**What processes develop/create, maintain, and change biodiversity?**

**What are the controls on biodiversity? (climatic controls, soil controls, anthropogenic, species interactions, etc.)**

**What are the patterns of biodiversity? (scale, spatial and temporal patterns)**

**What are the spatial and temporal scaling of the relationships between biodiversity, ecosystem function and ecosystem resilience?**

**What is driving biodiversity loss and how can we better understand the attribution of those causes? (from both the anthropogenic and natural sides)**

**How does biodiversity respond to change? What are the characteristics that make biodiversity more vulnerable to anthropogenic changes?**

**What are the consequences of biodiversity? (both natural and anthropogenic systems)**

 **How does biodiversity affect climate, hydrology, etc. (see above)?**

 **How does biodiversity affect human systems?**

**How does it make ecosystems more resilient, how does it affect ecosystem services, how does it affect natural systems (hydrology, climate)?**

**How do we respond as a society to changes in biodiversity?**

**What are the cultural attributes/characteristics that influence how societies respond to biodiversity change (in terms of policy, etc.)?**

**How do global changes (climate change, food security, water security, disease, political instability/conflict) affect human behaviors that affect biodiversity?**

How do we hindcast and forecast biodiversity?

Can we predict biodiversity patterns?

Notes:

Most questions apply to biodiversity in general (all life on planet Earth)

These questions are all interconnected

What do we mean by biodiversity? Not just species, it’s genetic/functional/ecosystem diversity; it’s the processes which are biotic and abiotic; also dynamics within species (demography, population dynamics, physiology, phenology); dimensions of biodiversity

What’s new:

\*\*Question of scale: the ability to measure processes at finer scales – closer to the scale where the processes are actually happening; improved ability to observe and model ecological processes

Have similar information everywhere – can model across large spatial extents

Smaller grain, larger extent, greater spectral resolution

Linking it to societal responses – decision-making kinds of tools

\*\*Have a good idea of the past (genomic data) and in terms of intra-specific diversity, the types of approaches that can be used to map genomics, reduced costs, greater availability, non-invasive techniques; being able to link intra-specific; can do adaptive genomics

Data availability

3D mapping of vegetation structure

Brought species distribution models closer to the actual physiological processes (rather than farther out proxies)

Ability to move from static to dynamic

Have a wealth of information from the past, can hindcast to test models and then use to predict

 Better data, better models

Acceptance and incorporation of citizen science and crowd-sourcing