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Compositional analysis
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Health outcomes are often multi-faceted as many environmental variables have synergistic impacts. By integrating data on chemical agents from the lithosphere, hydrosphere, and atmosphere, it will be possible to note the roles each play, and which are having the most demonstrable effect on long-term cognitive health outcomes. This presentation will showcase an integrated and compositional approach taken to model the effects that chemical agents in each sphere are having on long-term cognitive health outcomes. Firstly, chemical agent data will be extracted using circular buffers. Secondly, the relationships that chemical agents share across the environmental spheres are validated through correlation (complex heatmap/clustering) and dimension reduction (PCA) techniques. Thirdly, cognitive health outcome variables are integrated into this framework, to note which chemical agents and health variables show correlations. Lastly, a forward-selection algorithm like selbal is demonstrated to indicate the level of significance that each health outcome shares with each chemical agent(s). Through the integration of these techniques, it will be notable which chemical agents and environmental sphere is having the most significant effect on long-term cognitive health outcomes.