



Climate Impacts on Farming Decisions of Land Allocation in Pacific Northwest: Weather Shocks and Climate Shifts

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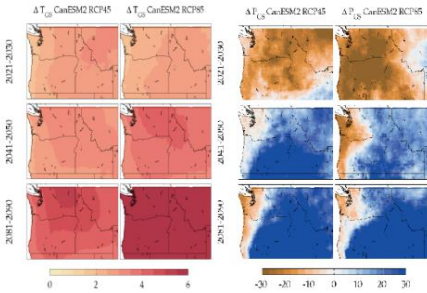


Fig. 1 Changes in mean T and total PPT over the growing season (CanESM2)

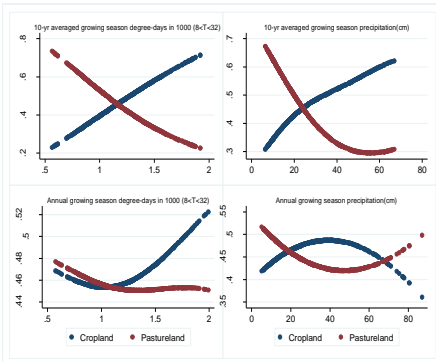


Fig. 2 Marginal effects of 10-yr averaged and annual DD and PPT on land use shares

According to projections from climate models, the Pacific Northwest (PNW) will be warming by 1-4°C by mid-21st Century, and will have slight increase in annual precipitation (Fig.1). These projected climate changes are likely to affect how farmers allocate land between major crop, livestock and non-agricultural uses. Using data from the PNW region, this paper first tests the hypothesis of climate change may affect land use shares, and then simulate the changes in land use share under future climate scenarios.

Our statistical results (Fig. 2) show that: (1) changes in land use shares are affected by net revenues from production; (2) cropland shares are increasing with more precipitation and degree-days (defined as temperature between 8°C and 32°C); (3) climate induces there is a strong substitution between land used for crops and livestock. Using projected climate data from several Global Climate Models (GCMs), we simulated the land use shares under future climate scenarios and find that cropland will increase (Fig.3) and pastureland will decrease (Fig.4) in PNW.

However, the results reported here are based on only one GCM (CanESM2). Next we will assess the implications of other GCMs and then link the results to the economic and environmental impact assessments being carried out with the TOA-MD model.

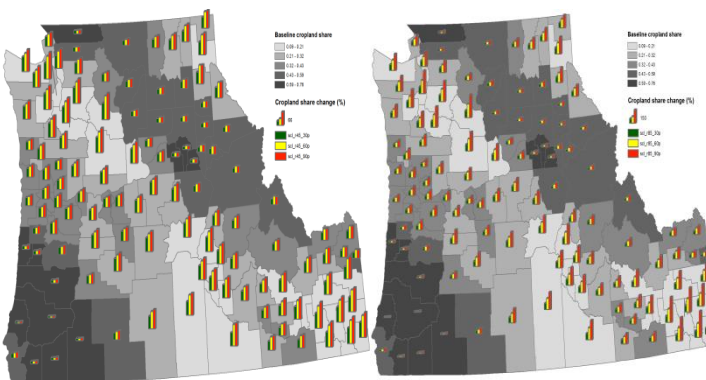


Fig.3 Effects of climate change on cropland shares (CanESM2)

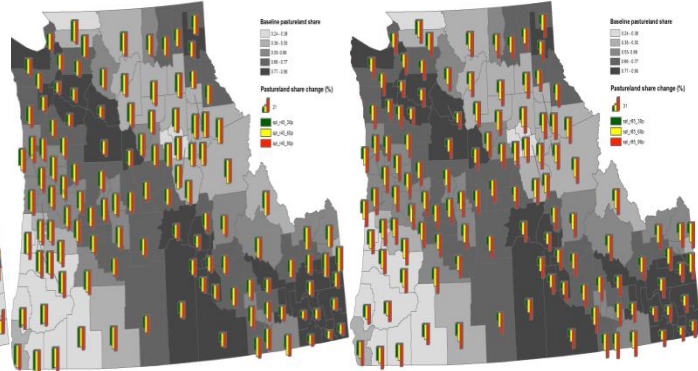


Fig.4 Effects of climate change on pastureland shares (CanESM2)

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