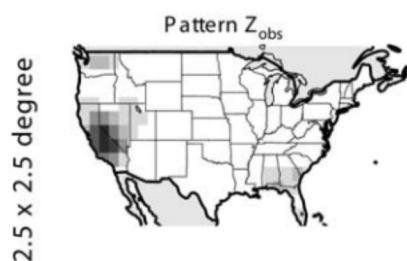


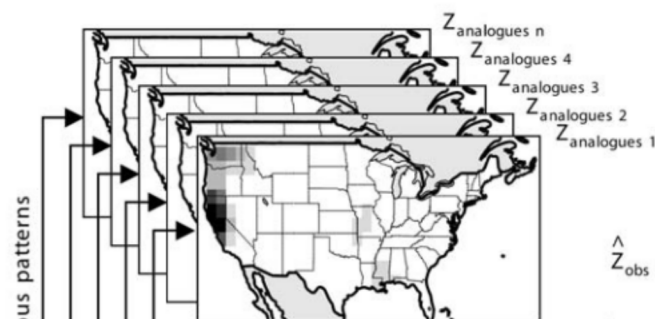
I) NEW PATTERN AT COARSE-RESOLUTION:

A new pattern obtained from a coarse resolution source, but the corresponding high-resolution (downscaled) pattern is unknown



II) FITTING THE ANALOGUE (DIAGNOSIS):

A subset of patterns from a historical library is selected as contributions to a constructed analogue of Z_{obs} based on spatial similarity evaluated at the 2.5 x 2.5 degree resolution.



III) DOWNSCALING THE PATTERN (PROGNOSIS):

A linear combination of the predictor patterns produces a least squares (constructed) analogue of Z_{obs} at 2.5 x 2.5 degree resolution

$$\hat{Z}_{obs} = A_{analogues\ 1} \cdot Z_{analogues\ 1} + A_{analogues\ 2} \cdot Z_{analogues\ 2} + \dots + A_{analogues\ n} \cdot Z_{analogues\ n}$$

Where $A_{analogues\ 1}$, $A_{analogues\ 2}$, ..., $A_{analogues\ n}$ are regression coefficients



1/8 x 1/8 degree

?



The high-resolution patterns for the same days as the coarse predictor patterns are also gathered

The downscaled pattern ($\hat{P}_{downscaled}$) is obtained by applying the same regression coefficients to the high-resolution patterns:

$$\hat{P}_{downscaled} = A_{analogues\ 1} \cdot P_{analogues\ 1} + A_{analogues\ 2} \cdot P_{analogues\ 2} + \dots + A_{analogues\ n} \cdot P_{analogues\ n}$$



Figure 3. Schematic of the method of constructed analogues for downscaling reanalysis fields from 2.5° x 2.5° grids to 1/8° x 1/8°