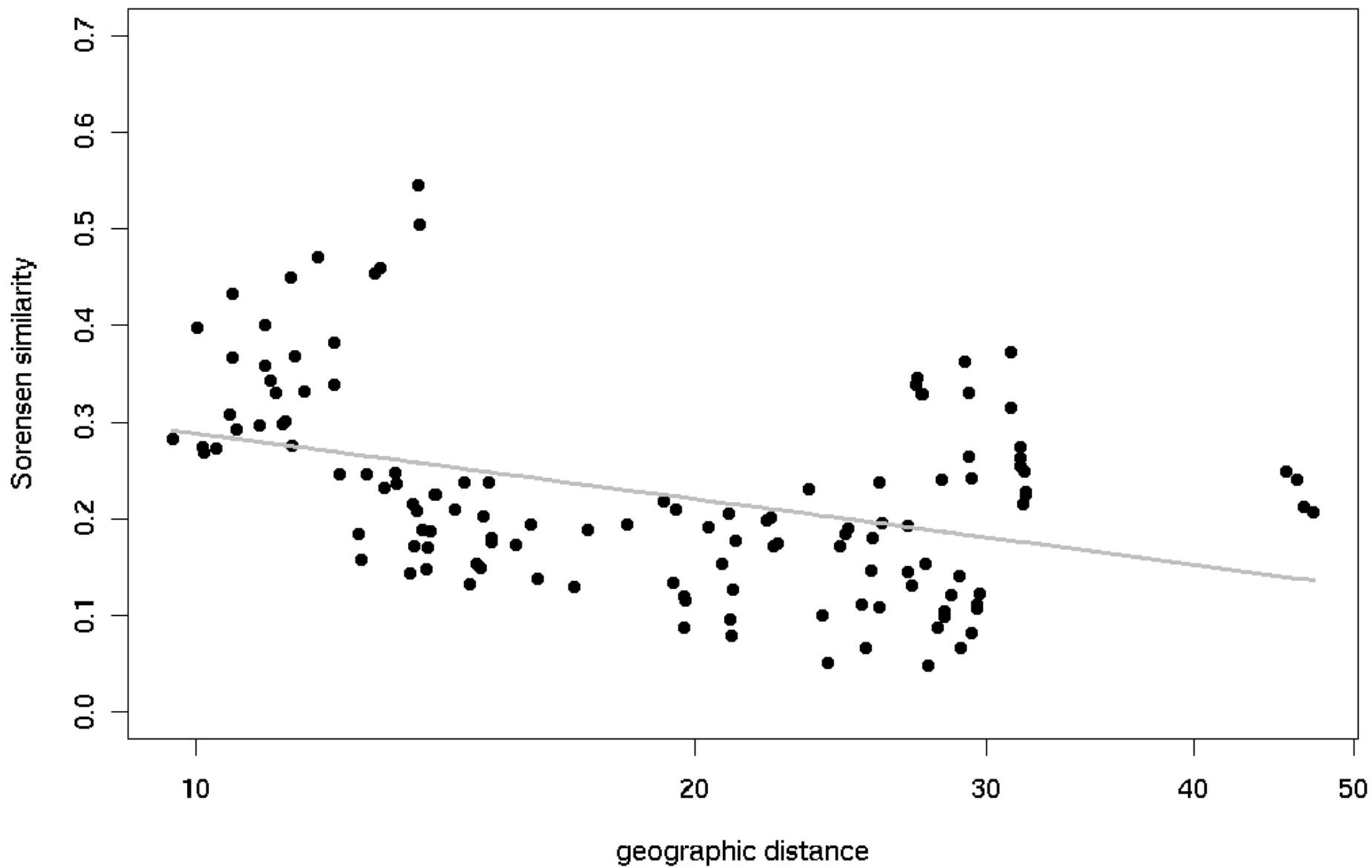




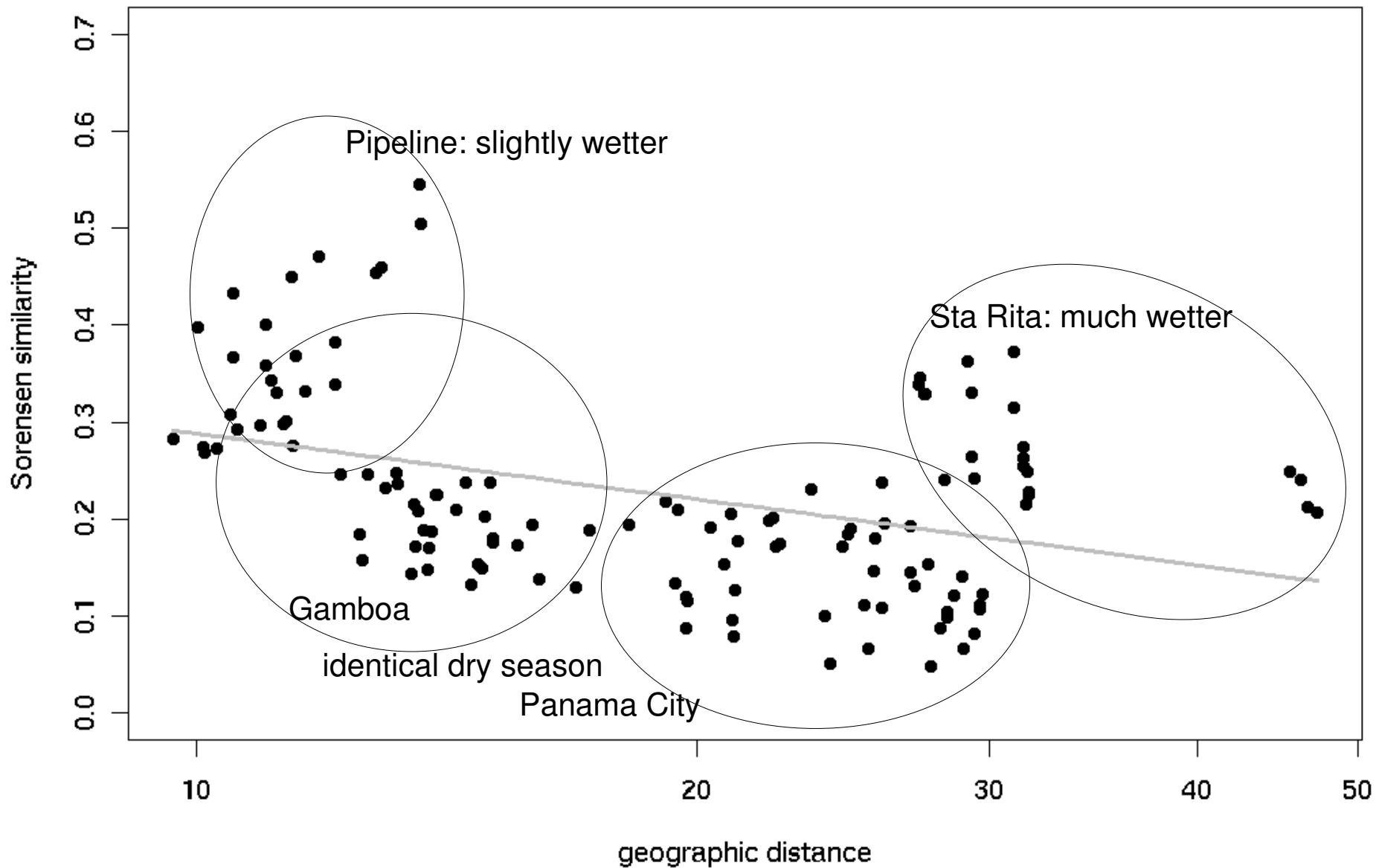




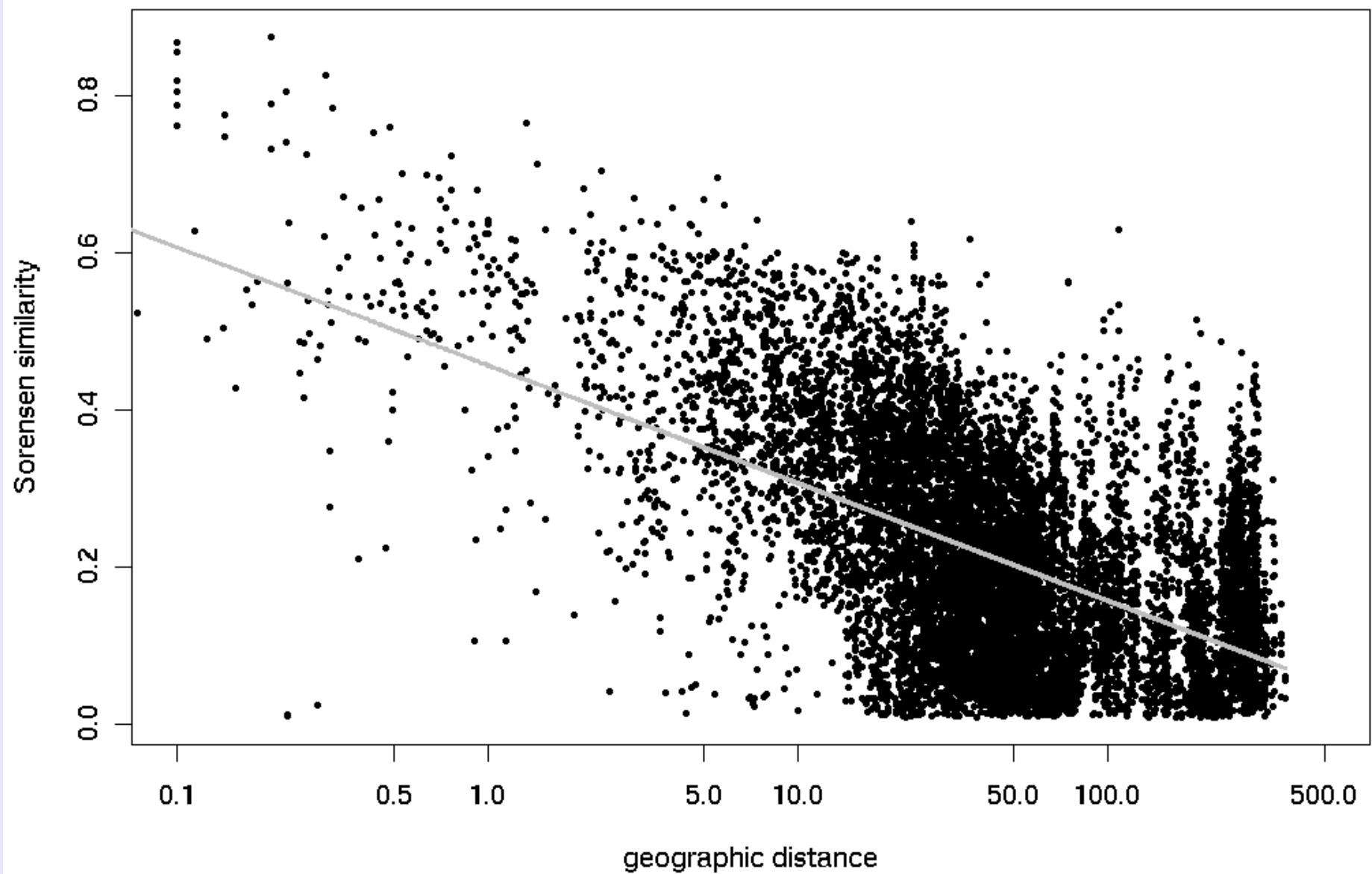
Laguna plots



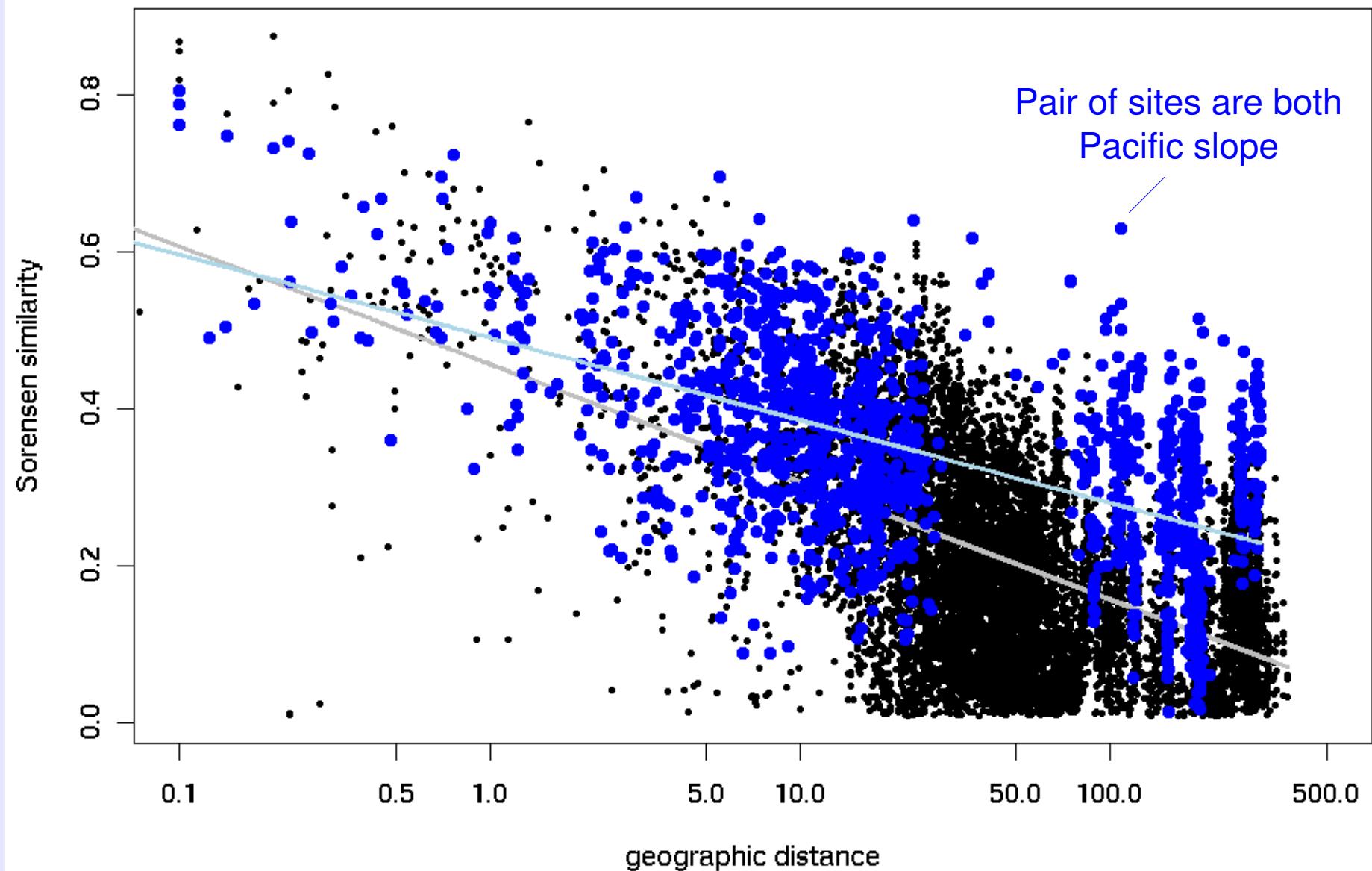
Laguna plots: soil overrides climate



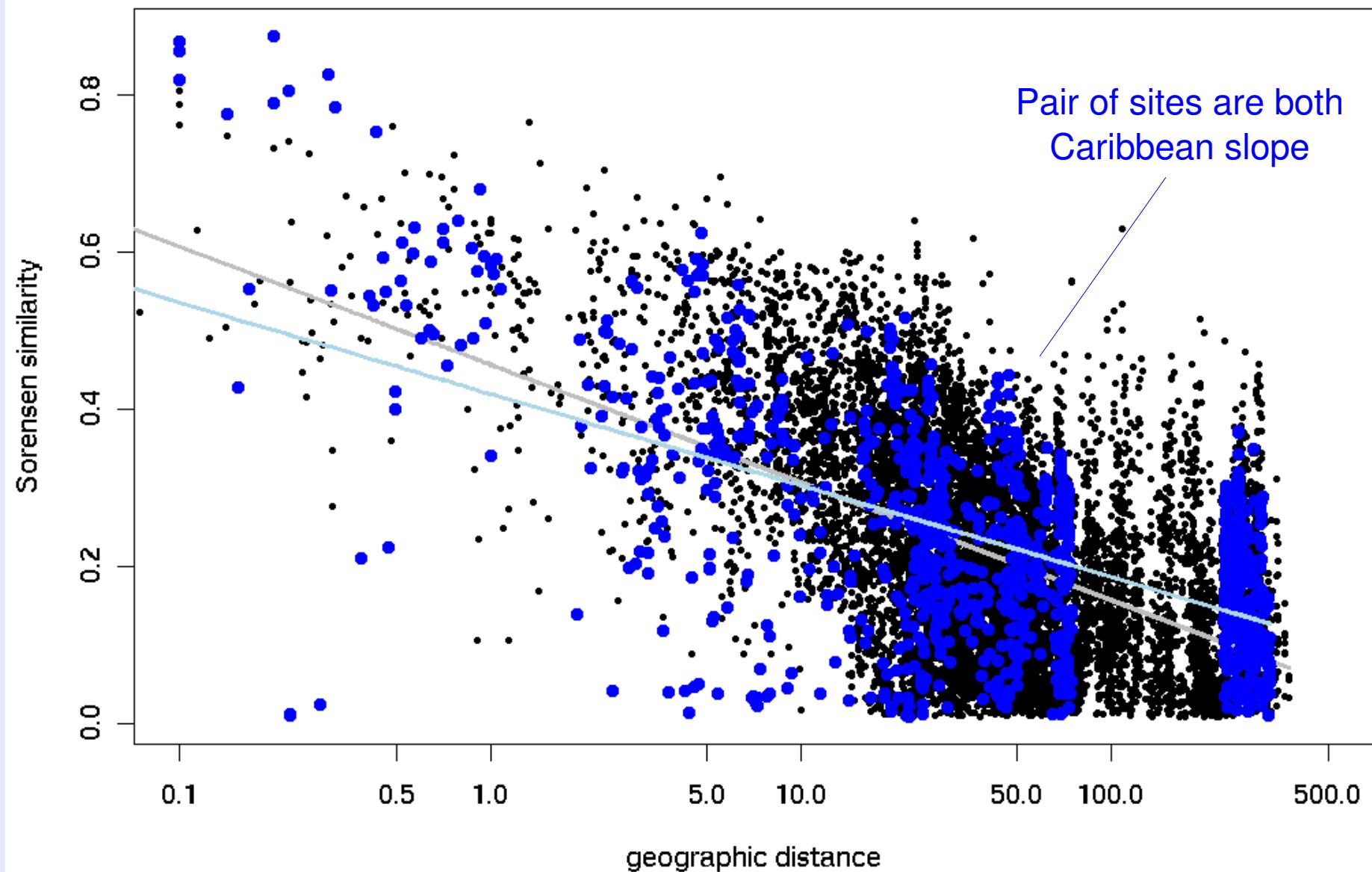
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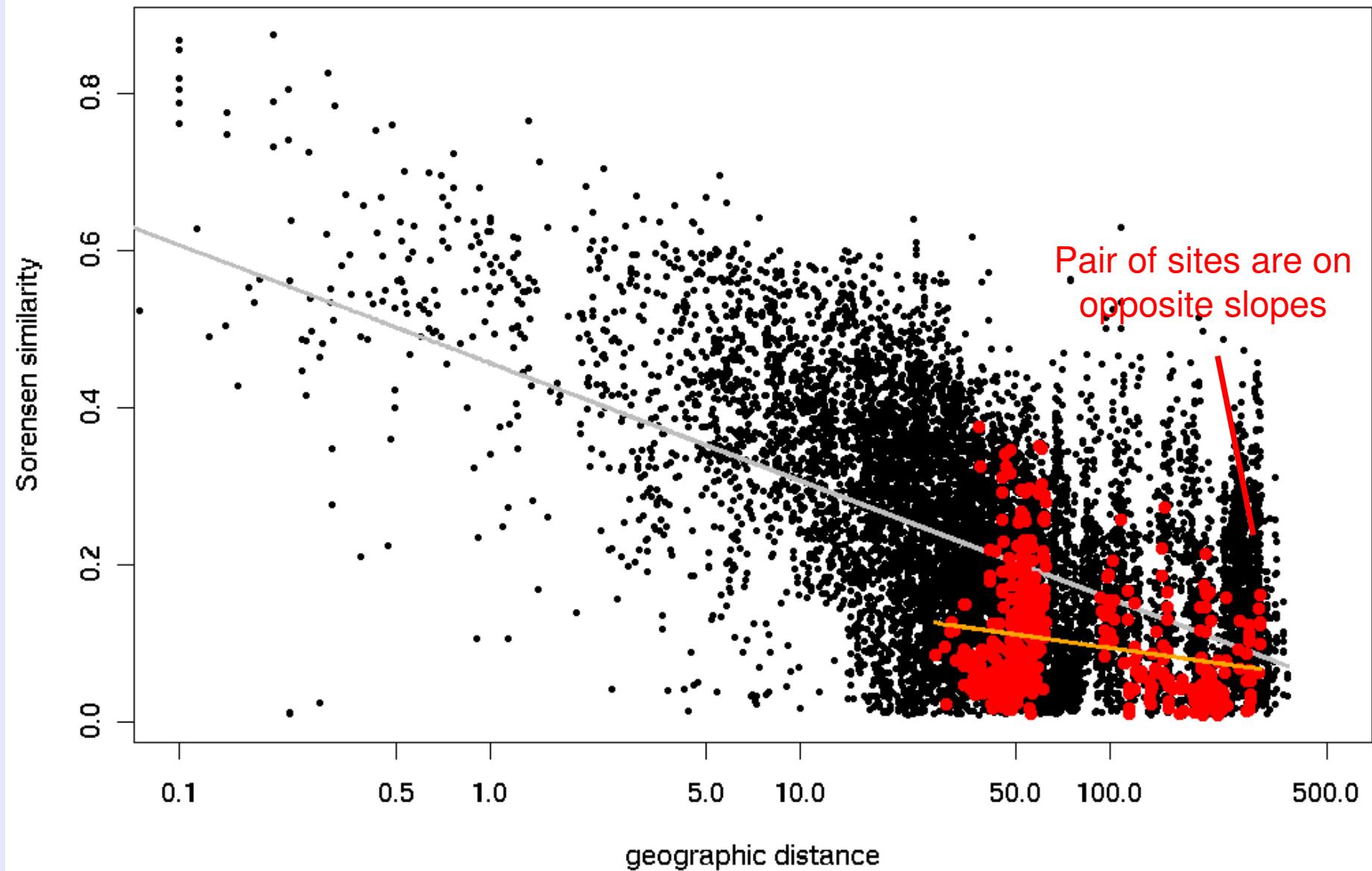
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Similarity decay with geographic distance
155 tree plots and inventories in Panama



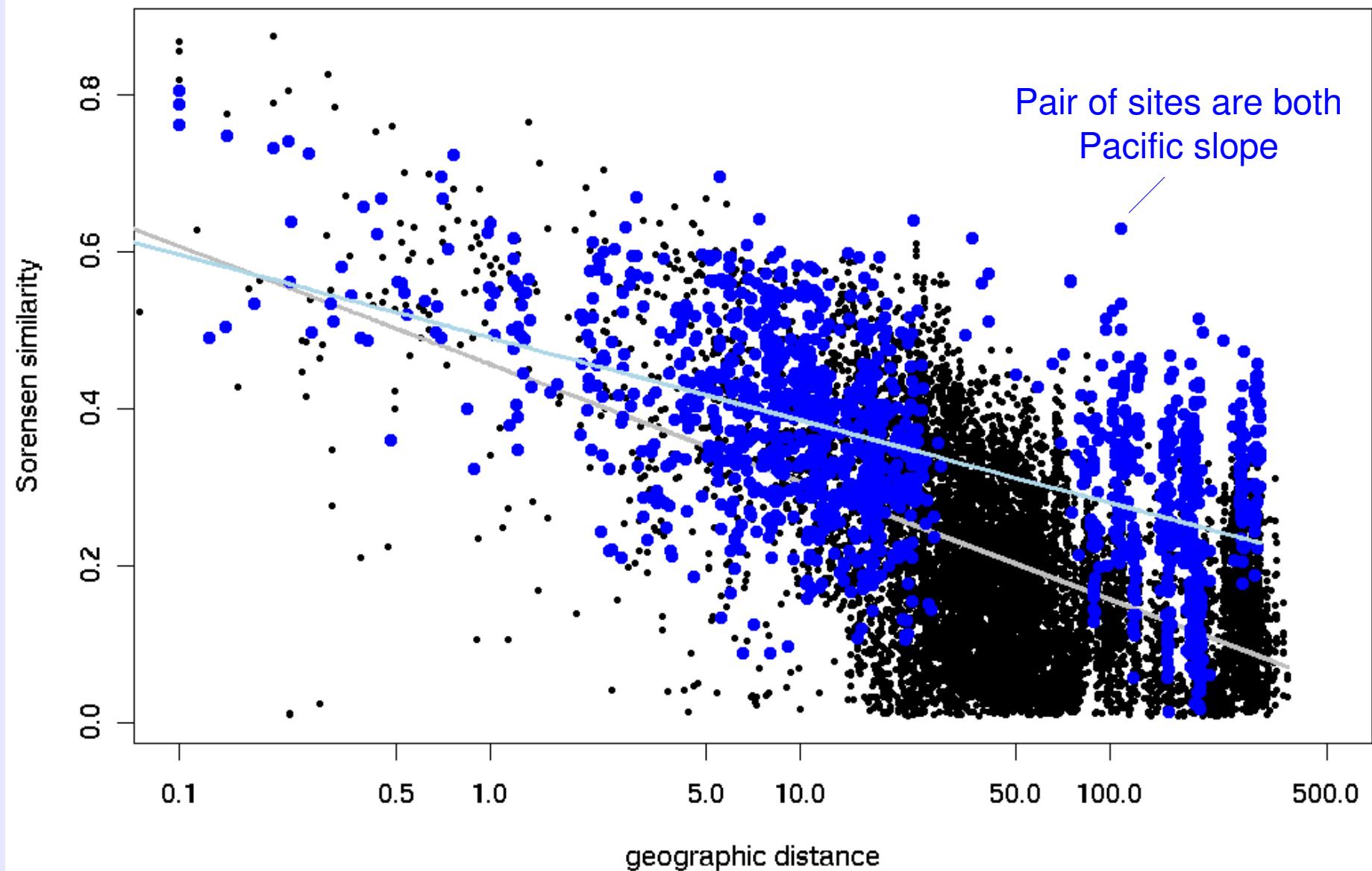
Similarity decay with geographic distance
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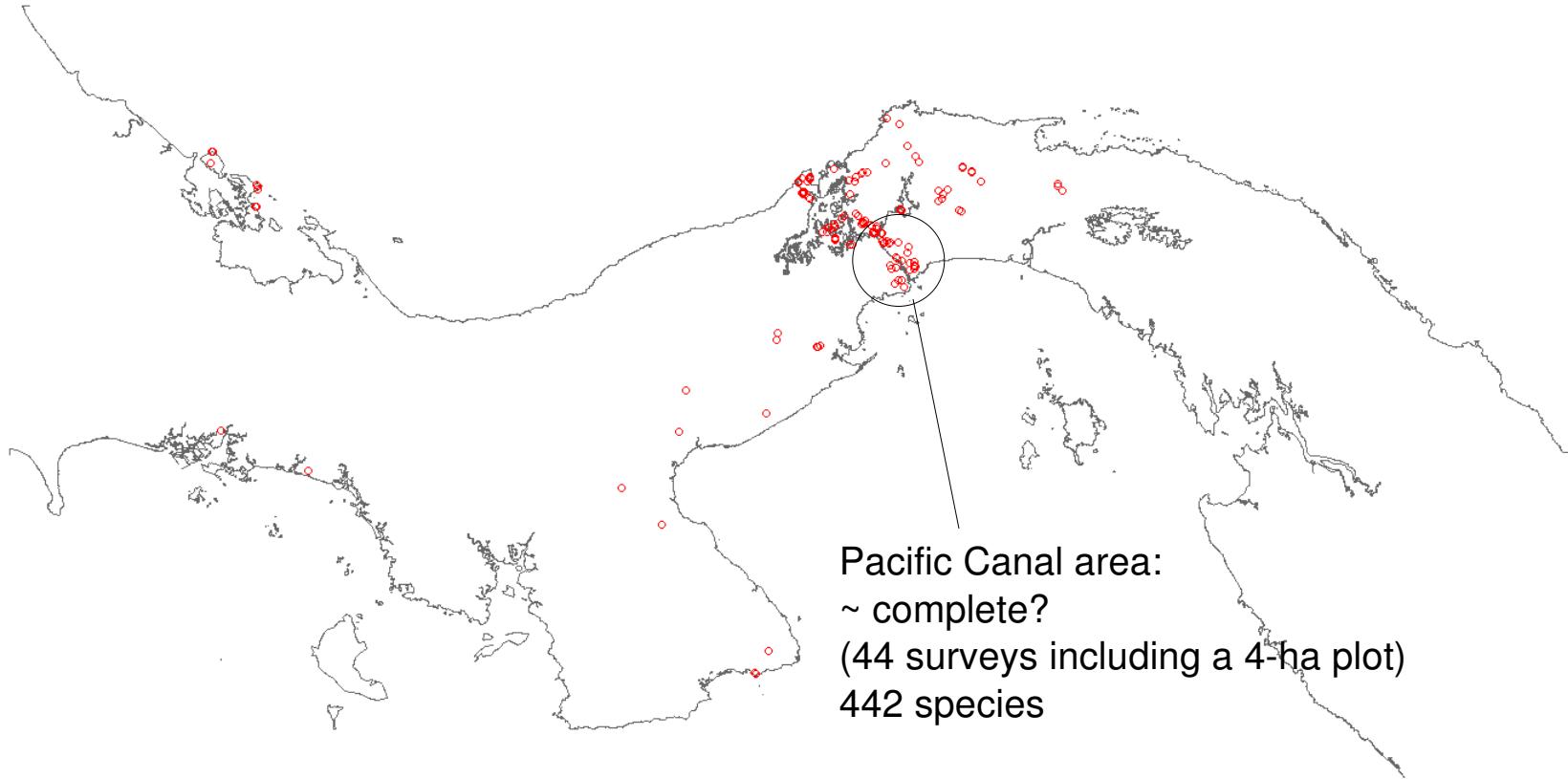


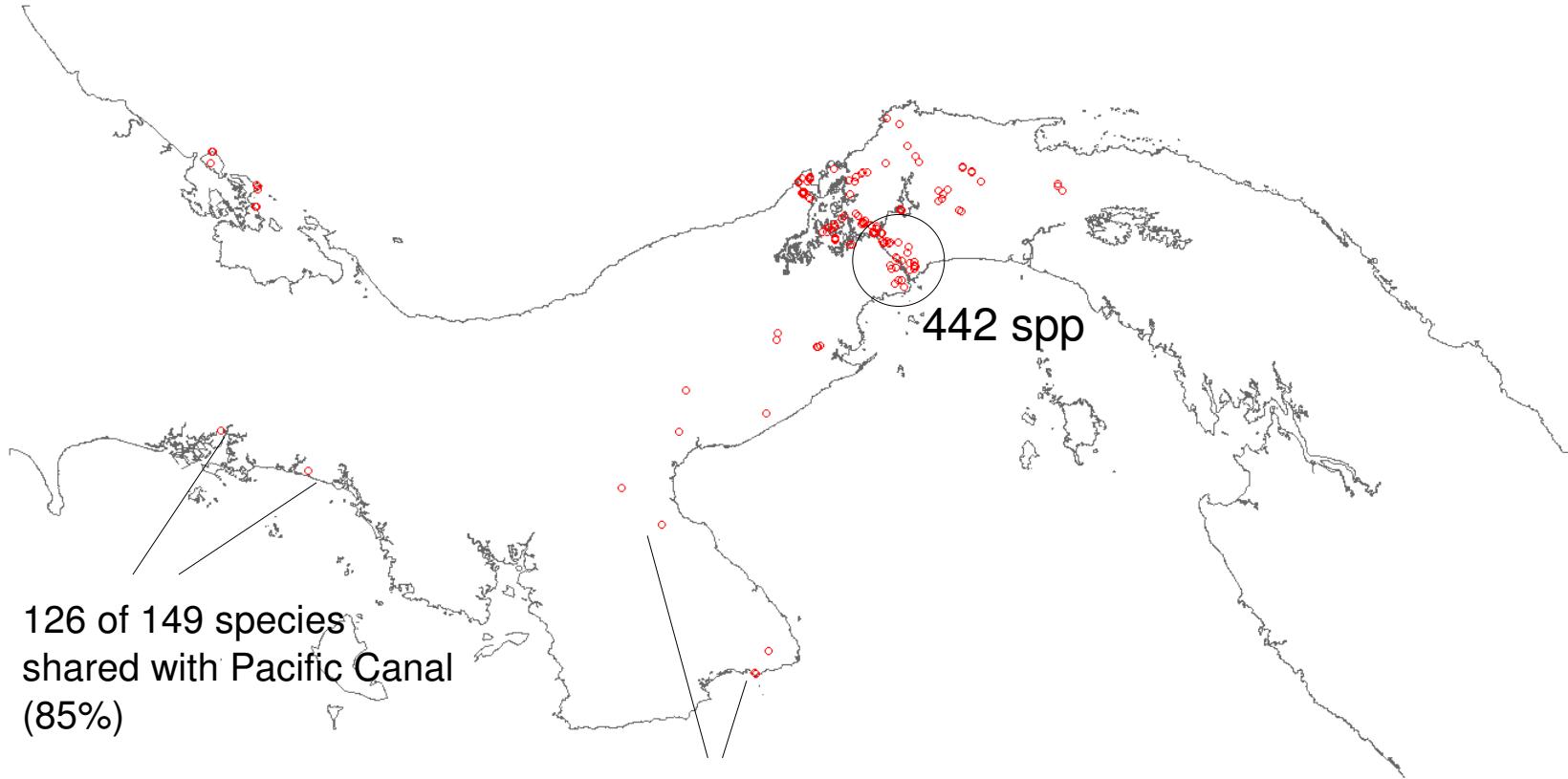
Sample size impact on beta-diversity



Similarity decay with geographic distance
155 tree plots and inventories in Panama





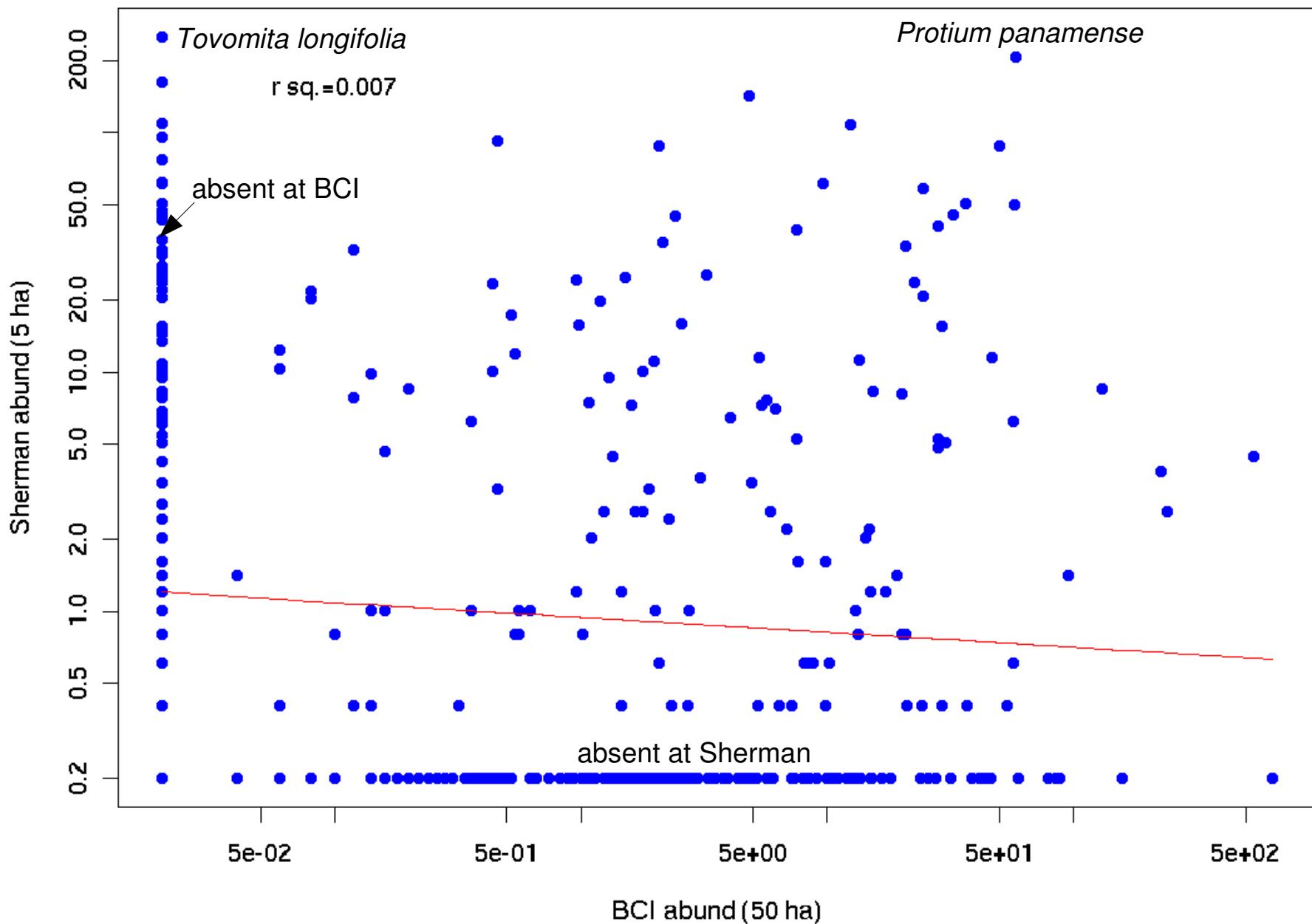


126 of 149 species
shared with Pacific Canal
(85%)

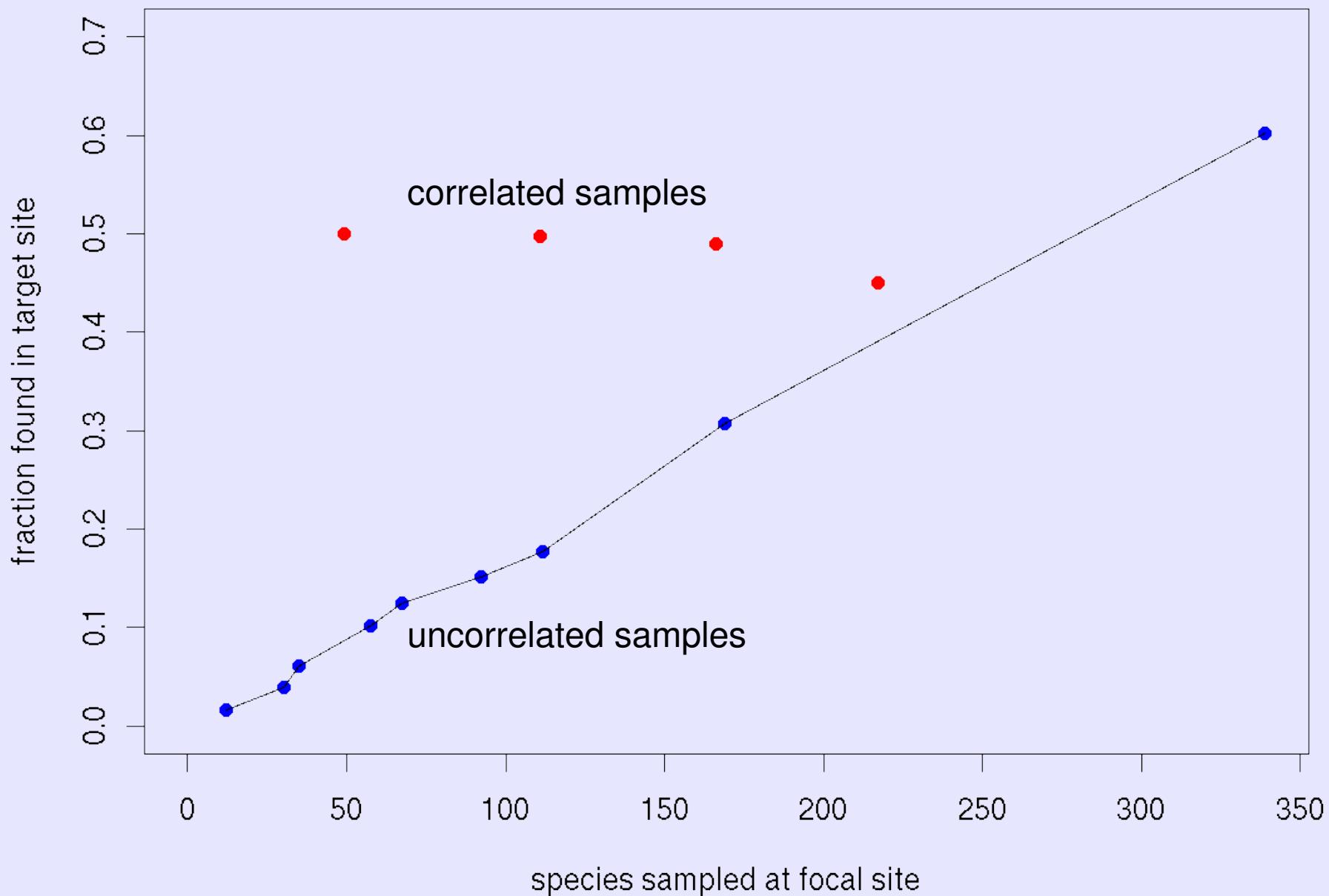
129 of 151 species
shared with Pacific Canal
(85%)

442 spp

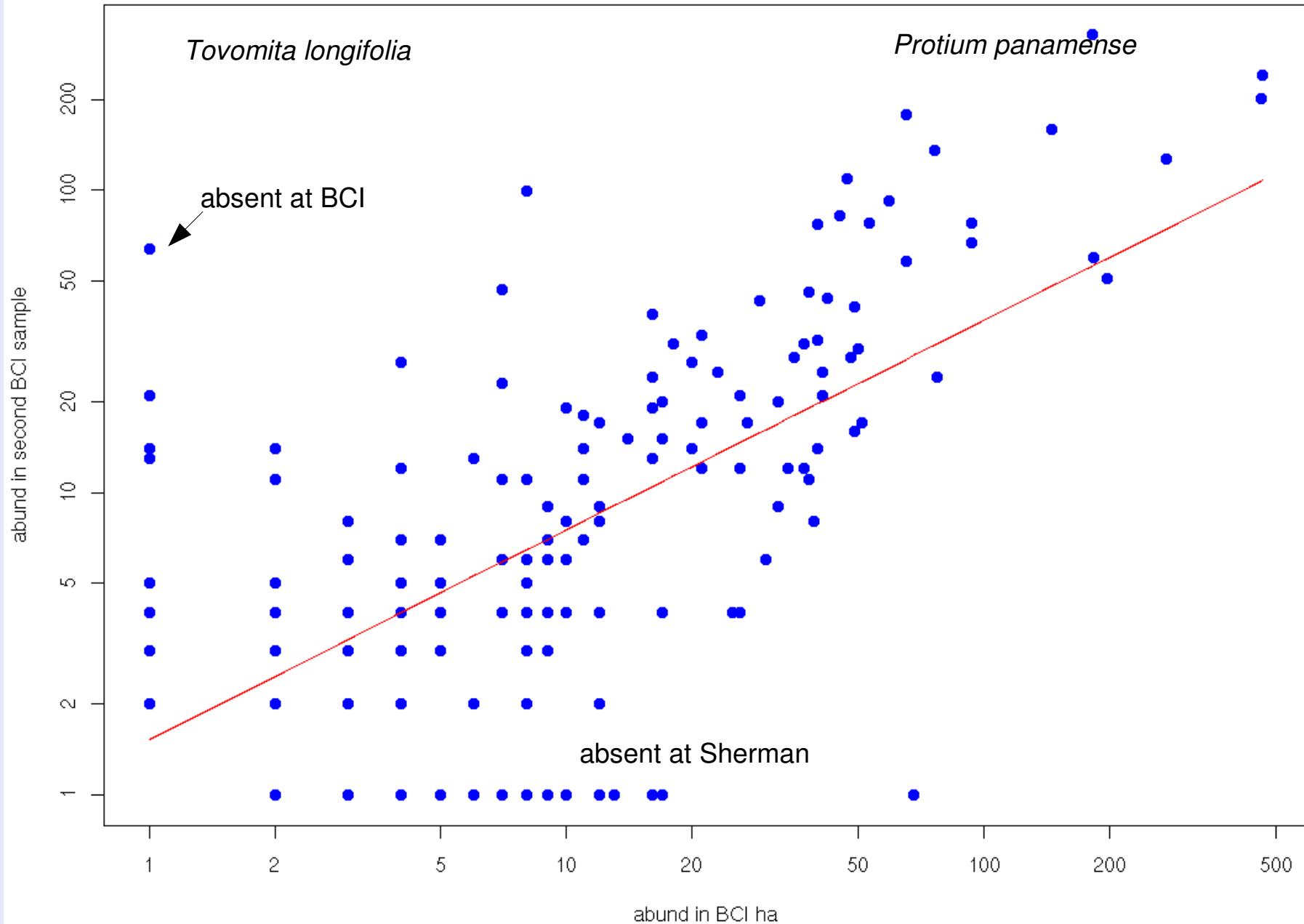
Uncorrelated abundances a few km apart



Sampling impact on species shared



Correlated abundances in nearby plots

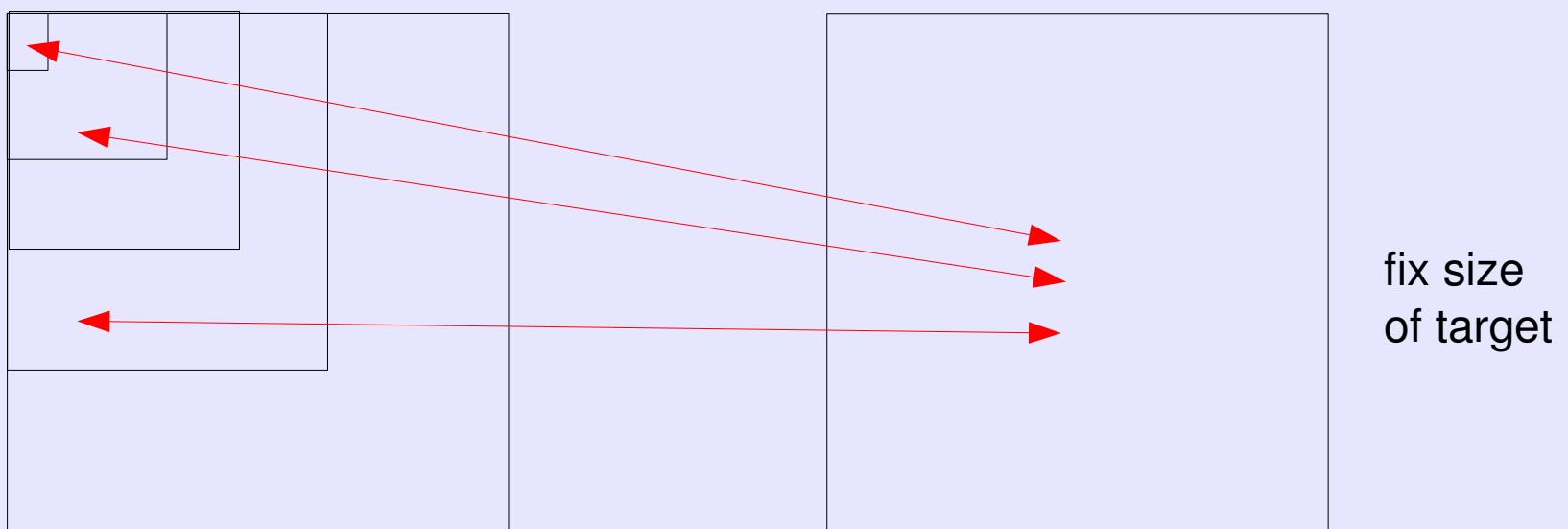
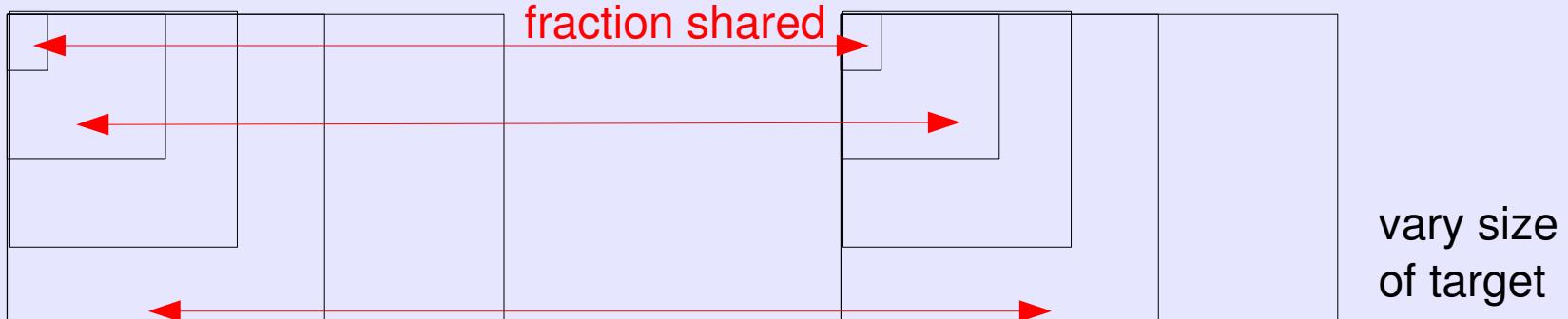


Biasing comparisons -- variable sampling effort

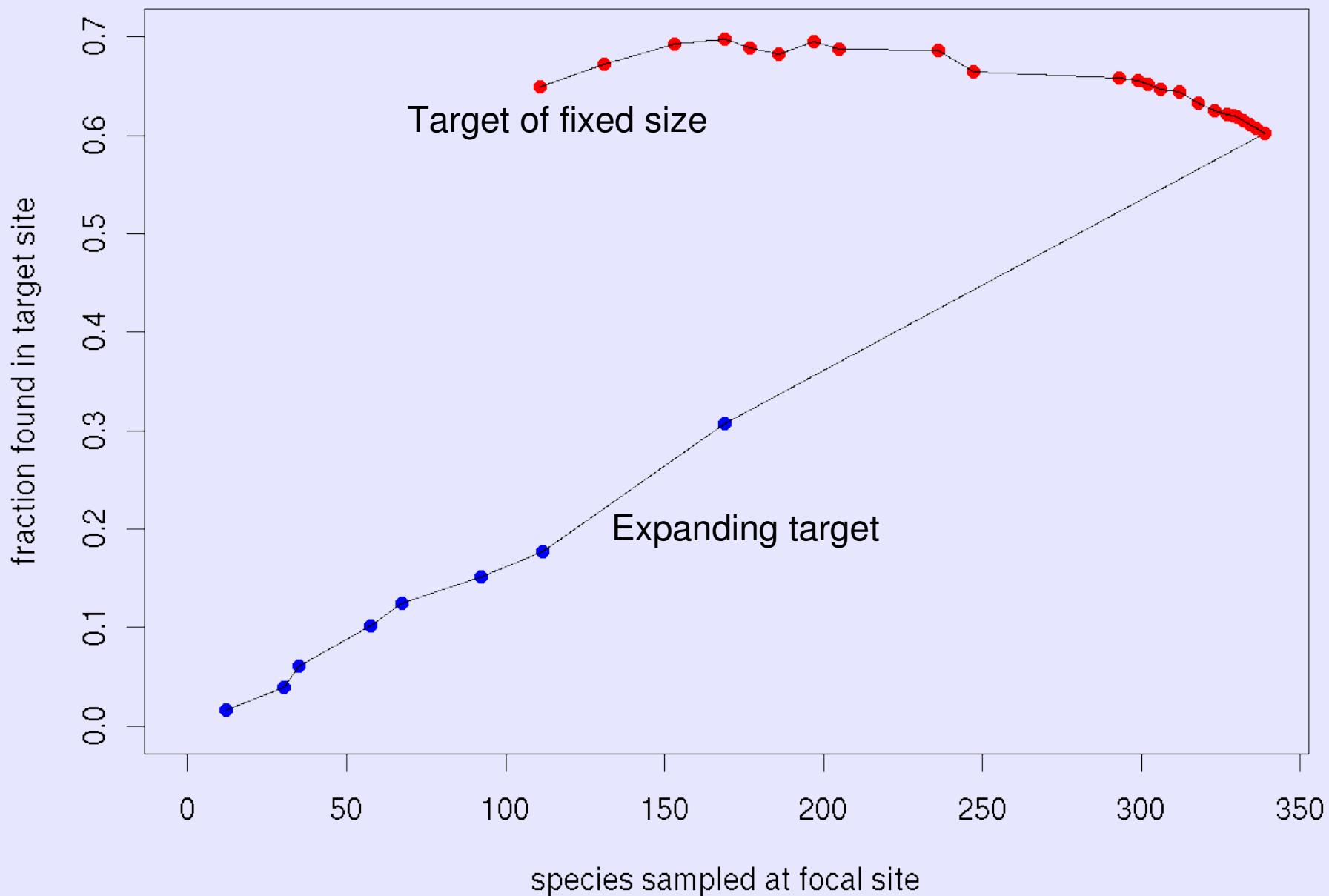


Sampling impact on species shared

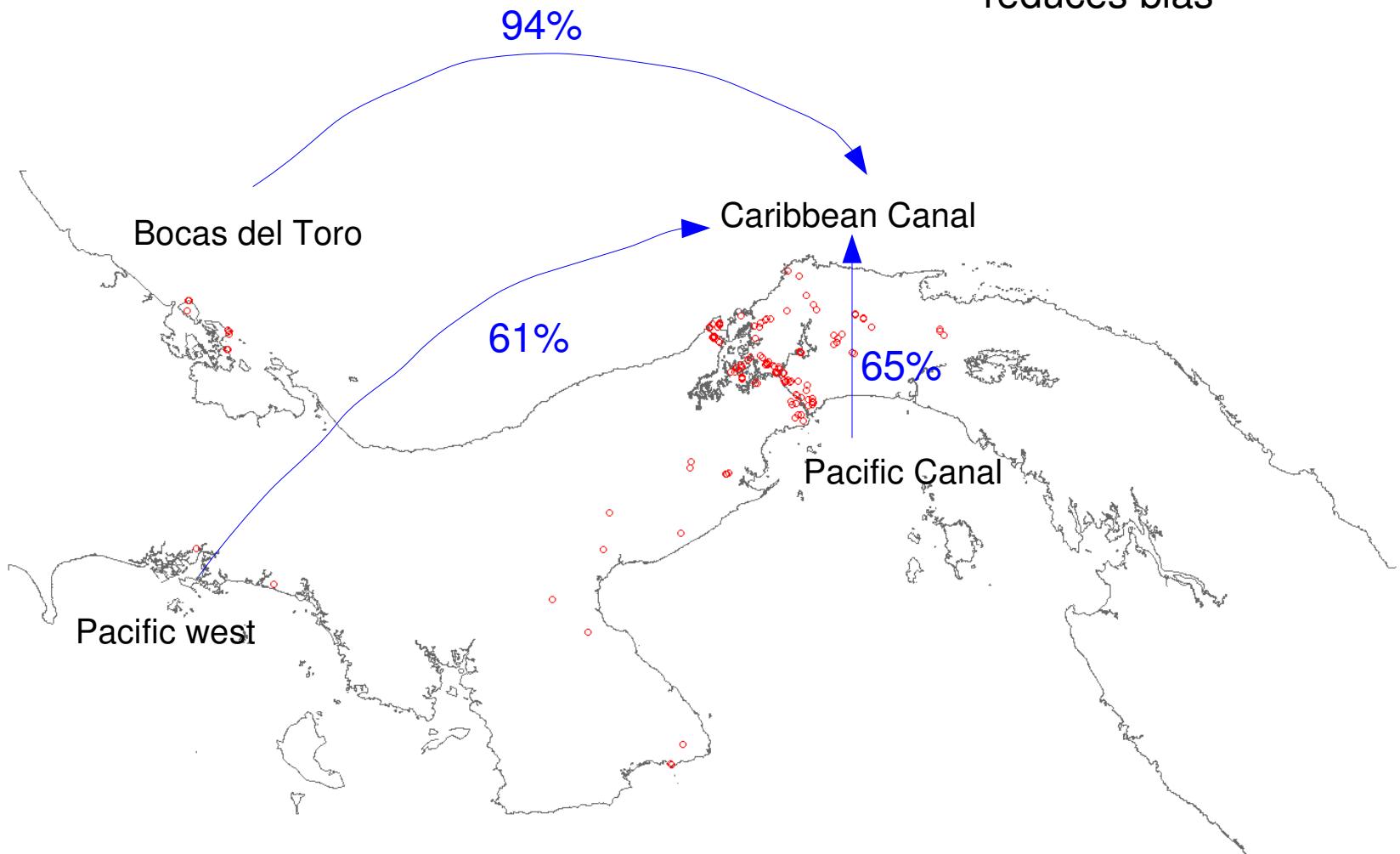
compare species in focal plots to those in a target sample



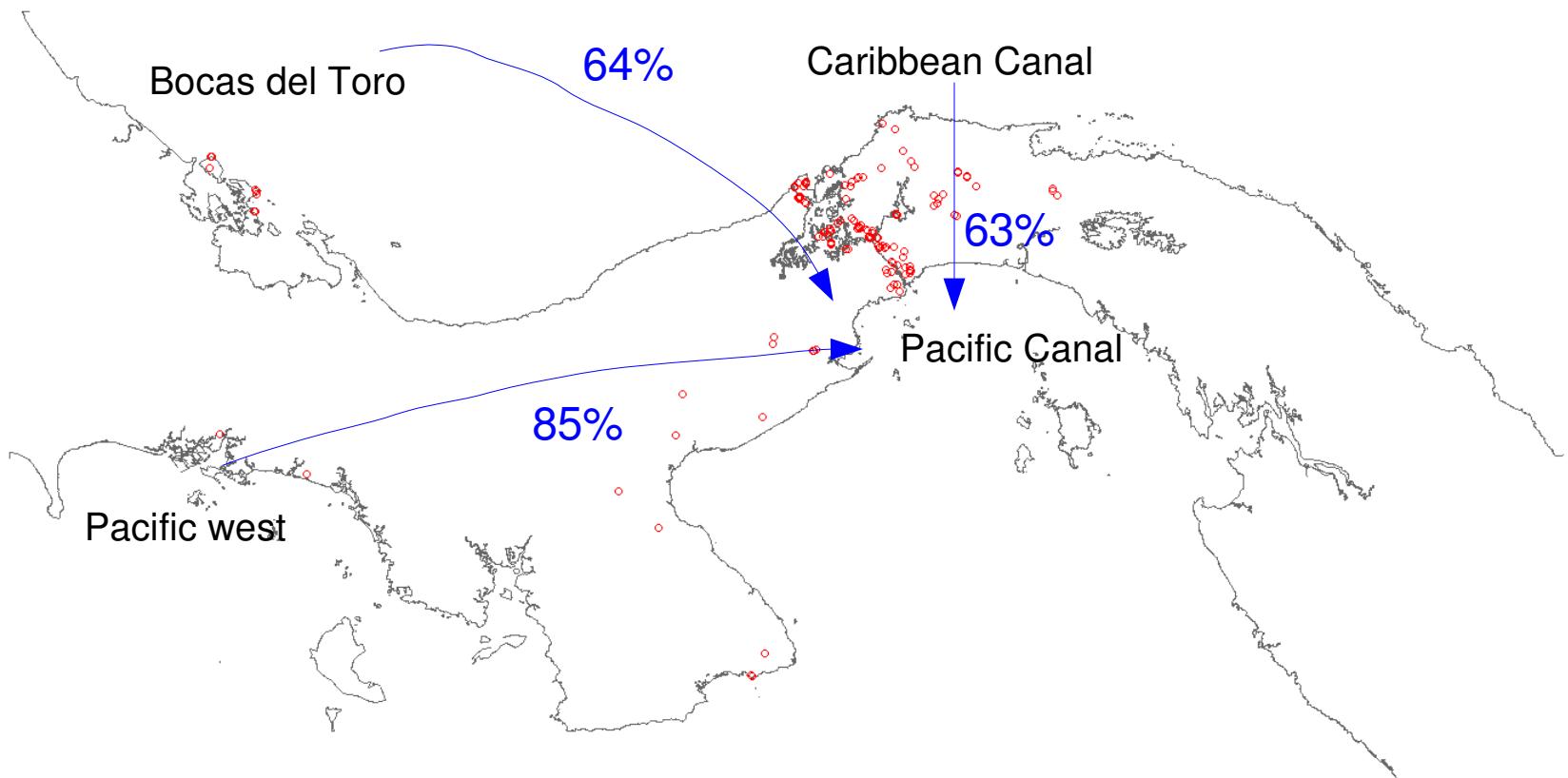
Sampling impact on species shared



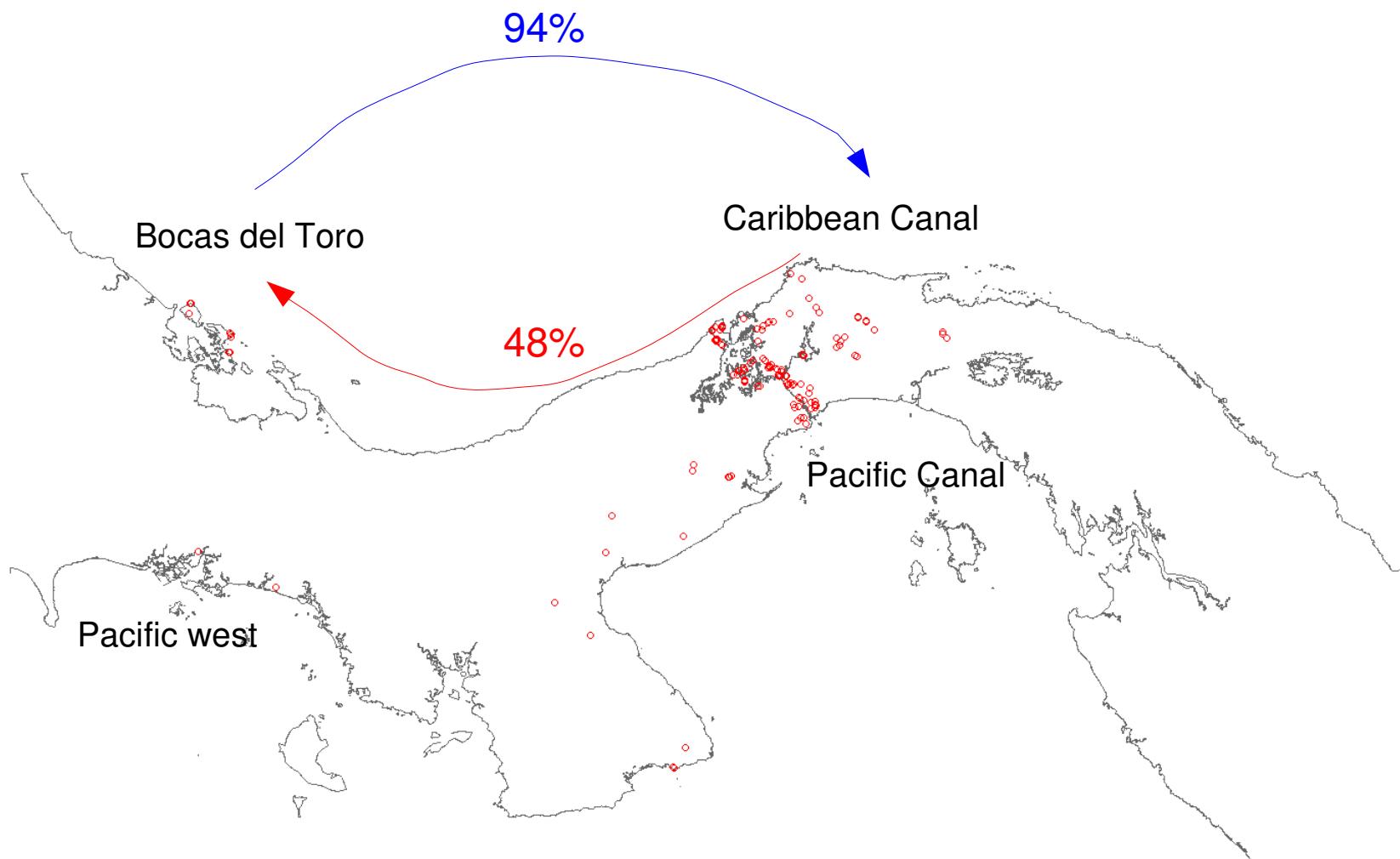
Comparisons against a fixed target
reduces bias



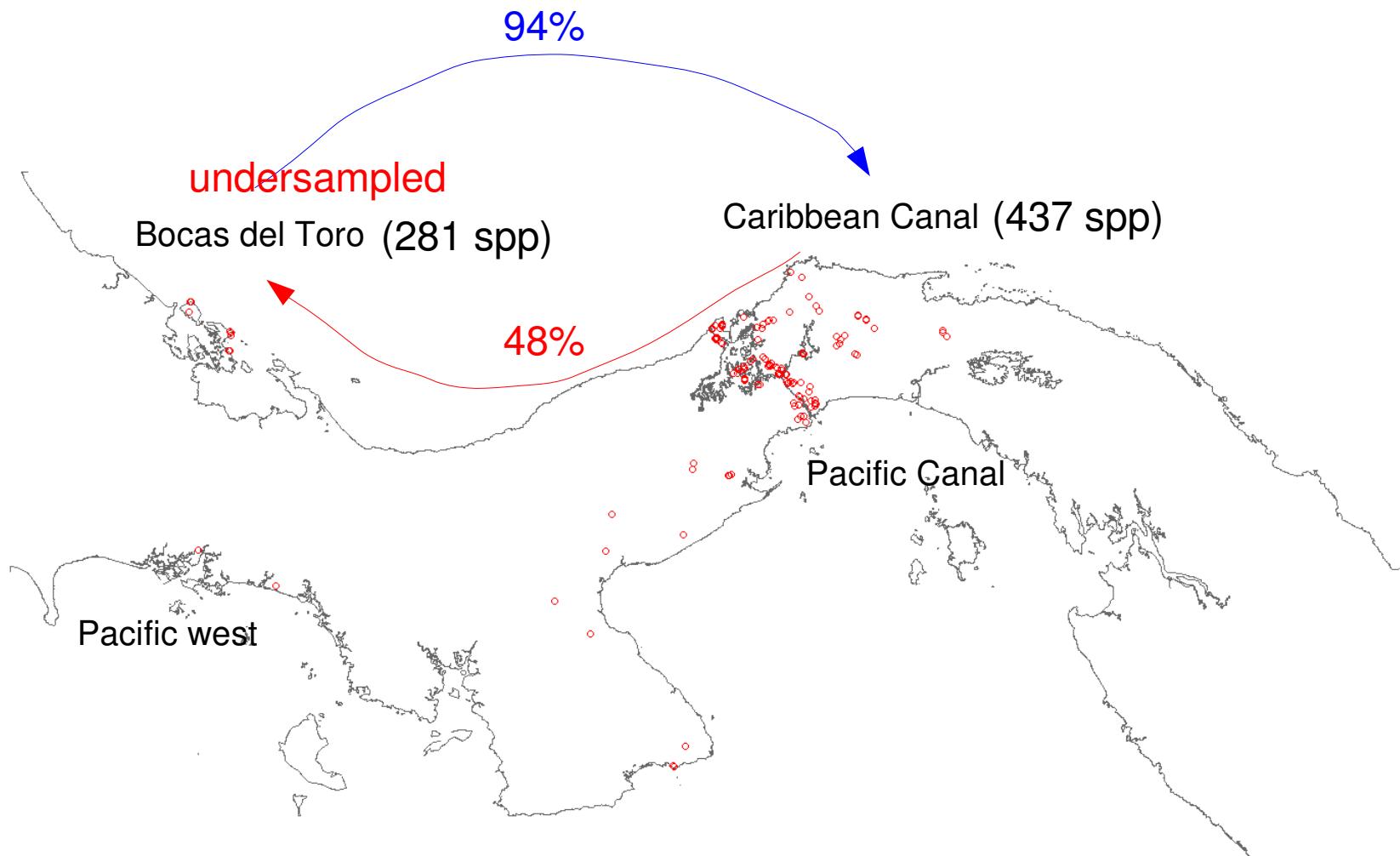
Comparisons against a fixed target
reduces bias



Target varies and estimate is biased

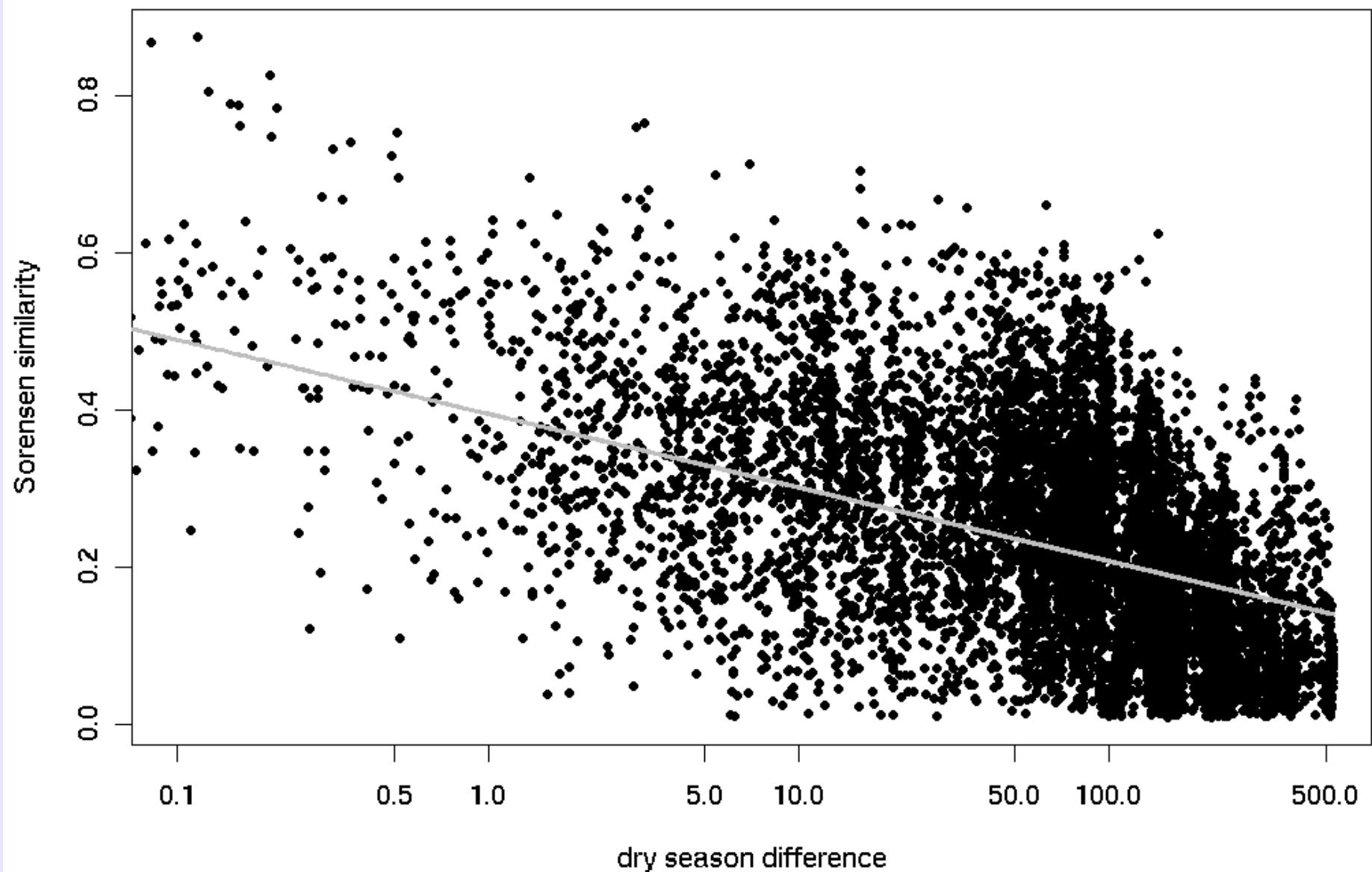


Target varies and estimate is biased

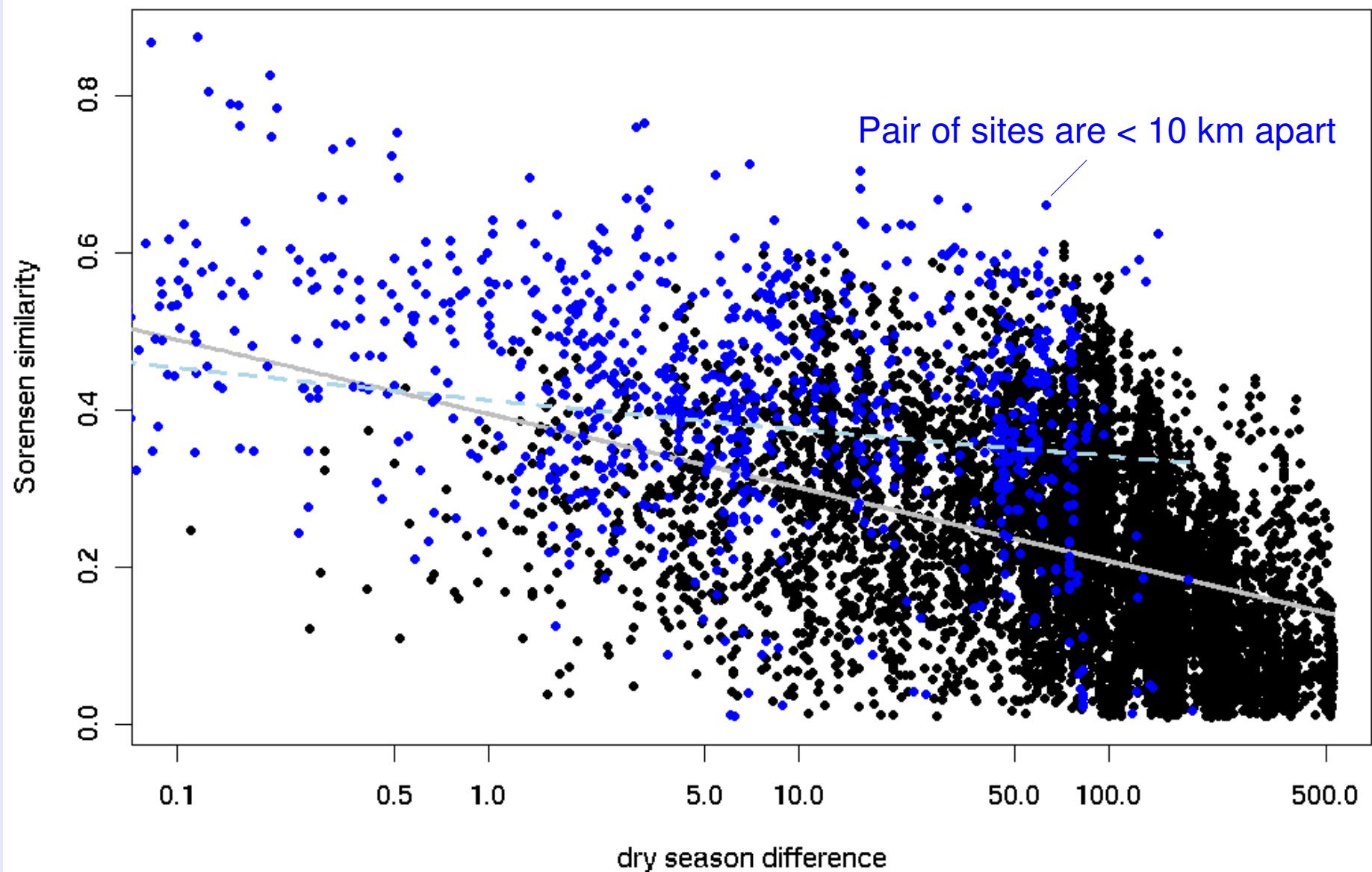




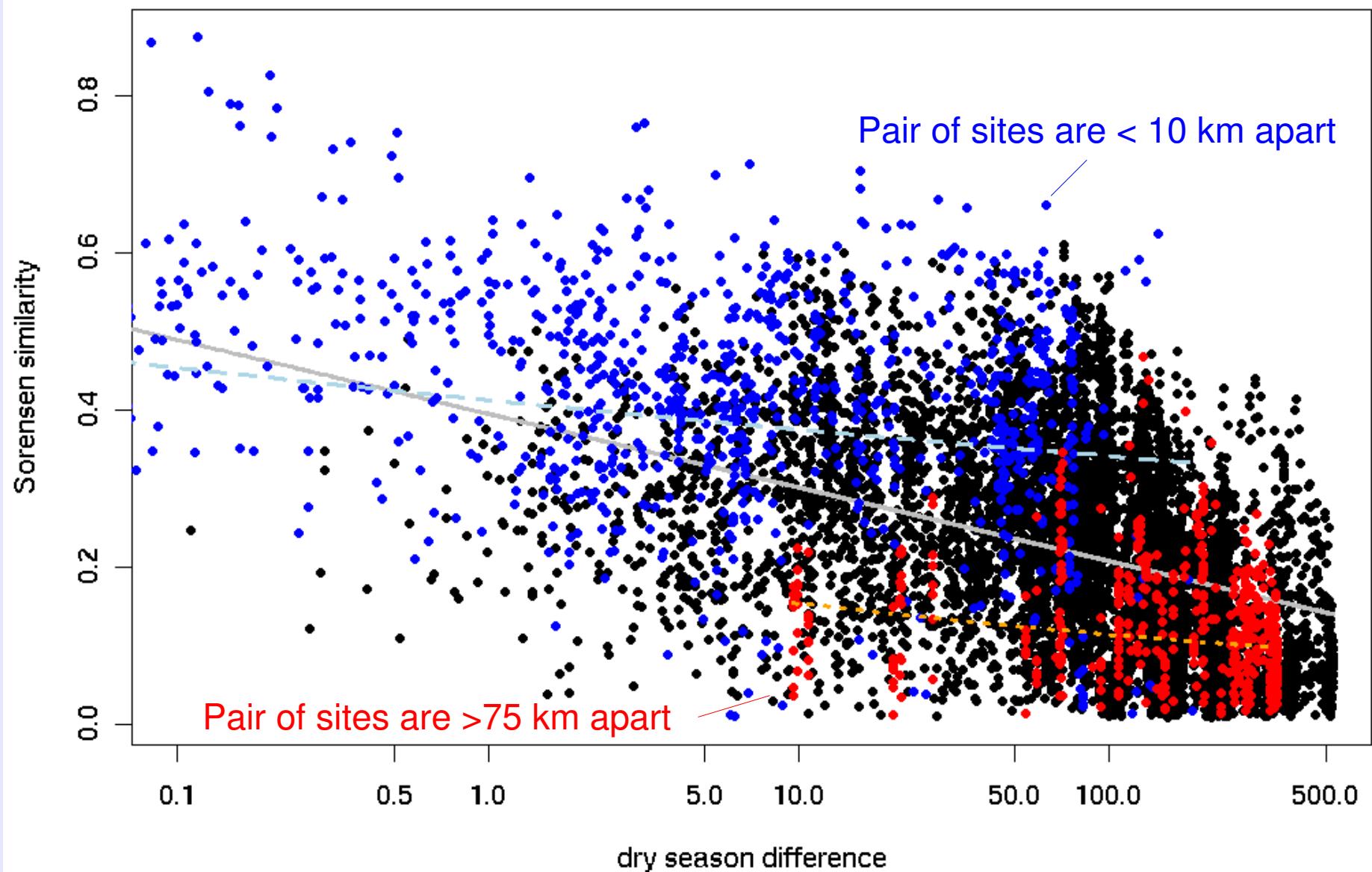
Similarity decay with climatic distance
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