History

In 1969 NASA held a brainstorming session on the contributions of space technology to the study of earth and ocean physics. The report of that meeting became known as the “Williamstown Report.” In response to the Williamstown Report, NASA created the Earth and Ocean Physics Applications Program (EOPAP) in 1972. In 1977, NASA initiated a Geodynamics Program to continue and to emphasize solid Earth research. In 1979, a Crustal Dynamics Project was formed within the Geodynamics Program to exploit the capabilities of new positioning methods emerging from space technologies. The NASA Solid Earth Science (SES) Branch was formed in 1989 by placing the Geology and Geodynamics programs under one branch.

Also in 1979, the Jet Propulsion Laboratory (JPL) created its own Crustal Dynamics Project, with Nicholas A. Renzetti as Manager. JPL had the prime responsibility for developing a mobile Very Long Baseline Interferometer (VLBI). Additionally, JPL initiated a program of investigation into the feasibility of using Global Positioning System (GPS) satellites as radio sources for the interferometry and the development of a more practical data processing technique.

In 1984, JPL was assigned the responsibility for development of differential GPS instrumentation and data processing techniques for study of dynamics of the solid earth. In June 1988 the program responsibility at JPL was transferred to the Office of Space Science and Instrumentation, and W. G. Melbourne became project manager. Renzetti stayed in the program to negotiate with foreign agencies for the creation of a six-station global network to be coordinated by JPL for support of space missions such as Topex-Poseidon, Arisotles, and the Earth Observing System (EOS). This network, linked with the original six GPS stations, became a 12-station GPS Global Network in 1992.

Provenance

Nicholas A. Renzetti, Program Manager of JPL’s Telecommunications and Data Acquisition (TDA) Office, and creator of JPL’s geodynamics program, created the collection over a period of several years. The collection was transferred from Renzetti’s office to the JPL Archives on December 17, 1991.

Collection Arrangement and Description

The collection is arranged into several series according to subject, and arranged chronologically within each series.

Geodynamics and Crustal Dynamics Projects (Box 1-2). This series includes reports, binders dealing with JPL project and subprograms, technical memorandum, conference proceedings, and brochures.

VLBI Documents (Box 2-3). The series includes reports pertaining to NASA Very Long Baseline Interferometry Program. Included in the series are two computer data discs.

EOS Materials (Box 4-5). EOS is an international program whose goal is to advance understanding of the entire Earth system on the global scale. EOS is an integrated scientific observing system that enables a multidisciplinary study of the Earth’s critical, life-enabling, interrelated processes involving the atmosphere, oceans, land surface, polar regions, and solid Earth, and the dynamic and energetic interactions between them. Various aspects of the EOS program were known in the United States as “Mission to Planet Earth.” The goal of “Mission to Planet Earth” was to understand how the Earth works as an integrated system, to broaden the understanding of all aspects of the Earth system, to have sufficient knowledge of the intricate elements of the Earth system and to make sound policy decisions.

The series includes reports, bound publications, objectives, statements to Senate hearings, reference handbooks.
European Space Agency (ESA) Materials (Box 5). ESA is a multi-national organization of fourteen European nations that work together and pool their resources in space exploration and the development of new technologies. ESA is a major partner in the EOS project.

GPS Documents (Box 6-7). The Global Positioning System is a satellite-based navigation system that provides precise three-dimensional position, velocity, and timing information to properly equipped users anywhere on or near the Earth. This series consists primarily of reports.

Earth System Sciences Committee (ESSC) Materials (Box 8). ESSC was created in November 1983 by the NASA Advisory Council to review scientific objectives for the study of Earth as a System, to devise an implementation strategy for meeting those objectives, and to define NASA’s role in such a program. Scientific program addressing the fluid subsystem, biogeochemical cycles, Solid Earth processes such as plate tectonics, and observing system integration. This series consists of minutes, and attachments, agendas, and reports.

Geodynamics Program Review (Box 8). The series consists of spiral-bound reviews and assessments of all the programs within the Geodynamics Program, including investigations.

JPL Geodesy and Geophysics Preprints (Box 9). This series of “preprints” includes widely distributed articles that were in the process of publication. The collection was compiled by the JPL Geodynamics Program.

National Research Council (Box 10). This series consists primarily of bound publications dealing with geodesy, and a few reports.

Conference Proceedings (Box 11-12). This series includes proceedings of conferences in which JPL employees had a major role in.

Miscellaneous JPL Publications/Documents (Box 12). This includes other JPL- created documents.

NASA Technical Memoranda (Box 13): Primarily annual reports of NASA Geodynamics Program.

Miscellaneous NASA Publications (Box 14): This includes other NASA-created documents.

Miscellaneous (Box 15): Single documents that did not fit into any of the above categories.

Conservation/Preservation
Standard preparations of documents for long term storage were completed. Some NASA and JPL technical reports were bound publications. They were not foldered, but were treated as a separate file in the folder list below.

Separation Statement
No items were separated from the collection.

Finding Aids
No other finding aids exist for the collection.

FILE FOLDER LIST

Box 1 of 15 – Geodynamics and Crustal Dynamics Programs
Fld. 1 JPL Interoffice Memorandum, N. A. Renzetti to JPL Archives, Earth Science Correspondence and Literature, dated December 16, 1991.
Fld. 2 NASA Contractor Report 1579- The Terrestrial Environment: Solid Earth and Ocean Physics, April 1970 (“Williamstown Project”)
Fld. 3 Henry F. Fliegel, Marvin Gantsweg, P. S. Callahan, JPL Technical Memorandum 33-725: LIBRA: An Inexpensive Geodetic Network Densification System, August 15, 1975
Fld. 4 1978 NASA Geodynamics Subprogram (binder, Folder 1 of 3)
Fld. 5 (Folder 2 of 3)
Fld. 6 (Folder 3 of 3)
Fld. 7  NASA Plan for International Crustal Dynamics Studies, April 1979
Fld. 8  Anne B. Kahle, John P. Schledge, Michael J. Abrams, Ronald E. Alley,
        Catherine J. LeVine, JPL Publication 81-55: Geologic Application of Thermal Inertia
        Using HCMM Data, September 15, 1981 (bound)
Fld. 9  brochures, 1981-83
Fld. 10 Federal Implementation Plan for the Application of Space Technology to
        Crustal Dynamics and Earthquake Research, June 1992 (bound)
Fld. 11 Fifth Annual NASA Geodynamics Program and Crustal Dynamics Project
        Review, January 24-28, 1983 (bound)
Fld. 12 L. S. Walter, NASA Conference Publication 2325: Geodynamics, February
        15-18, 1993 (bound)
Fld. 13 P. Liebrecht, R. Kolenkiewicz, J. Ryan, L. Hothem, NASA Technical
        Memorandum 85003: Crustal Dynamics Project (Session IV)
        Validation and Intercomparison Experiments 1979-80, March 1983
Fld. 14 Crustal Dynamics Project: Water Vapor Radiometer Functional
        Requirements, February 20, 1984 (bound)
Fld. 15 L.A. Buennagel, P.F. MacDoran, R.E. Neilan, D.J. Spitzmesser, L.E.
        Young, JPL Publication 84-16: Satellite Emission Range Inferred
        Earth Survey (SERIES) Project: Final Report on Research and
        Development Phase, 1979 to 1983, March 1, 1984
Fld. 16 Sixth Annual Conference on the NASA Geodynamics Program, May 14-
        17, 1984, Cincinnati, OH.

Box 2 of 15
Fld. 17 NASA Conference Publication 2390: Geopotential Research Mission
        (GRM), October 29-31, 1984 (bound)
Fld. 18 G. M. Resch, M.C. Chavez, N.I. Yamane, K.M. Barbier, R.C. Chandlee,
        JPL Publication 85-14: Water Vapor Radiometry Research and
        Development Phase Final Report, April 1, 1985 (bound)
Fld. 19 Seventh Annual Conference on the NASA Geodynamics Program, May 27-
        31, 1985, Baltimore, MD.
Fld. 20 Science, 12 September 1986 (serial)
Fld. 21 Proposal for the Development of an Advanced Geophysical Observatory
        in Southern California, Nov. 11, 1987
Fld. 22 Measurements of Present Day Crustal Movements in the India-Eurasia
        Collision Zone, Feb. 28, 1990
Fld. 23 NASA Research Announcement: Dynamics of the Solid Earth, December
        28, 1990
Fld. 24 Satellite Laser Ranging, July 1991
Fld. 25 General Correspondence, 1988-1991

Very Long Baseline Interferometry (VLBI) Documents
Fld. 26 NASA Very Long Baseline Interferometry Programs, Status and Plans,
        December 1979
Fld. 27 Technical Summary of NASA Very Long Baseline Radio Interferometry
        Programs, Status and Plans, December 1979 (bound)
Fld. 28 Henry Fliegel, JPL Publication 81-16: Session III of the VLBI/Laser
        Intercomparison Task of the NASA Crustal Dynamics Project,
        November 1, 1981 (bound)
Fld. 29  JPL 1700-7: Operational Mobile VLBI Data Acquisition System (MV-3), July 15, 1982.

**Box 3 of 15**

Fld. 30  JPL 1700-11: Operational Mobile VLBI Data Acquisition System (MV-3), Design Requirements, December 1, 1982


Fld. 32  JPL 1700-50: Mobile Very Long Baseline Interferometry System: Mojave Base Station Functional Description, June 1, 1984.


Fld. 36  CDP Data Analysis—1990 VLBI Geodetic Results 1979-1989 (two double-sided computer discs, inside a mailer)

**Box 4 of 15 – Earth Observing System (EOS) Materials**


Fld. 38  Earth System Science- A Program for Global Change- A Preview, May 1986


Fld. 49  EOS-2 Meeting Notes/Statement, December 1987

Fld. 50  GPS Geoscience Instrument for EOS and Space Station, July 15, 1988

Fld. 51  Mission to Planet Earth (materials removed from binder), 1989

Science Objectives for the GPS Geoscience Instrument (GGI) on EOS and Space Station Freedom, December 7, 1989

NASA Earth Science and Applications Division, The Highlights of 1989 (bound)

Box 5 of 15

NASA Goddard Space Flight Center, 1990 EOS Reference Handbook (bound)

Senate Committee on Commerce, Science and Transportation, Subcommittee on Science, Technology and Space- Hearing on the Mission to Planet Earth, April 3, 1990

Functional Requirements for the GPS Geoscience Instrument on EOS, August 10, 1990


EOS pamphlets, n.d.

Box 6 of 15 – Global Positioning System (GPS) Materials

Interagency Coordination Plan for Development of the Application of the Navstar GPS for Geodetic Surveying, July 1980


J. B. Thomas. JPL Publication 88-15: Functional Description of Signal Processing in the Rogue GPS Receiver, June 1, 1988 (bound)


Jeffrey T. Freymueller, Matthew P. Golombek, “Geometry and Treatment of Fiducial Networks: Effect on GPS Baseline Precision in South


Fld. 74 The GPS Global Tracking Network: Precise GPS Station Description, February 22, 1989


Fld. 76 James Kellogg, Timothy Dixon, Ruth Neilan, “CASA: Central and South America GPS Geodesy” *Eos*, vol. 70, no. 24, June 13, 1989

Fld. 77 GGI Global Positioning System Geoscience Instrument, July 1989


Fld. 79 Lindqwister, Lichten, Blewitt, “Precise Regional Baseline Estimation Using A Priori Orbital Information”, November 1989

Fld. 80 JPL/NASA Quarterly Review, GPS-Based Geodesy System, Development and Deployment, 23 February 1990 (bound)

Fld. 81 Selected Papers on The First Epoch Global Positioning System (GPS) Campaign in Central and South America (CASA UNO), From *Geophysical Research Letters*, vol. 17, nos. 3 & 5, 1990


Fld. 84 Geodynamics Program, GPS Experiment Summary, June 1990 (bound)

Fld. 85 California Permanent GPS Array (PGGA) System Development, July 1990

Fld. 86 J.A. Scheid, Global Positioning System, Data and Information System, Development Plan, Geodynamics Program, Office of Space Science and Instruments, Jet Propulsion Laboratory, August 8, 1990 (bound)

Fld. 87 GPS Applications to Space-Based Remote Sensing Missions: Coping with Denial of Accuracy, August 27, 1990

Fld. 88 Yoaz E. Bar-Sever, et al., “GPS-Based Orbit Determination and Point Positioning Under Selective Availability” 1990

Fld. 89 Draft- Global Positioning System- Mailing and Telephone Directory, October 1990

**Box 7 of 15**

Fld. 90 The First GPS IERS and Geodynamics Experiment- Newsletter #1, October 20, 1990


Fld. 92 The First GPS IERS and Geodynamics Experiment- Newsletter #2, November 21, 1990
Fld. 93  Global Positioning System – Mailing and Telephone Directory, December 1990
Fld. 94  Review of the GPS-Based Geodetic System, Geodynamics Program, Office of Space Science and Instruments, Jet Propulsion Laboratory, January 21-22, 1991 (bound)
Fld. 95  Standards for the Selection, Implementation and Operation of a GPS Station, February 1991
Fld. 96  “Guidance from Above in the Gulf War” *Science* March 1, 1991
Fld. 97  Space Geodetic Measurement Sites Subcommission Newsletter, April 1991
Fld. 98  TDA Senior Staff Meeting, A.L. Berman, September 1991
Fld. 99  Rogue Receiver (brochure), 1991
Fld. 100 GPS Correspondence, 1988-91
Fld. 102 N.A. Renzetti, Mission to Planet Earth, NASA-JPL Global Positioning System (GPS) Program for Geophysical and Geodetic Space Missions, August 1989 (bound)
Fld. 103 N.A. Renzetti, Mission to Planet Earth, NASA-JPL Global Positioning System (GPS) Program for Geodesy and Geophysics, November 1989 (bound)

**Box 8 of 15 – Earth System Sciences Committee (ESSC) Documents**

Fld. 105  Earth System Sciences Committee (ESSC) – A Working Framework, September 1984
Fld. 106  Funding Trends in NASA’s Space Science Program, September 1984
Fld. 108  ESSC Fifth Meeting, JPL, January 1985
Fld. 109  ESSC Meetings with attachments, October 1984-January 1985
Fld. 112  Preliminary Draft, Report on Solid Earth Geophysics, January 1985
Fld. 113  ESSC: Undetermined Report Drafts, n.d.

**Program Reviews – Geodynamics Program**

Fld. 114  Geodynamics Program, Earth Science, Office of Space Science and Instruments, Program Review, July 18-19, 1990 (bound)
Fld. 115  Geodynamics Program Review, Jet Propulsion Laboratory, February 27-March 1, 1991 (bound)

**Box 9 of 15 – JPL Geodesy and Geophysics Preprints**

Satellite Tracking System for Precise Positioning” March 1985
Fld. 129 No. 172: Geoffrey Blewitt, “Carrier Phase Ambiguity Resolution for the Global Positioning System Applied to Geodetic Baselines up to 2000 km” March 1989
October 1989


Fld. 140 No. 205: Raymond Hide, Jean O. Dickey, “Earth’s Variable Rotation” December 1990

Box 10 of 15 – National Research Council Materials


Fld. 144 NRC Committee on Earth Sciences, “A Strategy for Earth Science from Space in the 1980’s, Part 1: Solid Earth and Oceans” 1982

Fld. 145 NRC Panel on a Multipurpose Cadastre, *Need for a Multipurpose Cadastre*, 1980 (bound)

Fld. 146 NRC Geodynamics Committee, *Geodynamics in the 1980’s*, 1980 (bound)

Fld. 147 NRC Committee on Geodesy, *Geodetic Monitoring of Tectonic Deformation- Toward a Strategy*, 1981 (bound)


Fld. 149 NRC Committee on Geodesy, *Seafloor Referenced Positioning: Needs and Opportunities*, 1983 (bound)

Fld. 150 NRC Committee on Geodesy, *Geodesy: A Look to the Future*, 1985 (bound)

Fld. 151 NRC Committee on Geodesy, *Current Problems in Geodesy*, 1987

Fld. 152 NRC Committee on Geodesy, *Geodesy in the Year 2000*, 1990


Fld. 154 Major Directions for Space Science: 1995-2015, Interim Executive Summary, December 1984

Fld. 155 Major Directions for Space Science: 1995-2015, Executive Summary, December 1984

Box 11 of 15 – Conference Proceedings


Fld. 159 International Symposium on Space Techniques for Geodynamics, Sopron, Hungary, 1984, Miscellaneous Items
170 International Union of Geodesy and Geophysics, Vancouver,
British Columbia, Canada, August 9-22, 1987 (ten reports, together
in a slip-case) titles: Planetology, Oceanography, Atmospheric
Sciences, Vulcanology Geochemistry and Petrology,
Tectonophysics, Solar-Planetary Relationships, Seismology,
Geodesy, Hydrology, Geomagnetism and Paleomagnetism.
(bound)

Box 12 of 15
Fld. 171 Proceedings of the 13th International Cartographic Conference, Morelia,
Mexico, 12-21 October 1987, Vol. I (bound)
Fld. 172 Vol. II (bound)
Fld. 173 Vol. III (bound)
Fld. 174 Vol. IV (bound)

Miscellaneous JPL Publications
Fld. 175 R. H. Evans, S. S. Kent, J. B. Seidman, JPL Pub. 80-40: Satellite Remote
Sensing Facility for Oceanographic Applications, July 1, 1980
(bound)
Fld. 176 Richard L. Anglin, Jr., JPL Pub. 80-70: Stereosat: A Proposed Private
Sector/Government Joint Venture in Remote Sensing from Space,
August 1, 1980 (bound)
Fld. 177 W. H. Cannon, JPL Pub. 82-28: A Survey of the Earth’s Rotation,
November 1, 1981 (bound)
Fld. 178 (no author listed), JPL Pub. 83-34: Satellite-Derived Sea Surface
Fld. 179 F. H. Wright, ed. JPL D-752: Remote Sensing at JPL, Revision 1, 1984
(bound)
Fld. 180 Elmer Christensen, Flat-Plate Solar Array Project: 10 Years of Progress,
October 1985 (bound)
Fld. 181 J. P. Ford, J. B. Cimino, B. Holt, M. R. Ruzek, JPL Pub. 86-10: Shuttle
Imaging Radar Views the Earth From Challenger: The SIR-B
Experiment, March 15, 1985 (bound)
Fld. 182 Jo Bea Cimino, Benjamin Holt, Annie Holmes Richardson, JPL Pub. 88-
2: The Shuttle Imaging Radar (SIR-B) Experiment Report, March 15, 1985 (bound)

Box 13 of 15 – NASA Technical Memoranda
Fld. 183 NASA Technical Memorandum 81978: NASA Geodynamics Program:
Annual Report for 1979, May 1980 (bound)
Fld. 184 NASA Technical Memorandum 84010: NASA Geodynamics Program:
Annual Report for 1980, October 1981 (bound)
Fld. 185 NASA Technical Memorandum 85126: NASA Geodynamics Program:
Annual Report for 1981, August 1982 (bound)
Fld. 186 NASA Technical Memorandum 87359: NASA Geodynamics Program:
Fifth Annual Report, October 1984 (bound)
Fld. 187 NASA Technical Memorandum 4065: NASA Geodynamics Program
Fld. 188 NASA Technical Memorandum 4220: NASA Geodynamics Program:
Annual Report and Bibliography, August 1990 (bound)
Catalog Description
4.5 cu. ft. (15 boxes)

The collection consists of material relating to various Earth science projects conducted by the Jet
Propulsion Laboratory, NASA, and the European Space Agency. Primary focus in the collection is toward
géodésie, the study of the Solid Earth, geodynamics, and crustal dynamics.

The collection is divided into fourteen series: Geodynamics and Crustal Dynamics Programs, Very
Long Baseline Interferometry Materials, Earth Observing System Materials, European Space Agency
Materials, Global Positioning System Materials, Earth System Sciences Committee Documents,
Geodynamics Program Reviews, JPL Geodesy and Geophysics Preprints, National Research Council
Materials, Conference Proceedings, Miscellaneous JPL Publications, NASA Technical Memoranda,
Miscellaneous NASA Publications, and Miscellaneous Items.

Tracings
Renzetti, Nicholas A.
Jet Propulsion Laboratory (JPL) – Geodynamics Program
Jet Propulsion Laboratory (JPL) – Office of Space Science and Instruments
National Aeronautics and Space Administration (NASA) – Geodynamics Program
Melbourne, William G.
Lichten, Stephen M.
Williams, James G.
Newhall, X. X.
Dickey, Jean O.
Very Large Baseline Interferometry
Earth Observing System
Global Positioning System
European Space Agency

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