Monitoring the Climate System with Satellites

Introduction

This 2-hour module describes the unique role that environmental satellites play in monitoring the Essential Climate Variables (ECVs) that are key for measuring the climate system. Satellites are uniquely positioned to provide broad, spatially consistent, and continuous global sampling of many ECVs.

The module begins by reviewing how satellites observe key atmospheric elements and features that are found in a variety of climate cycles. From there, it explores events at the different scales (from seasonal to long-term) and the contributions that satellites make to improving our understanding, monitoring, and prediction of them. Finally, it discusses the challenges involved in monitoring climate with satellites.

Objectives

After completing this module, learners will be able to:

- Describe the Essential Climate Variables and the role that satellites play in monitoring them
- Identify the benefits of monitoring Earth’s climate with satellites
- Describe the scales of climate and how satellites contribute to monitoring some of the key cycles at each scale
- Scientific and technical challenges of using satellites to monitor climate and the importance of international coordination

References

The following resources provide additional information on the topics presented in this module.


GCOS (Global Climate Observing System), Web pages and documents sourced 2011. (Available online at http://www.wmo.int/pages/prog/gcos/)


GOSIC (Global Observing Systems Information Center), Web pages sourced 2011. (Available online at http://gosic.org)


NASA Earth Observatory, Web pages sourced 2011. (Available online at http://earthobservatory.nasa.gov/)


NOAA Environmental Visualization Laboratory, Web pages sourced 2011. (Available online at http://www.nnvl.noaa.gov)


NOAA NESDIS STAR (Center for Satellite Applications and Research), Web pages sourced 2011. (Available online at http://www.star.nesdis.noaa.gov/star/)


