

Collection Policy: SOIL, CROP AND ATMOSPHERIC SCIENCES

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1.0 TEACHING, RESEARCH AND EXTENSION PROGRAMS

1.1 Mission and emphases of the department

Soil and cropping systems management; crop physiology; soil water movement, measurement and modeling; soil chemistry and fertility; field crop production, nitrogen cycling in soil- crop systems; atmospheric phenomena, prediction, modeling; geographical information systems; soil survey; microbial degradation of organics. More information on the program can be found at the department's Web page: www.css.cornell.edu

1.2 Faculty research

There are approximately 46 faculty in the department. Although several work in more than one area, they can be roughly divided as follows:

Soils = 14
Crops = 20
Atmosphere = 12.

Research is tending away from classical agronomy to the science of soil, crop, air. More emphasis is on the environment, less on agriculture.

1.3 Graduate program

The Field of Soil, Crop and Atmospheric Sciences offers the Master of Professional Studies (Agriculture), the Master of Science, and the Doctor of Philosophy degrees. Students admitted to the Field may choose emphasis in any of the six Concentrations, which are:

- Atmospheric sciences
- Environmental information science
- Environmental management
- Field crop science
- Soil science
- Agronomy

There are approximately 58 graduate students.

Laboratory/field studies are analyzed by focusing on basic processes.

1.4 Undergraduate program

Approximately 40-50 undergrad majors, most of whom are emphasizing Atmospheric Sciences.

Curriculum retains basic process orientation, but now focuses to a greater degree on non- agricultural issues.

1.5 Extension activity

Faculty FTE is about 25% extension. Program areas include sustainable agriculture; soil and cropping systems management; weed science; soil/ root zone processes; manure and sludge management; water quality

1.6 Noteworthy facilities (e.g. unique classrooms, laboratories, farms, etc.)

Laboratory devoted to computer-assisted training in GIS; three research farms, several teaching laboratories for soil, crop, and atmospheric sciences.

2.0 SUBJECT DESCRIPTION AND GUIDELINES

2.1 Subject definition

Identification, understanding and management of the physical, chemical and biological processes in soils, crops, and the atmosphere that impose environmental constraints on agricultural production, land use, and environmental quality.

2.2 Subject scope

Subject interests are varied and numerous. Essentially all aspects of plant science except breeding, all areas of soil science, all areas of atmospheric science, applied physics and mathematics, applied statistics, soil mechanics, engineering related to flow in porous media, groundwater hydrology, microbiology, geology including geochemistry, land-use planning, sustainable agriculture, applied biology and related genetic engineering of crop and microbial species, simulation modeling and data acquisition, storage, and information handling. A specific list of topics includes:

Atmospheric Sciences:

- Basic principles of meteorology, such as heat balance of the earth; general and secondary circulations; air masses, fronts and cyclones; hurricanes, thunderstorms and tornadoes; atmospheric condensation.
- Meteorological observation, measurement and analysis. Weather map analysis and forecasting.
- Climate dynamics, including climate change and evolution; ice ages; greenhouse warming; the ozone hole; drought and deforestation; the evolution of climate.
- Microclimatology.
- Air pollution.
- Atmospheric modeling.
- The Engineering Library has the foremost collection of remote sensing materials, including descriptions of techniques; however, Mann collects on applications in agriculture, meteorology, and the environment.

Crop Science:

- Grain, protein, oil, fiber and sugar crops. Forage crops. Forest crops. Weeds. Tropical crops. Non-traditional crops, including crops for energy use (biomass).
- Crop growth, development and maturation, species recognition, soil and climatic adaptations, liming and mineral nutrition, herbicides and weed control, cropping sequences, management systems, crop improvement.
- Water status, environmental stresses.
- Seed science, except for vegetable seeds, which are covered by Geneva.
- Root-soil interactions, including root genetics and morphology; conservation tillage; and soil temperature.

Soil Science:

- Soil erosion, irrigation, drainage and water quality.
- Classification of soils.
- Weathering and soil genesis.
- Water status, precipitation, infiltration, evapotranspiration, groundwater, surface runoff, river meandering floods and droughts. Soil and fertilizer effects on the water source.
- Soil chemistry and microbiology.
- Soil fertility.
- The ecology of agricultural systems, including the impact of agriculture on the nutrient cycle, sustainable agriculture, effects of nitrogen fixation, acid rain, global warming and land disposal of wastes.
- Tropical soils and their function in traditional farming. Includes salt-affected soils, paddy rice cultivation and the characteristics of acid-sulfate soils.

Exclusions:

- Soils which are to be built upon are covered by the Engineering Library.

Other:

- History of farming in the U.S. from 1820 on, with an emphasis on techniques and environmental effects. Olin's History of Science collection covers other countries and time periods, as well as U.S. farming with an emphasis on governmental and political aspects.

2.3 Emerging trends in the subject area

Alternative technologies.

3.0 SPECIAL INFORMATION NEEDS AND RESOURCES

3.1 Special information needs of those working in this subject area.

Digitized availability of data bases in natural resources, social sciences, atmospheric/hydrological sciences.

USDA climate data. These data are most useful in digital form for downloading and manipulations.

CAB Abstracts

Easier availability of USGS working papers.

There is increasing interest in software; e.g., the educational software currently produced by NASA.

Large, substantial annual reports of aid organizations, such as ICRAF and CGIAR, are useful, as are databases generated by international research projects, such as ABRACOS.

3.2 Special collections or noteworthy resources in the field

3.3 Endowment funds or special funding arrangements

- o Mann Endowment -- general biology
- o Sherman -- microbiology
- o Clausen -- treatises
- o Harlan P. Banks Bookplate -- 2 books in paleobotany, coming from the Biomedical fund.

4.0 TYPES OF MATERIALS

4.1 Priorities for types of materials

See [Priorities Table](#).

Edited monographs are useful for class assignments, especially if opposing views are contained in the same volume.

Product catalogs, especially Web-based, are useful.

4.2 Format

4.3 Geographical guidelines

In priority order:

- o New York State
- o Northeastern U.S.
- o United States
- o Global

The department has many international students and has interests in agricultural techniques in diverse countries. Very specific techniques or crops in individual countries are best represented in the journal literature and USDA files.

4.4 Language guidelines

English; other languages on request. French materials, specifically those produced by ORSTOM and CIRAD, are also useful; they are not often indexed in mainstream indexes.

4.5 Chronological guidelines

Current.

5.0 OTHER RELATED LIBRARY COLLECTIONS

- Engineering Library -- engineering, hydrology, dams, geology, remote sensing, climatology, soil mechanics, climate change (all recent journals, occasional books, proceedings)
- Physical Sciences Library -- physics, chemistry, mathematics, planetary atmospheres (recent journals, books, proceedings)
- Geneva -- vegetable seed science and technology, entology
- CLEARs Library -- aerial photographs, topographic maps
- Entomology

6.0 POLICY QUESTIONS, COLLECTION NEEDS, FUNDING PROBLEMS OR OPPORTUNITIES

There is a new cross-college major called the Science of Earth Systems, in which SCAS is heavily involved. Materials, e.g., in paleoclimatology, are needed to support this major. A new Environmental Sciences major is contemplated. This major would require some basic textbooks.

7.0 PRINCIPAL LC CLASSES

QH84.8
QL 110
QR 111
S590-667
SB 973+
TD 878+

8.0 RELATED COLLECTION POLICIES

- Agricultural and Biological Engineering
- [NATR](#)
- [FLOR](#)
- [TOXI](#)
- International Agriculture
- [PLBI](#)
- [RURL](#) -- development studies
- [ENTO](#)

Priorities Table for Soil, Crop & Atmospheric Sciences

Code	IMPORTANCE/INTENSITY CODES DEFINITIONS
NA	Not applicable to the discipline.
0	Ephemeral; of insufficient value to be provided by library.
1	Of short term interest, but with little or no enduring value; very selectively acquired; retained, uncataloged, for limited duration only, e.g. newsletters in newly emerging, poorly documented areas, and manuals or pamphlets for reserve reading.
2	Limited scholarly interest or utility; collected very selectively, but not of high priority.

3	Important for research and/or instruction; should be well represented, but collected selectively rather than intensively.
4	Very important for faculty and/or students; intensively collected, i.e. every effort is made to provide as deep coverage of this literature as possible.
5	Essential to work in the discipline; the most important type of material for research or instruction purposes. Ensuring the highest possible coverage should be the library's top priority in this discipline.

Code	SERIALS	Notes
5	Journals, scholarly	-
5	Journals, technical	-
-	Journals, other (describe)	-
5	Annual reviews, advances in...	-
4	Scientific and technical reports and research bulletins of major academies, learned societies, professional research and educational organizations and government agencies	-
5	Proceedings, of international congresses and symposia	-
4	Proceedings, national or local	-
2	Statistical series	-
4	Trade journals and periodicals	-
NA	Popular periodicals, hobby	-
2	Popular periodicals, semi-technical	-
4	Popular periodicals, farm press	-
3	Newsletters/newspapers	-
3	Proceedings of legislative bodies	-
1	Student publications	-
4	Administrative publications of major academies, learned societies, professional, research and educational organizations and government agencies	-
1	Corporate annual reports	-
1	Yearbooks	-

3	Press releases	-
NA	Lists	-
2	Working papers	-
3-4	International Research Center Annual Reports	-
Code	MONOGRAPHS	Notes
5	Major scholarly monographs	-
5	Professional and technical	-
3	Subject histories	-
4	Textbooks, upper division, graduate	-
2	Biographies	-
2	Popular monographs	-
4	Technical reports	-
3	Government reports	-
5	Proceedings, international	-
-	Proceedings, other	-
3	Theses and dissertations (outside CU)	-
-	Festschrift	-
0	Patents	-
0	Corporate histories	-
0	How-to books & lab manuals	-
1	Pamphlets	-
NA	Ephemera (describe)	-
5	Maps	-
3	Technical bulletins/handbooks/compendia	-
Code	ELECTRONIC INFORMATION	Notes

5	Applications programs	-
5	Bibliographic databases	-
4	Bulletin boards	-
4	Fulltext files	-
5	Geographic information systems	-
5	Numeric/statistical files	-
-	Other (describe, taking as much space a necessary)	-

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