

Excel in Hydro-Analysis

Duration: 1 day

Synopsis

The course is for people who need to process hydrological data through Excel. Some experience with Excel is assumed and delegates are introduced to intermediate and advanced features of value in data analysis. Simple statistics are derived in Excel, which is used to organise and categorise data in pivot tables. Hydrologic data distributions are plotted in Excel using log transformation. Flow duration curves are plotted in Excel using log-Normal axes and flood series are plotted with Extreme Value distributions and the Gumbel reduced variate. Relations between variables are examined using Excel's regression and correlation functions to derive stage-discharge and index velocity relationships. Techniques for extending rating relationships are presented.

Prerequisites

Some prior experience of Excel is expected. Delegates should be broadly familiar with simple statistical and hydrological concepts.

Outcomes

After taking this course, delegates should be able to perform a range of analytical techniques on hydrological data using Excel. They should also have a range of Excel spreadsheets that remind them of the techniques and provide templates for future work.

Content

The course content may be adjusted to focus on the needs of participants but would normally include all of the following:

- Introduction to Excel's standard statistical functions and the Analysis Toolpack.
- Isolating data: sorting, filters and pivot tables.
- Descriptive statistics, measures of central tendency and spread.
- Flow distributions and logarithmic transformation, using array formulas.
- Plotting cumulative distributions, flow duration curves and deriving flow statistics.
- Plotting flood series in Excel to determine the return period of high magnitude events.
- Using Excel to calculate regression functions and correlation between datasets.
- Deriving stage-discharge and index-velocity relationships from river gaugings.
- Techniques for extending rating relationships.

Tuition uses a hands-on approach and is normally given with no more than six participants per tutor. The main features of each topic are explained using worked examples. Delegates apply these lessons in exercises, which are later explained using model answers. In addition to learning new techniques, delegates come away with a set of examples that they can later apply to their own data.