

SolarAnywhere forecast (Perez & Hoff)

ABSTRACT

This chapter describes, and presents an evaluation of, the forecast models imbedded in the SolarAnywhere platform. The models include satellite-derived cloud motion-based forecasts for the short to medium horizon (1-5 hours) and forecasts derived from NOAA's Numerical Weather Prediction (NWP) models for long horizons up to several days ahead. In addition the chapter describes a new high frequency (one minute) application of the cloud motion model for time horizons below one hour.

1. INTRODUCTION

SolarAnywhere is a solar resource platform that provides seamless data access from the past, to current conditions, to forecast conditions for every point in most of the North-American continent, Hawaii and the Caribbeans (SolarAnywhere, 2012).¹

1.1 Historical Data

The historical portion of SolarAnywhere covers the period of 1998 to current conditions. Irradiances are derived from the US geostationary weather satellites using a semi-empirical model of the type described in Chapter 2 (Semi Empirical Satellite Model). SolarAnywhere Standard Resolution includes hourly data geographically subsampled every 0.1° (~ 10 km) in latitude and longitude. SolarAnywhere Enhanced Resolution uses the native time and space resolution of the US geostationary satellites and provides half-hourly irradiances with a ground resolution of 0.01° (~ 1 km). Finally, SolarAnywhere High Resolution uses cloud motion (see below) to animate satellite images between consecutive half hourly native frames and produce one-minute irradiances with the native satellite's 0.01° geographical resolution. The new generation of US geostationary satellites (GOES R), which is expected to come on line in 2015, will deliver data on a 5-minute basis and this added resolution will be included in future SolarAnywhere products.

¹ Currently available in North America