

Summary:

The Nimbus-7 Earth Radiation Budget (ERB) instrument began recording data on November 16, 1978 and continued through June 20, 1980. The principal products are nine years of global albedo, outgoing longwave, and net radiation plus continuing solar irradiance measurements. The presence of an associated six-year Nimbus-7 global cloud data set enhances the usefulness of the ERB products. Chief uses of the data include studies in regional energy heat budgets, the improvement of climate and weather prediction models, interannual climate variations, shortwave bidirectional reflectance from Earth atmosphere scenes, and solar physics.

The spacecraft housed eight distinct subsystems and/or experiments for monitoring different aspects of the Earth and its environment.

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1. Project/Campaign Overview:

Name of Project/Campaign:

Nimbus-7 Earth Radiation Budget (ERB)

Project/Campaign Introduction:

See Summary.

Project/Campaign Mission Objectives:

The Nimbus-7 mission afforded an opportunity to conduct a variety of experiments in the pollution, oceanographic and meteorological disciplines. The mission also extended and refined capabilities demonstrated by experiments on previous Nimbus observatories. Specific objects of the mission were as follows:

- To observe gases and particulates in the atmosphere for the purpose of determining the feasibility of mapping sources, sinks, and dispersion mechanisms of atmospheric pollutants.
- To observe ocean color, temperature, and ice conditions, particularly in coastal zones, with sufficient spatial and spectral resolution to determine the feasibility of applications such as (a) detecting pollutants in the upper level of the oceans, (b) determining the nature of materials suspended in the water, (c) applying the observations to the mapping of sediments, biologically productive areas, and interactions between coastal effluents and open ocean waters, and (d) demonstrating improvement in ship route forecasting.
- To make quantitative measurements of air-surface boundary conditions (e.g., soil moisture, snow and ice cover, sea surface temperature and roughness, and albedo) or of precipitation, and to improve long-range weather forecasting in support of the Global Atmospheric Research Program.
- To continue to make baseline measurements of variations of long wave radiation fluxes outside the atmosphere and atmospheric constituents for the purpose of determining the effect of these variations on the Earth's climate.

Discipline(s):

Earth Science

Geographic Region(s):

Global coverage.

Detailed Project/Campaign Description:

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2. Data Availability:**Data Type(s):**

All data currently archived at the Langley DAAC are in native format.

Input/Output Media:

Data are available via FTP and on 4mm, 8mm, and DLT tapes from the Langley DAAC.

Proprietary Status:

There is no proprietary status for the data sets currently on-line at the Langley DAAC.

3. Data Access:**Data Center Location:**

Langley DAAC User and Data Services Office
NASA Langley Research Center
Mail Stop 157D
Hampton, Virginia 23681-2199
USA
Telephone: (757) 864-8656
FAX: (757) 864-8807
E-mail: support-asdc@earthdata.nasa.gov

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E-mail: support-asdc@earthdata.nasa.gov

Associated Costs:

Currently, there is no charge for media.

4. Principal Investigator Information:

H. Lee Kyle (P.I.)

5. Submitting Investigator Information:

H. Lee Kyle (P.I.)



6. References:

- Ardanuy, P. e., and H. Jacobowiz. A calibration technique combining ERB parameters from different remote sensing platforms into a long-term data set, *J. Geophys. Res.*, **89** (D4), June 30, 1984.
- Ardanuy, P., and J. Rea. Degradation asymmetries and recovery of the NIMBUS 7 earth radiation budget shortwave radiometer, *J. Geophys. Res.*, **89** (D4), June 30, 1984.
- Arking, A., and S. K. Vemury. The NIMBUS 7 ERB data set: A critical analysis, *J. Geophys. Res.*, **89** (D4), June 30, 1984.
- Barkstrom, B. R., and J. B. Hall. Earth radiation budget experiment (ERBE): An overview, *J. Energy*, **6**, 141-146, 1982.
- Davis, P. A., E. R. Major, and H. Jacobowitz. An assessment of NIMBUS 7 ERB shortwave scanner data by correlative analysis with narrowband CZCS data. *J. Geophys. Res.*, **89** (D4), June 30, 1984.
- Hickey, J. R., and A. R. Karoli. Radiometer calibrations for the earth radiation budget experiment, *Appl. Opt.*, **13**, 523-533, 1974.
- Hickey, J. R., B. M. Alton, F. J. Griffin, H. Jacobowitz, P. Pellegrino, and R. H. Maschhoff. Indications of solar variability in the near UV from the Nimbus 7 ERB experiment, paper presented at Third Scientific Assembly, IAMAP, Hamburg, Fed. Repub. Ger., Aug. 17-28, 1981.
- Jacobowitz, H., L. L. Stowe, and J. R. Hickey. The earth radiation budget (ERB) experiment. The Nimbus-7 User's Guide, pp. 33-69, NASA Goddard Space Flight Center, Greenbelt, MD, 1978.
- Jacobowitz, H., R. J. Tighe, and the NIMBUS 7 Experiment Team. The earth radiation budget derived from the NIMBUS 7 ERB experiment, *J. Geophys. Res.*, **89** (D4), June 30, 1984.
- Kyle, H. L., F. B. House, P. E. Ardanuy, H. Jacobowitz, R. H. Maschhoff, and J. R. Hickey. New inflight calibration adjustment of the NIMBUS 6 and 7 earth radiation budget wide-field-of-view radiometers, *J. Geophys. Res.*, **89** (D4), June 30, 1984.
- Maschhoff, R., A. Jalink, J. Hickey, and J. Swedberg. NIMBUS earth radiation budget sensor characterization for improved data reduction fidelity, *J. Geophys. Res.*, **89** (D4), June 30, 1984.
- Predmore, R. E., H. Jacobowitz, and J. R. Hickey. Exospheric cleaning of the earth radiation budget solar radiometer during solar maximum, *Proc. Soc. Photo.-Opt. Instrum. Eng.*, **338**, 104-113, 1982.
- Raschke, E., T. H. Vonder Haar, W. R. Bandeen, and M. Pasternak. The Annual Radiation Balance of the Earth-Atmosphere System During 1969-1970 From Nimbus-3 Measurements, NASA Tech. Note 7249, 1973.
- Smith, W. L., D. T. Hilleary, H. Jacobowitz, H. B. Howell, J. R. Hickey, and A. J. Drummond. Nimbus-6 Earth Radiation Budget Experiment, *Appl. Opt.*, **16**, 306-318, 1977.
- Soule, H. V., Earth Radiation Budget (ERB) Calibration Algorithm History, Research, and Data Systems, Contract. Rep. CR 170515, NASA, Greenbelt, MD, 1983a.
- Soule, H. V., Nimbus 6 and 7 Earth Radiation Budget (ERB) Sensor Details and Component Tests, NASA Tech. Memo, 83906, 1983b.
- Suomi, N. E. The thermal radiation Balances Experiment Onboard Explorer 7, NASA Tech. Note D-608, 11, pp. 273-305, 1961.
- Taylor, V. R., and L. L. Stowe. Reflectance characteristics of uniform earth and cloud surfaces derived from Nimbus-7 ERB, *J. Geophys. Res.*, **89** (D4), June 30, 1984.
- Vemury, S. K., L. Stowe, and H. Jacobowitz. Sample size and scene identification (cloud); Effect on albedo, *J. Geophys. Res.*, **89** (D4), June 30, 1984.

7. Glossary and Acronyms:

[EOSDIS Acronyms](#) (PDF).

8. Document Information:

- **Document Revision Date:** December 11, 1997
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