

# eqWatch

Version 1.8.9

## User Guide

October 2006



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## Overview

When a seismograph, eqLogger, or some other source detects a trigger, it sends the arrival data to a folder on the computer running **eqWatch**. **eqWatch** receives, records and displays these arrivals (date, time and site of a trigger).

**eqWatch** automatically:

- Monitors the folder for arrival data files
- Stores the arrival data in the eqSuite database
- Queries the database to find the number of recent arrivals
- If there are sufficient recent arrivals, eqWatch determines the location of the Event, stores it in the database, and sends out alerts.
- Displays the most recent arrivals and events in an activity log window
- Deletes each file from the input folder after processing

**eqWatch** displays alert messages if it cannot connect to the database.

# Setup and Adjustments

---

## Installation

1. Ensure that you have the correct hardware and operating system, and that Java is installed. See the "Technical notes" chapter for details.
2. The eqSuite Database must already be installed. Refer to the eqSuite Database Manual for instructions on how to do this.
3. Double-click on **eqsuite.msi** and follow the prompts to install eqWatch.
4. Create a folder on the hard disk to receive the waveform data from the seismographs.  
Usually this will be a folder on a local FTP server that Seimographs will be connecting to and writing files to.

### **Folder name restrictions:**

The folder name must end with 'in' or 'kelunji'.

The default setup is to use the folder:

`C:\inetpub\ftproot\eqwatch\in`

Examples of acceptable folder names: `D:\ftproot\kelunji`,

`C:\eqwatch\data\in`, `C:\seismograph\in`.

---

## Running for the first time

1. Start **eqWatch** from Start→All Programs→eqsuite→eqWatch1.8.9. You will get a message indicating eqWatch could not connect to the database, this is normal since you have yet to setup the database properties.
2. **Open** the eqWatch Properties dialog box.
3. To do this, Click on the **Files** menu, and then the **Properties** Menu Item.
4. Set up the properties as needed. They will be explained in the following chapters.
5. Click the *OK* button or the close box  of the eqWatch Properties dialog box.

---

## Starting and Stopping eqWatch

### Starting

Start **eqWatch** from

*Start→All Programs→eqsuite→eqWatch1.8.9.*

By default, when eqwatch is installed a shortcut is created in the startup menu of the *All Programs* menu. When you login eqWatch will start automatically. To prevent this from occurring remove this entry from the *Start→All Programs→Startup* menu.

### Stopping

To Stop **eqWatch**, select Exit from the File menu.

## Getting Data Into EqWatch

Arrival data can enter eqWatch by a variety of means.

### Read Files from a Local Folder

From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Files In** tab.

#### Settings:

**Input Folder:** The folder eqWatch will read files from.

Usually this is a folder on an FTP server that remote Seismographs write files to.



**eqWatch** does not create this folder, it must already exist. Specify the full path for the input folder you created in the **Installation** section of **Setup and Adjustments**.

As **eqWatch** processes the arrival data, it deletes the files from this folder.

### Read Files from an FTP Server

From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Files In** tab.

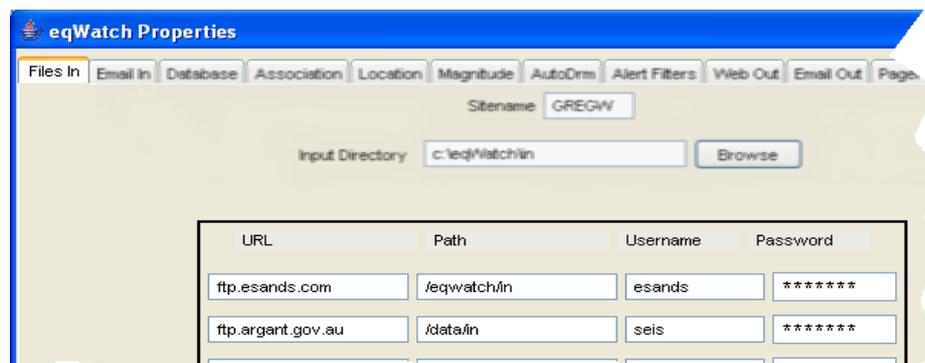
#### Settings:

**URL:** The URL of the FTP server to be connected to

**Path:** The path to the folder containing the files

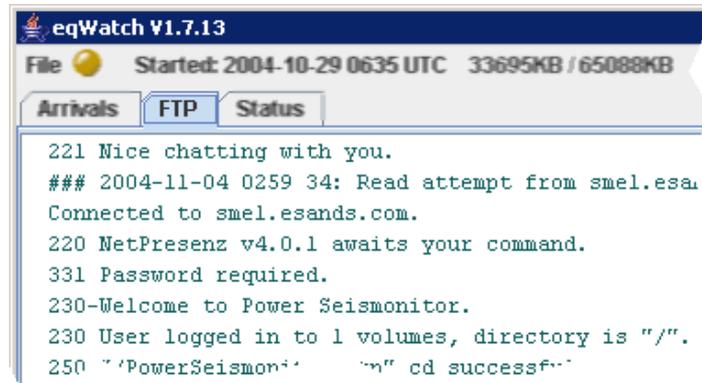
**Username:** User name for access to the FTP server

**Password:** Password for access to the FTP server



Note that eqWatch will poll each FTP server, checking for new files, every **2 minutes**. This may be an issue for the manager of the FTP server.

To view the progress of FTP requests, select the **FTP** tab on the main window.



## Read Arrivals from Email

From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Email In** tab.

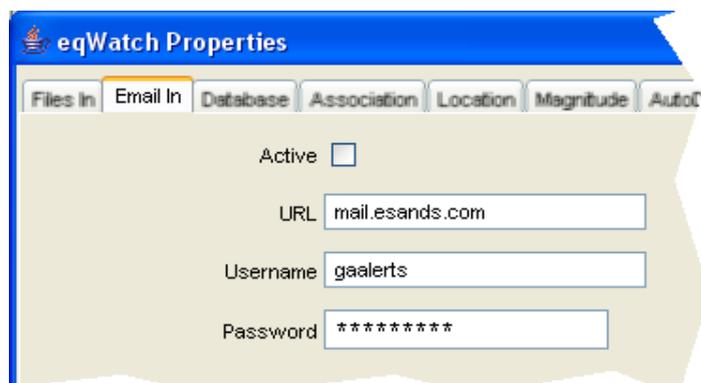
### Settings:

**Active:** Set if you want to check for emails

**URL:** The URL of an available POP3 email server

**Username:** Email username

**Password:** Email password



eqWatch will read emails in CSS Format.

A Typical Email may look like this:

```

2003315 1068521028.350 CTA bz__P _ 186.5 0.40 -999.00 -1.0 -1.00 -1.00 -1.00 __
-1434872 -1434872 -1 -1 __

```

Where:

2003315 = Year and Day of Year of Arrival.

1068521028.350 = Time of the arrival in seconds since Midnight, Jan 1, 1970

CTA = seismograph site.

bz = broadband, z (vertical) component

P = P Arrival.

The other numbers are not important.

## Retrieving Waveforms Using AutoDRM

In some cases, eqWatch receives Arrivals without any waveforms. Using AutoDRM, waveforms can be downloaded from some servers to be stored along with the arrival.

AutoDRM is an email based system. A request for data is sent in the form of an email, and an encoded email is returned.

For more information on AutoDRM go to:

<http://www.seismo.ethz.ch/autodrm/>

From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **AutoDRM** tab.

### Settings:

**Checkbox:** Set if you want to request AutoDRM waveforms.

**AutoDRM Address:** Email address to send requests to.

**Sites:** When Arrivals are received for these sites, an AutoDRM request is sent.



The screenshot shows the 'eqWatch Properties' dialog box with the 'AutoDRM' tab selected. The dialog has a blue header and a light beige body. At the top, there is a tabbed interface with the following tabs: Files In, Email In, Database, Association, Location, Magnitude, AutoDRM (selected), Alert Filters, Web Out, Email Out, and Pager Out. Below the tabs, there are four rows of settings. Each row starts with a checkbox, followed by the label 'AutoDrm Address', a text input field, the label 'Sites', and another text input field. The first row has a checked checkbox, 'autodrm@ga.gov.au' in the address field, and 'ARMA CTA MCG' in the sites field. The second row has a checked checkbox, 'autodrm@esands.com' in the address field, and 'TOMM WERM' in the sites field. The third and fourth rows have unchecked checkboxes and empty input fields.

| Checkbox                            | AutoDrm Address    | Sites        |
|-------------------------------------|--------------------|--------------|
| <input checked="" type="checkbox"/> | autodrm@ga.gov.au  | ARMA CTA MCG |
| <input checked="" type="checkbox"/> | autodrm@esands.com | TOMM WERM    |
| <input type="checkbox"/>            |                    |              |
| <input type="checkbox"/>            |                    |              |

Waveforms retrieved by AutoDRM are not used in calculating Earthquake locations. They are only stored in the Trigger Archive for later viewing by users.

## Connecting to the eqSuite Database

To view or modify the database connection properties:

Make sure the eqSuite Database is set up and is running. Refer to the eqSuite Database Manual.

eqWatch connects to the database using JDBC drivers. These are available for most brands of database server. eqSuite is supplied with a driver for MySQL.

From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Database** tab.

### Settings:

**Driver:** The name of the JDBC driver. Note that this is not the name of the file containing the driver.

For MySQL the name is `com.mysql.jdbc.Driver`.

**Server URL:** The location of the database.

The general format of a URL to a MySQL database is as follows:

```
jdbc:mysql://internetaddress:port/databasename
```

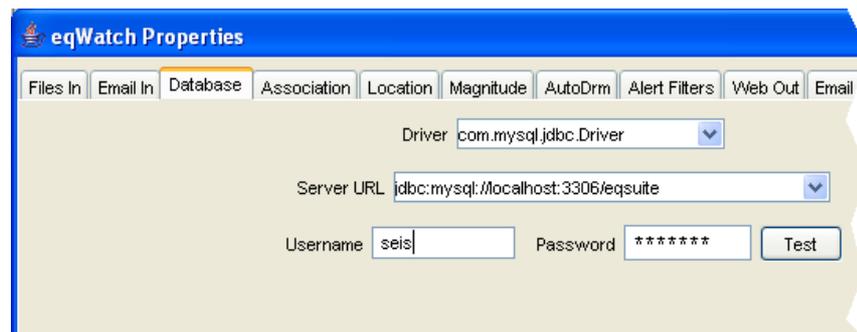
or, the default settings for a database on the same computer as eqWatch,

```
jdbc:mysql://localhost:3306/eqsuite
```

**Username:** Username for connecting to the database.

**Password:** Password for connecting to the database.

**Test:** After filling in the other settings, click the Test button to test whether eqWatch can connect to the database.



---

## Association – Determining if an Event Occurred

Before an earthquake event can be located, a decision has to be made as to whether an event has occurred at all.

eqWatch does this as follows each time an Arrival is received:

1. An Arrival is received.
2. The database is searched for other Arrivals with a time within the **Event Window**. An Arrival is within the Event Window if its time is within that many seconds before or after the original Arrivals time.
3. Each Arrival found is given a weighting of 1.0, unless its Site is listed in **Site Weighting**, in which case the Arrival is given the weighting written after its Sitecode.
4. The weightings are added up, and if they equal or better the **Arrivals in Event** value, an Event is declared.
5. If an Event is declared:
  - a. eqWatch waits the **Initial Location Delay** for more arrivals to be received.
  - b. Locates the event and sends alarms.
  - c. Waits the **Relocation Interval**.
  - d. If more arrivals within the **Event Window** have arrived then the Event is relocated and more alarms are sent.
  - e. Steps c and d are repeated until no further Arrivals are received.

The **Initial Location Delay** and **Relocation Interval** are used to prevent excessive relocations of events and excessive alarms.

From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Association** tab.

### Settings:

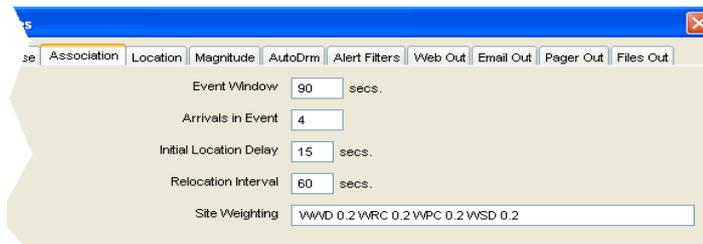
**Event Window:** Time searched in the database before and after the initial Arrival Time for other Arrivals that might make up an Event.

**Arrivals in Event:** If the sum of the weights of each Arrival equal or exceed this, then an Event is declared.

**Initial Location Delay:** Seconds before the Event is located for the first time. This gives time for more arrivals to be received.

**Relocation Interval:** Seconds waited after an Event has been located for further arrivals to be received. If more are received, then the event is relocated.

**Site Weighting:** Normally an Arrival has a weight of 1.0, unless its site code and alternative weighting is listed here.



## Locating the Earthquake

After a number of Arrivals have been Associated into an Event, it is then located.

From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Location** tab.

### Settings:

**Earth Model:** A file that describes the velocity that seismic waves move through the earth. Refer to the **Data Formats Manual** for details of the file format.

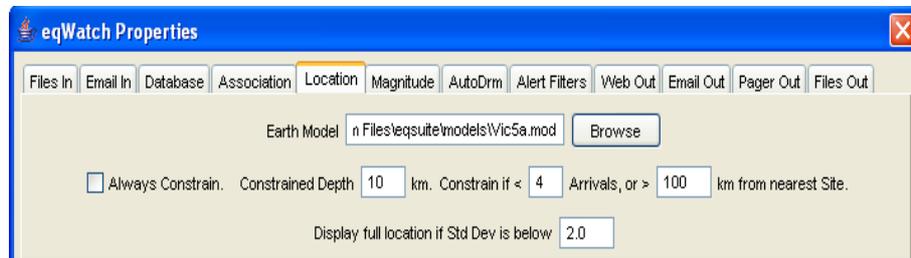
**Always Constrain:** Always assume the depth of the earthquake is the Constrained Depth.

**Constrained Depth:** A default depth for earthquakes.

**Constrain if:** Use the constrained depth if these conditions apply.

The depth of an earthquake is difficult to calculate when data is lacking and imprecise, and may contribute to an incorrect horizontal location. Some users may prefer to permanently constrain the depth to a value that is common for the local region.

**Display full location if Std Dev is below:** A high Standard Deviation indicates that the earthquake has not been located very accurately. Some of the Arrivals don't fit the result very well. Users may wish for a different alert to be sent depending on whether the Std Dev is low or high.



Once the Earthquake is located the following happens:

1. The Location is stored in the eqSuite Database. It is linked with an existing Event if one exists, otherwise a new Event is created.
2. An alert sound is played.
3. A Web Page is created.
4. Alerts are sent via Email and/or SMS

---

## Alert Sounds

When an Earthquake is located, eqWatch decides whether it is a new earthquake, i.e. a new Event, or merely an updated version of an already located earthquake, i.e. an Update to an Event.

If the earthquake is a New Event, the file **event.wav** is played.

If the earthquake is an Update, the file **update.wav** is played.

These files are found in the eqSuite folder, by default stored at [C:\Program Files\eqsuite](#)

These files can be replaced with different sounds if the user wishes.

## Earthquake Web Page

The following notes explain how eqWatch generate report web pages.

This consists of the creation of:

- HTML files from a template.
- An Image of Waveforms at the time of the earthquake, from the Waveform Archive.
- A Map from Image files.

## Properties for Creating Web Pages

From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Web Out** tab.

### Settings:

**Write File:** Write the web page files.

**Display Web Page:** Open the web page in a browser as soon as it is created.

**Report Directory:** Root folder to write web pages into.

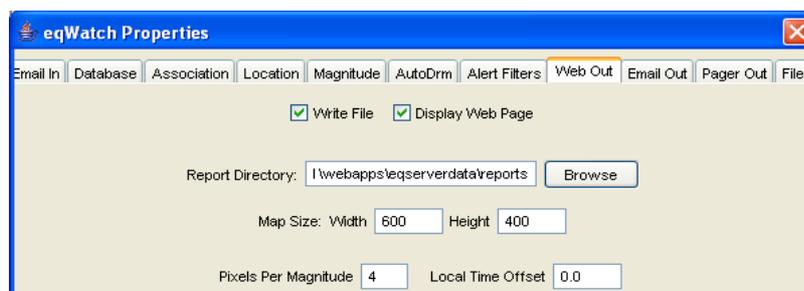
When operating with eqServer, set this folder to:

C:\Program Files\Apache Group\Tomcat 4.1\webapps\eqserverdata\reports

**Map Size:** The width and height of the generated Map.

**Pixels per Magnitude:** The diameter of the circle representing the Earthquake is this number x the location magnitude.

So for example, a magnitude 3 event with a Pixels per Magnitude of 4 would have a circle  $3 \times 4 = 12$  pixels in diameter.



From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Files Out** tab.

### Settings:

**Output Folder:** This is where files containing waveforms and triggers are stored after being read by eqWatch. These files are used to create the Waveform Image.



## Template HTML files

In the **eqSuite** folder should be a folder called **template**, by default found at:

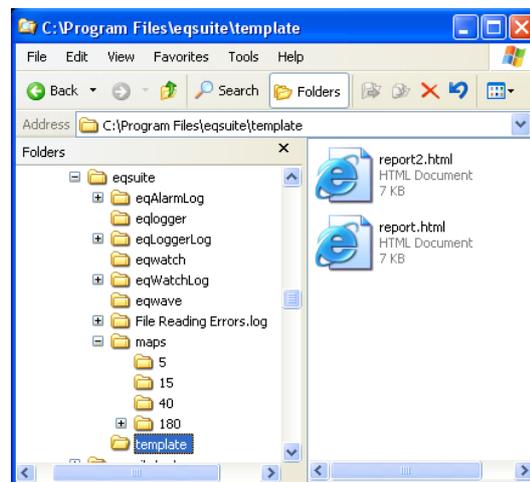
<C:\Program Files\eqsuite\template>

It should contain the following files:

**report.html** - The Web page displayed when an event has been accurately located.

**report2.html** - The Web page displayed when an event has occurred, but has a high Standard Deviation.

You may create other files as well, thus allowing you to produce reports for other purposes, but these two files are critical for eqWatch to operate.



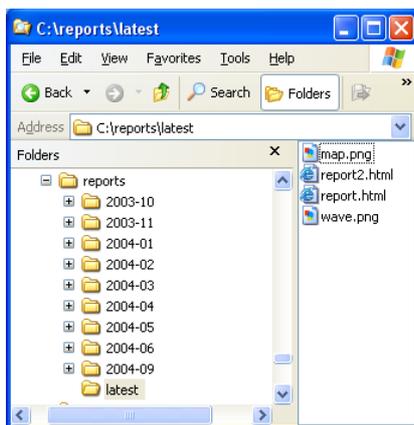
These files can be viewed and edited in a variety of web page editors, such as Microsoft FrontPage, Macromedia Dreamweaver or any text editor.

When an event occurs, eqWatch makes a copy of each file in the **template** folder and places it in an event folder and month folder in the **Report Folder** set in eqWatch's Properties. Keywords in the files are replaced with actual values, as shown below.

The most recent report is also copied into a folder called **latest** within the **Report Folder**.

If eqWatch is to function with eqServer the Report folder should be set to:

`C:\Program Files\Apache Group\Tomcat 4.1\webapps\eqserverdata\reports`



### Keywords

While eqWatch is copying the report HTML files, a simple keyword replacement is performed. A keyword is a single, all lowercase word surrounded by square brackets, for example: **[stddev]**. It will be replaced with the actual value it represents.

Thus, if a line of text in the file is "Standard Deviation = [stddev]", it will be changed to "Standard Deviation = 2.51",

Every file in the template folder will be processed by keyword replacement and stored in the **Report Folder**.

Keywords can be used as many times as needed within the same file.

Do not put non-text files, such as pictures, in the **template** folder. eqWatch will attempt keyword replacement in them as well, which could generate unexpected results.

eqWatch will create a map with the hypocenter of the event at its center. This map is a file with the name **map.jpg**. It is placed in the event folder in the Report Folder, and can be displayed in the HTML reports.

### Available Keywords

#### Event Related Keywords:

| <i>Keyword</i> | <i>Meaning</i>  | <i>Example</i> |
|----------------|---|----------------|
| [software]     | The name of the software that generated the report                    | eqWatch 1.2.8  |
| [latitude]     | Latitude to 1 decimal place, always positive, with N or S hemisphere. | 10.1N          |
| [latitudeunc]  | Latitude uncertainty in degrees, to 1 decimal place                   | 0.5            |
| [longitude]    | Longitude to 1 decimal place, always positive, with E or W            | 100.1E         |
| [longitudeunc] | Longitude uncertainty in degrees, to 1 decimal place                  | 0.5            |

| <b>Keyword</b> | <b>Meaning</b>   | <b>Example</b>                 |
|----------------|--|--------------------------------|
| [ml]           | ML magnitude to 1 decimal place  | 3.1                            |
| [md]           | MD magnitude to 1 decimal place  | 3.1                            |
| [depth]        | Depth of event in kilometres to 1 decimal place. If depth is fixed, it will have the message (Constrained) | 21.5km<br>20.0km (Constrained) |
| [depthunc]     | Uncertainty of the depth in kilometres to 1 decimal place  | 4.5                            |

**The time of the event in UTC time:**

|                |   |       |
|----------------|---|-------|
| [yearutc]      | the year                                  | 2001  |
| [monthutc]     | the month as a number                     | 3     |
| [monthtextutc] | the month as text,                        | March |
| [dayutc]       | the day                                   | 7     |
| [hourutc]      | the hour in 24 hour time                  | 23    |
| [minuteutc]    | the minute                                | 9     |
| [secondutc]    | the second                                | 3     |
| [timeunc]      | uncertainty in seconds to 1 decimal place | 5.4   |

**The time in the Local Timezone:**

|                  |                          |       |
|------------------|--------------------------|-------|
| [yearlocal]      | the year                 | 2001  |
| [monthlocal]     | the month as a number    | 3     |
| [monthtextlocal] | the month as text,       | March |
| [daylocal]       | the day                  | 7     |
| [hourlocal]      | the hour in 24 hour time | 23    |
| [hourampmlocal]  | the hour in 12 hour time | 11    |
| [ampmlocal]      | AM or PM hour string     | AM    |
| [minutelocal]    | the minute               | 9     |
| [secondlocal]    | the second               | 3     |

**The time on the Computers Clock when the Report was generated:**

|                |                          |       |
|----------------|--------------------------|-------|
| [yearnow]      | the year                 | 2001  |
| [monthnow]     | the month as a number    | 3     |
| [monthtextnow] | the month as text,       | March |
| [daynow]       | the day                  | 7     |
| [hournow]      | the hour in 24 hour time | 23    |
| [hourampmnow]  | the hour in 12 hour time | 11    |
| [ampmnow]      | AM or PM hour string     | AM    |
| [minutenow]    | the minute               | 9     |
| [secondnow]    | the second               | 3     |

**The nearest town to the Event:**

|                  |   |             |
|------------------|---|-------------|
| [nearestplace]   | name of the nearest town  | Manila      |
| [nearestregion]  | name of the nearest region  | Luzon       |
| [nearestcountry] | name of the nearest country   | Philippines |
| [nearestcompass] | direction of the earthquake from the town as a compass direction                    | NW          |
| [nearestdegrees] | direction of the earthquake from the town in degrees, North = 0°, turning clockwise | 310°        |
| [nearestkm]      | Distance from town to event in kilometres   | 12          |

**Arrivals used in the Location:**

Each of these keywords are replaced by a vertical list of values. They work best when placed in an HTML table. The table should have one row, and then one column for each keyword, for example,

|           |           |            |               |               |
|-----------|-----------|------------|---------------|---------------|
| [arrsite] | [arrtime] | [arrphase] | [arrresidual] | [arrdistance] |
|-----------|-----------|------------|---------------|---------------|

Which will produce a table similar to this:

|      |                          |   |       |         |
|------|--------------------------|---|-------|---------|
| GVLS | 2000-06-25 1234 43.7 UTC | P | 0.25  | 2.23km  |
| QVPS | 2000-06-25 1234 47.6 UTC | P | -1.53 | 5.45km  |
| TOSS | 2000-06-25 1234 52.2 UTC | P | 2.32  | 12.11km |
| ARMA | 2000-06-25 1234 56.3 UTC | P | -0.11 | 15.08km |

Not all the columns need to be used. For example, if the residuals or distances are not appropriate to report then those columns can be left out.

The columns can be placed in any order. For example, the phases may be placed before the time.

| <b>Keyword</b> | <b>Meaning</b>  |
|----------------|---|
| [arrsite]      | site names  |
| [arrtime]      | time of arrivals  |
| [arrphase]     | phase type  |
| [arrresidual]  | residual of arrival in seconds  |
| [arrdistance]  | distance from site to event   |
| [stddev]       | Standard Deviation<br>Closeness of fit of actual arrival times to expected times. This is a single number and does not require a column in a table. eg, <b>3.44</b> |

**Deferred Arrivals:**

To be used in a table, as done with Arrivals.

| <b>Keyword</b>     | <b>Meaning</b>                 |
|--------------------|--------------------------------|
| [deferredsite]     | site names                     |
| [deferredtime]     | time of arrivals               |
| [deferredphase]    | phase type                     |
| [deferredresidual] | residual of arrival in seconds |
| [deferreddistance] | distance from site to event    |

**Intensities:**

Intensities stored in the database at the time of the event.  
To be used in a table, as done with Arrivals. For example:

|                 |                 |                |
|-----------------|-----------------|----------------|
| [intensitysite] | [intensitytime] | [intensityamp] |
|-----------------|-----------------|----------------|

Which will produce a table similar to this:

|      |                          |   |
|------|--------------------------|---|
| GVLS | 2000-06-25 1234 43.7 UTC | 4 |
| QVPS | 2000-06-25 1234 47.6 UTC | 3 |
| TOSS | 2000-06-25 1234 52.2 UTC | 3 |
| ARMA | 2000-06-25 1234 56.3 UTC | 2 |

| <b>Keyword</b>  | <b>Meaning</b>          |
|-----------------|-------------------------|
| [intensitysite] | site name               |
| [intensitytime] | time intensity recorded |
| [intensityamp]  | intensity value         |

**Magnitudes:**

An estimate of the ML and MD magnitudes are calculated for each site. To be used in a table, as done with Arrivals. For example:

| [magsite] | [magsiteml] | [magsitemd] | [magsiteduration] | [magsiteamplitude] | [magsitefrequency] |
|-----------|-------------|-------------|-------------------|--------------------|--------------------|
|-----------|-------------|-------------|-------------------|--------------------|--------------------|

Which will produce a table similar to this:

|      |     |     |      |       |    |
|------|-----|-----|------|-------|----|
| GVLS | 3.4 | 3.6 | 12.3 | 12345 | 12 |
| QVPS | 3.7 | 3.4 | 13.2 | 12223 | 10 |
| TOSS | 4.2 | 4.0 | 9.0  | 9922  | 14 |
| ARMA | 3.6 | 3.8 | 8.8  | 13112 | 9  |

| <b>Keyword</b>     | <b>Meaning</b>  |
|--------------------|---|
| [magsite]          | site name   |
| [magsiteml]        | ML magnitude  |
| [magsitemd]        | MD magnitude  |
| [magsiteduration]  | duration of event in seconds. Used to calculate MD          |
| [magsiteamplitude] | peak amplitude of the event in counts. Used to calculate ML |
| [magsitefrequency] | frequency at peak amplitude in hertz. Used to calculate ML  |

**Waveform Image File**

The Output Folder, as set in the **Files Out** Properties tab, is searched for waveforms with a time between the earliest and latest arrivals used in determining the Earthquake Location.

The waveforms are read, merged together and an image file is generated, called **wave.png**.

## Map of Event

Along with creating a new set of HTML files with every event, **eqWatch** generates a map of the area surrounding the event, and calls it **map.png**. The template web page should include a link to this image. The map is generated by combining images stored in the **maps** folder.

By default this is found at:

<C:\Program Files\eqsuite\maps\>

Inside the maps folder is a number of subfolders with numbers for names.

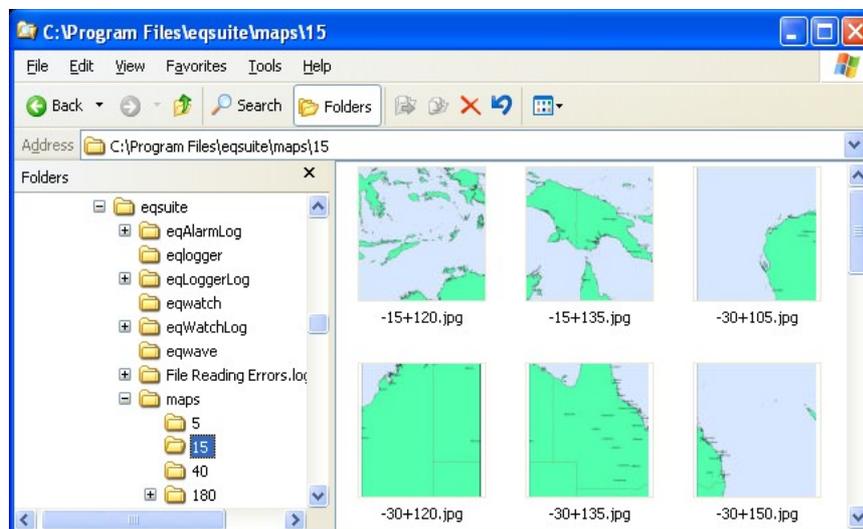
For example <C:\Program Files\eqsuite\maps\5\>.

These folders contain a number of image files. Each file is a map covering the number of geographic degrees noted in the folder name. The name of the file also denotes the co-ordinates of the southwest corner of the map.

So the file <C:\Program Files\eqsuite\maps\5\+10+120.jpg> represents a map  $5^{\circ} \times 5^{\circ}$  in size, with a southwest corner of latitude  $10.0^{\circ}$  N, longitude  $120.0^{\circ}$  E.

These files are stitched together and cropped to create a new map image with the earthquake at the center.

**eqWatch** looks in each of the folders, from smallest number to largest, for maps that contain the event location. For example if the location cannot be placed on any of the maps in the **5** folder, then the maps in the **15** folder are examined, and so on until World Map in the **180** folder is finally used if no other appropriate maps have been found.



You can replace or add additional map files to the collection if you wish. You can also replace the 5, 40 and 180 folders with other more suitable map sizes if desired.

The source maps are simple JPEG image files, which can be generated using a GIS system, created using a scanner or by other means.

The **eqWatch** Properties can be used to set the pixel size of the map, and the size of the circle drawn about the event location.





**Alert if "Old":** Sometimes an event location can be triggered by an arrival that has not arrived in real time. For example, from a seismograph that had lost telemetry for a period. Such events might not be worth immediate action during the night, and the unwanted SMS message.

**"Old" is older than:** A definition of how old an earthquake must be to be declared "Old".

**Alert if Std Dev <:** A high standard deviation means that a location could not be accurately determined. Users might not want alerts for unlocateable events.

**Alert if Event Location Moved at least:**

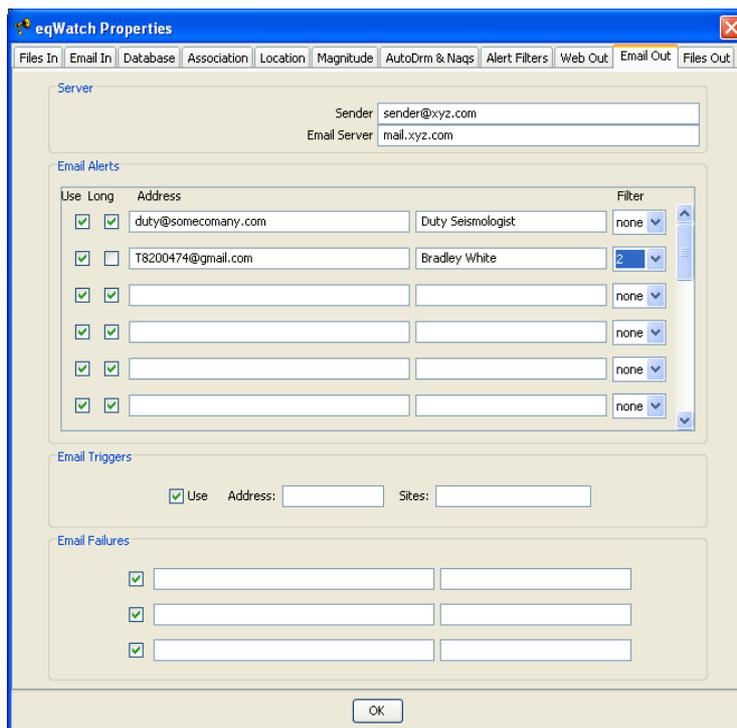
If arrivals are sent to eqWatch over a period of several minutes, there may be several updates to the Location as it is recalculated using the additional data. If the new location has not moved a sufficient distance from the previous version, then the user might not want to be alerted again, as they already know approximately where the earthquake occurred.

## Email Alerts

Email Alerts are sent after an earthquake has been located. They are only sent if they pass the filter applied to them.

The message sent is either a Long message, which is detailed, or a Short message, which is designed to fit into a single SMS message to a mobile phone.

Individual Arrivals can be relayed to an email address in CSS format as a means of passing information to another earthquake locaton system.



From the **Files** menu, select **Properties**, and then in the **eqWatch Properties** window select the **Email Out** tab.

### Settings:

#### Server

**Sender:** The return email address to be attached to the message.

**Email Server:** The SMTP email server to be used to send the message.

#### Email Alerts

This lists the email addresses to send alerts to.

**Use:** Whether on not to use this alert

**Long:** A Long or Short message?

**Receiver:** The email address to send the alert to.

**Filter:** The filter to use to decide whether on not to send the email.

## Email Triggers

Triggers (arrival detections) can be relayed to another earthquake location system via emails. Every trigger from the listed seismograph sites is emailed to the given address, encoded in CSS format.

Refer to **Read Arrivals from Email** for a description of the format of the email.

**Use:** Do we use this feature?

**Address:** Email address to send to.

**Sites:** The seismograph sites whose arrivals will be sent.

The screenshot shows the 'eqWatch Properties' dialog box with the 'Email Out' tab selected. The 'Server' section contains 'Sender: VicWatch@esands.com' and 'Email Server: mail.esands.com'. The 'Email Alerts' section is a table with columns 'Use', 'Long', 'Receiver', and 'Filter'. The 'Email Triggers' section has a checked 'Use' checkbox, 'Address: ts@esands.com', and 'Sites: CTA, EDS, ARMA'.

| Use                                 | Long                                | Receiver                         | Filter |
|-------------------------------------|-------------------------------------|----------------------------------|--------|
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | gregm@esands.com                 | none   |
| <input type="checkbox"/>            | <input type="checkbox"/>            | gregm@esands.com                 | 1      |
| <input type="checkbox"/>            | <input type="checkbox"/>            | 0412220959@onlinesms.telstra.com | 4      |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                                  | none   |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                                  | none   |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |                                  | none   |

Use    Address:     Sites:

---

## Storing Files in an Archive

Received files are written to an Archive on the local computer.

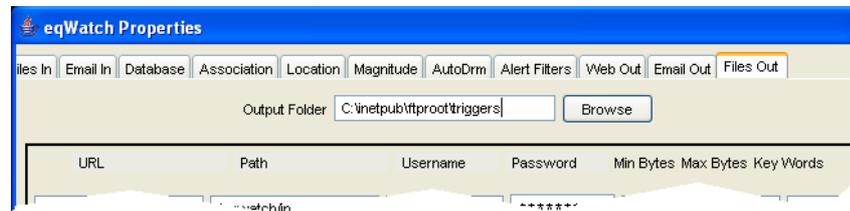
### Setup:

**Output Folder:** The Root of the File Archive.

eqWatch creates sub-folders representing the year, month and day of the arrival.

For example, an arrival on the day 2004-11-30, where the Output Folder = C:\inetpub\ftproot\triggers, will be stored in the folder: C:\inetpub\ftproot\triggers\2004\11\30

If eqWatch is used in conjunction with eqServer, then the Output Folder should be C:\inetpub\ftproot\triggers



## Relaying Files to FTP servers

Received arrival files can be sent to folders on remote FTP servers. Unlike writing to the Archive, the files are *not* written to a hierarchical folder system. They are simply written to the given folder.

The files can be filtered by their size and keywords in their filename.



Settings:

**URL:** URL of the FTP server to connect to.

To send files to the FTP server on the local computer, enter localhost.

**Path:** The folder on the FTP server to write files to.

**User:** The username needed to connect to the FTP server.

**Password:** The Password for the FTP server.

**Min Bytes:** The minimum size in bytes that a file must be in order to be written to the FTP server. An empty box means there is no minimum size.

**Max Bytes:** The maximum size of a file be written to the FTP server. An empty box means there is no maximum size.

**Key Words:** The filename of the file must contain one of the words listed in this box. An empty box means any filenames are accepted.

# Operation

## The Main Window

This window is displayed when eqWatch starts.

It contains three tabbed displays: Arrivals, FTP and Status.

**Arrivals** list seismic arrivals and displays located earthquakes.

**FTP** shows the interactions of FTP sessions, both sending and receiving files.

**Status** lists the State of Health data extracted from recently received files.

### Arrivals

This display lists arrivals and earthquakes as they are processed by eqWatch.

#### Arrival lines

Each line displays the following:

- Date & Time of the Arrival (e.g. 2004-11-23 0446 41.55)
- The Sitecode (e.g. POAT, NATM)
- The Arrival type (e.g. MAX, P or F)  
P = earliest detection of an earthquake.  
MAX = time of the peak amplitude.  
F = finish time of the earthquake.
- Peak Amplitude in counts (e.g. 5529.0)
- Frequency at Peak Amplitude (e.g. 25Hz)
- Delay between the Arrival and it being received by eqWatch.  
In the form days:hours:minutes:seconds  
(e.g. 00:00:00:47)

| Date & Time           | Sitecode | Arrival type | Peak Amplitude | Frequency | Delay       |
|-----------------------|----------|--------------|----------------|-----------|-------------|
| 2004-11-23 0446 41.75 | POAT     | MAX          | 5529.0         | 25Hz      | 00:00:00:47 |
| 2004-11-23 0427 22.52 | NATM     | P            |                |           | 00:00:20:24 |
| 2004-11-23 0427 23.25 | NATM     | MAX          | 125.0          | 10Hz      | 00:00:20:25 |
| 2004-11-23 0450 36.57 | DROM     | P            |                |           | 00:00:00:43 |
| 2004-11-23 0450 36.59 | DROM     | MAX          | 941.0          | 16Hz      | 00:00:00:46 |
| 2004-11-23 0450 40.00 | DROM     | F            |                |           | 00:00:00:45 |
| 2004-11-23 0452 25.64 | CHIL     | P            |                |           | 00:00:01:04 |
| 2004-11-23 0452 26.14 | CHIL     | MAX          | 113.0          | 25Hz      | 00:00:01:05 |
| 2004-11-23 0456 15.86 | WRP      | P            |                |           | 00:00:00:17 |
| 2004-11-23 0506 13.22 | MACS     | P            |                |           | 00:00:00:54 |
| 2004-11-23 0507 18.56 | MACS     | MAX          | 1433.0         | 4Hz       | 00:00:00:52 |
| 2004-11-23 0508 00.38 | GVL      | P            |                |           | 00:00:00:41 |
| 2004-11-23 0508 01.38 | GVL      | MAX          | 1717.0         | 12Hz      | 00:00:00:43 |
| 2004-11-23 0508 21.46 | WRP      | P            |                |           | 00:00:00:27 |
| 2004-11-23 0508 23.94 | WPC      | P            |                |           | 00:00:00:31 |
| 2004-11-23 0517 53.22 | DTMM     | P            |                |           | 00:00:01:38 |
| 2004-11-23 0517 56.00 | DTMM     | F            |                |           | 00:00:01:37 |

## Earthquakes

When an earthquake is located, details about it are also written to the Arrivals display.

```

eqWatch V1.7.13
File Started: 2004-11-19 0150 UTC 35932KB / 65088KB
Arrivals FTP Status
2004-11-23 2111 47.50 MACS MAX 684.0 4Hz 00:00:01:32
Located event at 2004-11-23 2103 49.
2004-11-23 2110 40.63 TINA P 00:00:02:46
2004-11-23 2110 41.06 TINA MAX 2034.0 2Hz 00:00:02:47
AutoLocation stored in database.
No change needed.
Event=(-23.3,-177.8) MO.40228024 2004-11-23 2103 **Test: day=false now=2004-11-23 2113 old=false moved=true inside=false minMag=4.5 st
Event=(-23.3,-177.8) MO.40228024 2004-11-23 2103 **Test: day=false now=2004-11-23 2113 old=false moved=true inside=false minMag=10.0 st
Event=(-23.3,-177.8) MO.40228024 2004-11-23 2103 **Test: day=false now=2004-11-23 2113 old=false moved=true inside=false minMag=4.5 st
Event=(-23.3,-177.8) MO.40228024 2004-11-23 2103 **Test: day=false now=2004-11-23 2113 old=false moved=true inside=true minMag=0.0 stdd
Event=(-23.3,-177.8) MO.40228024 2004-11-23 2103 **Test: day=false now=2004-11-23 2113 old=false moved=true inside=true minMag=0.0 stdd
Event=(-23.3,-177.8) MO.40228024 2004-11-23 2103 **Test: day=false now=2004-11-23 2113 old=false moved=true inside=true minMag=0.0 stdd
Finding nearest town.
Nearest town is Nukualofa, Tongatapu Island, Tonga, 3078km to FRED. Making HTML files.
Making map.
2004-11-23 2110 59.15 ROKM P 00:00:03:05
2004-11-23 2110 59.30 ROKM MAX 987.0 1Hz 00:00:03:08
04-11-23 2103
-177.8 -23.3 ML?? 356km SW Nukualofa sdl.2 arr14
WRP 394.1
WPC 394.9
FRED 397.0 1273
PETE 430.2 1490
WAM 432.0 136
CLAW 463.2 1172
MACS 463.6
CHIL 467.9 780
Done
2004-11-23 2112 56.96 DROM P 00:00:01:17
  
```

## FTP

This tab displays the interaction with remote FTP servers.

It is useful for checking that the connections are operating correctly.

Each separate FTP connection is given it's own colour.

```

eqWatch V1.7.13
File Started: 2004-11-19 0150 UTC 34592KB / 65088KB
Arrivals FTP Status
220 NetPresenz v4.0.1 awaits your command.
331 Password required.
230-Welcome to Power Seismonitor.
230 User logged in to 1 volumes, directory is "/".
250 "/PowerSeismonitor/ftp" cd successful.
no files
227 Entering Passive Mode (172,16,6,12,3,185).
150 ASCII transfer started.
226 Transfer complete.
221 Nice chatting with you.
331 Password required for src.
230 User src logged in.
250 CWD command successful.
221
*** 2004-11-23 0521 04: Relay attempt to localhost
Connected to localhost.
220-Microsoft FTP Service
  
```

## Status

Arrival files also contain information about the health of the seismograph that created them.

This tab displays this information, and also the time the last file was read by eqWatch.

This information is useful in determining what seismographs are operating, and if not then for how long they have been offline.

### Colours:

**Green** = a file was received less than 24 hours ago.

**Black** = a file between 24 and 48 hours ago.

**Red** = 48 to 336 hours (14 days) ago

| Site | Received           | Age      | Recorded           | Delay | Batt  | Supply | Charge | Total Mb | Free | Temp | Sync Time          | Sync   |
|------|--------------------|----------|--------------------|-------|-------|--------|--------|----------|------|------|--------------------|--------|
| ALL  | 2004-11-22 0425 37 | 01:00:55 | 2004-11-22 0423 52 | 1.8   | ----  | ----   | ----   | ----     | ---- | ---- |                    |        |
| AVOS | 2004-11-22 2033 38 | 00:08:47 | 2004-11-22 2031 45 | 1.9   | ----  | ----   | ----   | ----     | ---- | -1°  | 2004-11-22 2030 07 | 0.0000 |
| BEEN | 2004-11-22 2033 44 | 00:08:47 | 2004-11-22 2031 52 | 1.9   | 13.4V | 228mA  | 250mA  | 128.2Mb  | 97%  | 23°  | 2004-11-22 1932 50 | 0.0004 |
| BOON | 2004-11-11 0006 00 | 12:05:14 | 2004-11-10 2133 00 | 153.0 | 12.4V | 358mA  | 230mA  | 538.8Mb  | 98%  | 25°  | 2004-11-10 2118 00 | 0.0000 |
| BURD | 2004-11-23 0439 47 | 00:00:41 | 2004-11-23 0406 18 | 33.5  | 13.3V | 190mA  | 580mA  | 128.2Mb  | 99%  | 42°  | 2004-11-23 0340 35 | 0.0000 |
| CCRM | 2004-11-19 1636 38 | 03:12:44 | 2004-11-19 1634 10 | 2.5   | 14.2V | 256mA  | 0mA    | 128.0Mb  | 99%  | 15°  |                    |        |
| CDNM | 2004-11-23 0143 21 | 00:03:37 | 2004-11-23 0142 34 | 0.8   | 13.8V | 253mA  | 1000mA | 1.0Mb    | 32%  | 21°  |                    |        |
| CHIL | 2004-11-23 0453 28 | 00:00:27 | 2004-11-23 0452 46 | 0.7   | 13.1V | 282mA  | 50mA   | 538.8Mb  | 99%  | 41°  | 2004-11-23 0450 39 | 0.0000 |
| CLAW | 2004-11-23 0351 41 | 00:01:29 | 2004-11-23 0350 28 | 1.2   | 13.6V | 279mA  | 0mA    | 128.5Mb  | 97%  | 22°  | 2004-11-23 0346 56 | 0.0003 |
| CNS1 | 2004-11-23 0238 55 | 00:02:41 | 2004-11-23 0237 33 | 1.4   | 13.6V | 166mA  | 0mA    | 538.8Mb  | 99%  | 33°  | 2004-11-23 0232 26 | 0.0000 |
| CTBM | 2004-11-23 0203 06 | 00:03:17 | 2004-11-23 0202 08 | 1.0   | 14.0V | 266mA  | 40mA   | 128.2Mb  | 98%  | 22°  | 2004-11-23 0112 50 | 0.0000 |
| DLBQ | 2004-11-20 0746 43 | 02:21:34 | 2004-11-20 0746 43 | 0.0   | 12.5V | 156mA  | 150mA  | 32.2Mb   | 97%  | 35°  | 2004-11-19 0734 24 | 0.0000 |
| DROM | 2004-11-23 0520 53 | 00:00:00 | 2004-11-23 0520 34 | 0.3   | 13.4V | 201mA  | 240mA  | 32.1Mb   | 99%  | 29°  | 2004-11-23 0429 55 | 0.0000 |
| DTMM | 2004-11-23 0519 30 | 00:00:01 | 2004-11-23 0518 50 | 0.7   | 12.9V | 118mA  | 1000mA | 2.1Mb    | 95%  | 36°  |                    |        |
| ESSY | 2004-11-19 0445 55 | 04:00:34 | 2004-11-19 0445 44 | 0.2   | 12.2V | ----   | ----   | 255.9Mb  | 98%  | 26°  | 2004-11-19 0445 34 | 0.0000 |
| FAIR | 2004-11-23 0050 41 | 00:04:30 | 2004-11-23 0049 58 | 0.7   | 12.0V | 413mA  | 60mA   | 32.8Mb   | 99%  | 38°  | 2004-11-23 0045 32 | 0.0000 |
| FRED | 2004-11-23 0221 38 | 00:02:59 | 2004-11-23 0218 52 | 2.8   | 13.4V | 269mA  | 1080mA | 96.2Mb   | 99%  | 31°  | 2004-11-23 0210 31 | 0.0000 |

## Maintaining The Seismograph Site Table

The eqSuite database stores information on seismograph sites in the *site* table. The *File*→*Maintain Site Table* option displays a window with a list of sites displayed with in a table allowing the addition, modification, and deletion of sites from the database:

| Site | Longitude | Latitude | Eleva... | Fact... | Factor 2 | Open Date      | Close Date             | Operator | Owner    | Location/Co...      |
|------|-----------|----------|----------|---------|----------|----------------|------------------------|----------|----------|---------------------|
| AAI  | 128.167   | -3.7     | 0.08     | 0.4     | 1.15     | 2001/08/02 ... | 2030/12/30 13:00:00.00 |          |          | Ambon, Maluku, ...  |
| AAP  | 121.944   | 10.42    | 0.05     | 0       | 0        | 2001/08/02 ... | 2030/12/30 13:00:00.00 | PHIVOLCS | PHIVOLCS | Antique             |
| AAPA | 121.94    | 10.42    | 0.05     | 0       | 0        | 2001/08/02 ... | 2030/12/30 13:00:00.00 | PHIVOLCS | PHIVOLCS | Antique, Accele...  |
| AAPS | 121.94    | 10.42    | 0.05     | 0       | 0        | 2001/08/02 ... | 2030/12/30 13:00:00.00 | PHIVOLCS | PHIVOLCS | Antique, Seismo...  |
| ABEM | 146.389   | -37.719  | 0.549    | -2.4    | 2        | 2001/08/02 ... | 2030/12/30 13:00:00.00 | MEL      | MW       | Aberfeldy, Vic      |
| ADAM | 145.011   | -37.714  | 0.103    | 0       | 0        | 2004/06/22 ... | 2999/12/31 00:00:00.00 | MEL      | MEL      | Royal Parade P...   |
| ADE  | 138.714   | -34.967  | 0.655    | -0.65   | 1.55     | 2001/08/02 ... | 2030/12/30 13:00:00.00 | ADE      | ADE      | Adelaide, SA        |
| ADK  | -176.684  | 51.884   | 0.116    | 0.4     | 1.1      | 2001/08/02 ... | 2030/12/30 13:00:00.00 |          |          | Adak, Aleutian I... |
| ADT  | 138.714   | -34.967  | 0.655    | -0.65   | 1.55     | 2001/08/02 ... | 2030/12/30 13:00:00.00 | ADE      | ADE      | Adelaide Telem...   |
| AFI  | -171.777  | -12.909  | 0.706    | 0.4     | 1.15     | 2001/08/02 ... | 2030/12/30 13:00:00.00 |          |          | Afiamalu, Samo...   |
| AFR  | -149.778  | -17.538  | 0.05     | 0.4     | 1.15     | 2001/08/02 ... | 2030/12/30 13:00:00.00 |          |          | Afareaitu, Moor...  |
| AIA  | -64.267   | -65.25   | 0.011    | 0.4     | 1.5      | 2001/08/02 ... | 2030/12/30 13:00:00.00 |          |          | Argentine Is, A...  |
| AJI  | 139.097   | 35.043   | 0.059    | 0.4     | 1.1      | 2001/08/02 ... | 2030/12/30 13:00:00.00 |          |          | Ajiro, Japan        |
| AKI1 | 133.858   | -19.728  | 0.36     | -0.65   | 1.15     | 1987/11/30 ... | 1987/01/19 13:00:00.00 | AGSO     | Akai     | 1 site, NT          |
| AKI2 | 133.903   | -19.813  | 0.36     | -0.65   | 1.15     | 1987/01/19 ... | 1987/12/02 13:00:00.00 | AGSO     | Akai     | 2 site, NT          |
| ALOA | 150.38    | -10.3    | 0.1      | 0.4     | 1.55     | 2001/08/02 ... | 2030/12/30 13:00:00.00 |          |          | Alotau, PNG         |

To modify an attribute of a seismograph site, double click on the appropriate cell and enter the change. All changes are committed to the database immediately, but eqWatch will need to be restarted to see the changes as it only reads the database for site information on startup. You cannot modify the site name, if you need to change the site name delete the site and recreate it.

To add a new site, right click on the table to display a pop up menu, select add to open a new row at the top of the table (the table will scroll to the top of the table to display the new row entry. Enter a site code (this is the only time the site field can be edited), and tab through the remaining fields filling in the information as appropriate. The changes are committed to the database immediately.

Delete a site by displaying the pop up menu via a click on the right mouse button and selecting the delete option. A confirmation dialog will be displayed confirming you wish to delete the site or sites. You can select multiple sites with the use of the shift and control keys in conjunction with the right mouse button.

The table can be resorted with the sort option from the pop up menu.

## Log Files

eqWatch creates two text files: The eqWatch Log, and the Alarm Log.

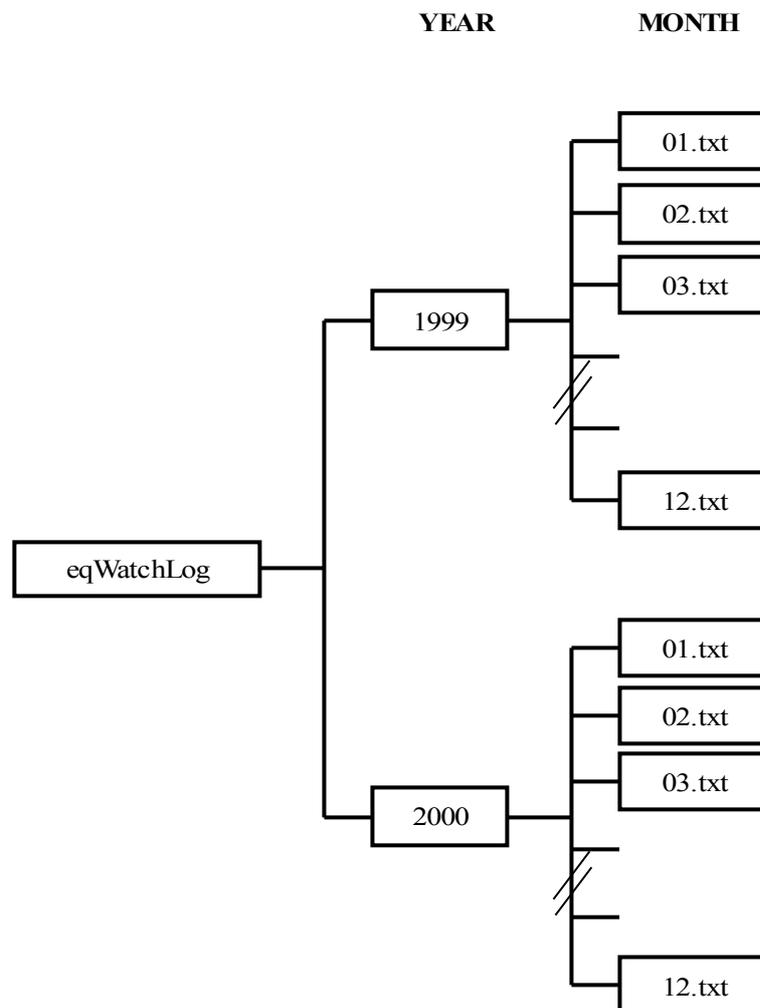
The eqWatch Log contains a copy of what is displayed in the Arrivals Tab in the main window.

The Alarm Log contains the text of the long and short alert messages, and the times and email addresses they were sent to.

A new log file is created for each month.

The eqWatch log files are stored, by default in:

[C:\Program Files\eqsuite\eqWatchLog\year\month.txt](#)



The Alarm log is stored in:

[C:\Program Files\eqsuite\eqAlarmLog\year\month.txt](#)

## Technical notes

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### Equipment required

You can use **eqWatch** on a computer with the following:

#### Operating system

eqWatch is a Java program and will run on any operating system that has Java 1.4 or later installed.

ES&S supplies an installer that will install eqWatch on Windows Operating Systems, from Windows 95 onwards.

#### FTP Server

Normally access to an FTP server is needed for remote Seismographs to connect to and send their files.

#### Java

**eqWatch** requires Java 1.4 or later.

The latest version of Java can be found at:

<http://java.sun.com/j2se/>

#### How to Check what version of Java is running

Open a **Command Prompt** or MS-DOS window.

On Windows XP this is found on the Start Menu at:

*Start->Programs->Accessories->Command Prompt.*

On the command line type:

```
java -version and then press Enter.
```

If java is installed you will see a reply similar to:

```
java version "1.4.2_02"
```

# Setting Up an FTP Server

## Internet Security

Please note that any computer that is exposed to the public Internet will be attacked sooner or later by hackers. It is vital that serious thought is put into the computers security before it is attached to the Internet.

The operating system should be updated with the latest Service Packs and Patches, and be protected by a Firewall.

All User accounts on the computer should have a password. A common error is to leave the Administrator user without a password.

The computer should be configured by a knowledgeable computer professional.

## Users

Each Seismograph that sends files to the FTP server should be given a username and password. A username unique to the seismograph allows you to track its connections in log files.

The convention of ES&S is to give a username that is the sitename of the seismograph, twice.

e.g. The Site "FRED" gets the username "FREDFRED".

A common password may be chosen for all sites, for the sake of simplicity.

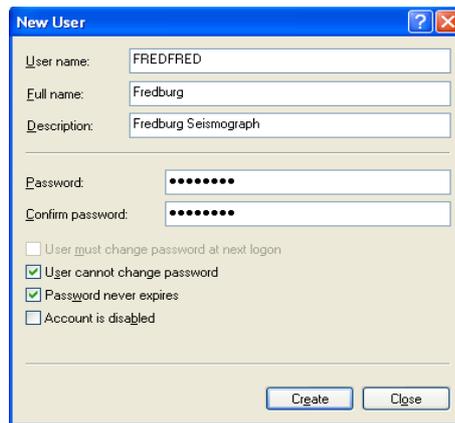
## To set up a new User

Open the **Computer Management** program, found at: Start Menu->Settings->Control Panel->Administrative Tools->Computer Management



Click the [+] signs until **Users** is displayed.

Right-Click on **Users** and select **New User**.



**New User**

User name: FREDFRED

Full name: Fredburg

Description: Fredburg Seismograph

Password: .....

Confirm password: .....

User must change password at next logon

User cannot change password

Password never expires

Account is disabled

Create Close

Fill in the **Username** and **Password**.

Uncheck the **User must change password at next login** box.

Check the **User Cannot change password** and **Password never expires** boxes.

Click the **Create** button to create the User.

Click the **Close** button when all the Users have been created.

## Changing a User Password



Select the user, right click and select **Set Password**.

## FTP Server

Windows XP comes with an FTP Server installed, which seismographs may use to deliver files to eqWatch and eqLogger.

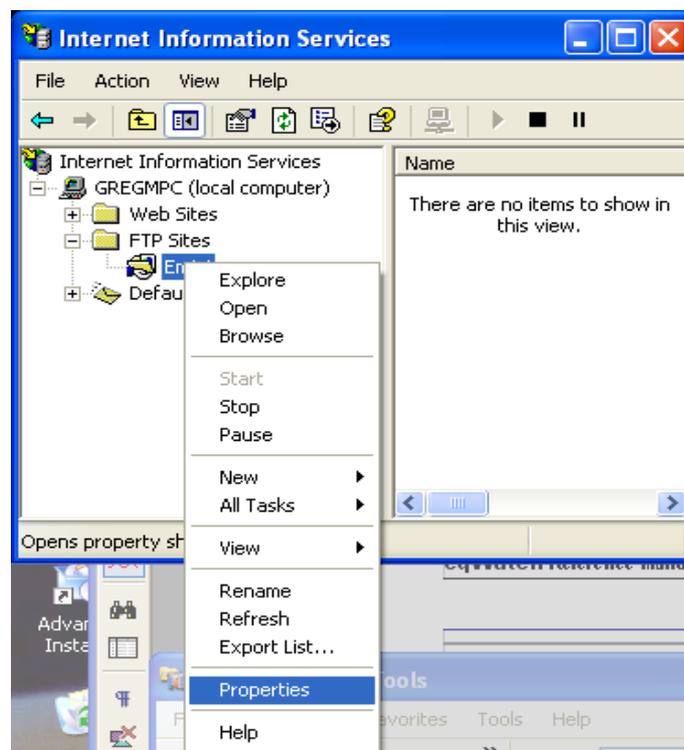
All windows users such as those created above will be able to connect to the FTP server. It is important that all users, including the Administrator, have passwords to prevent unauthorised access.

To configure the FTP server:

Open the **Internet Information Services** program.

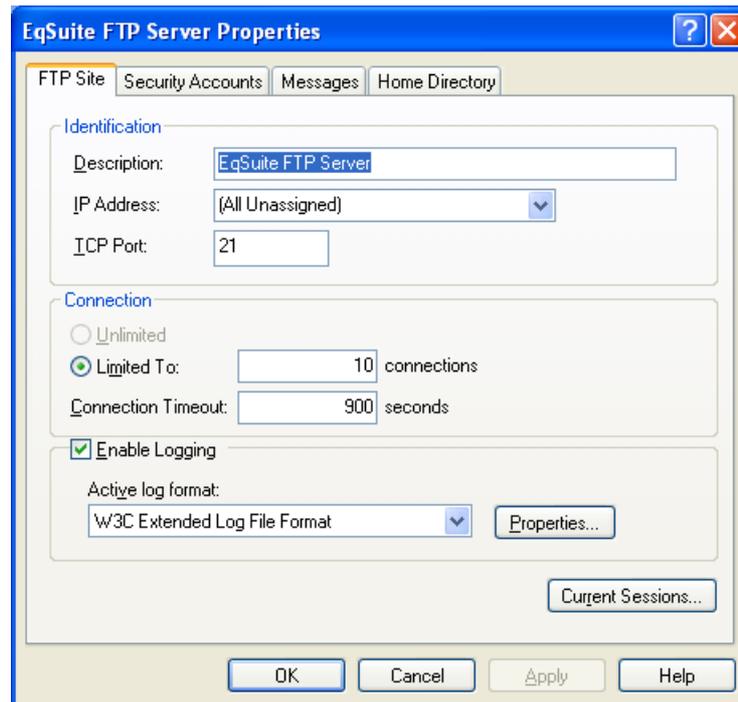
This is found as follows:

*Open the Start Menu->Settings->Control Panel->Administrative Tools->Internet Information Services*



Click on the **(local computer)** [+ ] sign, then the **FTP Sites** [+ ] sign, then right click on the  and choose the **Properties** menu option.

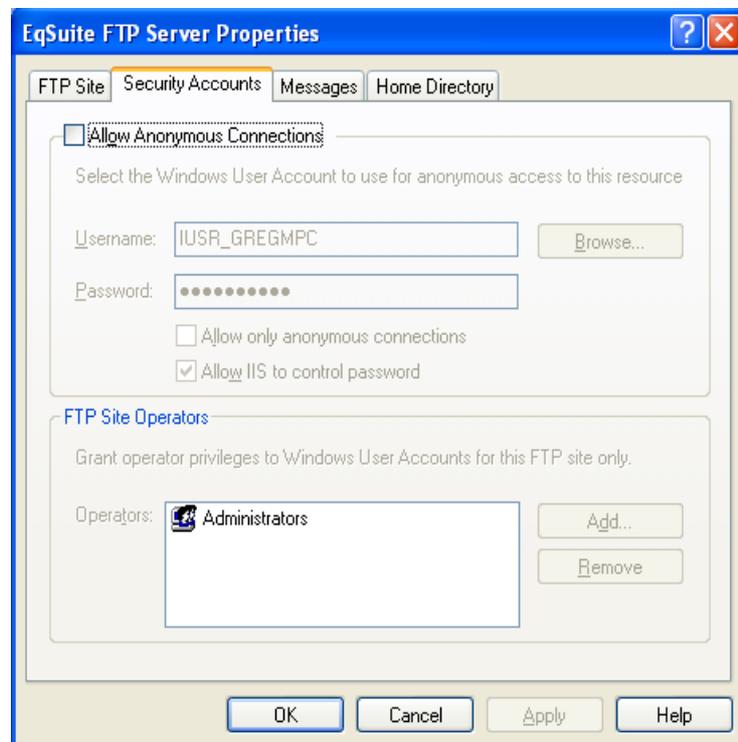
Setup Each Tab as follows:



The important features of the **FTP Site** tab are:

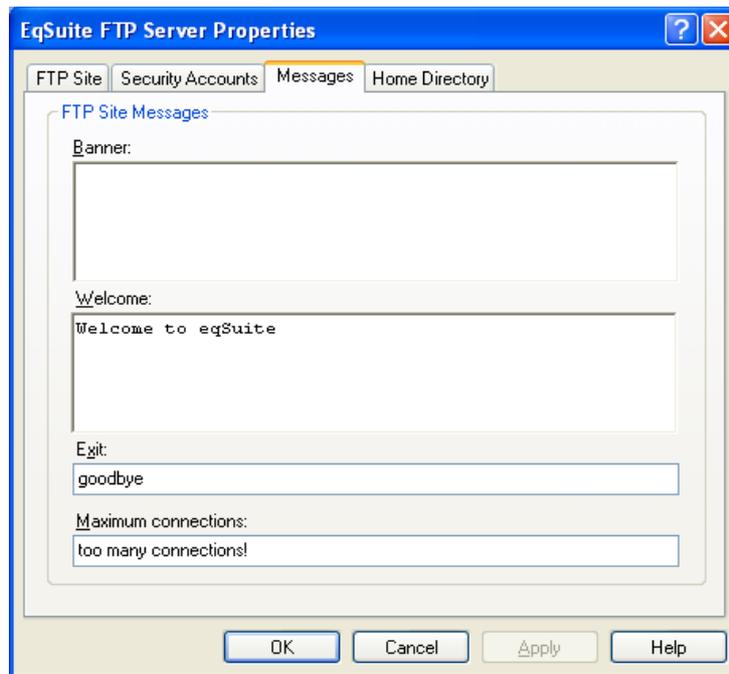
**Enable Logging** – Tick this box.

**Current Sessions...** - click this button to see who is currently connecting to the FTP site.



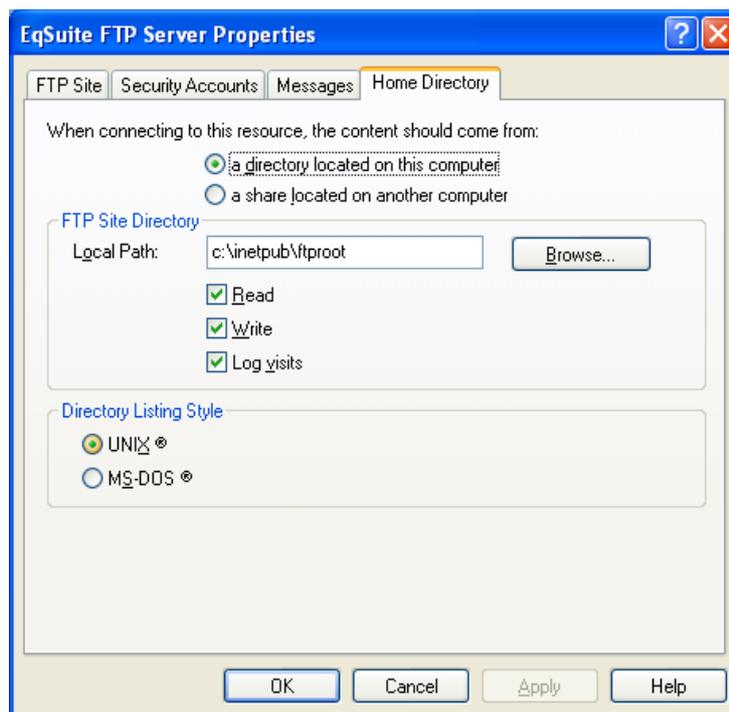
On **Security Accounts**,

**Allow Anonymous Connections** – Turn this OFF.  
We only want known users to connect.



On **Messages**,

Nothing is important. Set the messages to whatever you wish.



On **Home Directory**,

**Local Path:** Should be `c:\inetpub\ftproot`

**Read, Write, Log visits:** Tick all these settings.

**Directory Listing Style:** Choose **UNIX**

Click the **OK** button to close and finish.

## Testing the FTP connection

After creating users and activating the FTP server, you should test that users can successfully log in.

To do this, open up a **Command Prompt**.

This can be found at:

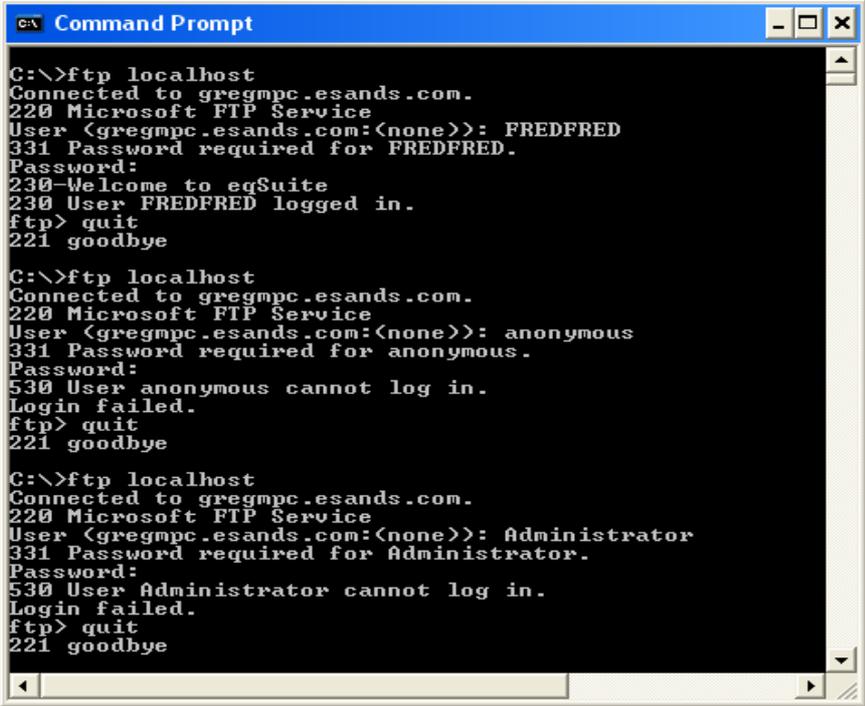
*Start Menu->Programs->Accessories->Command Prompt*

Type on the command prompt `ftp localhost`

You will be prompted for a username and password. Type these in and see if you get a successful connection.

Type `exit`, to finish the FTP connection.

Also test that the user "anonymous" cannot connect, and that "Administrator" cannot connect without a password.

A screenshot of a Windows Command Prompt window titled "Command Prompt". The window shows three separate FTP test sessions. The first session shows a successful login for the user "FREDFRED". The second session shows a failed login for the user "anonymous". The third session shows a failed login for the user "Administrator".

```
C:\>ftp localhost
Connected to gregmpc.esands.com.
220 Microsoft FTP Service
User <gregmpc.esands.com:(none)>: FREDFRED
331 Password required for FREDFRED.
Password:
230 Welcome to eqSuite
230 User FREDFRED logged in.
ftp> quit
221 goodbye

C:\>ftp localhost
Connected to gregmpc.esands.com.
220 Microsoft FTP Service
User <gregmpc.esands.com:(none)>: anonymous
331 Password required for anonymous.
Password:
530 User anonymous cannot log in.
Login failed.
ftp> quit
221 goodbye

C:\>ftp localhost
Connected to gregmpc.esands.com.
220 Microsoft FTP Service
User <gregmpc.esands.com:(none)>: Administrator
331 Password required for Administrator.
Password:
530 User Administrator cannot log in.
Login failed.
ftp> quit
221 goodbye
```