Identify critical transitions via threshold GAMs Transition Start date End date dates Time series State space Bimodality Abrupt shift Wash: Zoo Scaled metric score Critical transition Kin: Phyto 0.53 No transition Wind: Phyto 2 1970 2010 0.2 0.4 0.6 Year **Environment score** Density Levels of early warning signal assessment В Cyclopoid density (ind/ml) Daphnid density (ind/ml) 1990 2000 2010 1980 1990 2000 2010 Year Year ► Univariate ►Multivariate Univariate Computation of early warning signal Rolling window Expanding window Machine learning **Warnings** Exceed threshold +ve Kendall's tau EWS value Probability of > threshold critical transtion

Time point

Time point