



Gridded solar observations

Ongoing solar electricity generation growth is driving the need for more timely and accurate observations of solar irradiance – a fuel source directly influenced by the weather. The Bureau is significantly enhancing gridded solar observation data for Australia.

Observations from above and below

Satellite data received by the Bureau in real-time enables detailed analysis of clouds that diffuse incoming solar radiation. Combined with atmospheric moisture, surface albedo and aerosol information, the amount of shortwave solar radiation reaching the earth's surface can be estimated. Finally, the results are calibrated using observations of downwelling solar radiation at high-quality ground-stations operated by the Bureau. A new solar model will be implemented to enable real-time delivery of gridded observation data.

Current data offering

Every 3-6 months, the Bureau publishes hourly gridded solar irradiance observations covering Australia. This data is available through Climate Data Services and is processed manually in batches. The data is not currently available in real-time as manual quality control and processing is required.

Key changes

The new solar model output produced in near real-time will be calibrated using quality-controlled ground-based observations. The new product will have the following characteristics:

- 2x2 kilometre spatial resolution
- 10-minute temporal resolution
- Available within 30-minutes of each satellite observation
- Global Horizontal Irradiance (GHI) and Direct Normal Irradiance (DNI) fields



These changes will significantly enhance the utility of the Bureau's solar data and support real-time applications.

Applications

The new gridded solar observations product could be used for:

- Real-time system operation
- Monitoring solar generation performance
- Independent verification of other instruments and systems
- Planning and analysis
- Research and innovation

Implementing changes

The Bureau, together with strategic partners, is undertaking a project to deliver these enhancements by early 2021. Further information about the final products and how to access them will be provided in late-2020.

More information

For more information about this exciting project, contact:

Simon Troman: simon.troman@bom.gov.au

Max Gonzalez: maxwell.gonzalez@bom.gov.au