

Homework No. 3
Due Tuesday 12 September

Answer the following questions about the material in Sections 1 and 2 of:

Doswell, C.A. III, 1986: The Human Element in Weather Forecasting, *Nat. Wea. Dig.*, **11**, 6-17.

Answer on separate sheets. 20 points each.

1. According to Doswell, the weather forecasting process reduces to two basic steps. What are those two basic steps and describe them briefly?

The two basic steps are diagnosis and prognosis. In diagnosis, the meteorologist assesses the weather processes ongoing at diagnosis time on the bases of the meteorology responsible for them. In prognosis, an extrapolation is made on the basis of how these processes will evolve in time.

2. The two basic steps you listed in (1) above really are a verbal description of the first two terms in what mathematical expression?

“Diagnosis” and “prognosis” are the verbal equivalent of the first two terms in a Taylor’s Series Expansion.

3. Why does Doswell feel that the notion that subjective weather map analysis is a “burden” is wrong?

Performing map analysis allows the meteorologist to compare what he/she is seeing to models of how the atmosphere should be behaving; is the wind direction shown counter the pressure gradient? Are the temperatures on the map inconsistent with frontal positions? In essence, map analysis allows forecasters the opportunity to function as meteorological practitioners.

4. Why does Doswell feel that using objective guidance AFTER proper diagnosis yields a better forecast?

If diagnosis is done properly, some anticipation of future conditions is bound to develop in the forecaster’s mind. Whether it is simply how the wind directions should and will be developing locally, or motion of fronts, the proper diagnoses of these things automatically leads to a prognosis.

Then when guidance trends in the same way (or differently) the forecaster can evaluate the confidence in the forecast can increase or decrease and be adjusted.

5. In what situation is objective guidance the best in anticipating conditions?

The strength in all objective guidance is in dealing with ordinary weather conditions. However, when rapid changes in patterns occur, both the timing and strength of those changes is often erroneously assessed by the guidance.