ESdat

Environmental Data Management for Site Holders

Many site-holders engage a variety of consultants, laboratories, and in-house staff to collect, manage and report their environmental data.

Unfortunately this often results in data being trapped in various pdf reports, GIS layers, emails, excel workbooks, or even in hard copy. This data becomes increasingly difficult and time consuming to manage and retrieve as more data is collected and as legislative reporting requirements become more rigorous.

Organisations increasingly need professional staff to be able to quickly analyse their data using flexible and relevant mapping, graphing, statistical and Excel based tools, that can manage non-detects, exceedances, and complex datasets.

This means all environmental data needs to be consolidated into a single system which has tools to seamlessly manage, analyse and report the data. Data needs to be audited, reliable, and easily available. Key aspects of requirements are included below.

Efficient and Accurate Data Receipt and Consolidation

Most organisations receive the majority of their environmental data from consistent sources on an ongoing basis. If this data is being manually retyped into another format (such as spreadsheets) it is inevitable that errors will creep in, and that significant time will be invested to enter, check, and recheck the data.

In addition staff should have the ability to easily perform QA checks on the data during the receipt process. These might include:

- Completeness
  against what is expected
- Field and Laboratory QA
  RPD values for duplicates,
  detects in blanks)
  holding times,
  ionic balance,
  surrogate recoveries
  etcetera

- Produce a Chemistry Exceedance Table,
  highlight exceedances of environmental standards.

- Analyse the data as a time-series graphs, a trend analysis, or on a map.

Any data management system should automate all of these tasks, eliminating the time and the need to manually manipulate data. In a recent survey, most users of the ESdat system saved over 40% of their office time working with their data (see ESdat User Survey).

Combining new data.

Traditionally, whenever additional data is received it is necessary to update two or three copies of existing data, such as tables, graphs, maps or statistics. This is error prone and the multiple copies of the data lead to possible inconsistencies.

Data management Systems should eliminates this problem by combining all data into a single database; from which outputs are easily re-generated. ESdat also allows Excel files can be automatically updated from the database.

Sharing data among users/organisations

Within any single team there is typically a variety of methods used to manage environmental data, which reflects the Microsoft Excel or Access skill level for each individual.

Sharing data between team members is usually time consuming and imperfect as people need to learn how to find and use data managed by others.

If all team members access data from a consistent system, then data can be easily shared. Availability of automated tools to produce Tables, Graphs, Maps, and statistics means staff can easily and quickly analyse new datasets.

Regulatory and Standards Compliance

Many site holders have a regulatory obligation to be able to access and report their environmental data quickly, easily, accurately, and demonstrate an audit process to confirm the accuracy of that data. ISO 14001 also requires organisations to have systems in place to manage their data. Copying and pasting data in Excel is not consistent with those obligations.

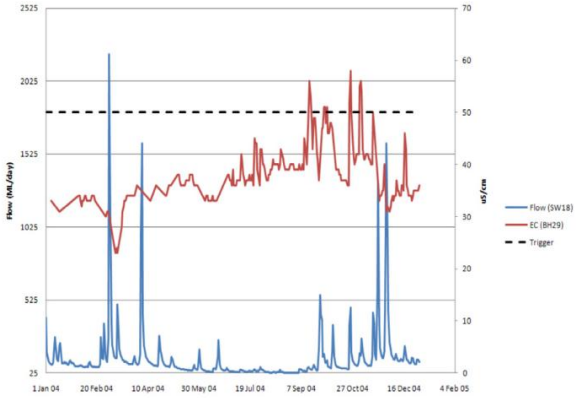
A data management system should store a complete audit trail of the data, including Certified Laboratory Documentation, Calibration, or other certificates, as well as automate imports and track edits and deletions. Reports should be available using ad-hoc, or recurring data filters. ESdat provides all of this functionality.

Functionality Requirements

Standard GIS systems are not able to easily provide the outputs that environmental professionals require. Below are an example of some outputs often needed, that are difficult to generate from within a standard GIS based system.

			Lead					
			Lead	Lead (Filtered)	Arsenic	Arsenic (Filtered)	Chromium (III+VI)	Copper
			mg/L	mg/L	mg/L	mg/L	mg/L	mg
EQL			0.005	0.001	0.005	0.001	0.005	0.0
CA MCLs			0.015	0.015	0.01	0.01	0.05	1.
US MCLs			0.015	0.015	0.01	0.01	0.1	1.
USEPA PRG Tap Water					0.000045	0.000045		1.
LocCode	WellCode	Sampled_Date-Time						
BH01	A	8/01/2004	0.12	0.093	0.17	-	-	-
		30/01/2004	0.108	0.0837	0.004	-	0.21	1.0
	B	8/01/2004	0.12	0.093	0.17	-	-	-
		30/01/2004	0.18167	0.17823	0.004	-	0.21	1.0
BH02	A		-	-	-	-	-	-
		8/01/2004	<0.0009	-	0.002	-	-	-
		30/01/2004	<0.001	-	0.17	-	0.084	0.0
	B	27/02/2004	<0.00102	<0.0009	-	0.0036	-	-
		30/03/2004	<0.001	<0.001	-	0.004	0.26	1.95
	C	8/01/2004	<0.0009	-	0.002	-	0.234	-
		30/01/2004	-	-	0.17	-	0.084	0.0
BH05	A	30/04/2004	0.00951	<0.001	-	-	<0.0061	<0.0
	B	27/02/2004	-	0.0018	-	-	-	-

Formatted Chemistry Exceedance Tables



Graphs with multiple parameters and trigger levels

Maps with time-series or depth data, and exceedances flagged

Maps with attribute colouring and range of values at each point

All these images were generated within ESdat.

Implementation Time

Often when organisations find they have a data management issue it needs to be resolved immediately.

ESdat can be installed, operational and users trained within days if necessary. You can immediately start requesting your laboratory files in ESdat format from the following laboratories (amongst others): EnviroLab / MPL;ALS; EcoWise; SGS; MGT; ARL; TAS; NMI; Leeder

If some integration or customisation work is requested users can start using the software immediately and customisation can come on-line as available.

ESdat

Business Case

Ultimately there needs to be a business case to purchase any environmental database system. In developing your business case it is often necessary to consider:

- How much time is currently lost through inefficient data management, analysis and reporting practices?
- How do you know the data is accurate and does not contain typographic errors?
- How much money has been spent on data which is now lost or unreliable?
- How much are you being charged by consultants to clean up your data?
- What are the implications if an inability to routinely analyse your data results in regulatory intervention?
- How much would it cost if you went with the wrong approach, and had to re-visit your decision?

More Information about ESdat

This document was prepared by EarthScience Information Systems, and Australian Company that develops the ESdat software. ESdat is used for environmental data management by many of Australia's leading site holders and consultants, and is supported by all major laboratories. For more information please see:

ESdat Web Site, Current Users, PDF Brochure, Purchase