

Name: _____

AGRON / MTEOR / ENSCI 406
Midterm Exam
Fall 2011

Answer each question as completely and concisely as you can. Please write clearly – if I can't read it, I can't give you credit for it. **Do not exceed the space given below the question.**

1. (20 points) On average, how do precipitation and evapotranspiration vary with latitude? What are the implications of this variation for the atmospheric moisture budget?

2. (15 points) Think of a point on Earth. On average, must shortwave radiation absorbed at this place be exactly balanced by longwave radiation emitted at this place? Explain why or why not.

3. (15 points) Suppose you were to measure the evapotranspiration in a soybean field just outside Ames at midday today. How do you think the resulting value would compare to the potential evapotranspiration for today (equal, much greater, much less, or some other comparison)? What if you had conducted the same measurements in late July? Explain your answer.

4. (20 points) Using physical principles, explain why the following statement is true: In the mid-latitudes of both North and South America, deserts tend to be found on the east sides of mountain ranges, but in the tropics, deserts tend to be found on the west sides of mountain ranges.

5. (10 points) Explain what is meant by the "geostrophic wind."

6. (20 points) We have discussed effects of the El Niño-Southern Oscillation (ENSO) on climate in the U.S. and around the world. Why is it that a disturbance in the tropical Pacific Ocean off the coast of South America can have such wide-ranging effects? Give as much *physical reasoning* as possible in your answer.