



U.S. Department of Transportation
Federal Highway Administration

The Highway Runoff Database (HRDB)

A data warehouse and preprocessor for the
Stochastic Empirical Loading and Dilution Model (SELDM)

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of Transportation
Federal Highway Administration

The HRDB provides representative statistics for quantifying runoff flows, concentrations, and loads





The HRDB has 10 data sets, 118 sites, 4,216 storms, and 55,311 EMC values

Data set	Sites	Storms	EMC
FHWA 1990	24	937	8,428
CA 2003	52	981	26,104
MA 2002	4	285	1,236
MA 2010	14	1,553	15,490
MI 1998	3	9	198
OH 1997	1	13	169
TX 1997	6	187	1,925
WA 2005	12	155	1,486
WI 2000	2	96	725
Sum	118	4,216	55,311



Data in Version 1.0.0a of the HRDB span the period from 1975 to 2009

FHWA 1990 Runoff Model

TX 1997 Highway Runoff

OH DOT 1995-1996

MI 1998 Highway Runoff

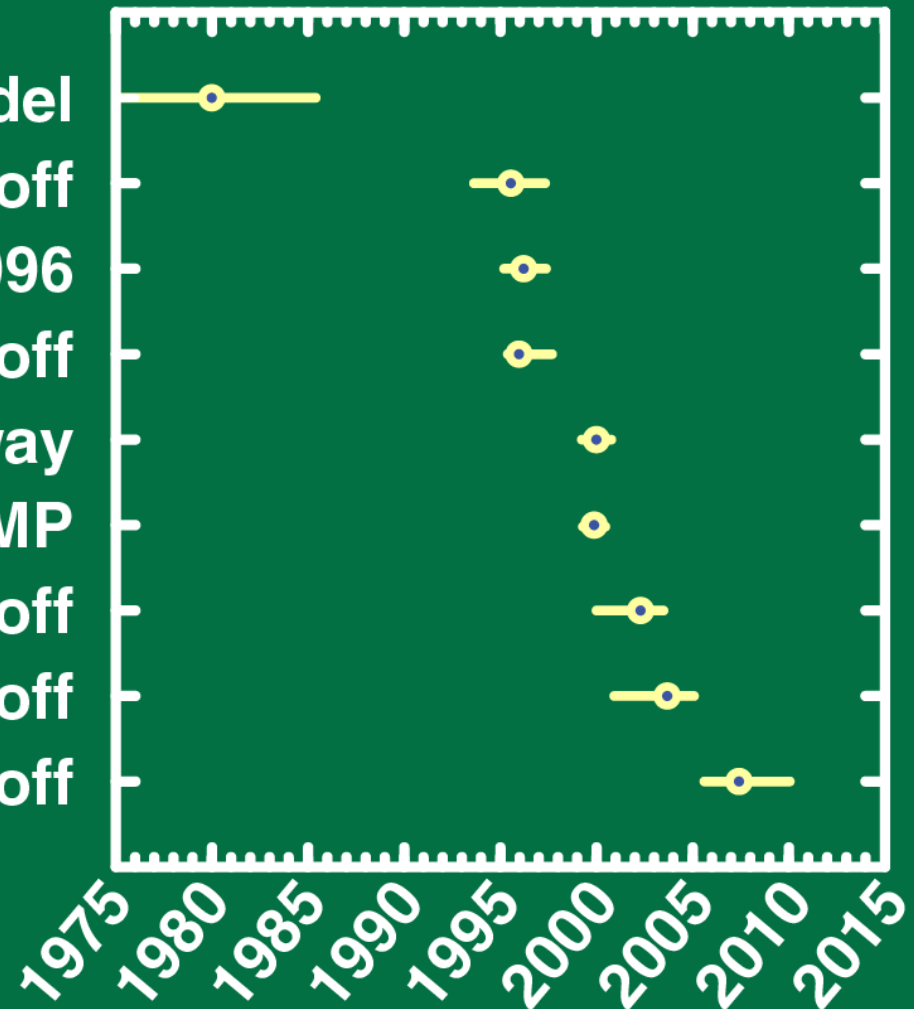
WI 2000 DOT Urban Highway

MA 2002 Highway BMP

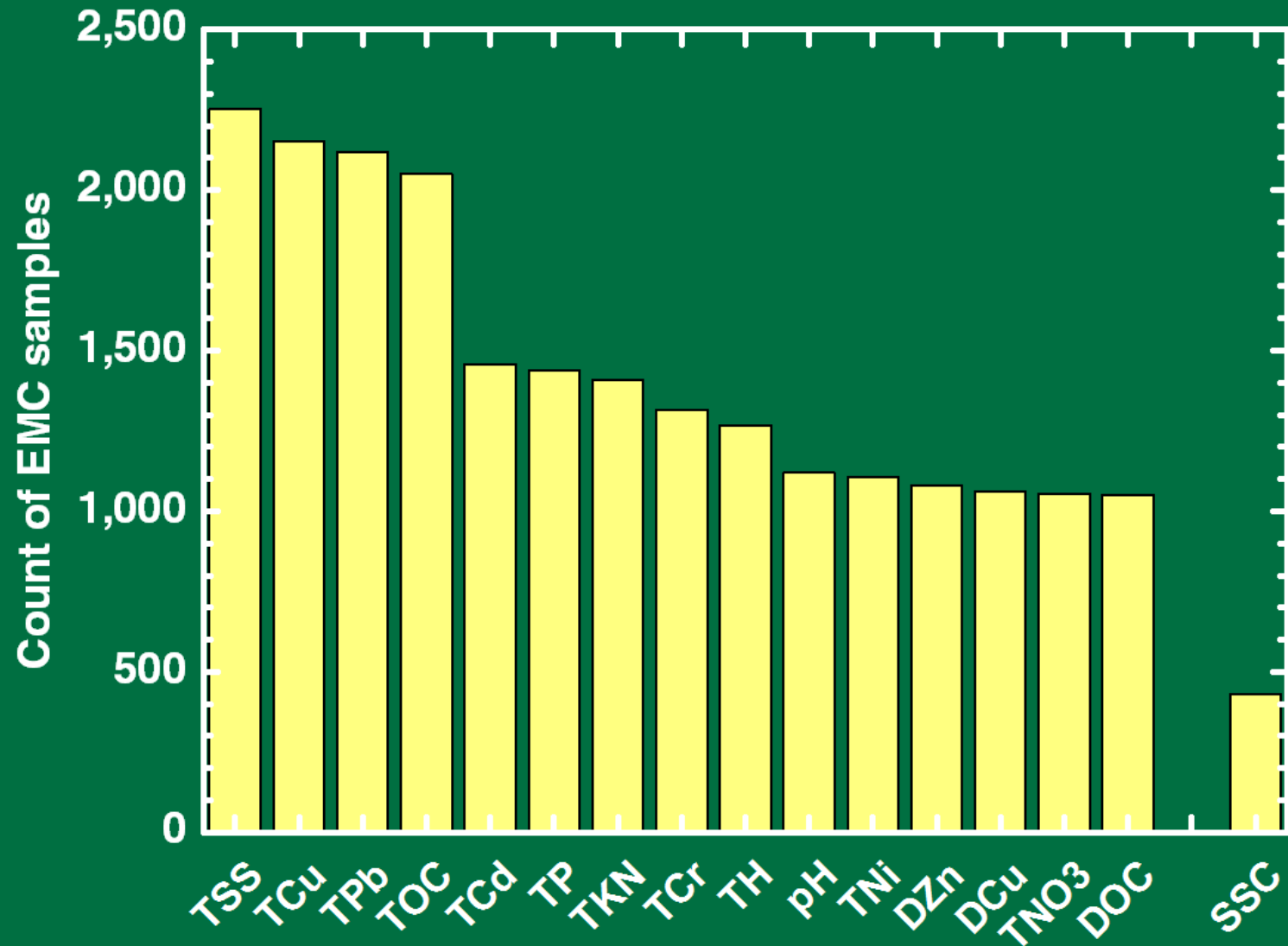
CALTRANS 2003 Highway Runoff

WA 2005 DOT Highway Runoff

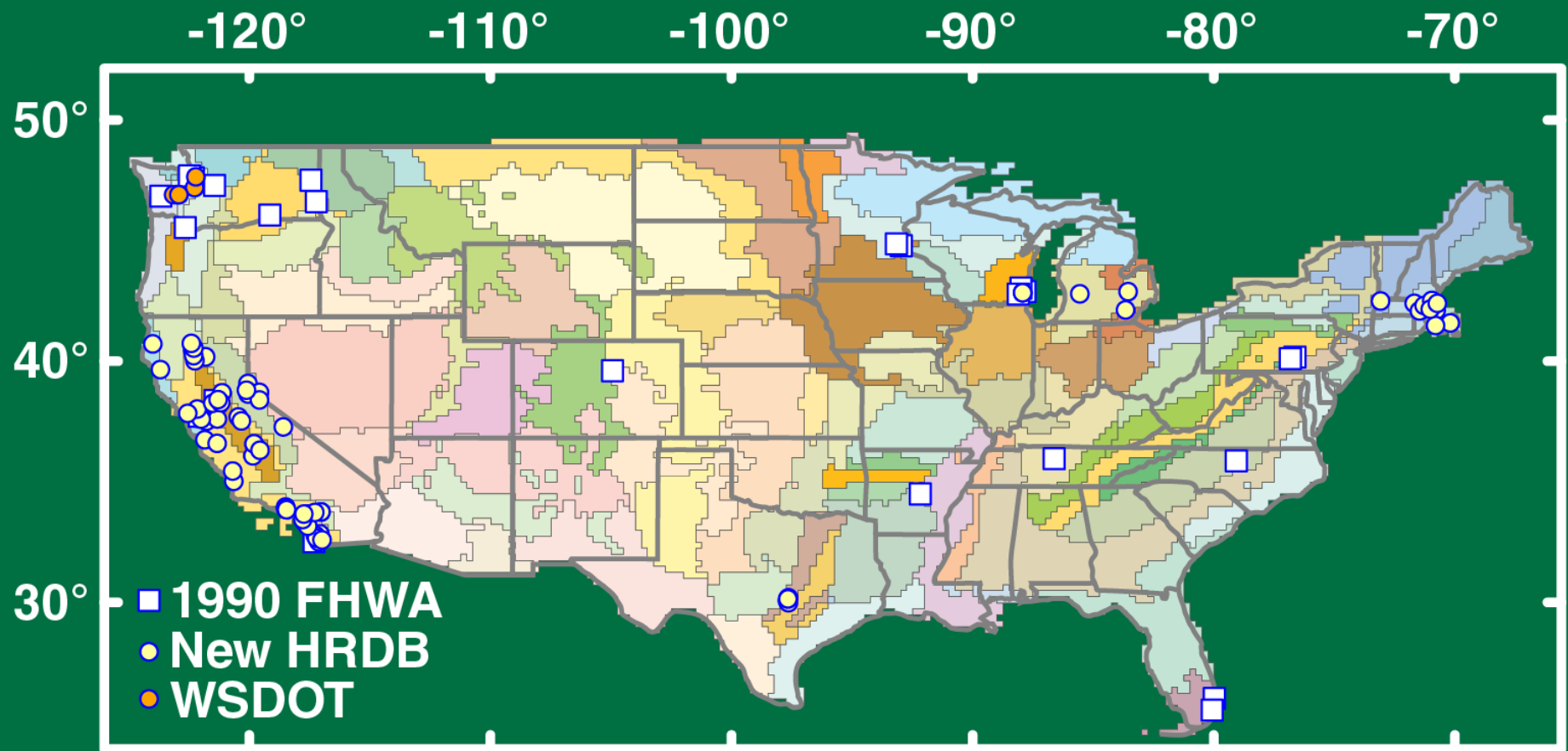
MA 2010 Highway Runoff



The HRDB has 194 different water-quality constituents, counts may indicate importance



HRDB has a lot of data, but more is needed,
please donate your (good) data



The HRDB can be used to obtain water quality pairs, water-quality statistics, and other data

Highway-Runoff Database Main Menu

Highway-Runoff Database: A Data Warehouse and Preprocessor for the Stochastic Empirical Loading and Dilution Model (SELDM)

[Version: 1.0.0a](#) [Explanation](#)

Select and Export Data for a Water-Quality Constituent in Tab-Delimited Format

Select and Export Data for a Water-Quality Constituent in Censored-Data-Program Format

Select Paired Water-Quality Constituent Values for Regression Analysis

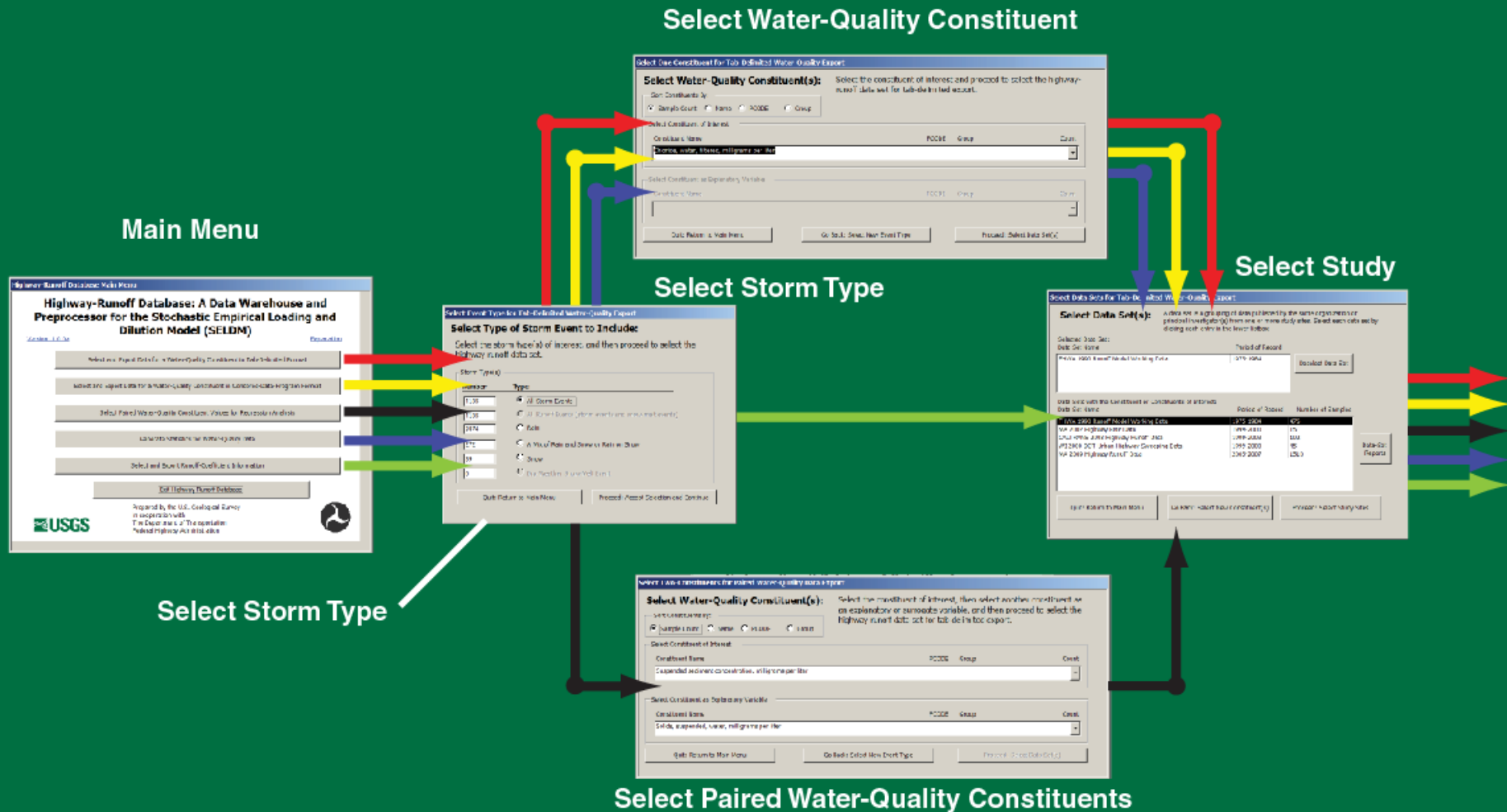
Generate Statistics for Water-Quality Data

Select and Export Runoff-Coefficient Information

Exit Highway-Runoff Database

 Prepared by the U.S. Geological Survey
in cooperation with
The Department of Transportation
Federal Highway Administration 

These are forms used to select data



These are forms used to obtain data

Export Runoff Coefficient

Export Runoff Coefficient Data

Save a Tab-Delimited File of Runoff Coefficient Information

This window is used to save a tab-delimited file of runoff coefficient information. The file will be saved in the current directory.

Select the Runoff Coefficient

☒ **Runoff Coefficient** ☐ **Runoff Coefficient (mm)** ☐ **Runoff Coefficient (in)**

Export Information

Export Tab-Delimited EMCs

Export Tab-Delimited Data

Save a Tab-Delimited File of EMC Values

This window is used to save a tab-delimited file of EMC values. The file will be saved in the current directory.

Select the EMC Value

☒ **EMC Value** ☐ **EMC Value (mm)** ☐ **EMC Value (in)**

Export Information

Export Detection Limit EMCs

Export Detection Limit EMCs

Save a File of EMC Values in a Format Suitable for Detection-Limit Programs

This window is used to save a file of EMC values in a format suitable for detection-limit programs. The file will be saved in the current directory.

Select the EMC Value

☒ **EMC Value** ☐ **EMC Value (mm)** ☐ **EMC Value (in)**

Export Information

Export Paired EMCs

Export Paired EMCs

Save a Tab-Delimited File of Paired EMC Values

This window is used to save a tab-delimited file of paired EMC values. The file will be saved in the current directory.

Select the EMC Value

☒ **EMC Value** ☐ **EMC Value (mm)** ☐ **EMC Value (in)**

Export Information

Select Site(s)

Select Monitoring Sites for Runoff Coefficient Water Quality Export

This window is used to select monitoring sites for runoff coefficient water quality export. The file will be saved in the current directory.

Select Site(s)

☒ **Runoff Coefficient** ☐ **Runoff Coefficient (mm)** ☐ **Runoff Coefficient (in)**

Export Information

Select Plotting-Position Equation

Select Plotting-Position Equation

Statistics for EMC Values

This window is used to select a plotting position equation for EMC values. The file will be saved in the current directory.

Select the Plotting-Position Equation

☒ **Plotting-Position Equation** ☐ **Plotting-Position Equation (mm)** ☐ **Plotting-Position Equation (in)**

Export Information

Export SELDM Statistics

Export SELDM Statistics

Statistics for EMC Values

This window is used to export SELDM statistics for EMC values. The file will be saved in the current directory.

Select the Plotting-Position Equation

☒ **Plotting-Position Equation** ☐ **Plotting-Position Equation (mm)** ☐ **Plotting-Position Equation (in)**

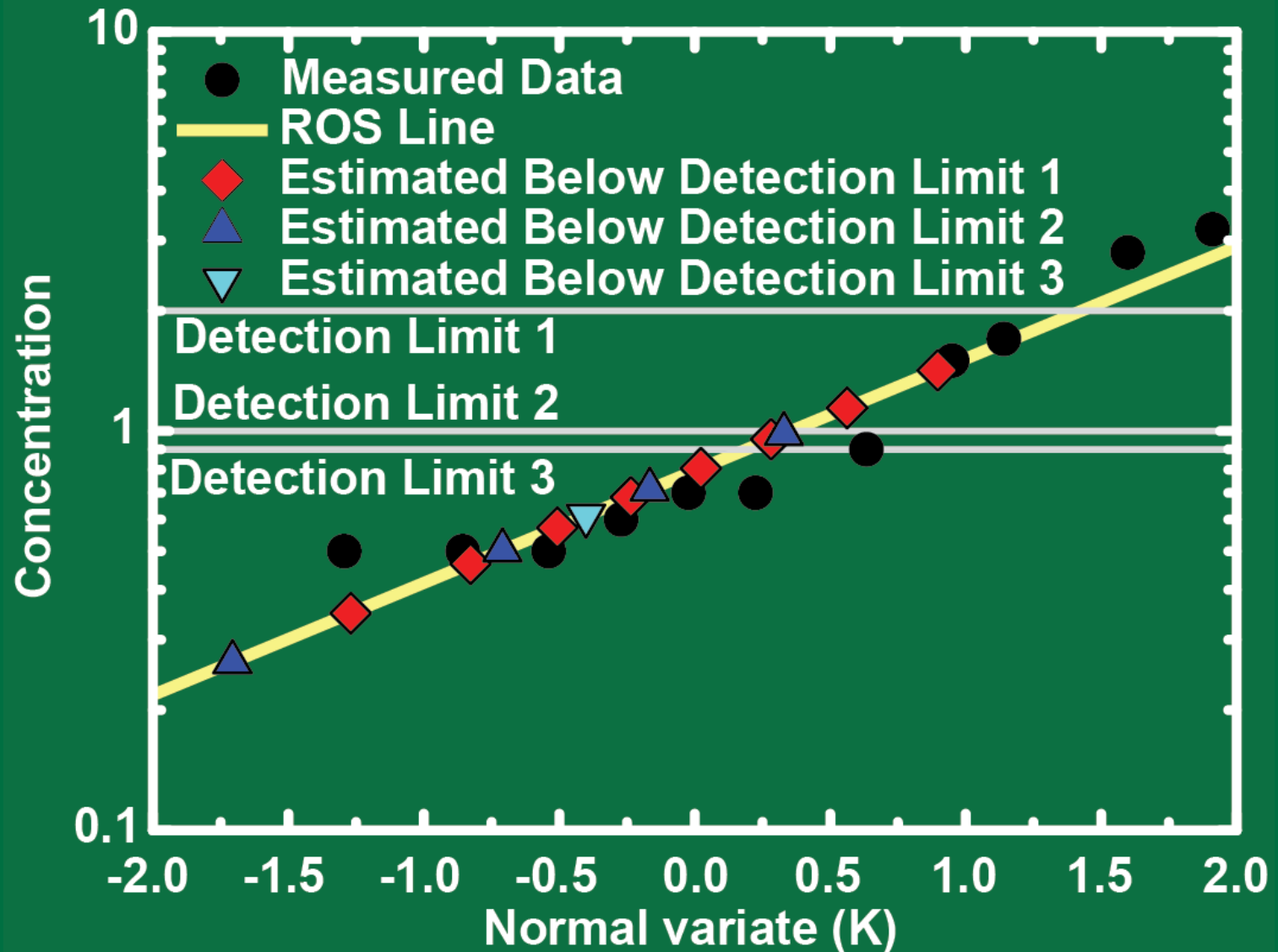
Export Information



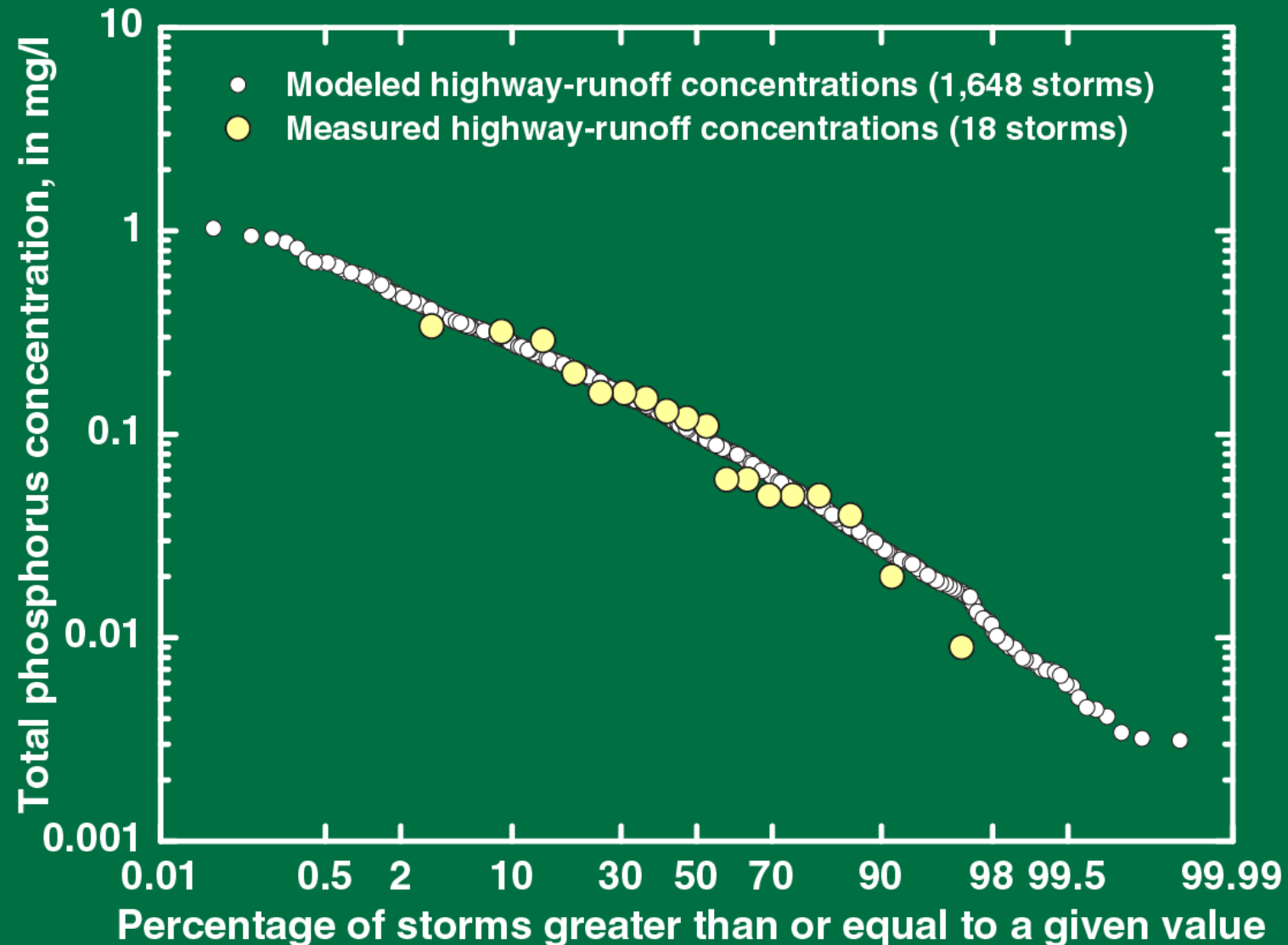
The mean, standard deviation, and skew from the HRDB are used with random frequency factor (K) values from SELDM to calculate any x for a normal (lognormal) or Pearson Type III (log-Pearson Type III) distribution

$$X_i = \text{Average} + \text{Standard Deviation} \times K_i$$

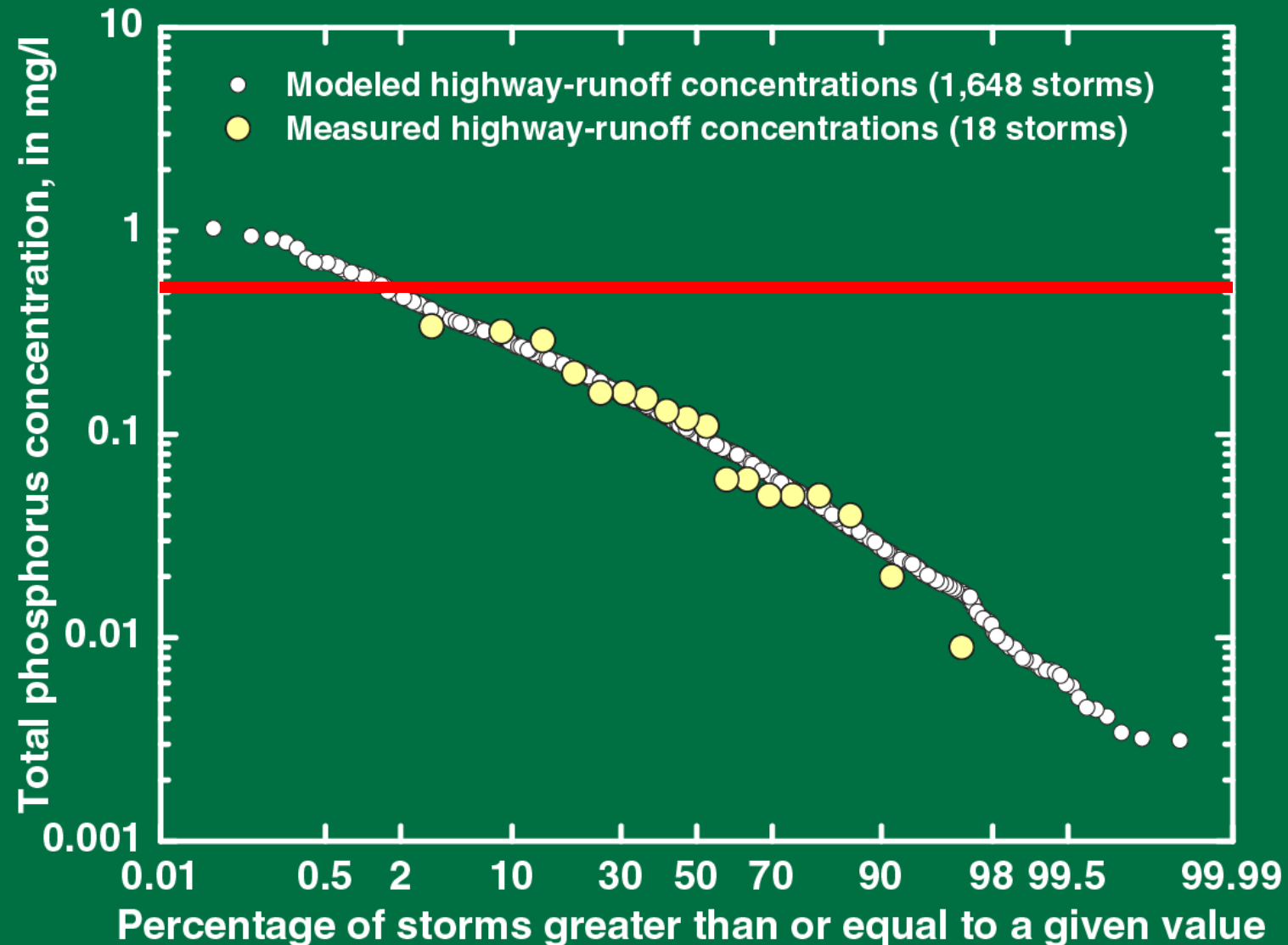
The HRDB calculates detection-limit statistics



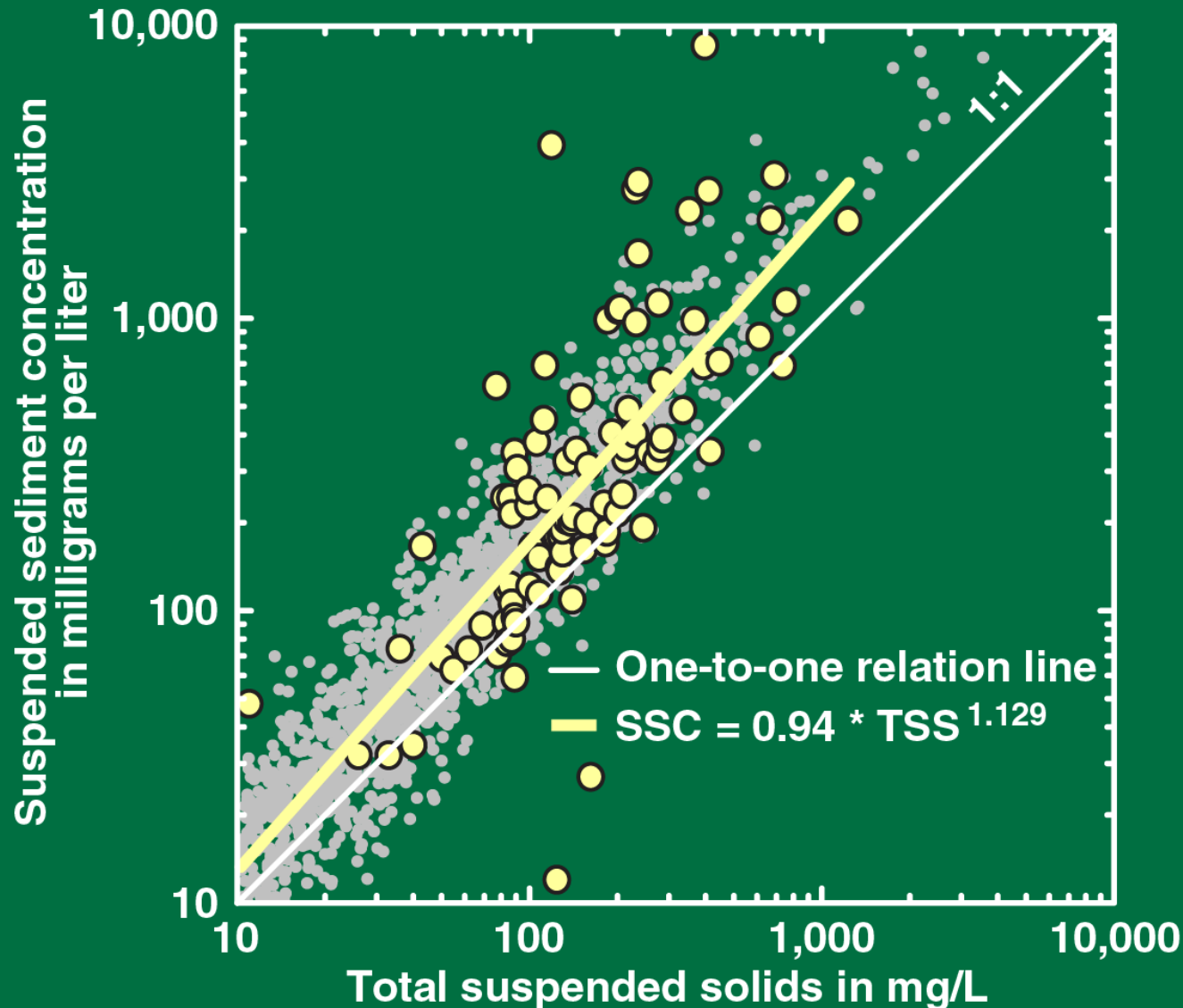
The HRDB provides measured data and statistics; SELDM provides long-term estimates



The HRDB provides measured data and statistics; SELDM provides long-term estimates



We can use dependent-quality relations to predict one variable from another



The web site has links to reports, software, SELDM version 1.0.1 and HRDB version 1.0.0a at <http://webdmamrl.er.usgs.gov/g1/fhwa/SELDM.htm>

