A Natural Resources Inventory (NRI) soil quality pilot project was conducted in 1996. The main objectives of the project were to test the feasibility of sampling soils and monitoring soil quality indicators at points within the NRI sampling frame, to evaluate various indicators of soil quality, to assess soil quality at regional and national scales, and to assess the status and changes in soil quality as a result of various land uses. The project involved many cooperators from within USDA-NRCS, USDA-ARS, and several universities. The study was conducted in four major land resource area (MLRA) regions (Fig. 1). Area wide sampling (i.e., sampling regardless of soil type within the MLRA) was conducted in MLRAs 9 and 105, while benchmark soil sampling was conducted in MLRAs 67 and 77. Information gathering at each site included collecting soil samples, a profile description from an auger hole, and assessment of site characteristics and near-surface properties to a depth of 30 cm. In MLRA 9, an additional suite of biological tests was also conducted. Results from the soil quality pilot project can be found in Brejda et al. (2000a, 2000b, 2000c, 2001).

One unreported aspect of the pilot project is the near-surface property information collected at each sampling point. The near-surface property information was to be used in the calculation of a soil quality morphological index (SQMI), a perceived indicator of soil quality (Grossman et al., 2001b). The index provides a relative ranking of optimal physical conditions for root growth and development, and for free movement of water and air. The SQMI is determined from the near-surface soil properties to a depth of 30 cm (or to a root restrictive layer if shallower). The index combines information about soil texture, structure, moist rupture resistance, dry crust strength and thickness, and surface-connected macropores and cracks. These features are described in the Soil Survey Manual (Soil Survey Staff, 1993). The index is best measured when the soil moisture content is at or near field capacity. This provides a consistent reference state for comparing SQMI scores among soils.

The index was developed out of a need to characterize the near surface in detail for Soil Survey and to evaluate soil quality in the field using soil morphology. Changes in near-surface morphology due to land use and management (dynamic soil quality) generally have not been recognized in soil survey. Also, field morphological evaluations of the near surface have not been actively applied in soil quality assessments (Grossman et al., 2001a).