

## Long-range (30-day) prediction of winter persistent inversions in the Intermountain West, United States

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During the winter season, heavy rainfall events in the western United States are frequently associated with the intraseasonal oscillation (ISO). In the Intermountain West, a different weather event is gaining increasing attention, i.e. persistent inversions. Deep inversions often develop in valleys and mountain basins and frequently lead to poor air quality. A close linkage between the occurrence of wintertime persistent inversions and the 20-40 day ISO was identified. The 20-40 day ISO is a pronounced mode in the midlatitude circulations but more so, its intraseasonal timescale implies that forecasting persistent inversions in the Intermountain West is beyond the ~10 day horizon of weather forecast models. Empirical and dynamical forecasts of the ISO exhibit skill at lead times beyond two weeks, including the operational Climate Forecast System (CFS) of the NCEP which has demonstrated credible skill in predicting the ISO. Such circumstances imply that the CFS may exhibit potential in predicting the inversion development with a long lead time. These circumstances lead us to undertake an investigation of the CFS's performance skill in predicting persistent inversions for northern Utah. A model was subsequently developed and published making long-range forecast fo prolonged inversion events. The effective skill is shown to be at the 30-day range for persistent inversion events.