The northern permafrost region contains approximately 50% of the estimated global below-ground organic carbon pool and more than twice as much as is contained in the current atmospheric carbon pool. The sheer size of this carbon pool, together with the large amplitude of predicted arctic climate change implies that there is a high potential for global-scale feedbacks from arctic climate change if these carbon reservoirs are destabilized.

Nonetheless, significant gaps exist in our current state of knowledge that prevent us from producing accurate assessments of the vulnerability of the arctic permafrost to climate change, or of the implications of future climate change for global greenhouse gas (GHG) emissions.

In order to close these gaps, the key objectives of PAGE21 are:

- to improve our understanding of the processes affecting the size of the arctic permafrost carbon and nitrogen pools
- to produce, assemble and assess high-quality datasets in order to develop and evaluate representations of permafrost and related processes in global models,
- to improve these models accordingly,
- to use these models to reduce the uncertainties in feedbacks from arctic permafrost to global change.

The concept of PAGE21 is to directly address these questions through a close interaction between monitoring activities, process studies and modeling on the pertinent temporal and spatial scales. PAGE21 is determined to break down the traditional barriers in permafrost sciences between observational and model-supported site studies and large-scale climate modeling. PAGE21 is directly linked to the Japanese GRENE-TEA project. Both projects have similar research objectives and will operate in strong cooperation.