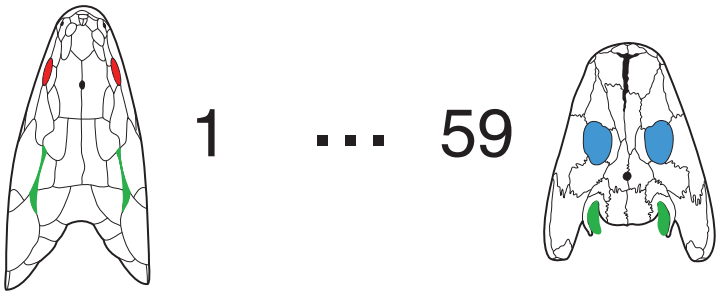
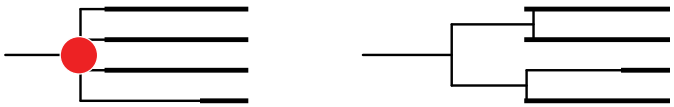
phylogenetic comparative methods

Assemble time-calibrated phylogeny of 59 taxa with skull and orbit preservation that bracket water-land transition



Measure eye socket and skull length

create distribution of 1,000 phylogenetic trees to account for uncertainties in time calibration



use computational trait evolution to identify locations of selective regime change across all 1,000 trees

computational visual ecology

Group socket lengths according to trait evolution results

Estimate pupil size for each group

Compute light fields for selected visual environments

Compute range, volume and derivatives for viewing standard object across conditions using pupil estimates