



## **Incorporating model quality information in climate change detection and attribution studies**

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In a recent multi-model detection and attribution (“D&A”) study using the pooled results from 22 different climate models, the simulated “fingerprint” pattern of anthropogenically-caused changes in water vapor was identifiable with high statistical confidence in satellite data. Each model received equal weight in the D&A analysis, despite large differences in the skill with which they simulate key aspects of observed climate. Here, we examine whether water vapor D&A results are sensitive to model quality. We evaluate how well models reproduce the observed variability of water vapor and sea-surface temperature in different regions and on different timescales, and also assess model skill in simulating the mean state and seasonal cycle. The “top ten” and “bottom ten” models are selected with three different sets of skill measures and two different ranking approaches. The entire D&A analysis is then repeated with each of these different sets of more or less skillful models. Results indicate that our ability to identify an anthropogenic fingerprint in observed water vapor data is not impaired by inclusion of some form of “screening” based on model quality.