

**INDIANA UNIVERSITY**  
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Department of Geography, Atmospheric Science Program  
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<http://www.indiana.edu/~climate>  
Director: Dr. Sue Grimmond

**DEGREES OFFERED**

B.A., B.S., B.S.E.S., M.A., M.S., M.S./M.S.E.S. (with School of Public and Environmental Affairs), Ph.D.

**INSTRUCTIONAL FACULTY**

C. Susan B. Grimmond (Ph.D., University of British Columbia), Associate Professor. Micrometeorology, Hydroclimatology, Field Techniques, Urban.

Sara C. Pryor (Ph.D. University of East Anglia), Associate Professor. Air Quality, Atmospheric Aerosols, Atmospheric Chemistry, Atmosphere-Surface Exchange, Synoptic Meteorology and Climatology

Scott Robeson (Ph.D. University of Delaware), Associate Professor. Climatic Change, Statistical Climatology.

Hans Peter Schmid (Ph.D. University of British Columbia), Assistant Professor. Biosphere-Atmosphere Exchange, Boundary Layer Meteorology, Micrometeorology, Turbulence.

Rebecca J. Barthelmie (Ph.D. University of East Anglia), Associate Scientist, Atmospheric Chemistry, Coastal Meteorology, Numerical Modeling.

Bennet Brabson (Ph.D. MIT), Adjunct Professor, Wind energy, Environmental Physics

Greg Olyphant (Ph.D., University of Iowa), Adjunct Associate Professor. Micrometeorology, Hydrology.

Catherine Souch (Ph.D., University of British Columbia), Adjunct Associate Professor. Paleoenvironments, Wetlands.

Philip Stevens (Ph.D. Harvard University), Adjunct Assistant Professor, Atmospheric Chemistry.

There are numerous other faculty on campus who teach related courses and conduct research in the atmospheric and hydrologic sciences.

**UNDERGRADUATE COURSES**

- G107 Physical Systems of the Environment
- G109 Weather and Climate
- G208 Human Impact on the Environment
- G235 Introductory Geographic Methods
- G237 Cartography and Geographic Information
- G250 Computer Methods in Geography
- G304 Physical Meteorology & Climatology
- G305 Environmental Change – Nature and Impact
- G336 Environmental Remote Sensing
- G338 Introduction to Geographic Information Systems
- G350 Instrumentation and Field Methods in Atmospheric Science
- G405 Hydroclimatology
- G407 Climate Dynamics
- G431 Dynamic Meteorology

- G433 Synoptic Meteorology and Climatology
- G434 Air Pollution Meteorology
- G436 Advanced Remote Sensing: Digital Image Processing
- G437 Topics in Mesoscale Meteorology
- G438 Advanced Geographic Information Systems
- G439 Topics in Geographic Information Science
- G440 Topics in Environmental Geography
- G460 Geography Internships (e.g. NWS, NCAR, Field work with faculty)
- G470 Micrometeorology
- G471 Topics in Micro and Boundary Layer Meteorology
- G472 Advanced Instrumentation and Field Methods in Atmospheric Science
- G475 Climate Change
- G477 Topics in Atmospheric Science
- G488 Applied Spatial Statistics
- G489 Atmospheric Data Analysis

## **GRADUATE COURSES**

- G505 Hydroclimatology
- G507 Climate Dynamics
- G531 Dynamic Meteorology
- G532 Physical Meteorology and Climatology
- G533 Synoptic Meteorology and Climatology
- G534 Air Pollution Meteorology
- G535 Topics in Mesoscale Meteorology
- G536 Advanced Remote Sensing: Digital Image Processing
- G538 Geographic Information Systems
- G539 Advanced Geographic Information Systems
- G540 Topics in Environmental Geography
- G570 Micrometeorology
- G571 Topics in Micro and Boundary Layer Meteorology
- G572 Advanced Instrumentation and Field Methods in Atmospheric Science
- G575 Climate Change
- G577 Topics in Atmospheric Science
- G588 Applied Spatial Statistics
- G589 Atmospheric Data Analysis
- G602 Topical Seminar in Atmospheric Science
  - Mathematical Modeling in Climatology
  - Climate Change and Variability
  - Statistical Climatology
  - Boundary Layer Meteorology
  - Urban Micrometeorology
- G830 Readings in Climatology
- G840 Research in Climatology
- G845 M.A./M.S.E.S. Research Papers
- G850 M.A./M.S. Thesis
- G860 Ph.D. Thesis

## CORRESPONDENCE COURSES

G107 Physical Systems of the Environment  
 G109 Weather and Climate  
 G304 Physical Climatology & Meteorology

## NUMBER OF DEGREES GRANTED (Fall 1997 through Summer 1999)

Bachelor's 11  
 Master's 2  
 Doctorate 0

Brooks Pearson, Ph.D. Fall 1999. An estimation of potential production of agri-based ethanol and its contribution to transportation emissions. Advisor: Sara Pryor

Justin Schoof, MS Fall 1999. Synoptic circulation classification and downscaling for the Midwestern United States. Advisor: Sara Pryor

Kelley Hook, MA Fall 1998. Development and Application of a Mathematical Time-Series Model to Simulate Daily Total Wind Energy. Advisor: Scott Robeson

Jane Southworth, MA 1997. Controls on Stomatal Conductances of Three Plant Species within an Urban Area. Advisor: Sue Grimmond

## ETHNICITY AND GENDER PROFILES

	C		AA		NA		H		AP		Other		Total	
	M	F	M	F	M	F	F	F	M	F	M	F	M	F
BA/BS	7	2							1	1			8	3
M.A./M.S.	2	1											2	1
Ph.D.	1	0											1	0
Current Undergraduate Majors	12	4											12	4
Current Graduate Majors	5	3											5	3

## GRADUATION PROJECTIONS

	99-00	00-01	01-02	02-03	03-04
Bachelors	8	8	9	10	10
Masters	2	3	3	3	3
Doctoral	2	0	1	1	2

## CAREER CHOICE OF GRADUATES (Fall 1997-Summer 1999)

	B.A./B.S.	M.A./M.S.	Ph.D.
Civilian Government	2		
Military Service			
Private Sector	4		1
University Faculty			
Other		1	
Further University Education	5	2	

Unknown

## CURRENT CAREERS OF FALL 1995 THROUGH SUMMER 1997 GRADUATES

	B.A./B.S.	M.A./M.S.	Ph.D.
Civilian Government			
Military Service			
Private Sector			
University Faculty			
Other	6	1	
Further University Education	2	1	
Unknown			

## TYPES OF STUDENT FINANCIAL SUPPORT

Associate Instructorships, Summer Associate Instructorships, Research Assistantships, Work Study, Fellowships

## GRADUATE STIPENDS

Typical graduate assistant stipends (20 h per week for two semesters)

Teaching & Research Assistantships  
M.S. Student/ Ph.D. Student \$10,950 + tuition waver + health insurance + summer funding

Some students receive supplemental fellowship support.

## RESEARCH GRANTS AND CONTRACTS

Title	PI	Sponsor	Period	Amount
Searching for anthropogenic climate change signals using non-correlation-based approaches	Legates, Davis, Robeson	NOAA/DOE	9/1/1999-8/31/00	\$50,000
Acquisition and development of instrumentation to quantify atmospheric deposition pathways.	Pryor and Barthelmie	MRI, NSF	9/1/1999-8/31/2002	\$260,000
Measurement and modeling of carbon and nitrogen dynamics in a mid-latitude deciduous forest.	Pryor, Barthelmie, Carreiro	DOE/NIGEC	7/1/1999-6/30/2002	\$446,000
Parameterizing the chemistry of atmospheric aerosols	Barthelmie and Pryor	Atmospheric Chemistry, NSF	9/1/1997-8/31/2001	\$260,000
Measurements of Fluxes and Concentrations of CO <sub>2</sub> in and over a Deciduous Forest in the Midwest: Stage II	Schmid, Grimmond	DOE/NIGEC	7/1/1999-6/30/2002	\$782,314
Determinants of Concentration and flux of CO <sub>2</sub> at a Midlatitude Forest (sub-contract, Harvard U.)	Schmid	DOE/TCP	4/1/1998-3/31/2001	\$109,784
Mass and Energy Exchange in a Northern Hardwood Forest – I.U. Subcontract (U. Michigan)	Schmid	DOE/NIGEC	7/1/1997-6/30/2000	\$298,051

Urban forestry exercises: the integration of field measurements and GIS/Remote sensing	Grimmond, Souch, Wilson	USDA FS	5/1/1999-5/1/2001	\$5500
Measurements of fluxes and concentrations of CO2 in and Over a Deciduous Forest in the Midwest	Grimmond, Schmid, Pryor, Barthelmie	DOE/NIGEC	7/1/1996-6/30/2000	\$917,844

### **SPECIAL ACADEMIC AND RESEARCH NOTES**

The Atmospheric Science group has a variety of instrumentation, laboratory, and computer facilities.

Much of the experimental work is centered on a permanent 46 m micrometeorological tower in the nearby Morgan-Monroe State Forest, to measure the exchange of carbon, nitrogen compounds, water, energy, and momentum between the forest and the atmosphere (see <http://www.indiana.edu/~co2>). The micrometeorological instrumentation at this site includes multiple systems to measure eddy covariance fluxes and turbulence statistics (3-D sonic anemometers and infra-red gas analyzers), four component radiation balance, PAR, and other micrometeorological and standard meteorological variables. Additional equipment includes a tethered balloon/radiosonde system with ozone monitoring, several fixed and telescopic micrometeorological tall towers, krypton hygrometers, 2-D sonic anemometers, 1-D sonic anemo/thermometers, data loggers and field computers.

Chemical measurement systems for atmospheric gases and particles include; two 10-stage impactors, one particle sizing probe, multiple denuder sampling levels, three continuous high precision ammonia measurement systems, high precision instrumentation for analysis of oxides of nitrogen, fast-response ozone analyzers, and two wet-dry deposition samplers. During 1999 an atmospheric chemistry laboratory has been added to the on-site facilities that includes high precision ion chromatography used for analysis of low concentration of inorganic compounds.

Departmental and University computing facilities are state of the art. Departmental equipment includes both Windows and Unix workstations (in graduate student offices and shared computing rooms), color and monochrome laser printers, slide-maker, CD-burner, etc. University facilities are largely Unix-based and provide both general-purpose and high-end research facilities (e.g., 70+ RS/6000s available in serial and parallel modes). See <http://www.indiana.edu/~uits/rac/> for more information.

Internships over the last couple of years include those with the U.S. Forest Service, National Park Service, City of Indianapolis, Smithsonian Institution, WLKY-Louisville, WISH- Indianapolis, and WNEM-Michigan. We also have excellent collaborative relationships with Indiana Department of Environmental Management (IDEM), Indiana Department of Natural Resources, and the NWS office at the Indianapolis Airport.