Climate variability, crop yield and food provision

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Crop productivity (yield per unit area) is closely linked to the growing season's weather due to both direct factors (e.g. those which affect crop physiology) and indirect factors (e.g. those which contribute to disease intensity or crop management). The likely increase in extreme weather events in coming decades due to changes in climate variability and mean values therefore raises concern for future crop productivity, and hence food production in general.

Recent years have seen considerable improvements in both crop modelling and seasonal forecasting. This means that analyses of the potential effectiveness of crop management intervention in response to anticipated weather can now be made with some confidence at plot-level, but analyses at larger spatial levels still need to be interpreted with caution. Robust scaling techniques are therefore needed which combine crop modelling approaches suitable for application at large spatial levels (where data is usually less available) with downscaled GCM output and seasonal forecasting techniques.

While biophysical determinants of crop yield are clearly major factors in food production, socioeconomic factors increasingly need to be considered as the spatial level of analysis changes from plot to farm to county and larger; and as interest moves from productivity to regional production. This is particularly so in regard to the broader concept of food provision, which encompasses – in addition to production issues – notions of availability of, and access to food. Nevertheless, regional-level, bio-physical production models which combine enhanced cropping-system modelling and seasonal forecasting are needed. They will play a critical role in developing the integrated tools needed to help policy formulation aimed at reducing the vulnerability of food provision to changes in climate variability.

The presentation will include consideration of climate variability, crop modelling and scaling issues within the context of food provision concepts.

Monday II (Keynote talk)