Santarém Carbon Cycle Project

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Aerosol Radiation Measurements Climate Research Facility in the Amazon Basin - ACRF

- ***Aerosol life cycle***

1. Manaus pollution plume + VOCs → impact on SOA + new particles.
2. Aging of bb plumes and the subsequent formation of additional SOA.
3. Anthropogenic emissions: Manaus pollution + bb aerosols from the ring of fire:
   - Aerosol microphysical, optical, CCN and ice nuclei;
   - Pristine vs anthropogenical air masses.

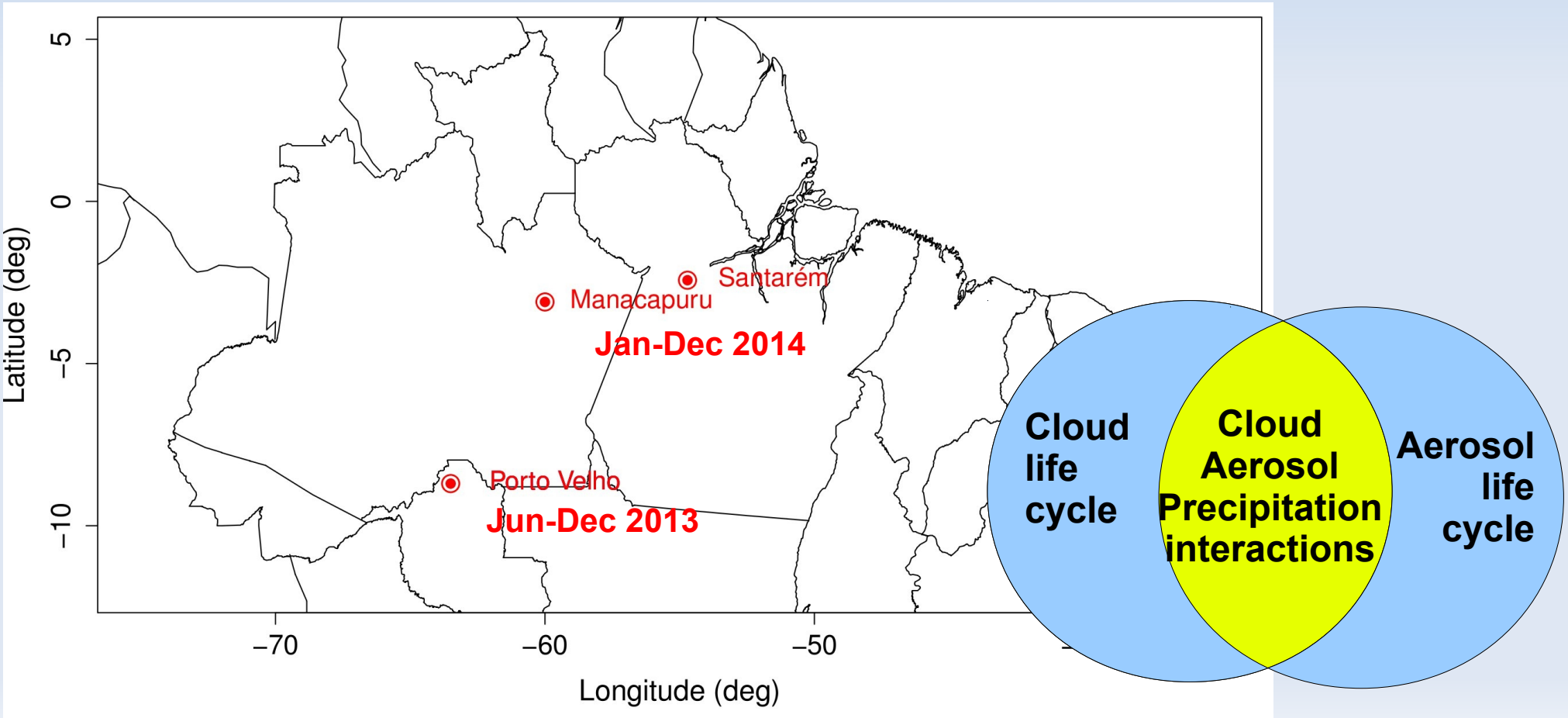
- ***Cloud life cycle***

1. Landscape heterogeneity in dynamics of convection and clouds.
2. The evolution of convective intensity from severe storms in the dry season to moderate storms in the wet season, and how changes caused by local deforestation lead to similar transitions;
3. The transition from shallow to deep cumulus convection during the daily cycle (comparison with other ARM sites)

- ***Cloud aerosol precipitation interactions***

1. Aerosol effects on scattered cumulus clouds, aerosol radiative effect, focus on the impact of bb aerosols.
2. Aerosol effects on deep convective clouds, precipitation, and lightning under different aerosol and synoptic regimes, including the roles of aerosols in changing regional climate and atmospheric circulation.
3. Improvement of parameterizations of aerosol-cloud interactions in the climate models

The ARM Climate Research Facility in the Amazon Basin

- Biomass Burning Emissions: Porto Velho, Brazil
- MegaCity Outflow in the Tropics: Manaus, Brazil

" Therefore, in the proposed deployment, we will have the capability to contrast high and low aerosol loadings."