# ETWG Integration - Subsurface Permeability

## Introduction

This page describes focuses on determination of rates of water flux from the "near surface" soil zone into the groundwater system. The exact characteristic and definition should be clearly stated in text contributed to these pages, including approaches that are known to only approximate or serve as an index to an actual physical characteristic or modeling parameter. For example, the meaning of "groundwater flow coefficient" may not be clearly or consistently understood across this community. Even if it is, one party might equate this term with the "base flow index" derived from a record of streamflow observations from a gage, where others may find this totally inappropriate. All are okay to discuss here, just make it clear what's what.

### Geological Data

Rather than just using a soils database, such as STATSGO or SSURGO, surficial geology is being examined as an alternative. Most of this discussion focuses on a relatively new data set that describes permeability based on analysis of geology. This data set is being examined as a way to quantify the flux rates of water from near-surface soils to the groundwater system. This data set has been produced by Gleeson and others. For more information, see:

- Gleeson, T., Smith. L., Jansen, N., Hartmann, J., Dürr, H., Manning, A.H.,van Beek, R. and A.M. Jellinek (2011) Mapping permeability over the surface of the earth. *Geophysical Research Letters*, 38, L02401, doi:10.1029/2010GL045565.

- Jansen, N., Hartmann, J., Lauerwald, R., Dürr, H.H., Kempe, S., Loos, S. and Middelkoop, H., 2009. Dissolved Silica mobilization in the conterminous USA. Chemical Geology DOI: 10.1016/j.chemgeo.2009.11.008. [Do not pass on without permission from Jens Hartmann (geo@hattes.de) or Nils Jansen (nils.jansen@zmaw.de).]

### Streamflow analyses

Software, such as the USGS Hysep program, can be used to graphically or statistically analyse a hydrograph to identify the components that constitute overall streamflow volume (such as the contribution from groundwater) and characterize flux rates or coefficients to describe the component.

[more coming on this topic]

## Geological Data

### Comparison with other data sets

The areas in permeability data set with a k_perm value of 0 are shown in the figure below.
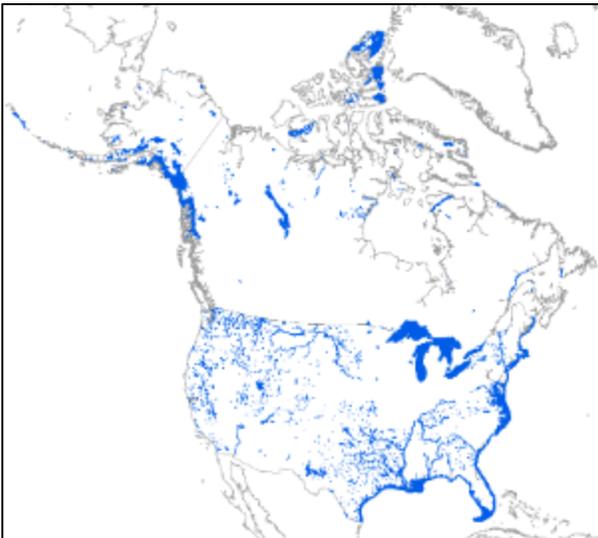


These areas were compared with several other data sets.

- NLCD 2001
- NHDPlus waterbodies