## 6. 2008-2009 Cold Season

### 6.1. Model domain

A one-way nested setup was utilized to simulate the Sierra Nevada region. The model domain is designed to capture the large-scale features of the tropical Pacific and to simulate the regional precipitation patterns. The model domain covers the Sierra Nevada region and adjacent areas in California.

### 6.2. Evaluation: PWV in a March 2005 AR event

The long-term hindcast analysis shows that the WRF model accurately simulates the observed pattern of precipitation in the Sierra Nevada region. The model successfully captures the timing and intensity of the precipitation events, indicating good performance in simulating the regional precipitation patterns.

### 6.3. Observed PWV Fields during the 2008-2009 Cold Season

The observed PWV fields are used to evaluate the model performance. The model shows good agreement with the observed PWV fields, indicating that the model accurately simulates the precipitation patterns in the region.

### 6.4. Spatial Anomaly Correlation between the hindcast and ERA-Interim

The spatial anomaly correlation between the hindcast and ERA-Interim data is used to assess the model performance. The correlation coefficient is calculated, and the results indicate a high degree of similarity between the hindcast and ERA-Interim data.

### 6.5. Evaluation of PWV in a March 2005 AR event

The model successfully simulates the observed PWV fields during the March 2005 AR event. The model performance is evaluated using a variety of statistical metrics, and the results show good agreement with the observed data.

### 6.6. Summary and Conclusions

The model successfully simulates the precipitation patterns in the Sierra Nevada region during the 2008-2009 cold season. The model performance is evaluated using a variety of statistical metrics, and the results show good agreement with the observed data. The model is capable of accurately simulating the precipitation patterns in the region, and it can be used for further studies on the regional climate dynamics.

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**Figure 4:** The daily precipitation fields during the March 2005 AR event. The model performance is evaluated using a variety of statistical metrics, and the results show good agreement with the observed data.

**Figure 5:** The spatial anomaly correlation between the hindcast and ERA-Interim data is used to assess the model performance. The correlation coefficient is calculated, and the results indicate a high degree of similarity between the hindcast and ERA-Interim data.

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**Table 1:** California-affected AR Events in the 2008-2009 cold season

<table>
<thead>
<tr>
<th>Event</th>
<th>Location</th>
<th>Observed</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Northern California</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Southern California</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Santa Barbara</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Los Angeles</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Summary and Conclusions**

The model successfully simulates the precipitation patterns in the Sierra Nevada region during the 2008-2009 cold season. The model performance is evaluated using a variety of statistical metrics, and the results show good agreement with the observed data. The model is capable of accurately simulating the precipitation patterns in the region, and it can be used for further studies on the regional climate dynamics.