Australian Government

Geoscience Australia

Solar Resource Mapping Program

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Solar Resource Mapping Project

- The project is focused on providing pre-competitive solar resource mapping for large-scale solar power development within Australia.
- funded under the solar flagship program within Department of Resources, Energy & Tourism.
- large portion of the work is a collaboration between GA and the Bureau of Meteorology

Solar Resource Mapping Project

The project can be roughly divided into 3 parts.

- Improved long term solar exposure data (GA/Bureau)
- Improved Infrastructure and Topographic Data (GA)
- Improved access to this data – Australian Solar Energy Information System
  - Usable Media Product – USB
  - Web Download
  - Web Services
  - Spatial Analysis through geoprocessing

Solar Resource Mapping Project

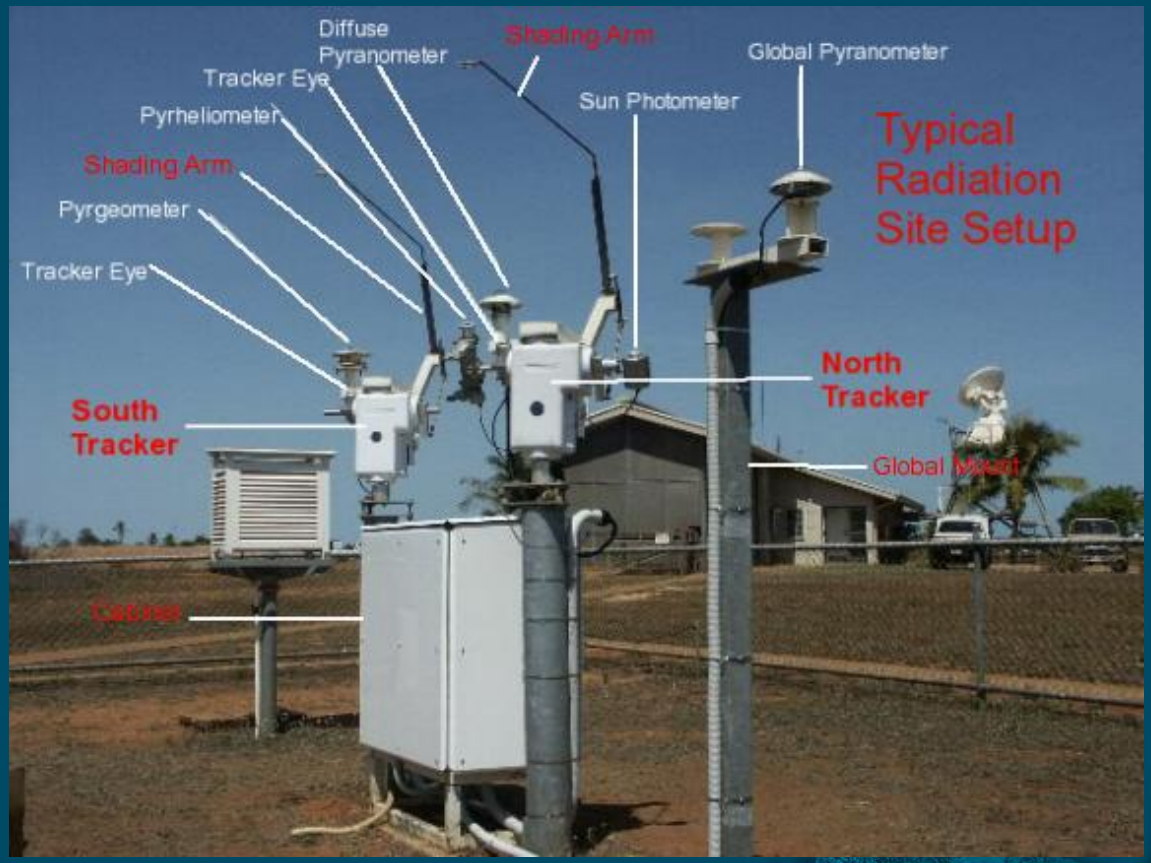
Main focus of this update is the Improved long term solar exposure data (GA/Bureau).

- 8 New Bureau high quality ground station distributed across Australia with the focus on improving solar exposure data for solar power production.
- Improvement and reprocessing of the solar exposure grid record to provide long term data for the industry
- Better understanding of how to use the data

Solar Resource Mapping Project

measured at each solar ground station:

- Direct solar irradiance (active solar tracking pyrheliometer)
- Diffuse solar irradiance (active solar tracking shaded pyranometer)
- Global solar irradiance (pyranometer)
- Downwelling infrared irradiance (active solar tracking shaded pyrgeometer)
- Direct solar spectral transmission at 412, 500, 610, 778 nm with a spectral radiometer (using active solar tracking); 368, 812 and 868 nm will be available at all current sites before September 2011.

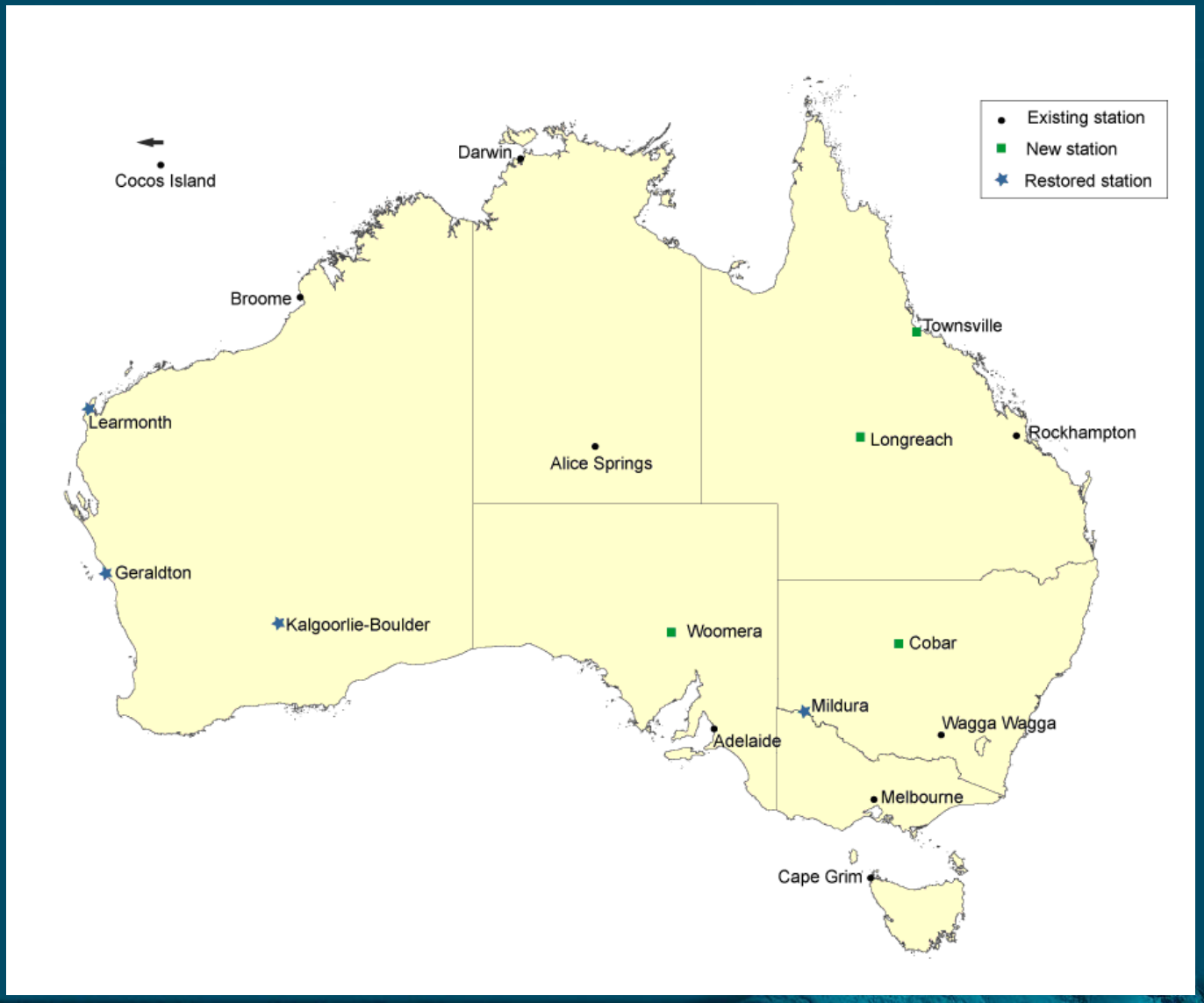


Bureau Solar Ground Station Sites

Current
- Cape Grim
- Melbourne
- Wagga Wagga
- Adelaide
- Rockhampton
- Alice Springs
- Darwin
- Broome
- Cocos Island

Additional Stations Restored
- Mildura
- Learmonth
- Kalgoorlie-Boulder
- Geraldton

New
- Townsville
- Cobar
- Woomera
- Longreach



Derived parameters

- The derived parameters obtained from each station in the expanded solar ground station network are as follows:
- 1-minute statistics of irradiance (mean, maximum, minimum, standard deviation), for each of solar direct, diffuse and global irradiance
- 1-minute statistics of downwelling infrared irradiance
- 1-second resolution sunshine duration
- Atmospheric transmission and optical depth at up to seven wavelengths
- Automated metadata on instrument and data collection performance.

Solar Resource Mapping Project

The resulting gridded solar data from the project will be approximately some 9000 grids. Each grid has cell coverage of 0.05° latitude-longitude (grid cells approximately 5 x 5 km2) and covers the Australian landmass (Fig.3). The project deliverables are as follows:

- Daily global horizontal exposure 1990 to Mar 2013 (approximately 8000+ grids).
- Monthly means of daily global horizontal exposure 1990 to Mar 2013 (279 grids).
- Monthly climatologies of hourly global horizontal exposure (216 grids - one grid for each of 18 hours for each month of the year).
- Monthly climatologies of hourly direct normal exposure (216 grids – one grid for each of 18 hours for each month of the year).
- An assessment of the uncertainty of each dataset.
- Detailed supporting information (in electronic format) to maximize the value of the final product to the industry and minimize any ongoing support required.

Australian Solar Energy Information System V1.0

Solar Exposure Data

- Australian Daily Gridded Solar Exposure Data 1990 to 2009
- Australian Hourly Global Solar Exposure Data 1998 to 2007
- Australian Monthly Solar Exposure Gridded Data 1990 to 2007
- Australian Hourly Direct Solar Exposure Data 1998 to 2007

Energy Infrastructure Data

Topographic data

- Elevation (DEM , SLOPE)
- Administration Boundaries
- Infrastructure - Roads, Railways,
- Built Up Areas, Populated Place
- Prohibited Area & Reserves
- Water Resources

Solar Resource Mapping Project Timeline

- Dec 2011 – Release of ASEIS V1.0
- June 2012 – Release of ASEIS V2.0
  - Improved Solar Exposure and Infrastructure Data
- June 2013 – Release of ASEIS V3.0
  - Web Version
  - Improved Solar Exposure Data

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