Increase production by 20% while reducing environmental impact by 20% by 2025

Sustainability: Given pop growth, climate change, how do we maintain long-term persistence of desired ecosystem services.

Framing question: In unmanaged systems, biodiversity is directly and positively related to ecosystem function and services. How is biodiversity related to provision of ecosystem services within agricultural landscapes, and do these relationships change under different management systems and in response to changing climate and land use?

Entomology – look across the diversity of ag systems and ask what data do we have that could examine the relation of diversity to ESS. What do we know now, and what are the gaps?

Medium term – with new data, characterize components related to specific disturbances

Long term – over decades, how are biodiversity patterns changing in relation to land use and climate

Need to think about diversity over time and space

Scale: Ranch/Farm scale and larger

Examples from sites:

Mirsky: many croplands working at large enough scales to address diversity (>10 ha);

Sanderson: NASS data available at county level

Skinner: ASP is addressing increases in diversity to increase productivity

Swain: Think about services and disservices associated with biodiversity: drivers of invasives?

UNL: Large-scale study of bird biodiversity at county level in central Great Plains

Landis: Has modelled effects of bioenergy perennial crops on multi-taxa biodiversity

Browning: Phenology could be linked to biodiversity patterns

Landis: Matrix of what we know

Contact Names:

Cook Farm: Sanford Eigenbrode

Great Basin: Fred Pierson

KBS – Landisala

Mandan – David Toledo

El Reno – Brekke Munks

Gulf Coast – Jason Schmidt

Platte River: Tala Awada and Brian Weinhold

Upper Missippi - Moorman

Lower Chesapeake: Mirsky

Texas Gulf – Wayne Polley

Upper Chesapeake - Sarah Goslee

WG - Chandra Holafield-Collins

Lower Mississippi – Jason Taylor

Goodwater – Newell Kitchen

Archbold – Betsey Boughton

Jornada – Dawn Browning;

Need to think about USGS collaborators

Taxa:

Belowground biodiversity:

Weed diversity:

Predatory and Parasitic Insects and pest suppression:

Grassland Bird Diversity:

Bats and pest control:

No Regrets Measurements:

Soil microbial diversity (Munks protocol)

Plant diversity (NEON protocol)

Arthropod suction trap @ observatories - passively sampled insect fauna (long-term, standardized method)

Linking phenocam with ANPP and plant diversity

Hyperspectral imagery collected at regular intervals at multi-farm/ranch or large landscape scale (NEON, Planet Labs)

Multi-return LIDAR point cloud

Landscape (farm scale) and hyperspectral diversity

Fish and aquatic biodiversity sampling at LTAR watershed outflow points or within watershed (USGS sampling targeted at LTAR site)