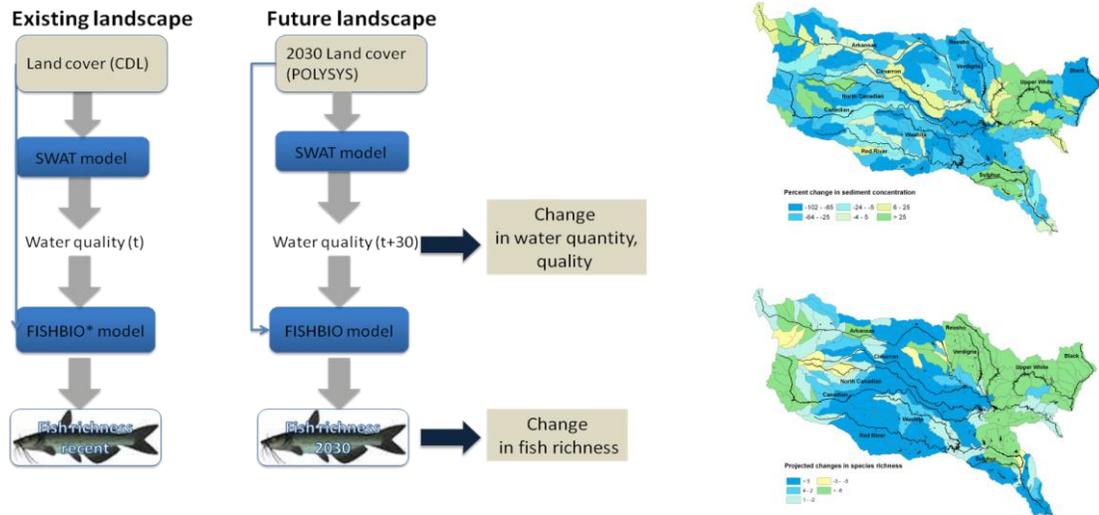


# Water Quality and Biodiversity Effects of Bioenergy Production

## How can the US develop sustainable biomass energy?

An important future challenge currently facing the U.S. will be to ensure that bioenergy supplies meet sustainable production standards that protect or enhance water quality and aquatic biodiversity. This project, funded by DOE’s Office of Biomass Programs, seeks to evaluate whether and how 2<sup>nd</sup> generation feedstocks will that promote the long-term economic viability of bioenergy feedstock production by improving water quality and, thereby, protecting biodiversity. We have developed quantitative, science-based models to quantify changes in aquatic biodiversity in response to projected land-use changes associated with expanding production of bioenergy feedstocks and use of agricultural residues.

Our approach begins with bioenergy-driven changes in the agricultural landscape projected by the POLYSYS model and downscaled to produce future realizations. These bioenergy futures are evaluated by using a regional-scale watershed model to forecast changes in water quantity and quality. We developed an empirical model (FISHBIO) to link fish richness to changes in aquatic habitat. This research is an important step toward understanding causal linkages between fish diversity and land-use changes associated with bioenergy, which will help to identify sustainable practices.



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