

LSC# 49  
Action Approved  
4-4-91

Cover Sheet  
Request for Approval to Use W-Designation

TYPE I. PROFESSOR COMMITMENT

Professor Ruth I. Shirey x2250  
Writing Workshop? May 1989; followup workshops in 1989-90.  
Proposal for one W-course - GE 252 Geog. of Latin America  
(attached)  
Agree to forward syllabi for subsequently offered W-courses? Yes.

SIGNATURES:

Professor Ruth I. Shirey  
Department Chairperson R. B. [unclear]  
College Dean R. [unclear]  
Director of Liberal Studies Chad [unclear] 4-4-91

COMPONENTS OF A PROPOSAL FOR A WRITING-INTENSIVE COURSE:

I. Writing Summary.

GE 252 Geography of Latin America is a Liberal Studies Elective and is taken by geography, Spanish, and international studies majors, as well as the student getting in depth knowledge of geography for Liberal Studies. The major objectives of the course are to allow the student to become more proficient in geographic thinking and techniques of analysis and to learn about the areas that make up Middle and South America. Writing assignments are integral in achieving both objectives.

The types of writing activities that are included in GE 252 and will be included in other geography courses taught by this instructor are:

A. Short essays of one to three pages to demonstrate mastery of important geographic concepts and/or lines of inquiry. In some cases the student is asked to use geographic concepts to analyze a piece of literature for geographic content as in the assignment that required students to use the five themes of geography to analyze the geography presented in a chapter of Paul Theroux' Old Patagonian Express. In other cases students are asked to use information and ideas from various sources to write an analysis of a subtopic associated with a class unit. The rainforest essay is an example. In a given semester three to four of these essays would be required for a

total of five to ten pages and 15-25 percent of the grade.

B. A briefing report and a paper on a country or a briefing report, country paper and a paper on a selected geographic topic. Students are to demonstrate knowledge and understanding of the geography of a particular Latin American country or topic. This is a two part assignment designed to help students understand the difference between the presentation of geographic information and geographic analysis. Students gather information and ideas from a variety of sources: factual and analytical. Students are asked to write their paper as if they had assumed the role of a geographer with a particular specialty and one of three viewpoints. Eight to fifteen pages would be required during a particular semester for 20-30 percent of the course grade.

C. A poster presentation on a topic appropriate for Geography Awareness Week or Earth Day. The poster must include graphic and written exposition and may include photographs. The writing associated with this assignment must be concise and to the point and related to the graphic representation of the particular geographic topic. Students make brief oral reports on their posters. Two pages of writing. 10 percent of course grade.

D. Written analysis of various techniques of geographic analysis such as mapping and other types of graphing, statistical analyses, etc. and written map and graphic interpretation are required. The water balance exercise is an example of this. 3-5 pages total. 10 percent of grade.

D. Students also are given ungraded assignments such as 1) writing end-of-class summaries or short essays to identify significant issues dealt with in class, 2) to stimulate class discussion, 3) to facilitate understanding of reading assignments or map analysis, and 4) note taking in class.

#### General Requirements

Students will write 20 to 22 typewritten pages for evaluation during the course of a semester. They are required to turn in note cards and outlines, draft papers as well as finished products. Time is spent in most classes discussing current assignments and opportunities to discuss writing projects is provided both in class and during office hours. Opportunities for revision are given at every stage except the end of the semester.

All written assignments for evaluation must be in standard American English (Western Pennsylvania Province), organized logically, and written with clarity. The student's writing must demonstrate a reasonable degree of mastery and application of geographic concepts and skills. Particular care is given to having the student demonstrate ability to "read" maps and other

graphics through their writing. Students are also asked to include maps and graphics in their essays and papers as an integral part of accomplishing these assignments.

Students are strongly encouraged to use correct spelling and grammar although errors seldom hinder instructor comprehension and therefore rarely affect student grades.

- II. A copy of the syllabus for GE 252 is attached.  
Note that this syllabus will be further transformed to reflect all the writing assignments required.
- III. Assignment Sheets for spring semester 1991 are attached.  
Selected illustrative assignments are included.

GE 252  
Spring 1991

### Annotated Essay on the Rainforest

I. This assignment involves writing a three-page essay on some aspect of the rainforest. The essay is to be based on your research from class notes, the NGS videotapes shown in class, the textbook and the section in the Supplemental Reader, pp. 14-29.

II. In order to do this assignment successfully you will need to narrow your focus because there is so much to consider that you cannot possibly do a good job if you try to write about everything. Therefore, here are some topic suggestions:

The Importance of the Rainforest to Indigenous Peoples  
Environmental Consequences of Rainforest Destruction:  
Local, Regional, and Global  
Population and Economic Development Pressures on the  
Rainforest  
The Scientific Importance of the Rainforest  
Strategies for Rainforest Preservation

III. Your essay must be three-pages long, double-spaced, and typed or wordprocessed. When you turn it in, you will need to demonstrate the careful planning of the essay by turning in your note cards, outline, and a draft in addition to the final product. Writing takes time; an essay dashed off at the last minute will not be acceptable. The essay also must be in standard written U. S. English with correct spelling and grammar.

IV. Since this is a geography class, a map or other graphic is most appropriate. If you include one, it cannot take up more than 1/2 page and it must be hand drawn by you. It cannot be a map or other graphic copied from one of the sources.

V. I consider this to be a very important assignment to demonstrate your understanding of the problems in rainforest regions of Latin America and of geography. Remember to at least think like a geographer: Where? Why here? What significance? Five Themes. I don't want you to write these into the paper. Just use them as a check list to make sure you are writing good geography.

VI. Good luck.

R.S.

GE 252 Geography of Latin America  
Spring 1991

The Old Patagonia Express  
Paul Theroux

USING FIVE THEMES OF GEOGRAPHY TO  
ANALYZE A BOOK

I. Having read the book, each student will analyze a chapter of the book using the five themes:

Location: Position on the Earth's Surface.

Absolute

Relative

Place: Physical and Human Characteristics.

Relationships within Places: Human and Environment

Interaction

Movement: Humans Interacting on the Earth

Regions: How They Form and Change

See the attached example for a novel, Valley of Decision about a steel family in Pittsburgh. We'll number off in class to assign your chapter.

II. Theroux tells you a great deal about the places he visited in Latin America. He frequently talks about the characteristics of places, both human and physical. He often refers to location. Movement is what his book is all about. Regions, areas with unifying similarity, are identified.

III. What to turn in: Not more than two pages, single-spaced of ideas and information categorized by the five themes. Keep in mind that you will have to make arbitrary decisions about what theme to place a particular item with.

IV. Assignments must be typewritten.

V. Due date: 2/12/91.

GE 252 Geography of Latin America  
Spring Semester 1991

Instructor: Dr. Ruth I. Shirey  
Office: Leonard 1B  
Office Hours: 8-10 Mon; 11:30-1:00 TR  
Telephone: 357-3765

Course Description: Impact of rapid population growth and economic development on the environment and spatial organization of Latin America are considered. The resource base and cultural heritage of the region are studied.

Course Objectives:

1. Expand knowledge base of Latin America.
2. Apply geographic skills to analyzing and understanding the Latin American region.
3. Write to learn.

Required Books:

Blouet and Blouet (B&B), LATIN AMERICA: AN INTRODUCTORY SURVEY. SUPPLEMENTAL READINGS (SR) FOR LATIN AMERICAN GEOGRAPHY (both of these are available at Kinkos). Theroux, Paul (TP), OLD PATAGONIAN EXPRESS, is available at the bookstore.

Course Outline:

- I. Introduction. Geography: Five Themes, Four Traditions, and Three Questions. Place names in Latin America.  
Tues., 1/22/91

\*Reading Assignment: BB, Preface; SR, outline maps, pp.1-6;  
Begin reading Theroux (TP).  
\*Prepare for cooperative learning project on Thursday.

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- II. Places, Countries and Regions of Latin America. 1/24/91.  
Cooperative Learning Project: Latin American Place Location.

\*Reading Assignment: BB, Chap. 1

Essay on "Location and Place Names in Latin America" due  
1/31/91.

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- III. Physical Environments of Latin America

Environment as God, illusion, obstacle and opportunity  
for ecological research. 1/29/91

\*Reading Assignment: SR, pp. 8-9, 14-16. Alexander von Humboldt, Geographic Pioneer, NATIONAL GEOGRAPHIC (NG). Vol. 168, No. 3 (September 1985). pp. 318-351. "Tepuis--Venezuela's Islands of Time." NG. Vol. 175, No. 5 (May 1989). pp. 526-562.

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Climates of Latin America - 1/29 & 31/91

Influence of latitude, land and water distribution and altitude; ocean currents

Genesis of climatic regions: the association between climatic types and seasonal pressure distribution

Location of climatic regions

Cooperative Learning Project: Regional Environmental Associations; Water Budgets for Selected Latin American Stations.

\*Reading Assignment: SR, pp. 10-11, "Jamaica: Hard Times, High Hopes," NG. Vol. 167, No. 1 (January 1985). pp. 114-140.

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Landforms and Landform Regions - 2/5/91

Regionalization of South America based upon Lobeck's Physiographic Diagram.

\*Reading Assignment: "The High Andes," NG. Vol. 171, No. 4 (April 1987). pp. 422-460.

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Natural Hazards of the Americas: Causes and Consequences - 2/7/91. Hurricanes, floods, volcanic eruptions, earthquakes, landslides, mudslides, drought.

\*Reading Assignment: SR, pp. 12, 13; "When the Earth Moves, Eruption in Colombia, and Earthquakes in Mexico," NG. Vol. 169, No. 5 (May 1986). pp. 638-675.

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The Rainforests of Latin America: Location, Nature and Problems. 2/12/91. Examples from Mexico, Costa Rica, Brazil and Other Amazon Basin Countries.

\*Reading Assignment: SR, pp. 14-28. "Rondonia: Brazil's Imperiled Rain Forest," NG. Vol. 174, No. 6 (December 1988). pp. 772-799. "Monkey in Peril," NG. Vol. 171, No. 3 (March 1987). pp. 387-396

Essay on "Significance and Preservation of Tropical Rainforests" due 2/19/91.

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IV. Pre-Columbian Geography of Latin America: Civilizations and Agricultural Legacies. 2/14 & 19/91.

\*Reading Assignment: B&B, Chap. 2, pp.34-44. SR, pp. 29-30, 31-36, 37-42. "Rio Azul: Lost City of the Maya," NG. Vol. 169, No. 4 (April 1986). pp. 420-451. "Exploring a Vast Maya City, El Mirador," NG. Vol. 172, No. 3 (Sept. 1987). pp. 317-339. "La Ruta Maya," NG, Vol. 176, No. 4 (October 1989). pp. 424-479.

EXAM 1 - 2/21/91

V. Conquest and Colonial Geography of Latin America. 2/26 & 28/91

\*Reading Assignment: B&B, Chap. 2, pp. 45-83. SR, pp. 43 & 44. "Columbus and the New World," NG. Vol. 170, No. 5 (November 1986). pp. 566-600. "Following the Route of Cortes," NG. Vol. 166, No. 4 (October 1984). pp. 420-459. "Acts of Faith in Chile," NG. Vol. 174, No. 1 (July 1988). pp. 54-119.

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VI. Transportation and Economic Development. 3/5 & 7/91.

\*Reading Assignment: B&B, Chap. 3. Complete TP. SR, pp. 45-119. "Panama," NG. Vol. 169, No. 4 (April 1986). pp. 466-496. "Cocaine's Deadly Reach," NG. Vol. 175, No. 1 (Jan. 1989). pp. 3-47.

\*Prepare for class discussion on TP, 3/7/91.

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VII. Population: Distribution, Growth, Migration, and Emigration. 3/19, 21 & 26/91.

\*Reading Assignment: B&B, Chap. 5. SR, pp. 119-158. "Guatemala, A Fragile Democracy," NG. Vol. 173, No. 6 (June 1988). pp. 768-695. "Nicaragua: Nation in Conflict," NG. Vol. 168, No. 6 (December 1985). pp. 776-811.

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VIII. Agriculture. 3/28 & 4/9/91.

Reading Assignment: B&B, Chap. 4. "Mexico's Heartland-- The Bajio," NG. Vol. 178, No. 6 (Dec. 1990). pp. 122-143.

Essay on "Roots of the Latin American Food Supply Problem" due on 4/9/91.



EXAM 2. 4/11/91.

IX. The Latin American City. 4/16, 18, & 23/91

\*Reading Assignment: B&B, Chap. 6. SR, pp. 160-206.  
"Mexico City, An Alarming Giant," NG. Vol. 166, No. 2  
(August 1984). pp.138-178. "Brazil--Moment of Promise and  
Pain," NG. Vol. 171, No. 3 (March 1987). pp. 348-386.

Market Area Analysis of a Latin American City and Exhibit  
for Earth Week due 4/23. Exhibits will be posted 4/23-  
25/91.

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X. Industrial Location: Mining & Manufacturing. 4/25 & 30/91

Reading Assignment: B&B, Chap. 7. SR, pp. 207 to end  
of reader. "Argentina's New Beginning," NG. Vol. 170,  
No. 2 (Aug. 1986). pp. 226-255.

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Exam 3. Final Week.

Evaluation will be based upon:

- 1) occasional geographic skill assignments (10-15 points each)
- 2) three three-page essays (25 points each)
- 3) a short research paper (50 points) and accompanying exhibit (50 points)
- 4) three objectives exams (75 points each)

Scores are recorded and grades are assigned based upon percent of total points achieved: 90 percent, A; 80 percent, B; 70 percent, C; 60 percent, D.

Class attendance is the student's right and responsibility. Students are expected to participate in the class by being present, participating in class and group discussion, and preparing all assignments by the due date. Special arrangements must be made with the instructor for makeup exams and other adjustments to the schedule and should be expected only for medical or professional reasons.

GE 252 Geography of Latin America  
Final Semester Writing Assignments

Final Assignments for the Semester

There are three parts to the final writing assignments for Geography of Latin America this semester. They involve three different types of presentations of information and ideas and are designed to allow you to demonstrate that you have learned several aspects of Latin American geography in depth.

I. & II. The first two parts of this assignment are two reports on a country in Middle America (Mexico, Central America, Panama, Greater or Lesser Antilles; check on countries in the Lesser Antilles to be sure sufficient information exists to do the assignment).

A. The first report is to be a factual briefing report on the country. Use the five themes of geography as a guide to decide what information to include. Sources of data may be your textbook and the supplemental readings book, Latin American Statistical Abstract and World Almanac, an encyclopedia, the Population Reference Bureau World Data Sheet, and the books on reserve at the Library. Organize the data topically (not by the five themes) in the report. Present the data and information clearly using phrases, and if necessary, sentences. You may include small maps or graphics, such as the country's flag, but in no case may the briefing report be more than two pages, single spaced.

B. The second report is a 7-8 page analytical paper on the geography of your selected country. You may rely on information gathered for the briefing report for the paper but must take an analytical approach in writing this second report. You must use the sections in each of the three books on your country at the reserve desk. Each of these was written by an academic geographer who is skilled in the art and science of the geographer. All are analytical in their presentation. The fundamental geographic questions, five themes, and four traditions underlie the way that they think about an area or country. Of the three books, pay greatest attention to the quality of West and Augelli, who have the reputation of having written the best regional geography textbook ever written in North America or Europe.

General guidelines for doing these two assignments:

1. Select a perspective from which to write from the following:
  - a. You are a marketing geographer with an international firm. Your job is to present information and analysis that will allow you and the firm to decide whether the country you are studying has favorable environmental, resource,

political-social-economic conditions to be considered seriously as a place for investment. Choose your own type of international firm: manufacturing, resort development, information processing, etc.

b. You are an academic historical-cultural geographer who is planning a credit field study course in Middle America. Your objective is to provide an opportunity for students to do in depth study of the country's historical geography. Write your paper as a background guide for the students in understanding the country.

c. You are a geographer with an environmental resources and preservation specialty who has been hired by an international agency to do the background research, prepare a plan, and design an implementation strategy to solve the energy supply problems of your country. The objective of your project is to increase economic growth with the minimum amount of environmental pollution of any type.

Regardless of which perspective you choose, keep in mind that your objective is to write an academic analytical paper from a geographer's viewpoint.

2. While doing research for your paper, compare the writing in encyclopedias with that in the books on reserve. Ask yourself the questions, "Where?", "Why here?", "Of what significance is this?", frequently. Keep the five themes and four traditions in mind as you decide what to include. You may choose to actually write about the themes by name as well as using them to plan your paper.
3. You may include one or two well-executed maps or other graphics in your paper. However, they must be hand- or computer-drawn. You may base the map or graphic on existent ones but may not include a copy in the paper.
4. Technical Specifications Checklist:
  - \_\_\_\_\_ 6-7 pages, double-spaced, typed or wordprocessed
  - \_\_\_\_\_ Correct spelling and grammar
  - \_\_\_\_\_ Well-organized and presented
  - \_\_\_\_\_ Hand- or computer-drawn maps and/or graphics
  - \_\_\_\_\_ Note Cards, outline, draft, and final paper must be turned in on the due date.
  - \_\_\_\_\_ Endnotes and bibliography (may be integrated)
  - \_\_\_\_\_ Please do not use a plastic cover on your paper-- A staple in the upper left hand corner is sufficient.
5. Due Date for Note Cards and Outline: April 11, 1991  
Due Date for Paper: May 2, 1991

III. Earth Day Poster. Select an environmental condition, issue or problem associated with your selected country and/or the rainforest regions of Latin America and prepare a poster presentation on that subject. The poster should include:

- \_\_\_\_\_ a title
- \_\_\_\_\_ maps and/or other graphics
- \_\_\_\_\_ photographs are optional but good to include
- \_\_\_\_\_ 4 or 5 short narrative statements of explanation of at least 50 words each. These must be typed.
- \_\_\_\_\_ list of source(s)




Due date for the posters: April 23. Come to class prepared to spend a few minutes talking about what you tried to accomplish in selecting the topic and presenting it on the poster.

Water Balance Diagrams

Definitions:

- P Precipitation (rain, snow, sleet, or hail), monthly averages in inches.
- PE Potential evapotranspiration or water need. This is the amount of soil water needed if plant growth is to be maximized. PE is roughly proportional to temperature.
- ST Soil moisture storage. For our purposes we assume the soil stores a maximum of 4 inches of water in the root zone of plants. Actually, this varies considerably from place to place depending on soil texture.
- AE Actual evapotranspiration or water use. This is the actual amount of water used from the soil. This is often less than PE when moisture in the soil is limited.
- D Moisture deficit. A moisture deficit occurs when PE is greater than P, and no water is left in the soil ( $ST = 0''$ ). It is the calculated difference between PE and AE.
- S Surplus (runoff).  $S = P - PE$  when ST is 4 inches. A surplus occurs when P is greater than PE, and the soil is full of water ( $ST = 4''$ ). The excess becomes runoff, both direct and indirect.

Procedure for constructing a water balance diagram:

1. Plot P on your graph using a black line with  as the point symbol for monthly values.
2. Plot PE using a black line with  as the point symbol for monthly values.
3. Plot AE using a black line with  as the point symbol for monthly values.

Next, look at the monthly ST values on the table for your station. If ST is always less than 4 inches, go directly to Step 5. If ST reaches 4 inches at any time during the year, following usage by plants, draw a heavy vertical line between the P and PE curves at the first month this occurs in the yearly cycle. (In this example, a heavy vertical line would be drawn between the P and PE lines in December, because ST reaches 4 inches following usage and recharge from May through November.) After this time, as long as P is greater than PE, the area between the P and PE curves represents Surplus (runoff). Color this area blue.

5. When PE is greater than AE, the area between the PE and AE lines represents moisture deficit. Color this area red.
6. When AE is greater than P, the area between the AE and P curves represents use of soil moisture. Color this area yellow.
7. When P is greater than PE, the area between the P and PE curves represents soil moisture recharge. Color this area green, up to the line you draw in Step 4.

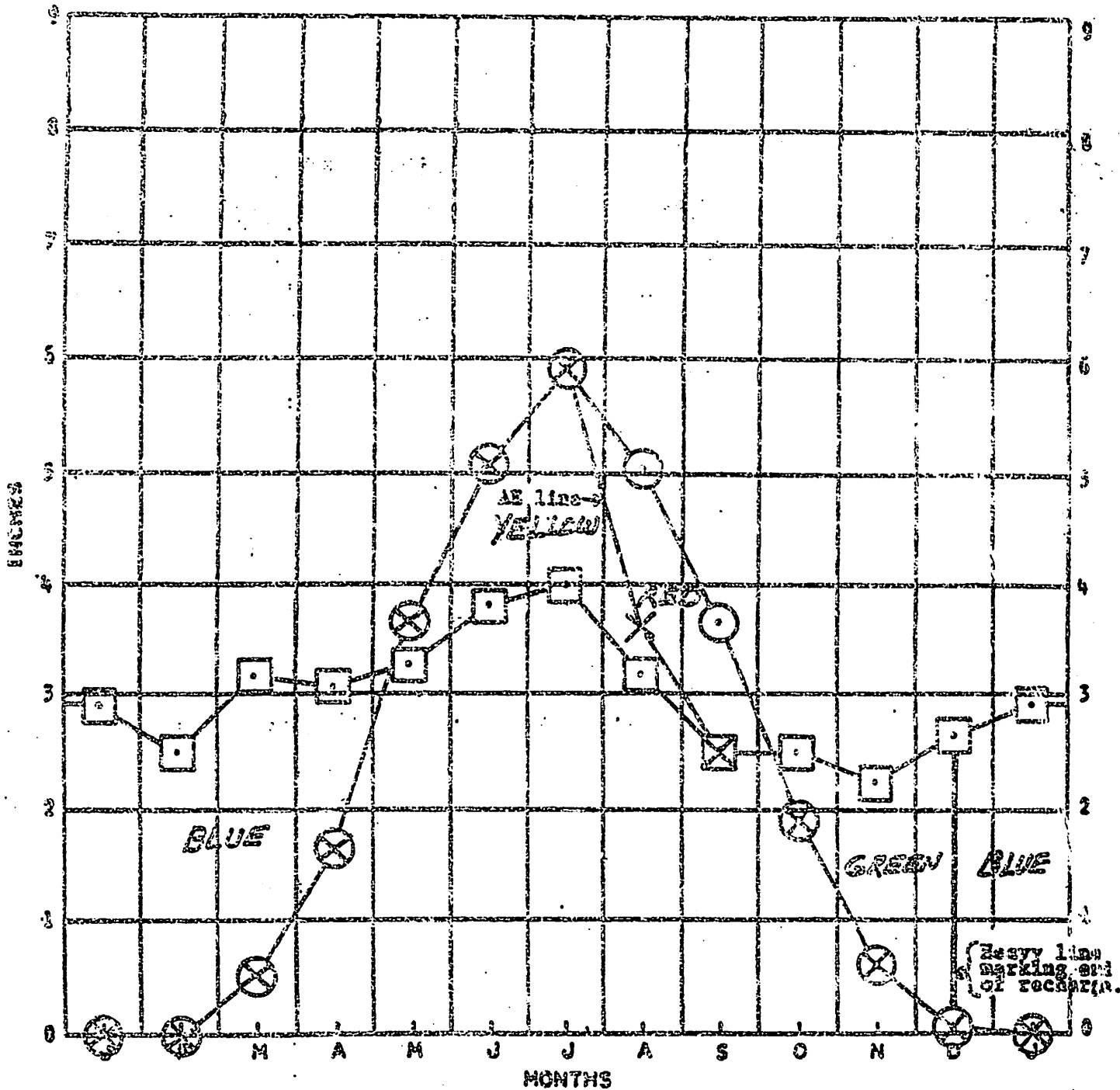
Pittsburgh, Pennsylvania

|      | <u>J</u> | <u>F</u> | <u>M</u> | <u>A</u> | <u>M</u> | <u>J</u> | <u>J</u> | <u>A</u> | <u>S</u> | <u>O</u> | <u>N</u> | <u>D</u> | <u>YEAR</u> |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|
| PE   | 0.0      | 0.0      | 0.5      | 1.7      | 3.7      | 5.1      | 5.9      | 5.1      | 3.7      | 1.9      | 0.6      | 0.1      | 28.3        |
| P    | 2.9      | 2.5      | 3.2      | 3.1      | 3.3      | 3.3      | 4.0      | 3.2      | 2.5      | 2.5      | 2.3      | 2.7      | 36.0        |
| P-PE | 2.9      | 2.5      | 2.7      | 1.4      | -0.4     | -1.3     | -1.9     | -1.9     | -1.2     | 0.6      | 1.7      | 2.6      |             |
| ST   | 4.0      | 4.0      | 4.0      | 4.0      | 3.6      | 2.3      | 0.4      | 0.0      | 0.0      | 0.0      | 2.3      | 4.0      | 25.6        |
| AE   | 0.0      | 0.0      | 0.5      | 1.7      | 3.7      | 5.1      | 5.9      | 3.5      | 2.5      | 1.9      | 0.6      | 0.1      |             |
| D    | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 1.5      | 1.2      | 0.0      | 0.0      | 0.0      | 2.7         |
| S    | 2.9      | 2.5      | 2.7      | 1.4      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.0      | 0.9      | 10.4        |

# WATER BALANCE DIAGRAM

STATION LOCATION PITTSBURGH, PA

CLIMATE HUMID CONTINENTAL



SOIL MOISTURE UTILIZATION  
 SOIL MOISTURE RECHARGE  
 WATER DEFICIT  
 WATER SURPLUS

POTENTIAL EVAPOTRANSPIRATION  
 PRECIPITATION  
 ACTUAL EVAPOTRANSPIRATION

Easy line marking end of recharge.

**EXAMPLE:** The following example shows how you should answer water balance exercise questions.

Name \_\_\_\_\_

### Water Balance Exercise

**Directions:** Plot the climatic data for your selected station on the accompanying water balance graph using the instructions provided. Then, use your constructed water balance diagram, and data, to answer the following questions. This exercise is worth 14 points.

Station location Pittsburgh, Pa. Climate Humid Continental

1. **Surplus.** During which months does surface runoff (surplus) occur at your station? Explain why the surplus period occurs using P, PE, AE and ST in your answer. If no surplus occurs, explain why it doesn't. (4 points)

Surface runoff occurs during December, January, February, March, and April. Runoff occurs because precipitation (P) is greater than potential evapotranspiration (PE), and soil moisture storage (ST) is at the maximum of 4 inches. Thus, the excess water not being used by plants, and which cannot be absorbed by the soil, becomes surplus (S). Actual evapotranspiration (AE) is equal to potential evapotranspiration (PE) during this period, because plants have more than enough water to satisfy their growth needs.

2. **Recharge.** During which month (s) does soil moisture recharge occur at your station? (2 points)

October, November and December

3. **Deficit.** During which months would it be necessary to water plants at your location? Explain why the deficit period occurs using P, PE, AE and ST in your answer. (4 points)

According to the diagram, it would be necessary to water plants during July, August, and September, since a water deficit (D) occurs during this period. The deficit occurs because potential evapotranspiration (PE) is greater than precipitation (P), and no water is left in the soil (ST = 0 in.). Actual evapotranspiration (AE) is less than potential evapotranspiration (PE) during this period, because plants do not have enough water to satisfy their needs.

**NOTE:** It is not necessary to water plants during the soil moisture usage period (yellow zone on the diagram).

4. **Accuracy and completeness** in plotting the diagram. (4 points)







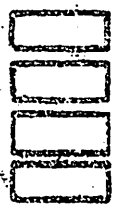
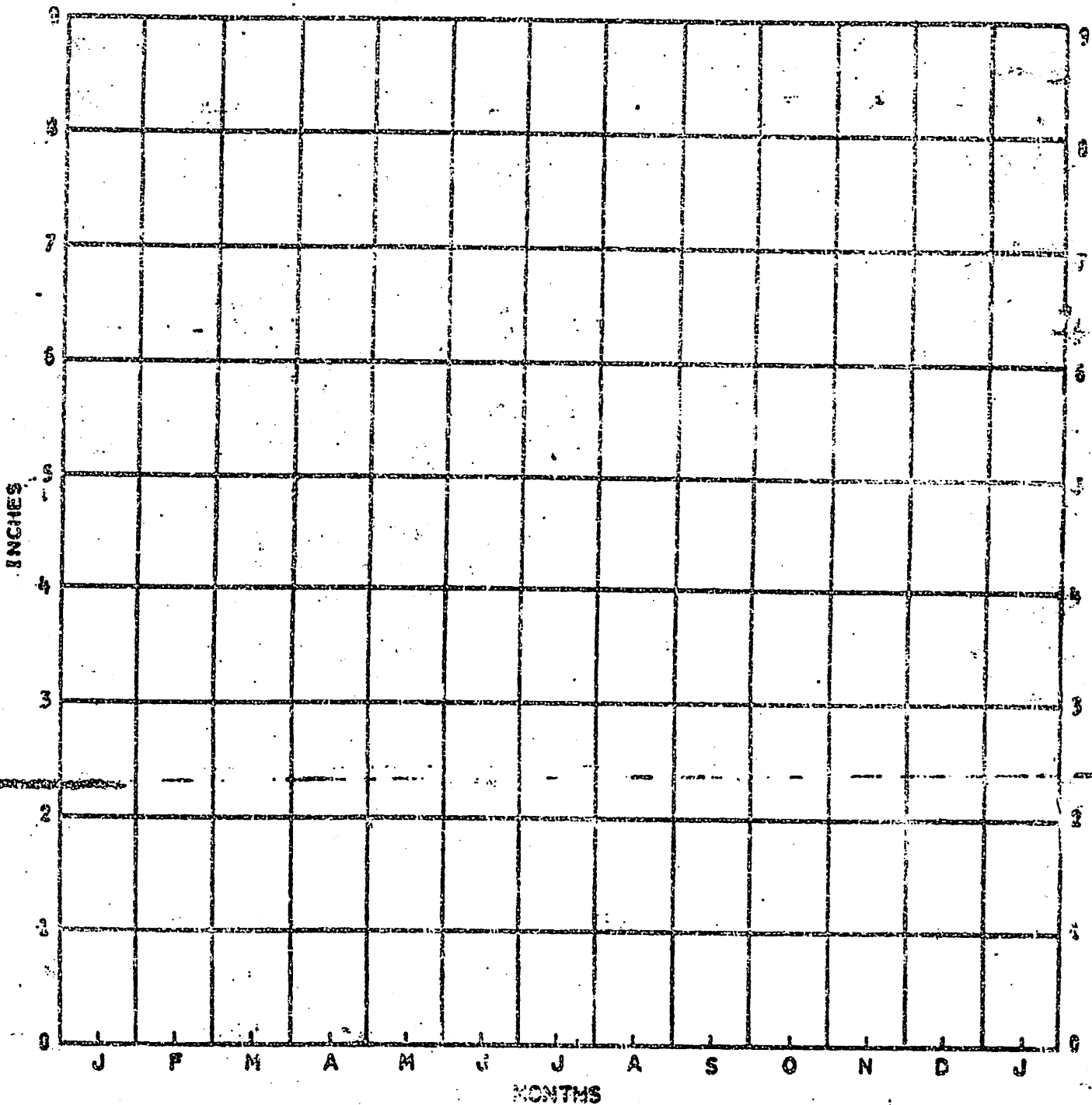




# WATER BALANCE DIAGRAM

STATION LOCATION \_\_\_\_\_

CLIMATE \_\_\_\_\_



- SOIL MOISTURE UTILIZATION
- SOIL MOISTURE RECHARGE
- WATER DEFICIT
- WATER SURPLUS
- POTENTIAL EVAPOTRANSPIRATION
- PRECIPITATION
- ACTUAL EVAPOTRANSPIRATION

Name \_\_\_\_\_

### Latin America Water Balance Exercise

Directions: Plot the climatic data for your selected station on the accompanying water balance graph using the instructions provided. Then, use your constructed water balance diagram, and data, to answer the following questions. This exercise is worth 14 points.

Station location \_\_\_\_\_ Climate \_\_\_\_\_

1. **Surplus.** During which months does surface runoff (surplus) occur at your station? Explain why the surplus period occurs using P, PE, AE and ST in your answer. If no surplus occurs, explain why it doesn't. (4 points)
2. **Recharge.** During which month (s) does soil moisture recharge occur at your station? (2 points)
3. **Deficit.** During which months would it be necessary to water plants at your location? Explain why the deficit period occurs using P, PE, AE and ST in your answer. (4 points)
4. **Accuracy and completeness in plotting the diagram.** (4 points)