



## How variable is the Earth's albedo?

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Broadly speaking, changes in climate depend essentially on three basic parameters, the amount of incident sunlight, the fraction of this sunlight that is reflected by the Earth, and the trapping of the Earth's infrared radiation by clouds and greenhouse gases. While substantial efforts have been made over the past few decades at characterizing the effects of both the solar irradiance and the greenhouse gases on climate, significant questions remain regarding the Earth's reflectance -or albedo. Recent estimates of its variability from a range of sources indicate a much larger-than-expected, and not currently understood, inter-annual and decadal variability. On the other hand, if global-mean temperatures have been stable to within  $\pm 1^{\circ}C$  over the past 1000 years, this would imply high albedo stability to within some small range. This stability might be a fundamental property of the climate system (at least in the unperturbed state), which remains unexplored. Here, I will focus on the available datasets related to earth's reflectance, in order to assess the observational constraints on the models. We find a consistent picture among all datasets of an albedo decreased during 1985-2000 between 2-3 and 6-7  $W/m^2$ , which is highly climatically significant. The largest discrepancy among the datasets occurs during 2000-2004, when some present an increasing reflectance trend, while others show a steady decrease.