The U.S. National Ecological Observatory Network (NEON) was designed around a set of science questions derived from two National Research Council studies. Although not identical to those in Fleshman et al., there are thematic similarities. NEON is designed as a continental-scale platform for understanding and forecasting the impacts on ecology of climate change, land use changes, and invasive species. We anticipate NEON scientific data and information to be re-purposable for operational needs, including resource management and policy.

NEON provides a national baseline for critical environmental data. There are several classes of questions that our Federal partners are tasked with answering that would benefit from capitalizing on that national baseline. Interoperability between observation systems nevertheless remains a challenge.

The `interoperability fabric` enables this value chain by establishing well documented and traceable requirements, well documented and fully transparent algorithm for model and data products, measurements calibrated using traceable global standards, and informatics.

The `interoperability fabric` is a concept that embodies the ability to share data and resources across different domains and scales. It is designed to facilitate data exchange and collaboration by providing a standardized framework for the creation, storage, and retrieval of data.

The `interoperability fabric` is composed of several key components:

1. **Observation Systems/Data Sources**: This includes the various observation systems and data sources that provide the raw data for the fabric. These systems could be environmental monitoring stations, satellite imagery, or other resources.
2. **Data Products**: These are the processed and analyzed data products that are generated from the raw data. They may include maps, charts, or other visualizations that help to interpret the data.
3. **Science Requirements**: This component defines the needs and requirements for the data products. It includes the specific questions or objectives that the data is intended to address.
4. **Interoperability**: This is the ability to share and exchange data across different systems and domains. It enables the integration of data from various sources and the creation of a unified view of the data.
5. **Applications**: This includes the various applications that make use of the data products, such as decision support systems, policy development, and research.

Many of the concepts herein are encapsulated in an Earth Science Collaboratory (ESC) framework proposed by members of the Federation of Earth Science Information Partners (ESIP). ESIP members, led by individuals from NASA's Goddard Space Flight Center, are evolving the ESC framework into a reference architecture for community use.