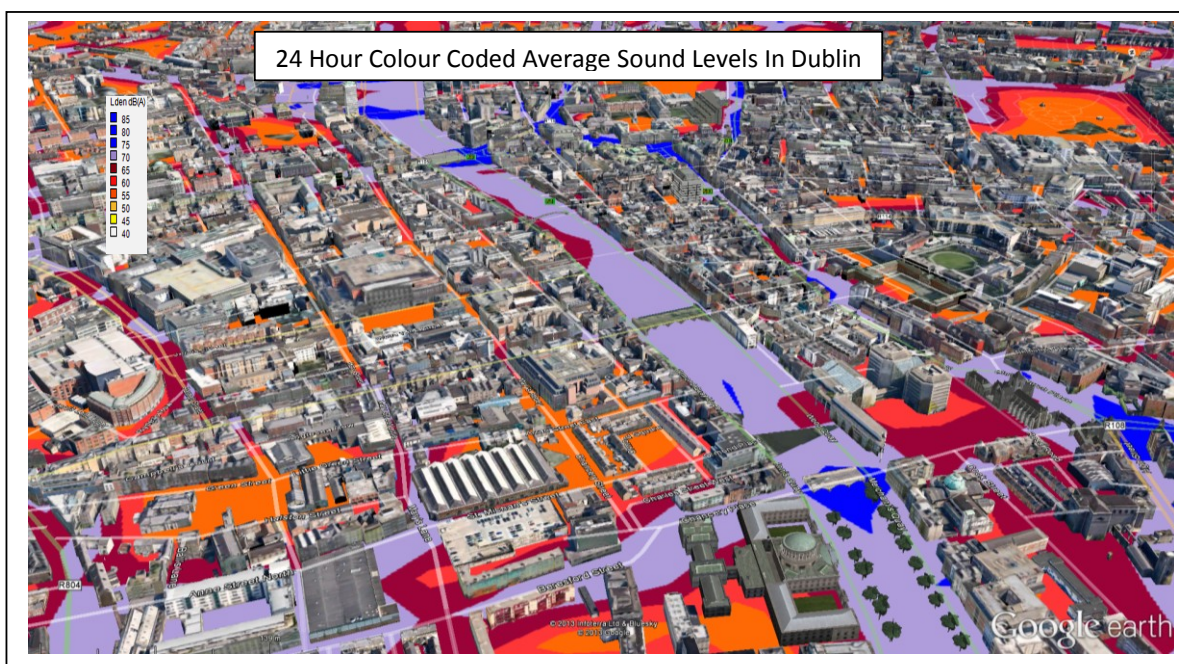


DUBLIN CITY COUNCIL

AMBIENT SOUND MONITORING NETWORK

Annual Report For 2012



Produced by
Traffic Noise & Air Quality Unit
Roads and Traffic Department,
Dublin City Council

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www.dublincity.ie

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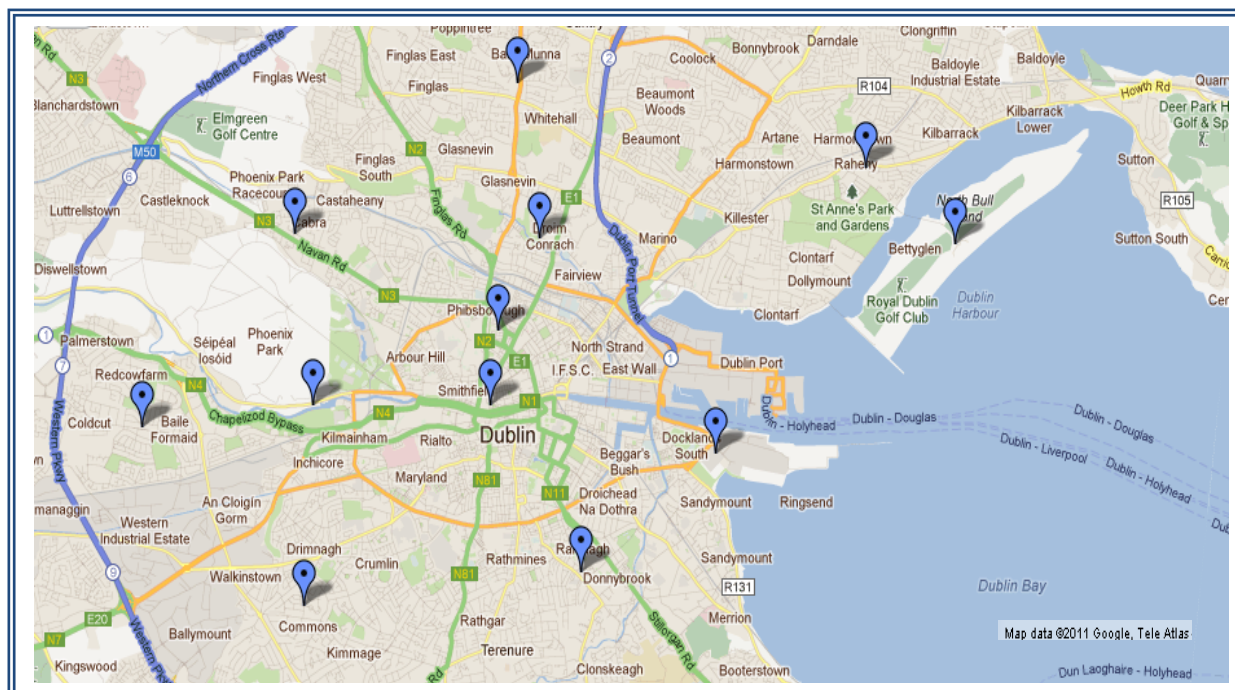
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Introduction

This is the fourth Annual Report for the Dublin Ambient Sound Monitoring Network. Dublin City Council commenced the installation of a permanent ambient sound monitoring network in 2009. Currently the monitoring network is comprised of 12 sites. It is anticipated that there will be further expansion of the network over the next five years in line with the Dublin Agglomeration Noise Action Plan. The purpose of the network is to measure outdoor ambient sound levels in the City, at sites which are representative of typical sound levels to which citizens are being exposed.

Fig. 1 Sound Monitoring Sites - 



It should be noted that the sound level meters are located so that there is no single dominant sound source, such as major roads, road junctions, industrial sources etc. which would have a disproportionate influence on the outdoor ambient sound levels being measured. The network currently consists of 12 monitoring locations.

- Ashtown, off Navan Rd. D7, Private House
- Ballyfermot Road, D10, Civic Centre
- Ballymun Road, D11, Library
- Bull Island, D3, Interpretative Centre
- Chapelizod Road, D8, Dublin City Council Rowing Club
- Howth Road, D5, Raheny Library
- Blessington Basin, Blessington St, D1.
- Millmount Avenue, D9, Drumcondra Library
- Percy French Road, D12, Walkinstown Library
- Ringsend, D4, Irishtown Stadium
- Woodstock Gardens, Ranelagh, D6, Snr. Citizens Residential Scheme
- Chancery Park, Public Park, Dublin 1

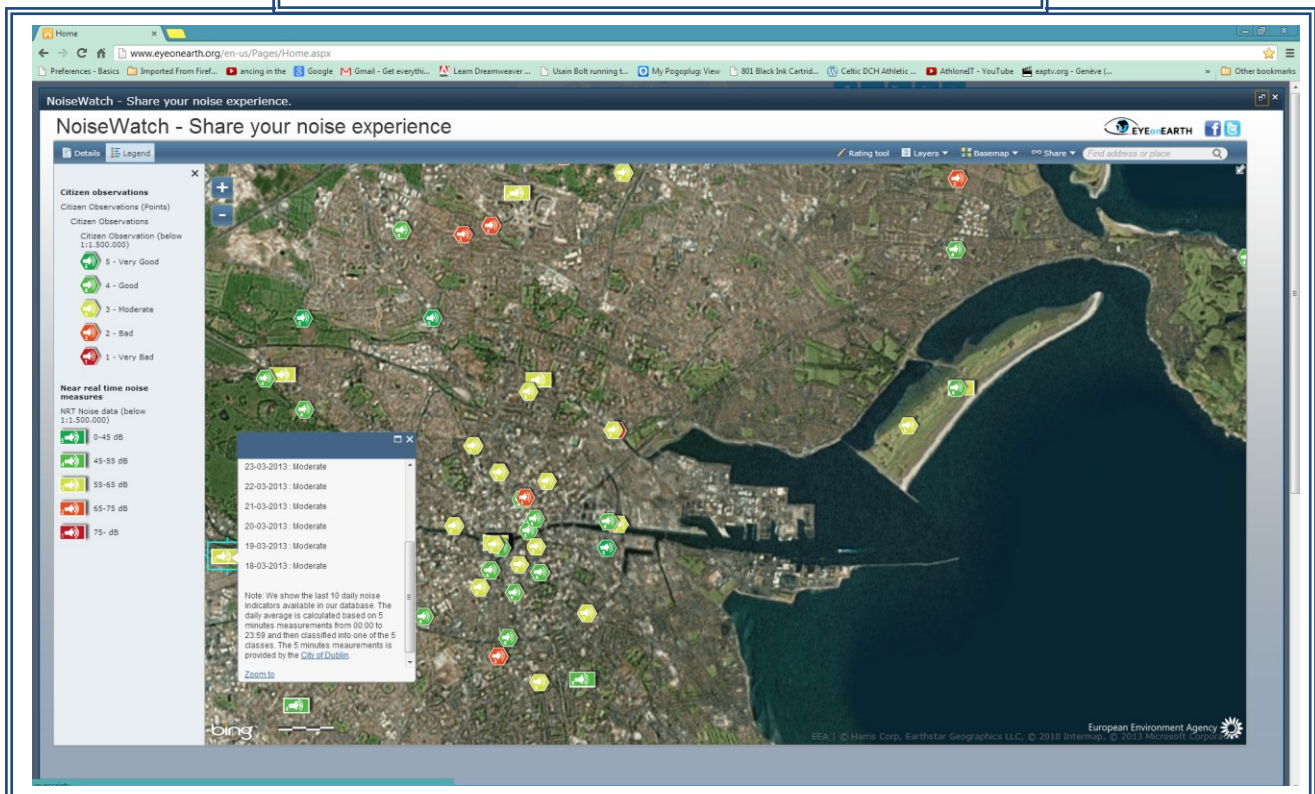
EyeonEarth

Dublin City Council's monitoring network is currently feeding into the European Environment Agency supported website 'EyeonEarth' (<http://www.eyeonearth.org/en-us/Pages/Home.aspx>). 'Eye on Earth' is a 'global public information network' for creating and sharing environmentally relevant data and information online through interactive map-based visualisations. The overall goal is to improve the environment by sharing information and knowledge. In May 2008, Eye on Earth was launched with WaterWatch, an online interactive map of Europe that presents the latest available official water quality data. This was followed in November 2009 with AirWatch providing near real-time data on three air pollutants, and NoiseWatch in December 2011. NoiseWatch users can measure noise levels with a Noise Meter mobile app. In the future, EEA aims to engage users in citizen science to observe and report environmental data to fill important knowledge gaps. ' – Eye on Earth website

It is also hoped to have a Dublin City Council website developed by the end of next year which will compliment this site and which will displayed more detailed information including near real time data from our monitoring network.

Fig. 1A Screen Grab from EyeonEarth website page

Rectangles represent permanent monitoring.
Polygons represent public's shared sound level.



Measurement Parameters

The European Commission requires the use of a parameter called the *Lden* (Sound Level for **Day**, **Evening** and **Night**) in population exposure assessment. This measurement parameter of *Day-evening-night level* is a descriptor of average sound levels over a whole day with the addition of a penalty of 5 dB(A) for evening sound (i.e. 19.00-23.00) and a penalty of 10 dB(A) for night time sound (23.00-7.00). *Lden* has been put forward as a single value parameter for the quantification of annoyance caused by noise.

The monitoring network measures continuously, 5 minute parcels of sound right throughout the year. These periods of 5 minute sound levels are then converted and presented as average hourly sound levels in decibels (dB(A)). This enables the compilation of *day, evening, night, and Lden* statistics.

Sound Sources

In 2012 the Dublin City Council noise maps were revised using updated computer models and datasets. The models have shown that traffic is still the dominant sound source in Dublin. This sound comes from two aspects of traffic – the road surface i.e. wheel\tyre interface where sound levels increase with speed and secondly, engine\ gear change and body rattle sound, normally observed at lower speeds. Whilst measurements at the monitoring locations are influenced by traffic generated sounds the monitors are located so that the measurements are not totally dominated by this source. The aim is to measure total ambient sound without one source dominating another.

The second most influence on the measured sound is the weather. It may be stating the obvious, but the sound levels at the monitoring sites become elevated once there is an increase in wind speed and/or a heavy rain showers. This can be seen from the measurements at the Bull Island site which is heavily influenced by wind and wave sounds. It is therefore important to understand that an increase in sound levels over a particular period may not necessarily mean an increase in 'noise levels' – noise being defined as unwanted sound. Having said that, the weekly and monthly measurements demonstrate regular and repeating sound patterns. This can only be as a result of manmade sound emissions.

The site locations are displayed on maps to the rear of this report and give an indication as to the type of areas in which they are situated. Bull Island, again this year, tends to be the most erratic site, in that there is no readily discernable pattern to the measured levels. As already stated, this site would be impacted more by the time of the tides and weather rather than sounds from traffic and human activity. The Blessington Basin site was installed in order to validate the computer models indication that this area could be deemed to be a 'Quiet Area' and subsequently be nominated for delimiting as a quiet area by the Minister for Environment.

Data Loss

Loss of data is mainly due to the drifting of the calibration of the microphones or power failure at a site. Data which could not be verified with a correct calibration was discarded. There was no instance of vandalism at any of the sites this year, but again this year, birds do seem to like the foam wind shields protecting our microphone assemblies. Most sites experienced damage to their wind shields by birds. This resulted in the discarding of data at those sites during the periods with damaged wind shields.

Guidelines\ Standards for exposure to Ambient Sound levels

Sound emission criteria for certain sources, outside of the work environment, can be applied and enforced through Integrated Pollution Prevention Control licences, Planning Control, or Section 107-108 of the Environmental Protection Agency Act 1992. There are no legally binding statutory limits for ambient sound levels, similar to currently existing air quality standards. However the levels outlined below are used for guidance and comparison purposes.

Areas with desirable\undesirable or high\low sound levels

The Dublin City Council Noise Action Plan Oct 2008-Nov2013 proposes that areas with undesirable high sound levels are areas with a night time sound level greater than 55 decibels and a daytime level greater than 70 decibels. Areas with desirably low sound levels are defined as areas with a night time level less than 50 decibels and/or a daytime level less than 55 decibels. The Noise Action Plan is currently under review but it is not anticipated that these criteria will be altered.

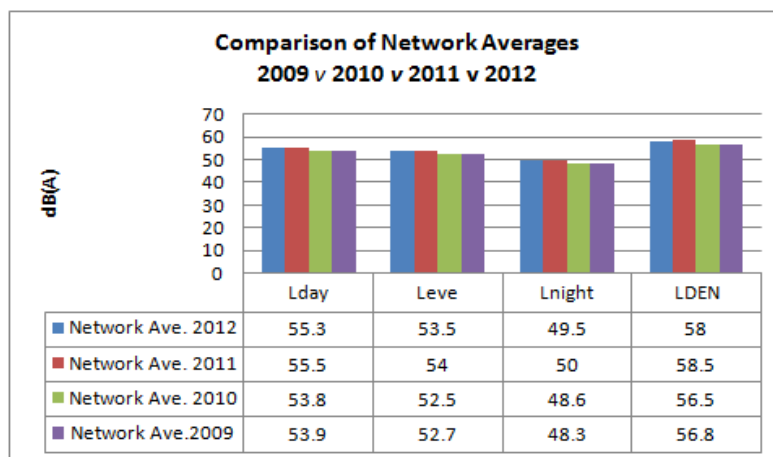
The World Health Organisation Night Noise Guidelines (NNGL) for Europe

These guidelines propose a **Night Noise Guideline (NNGL)** Lnight for outside = 40 dB; Interim target (IT) Lnight, outside = 55 dB.

Summary Results

The measurements for the year 2012 indicate that two locations – Ballymun and Chancery Pk., exceeded the undesirable values of 55dB night\70dB day, with a night time value of 56dB(A) and 55.9dB(A) respectively. This was an increase of approximately 1dB on 2011. Similar to last year, six sites met the desirable criteria for

Fig.2



night time levels (Drumcondra, Blessington Basin, Ringsend, Bull Island, Walkinstown, Ranelagh). The overall Network Average also met the desirable night time level with a value of 49.5dB (A). Six sites - an increase from four in 2011, met the desirable value for daytime, (Ringsend, Bull Island, Walkinstown, Woodstock Gdns\Ranelagh, Blessington Basin and Navan Rd.). The Network Average of 55.3dB(A) was just 0.3dB outside the desirable daytime value. All of the sites except Ballymun and Chancery Pk. met the WHO NNGL interim target for exterior night time level of 55dB(A). However the network average was comfortably below this level. Set out in *fig.2* is a comparison of the Network averages for 2009, 2010, 2011 and 2012. Figures 3&4 display more detail for the individual sites. The 2012 Network yearly average figures show a marginal reduction of -0.6 to -0.2dB change on year 2011.

Fig.3

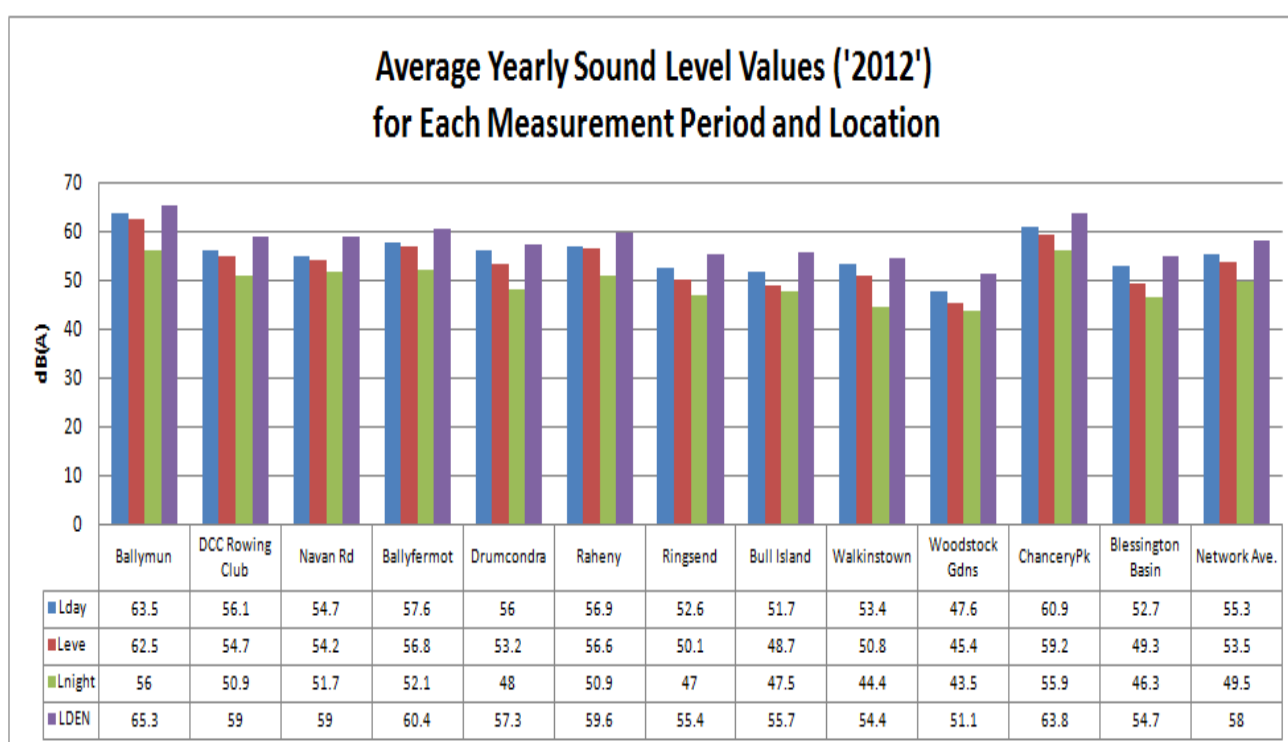
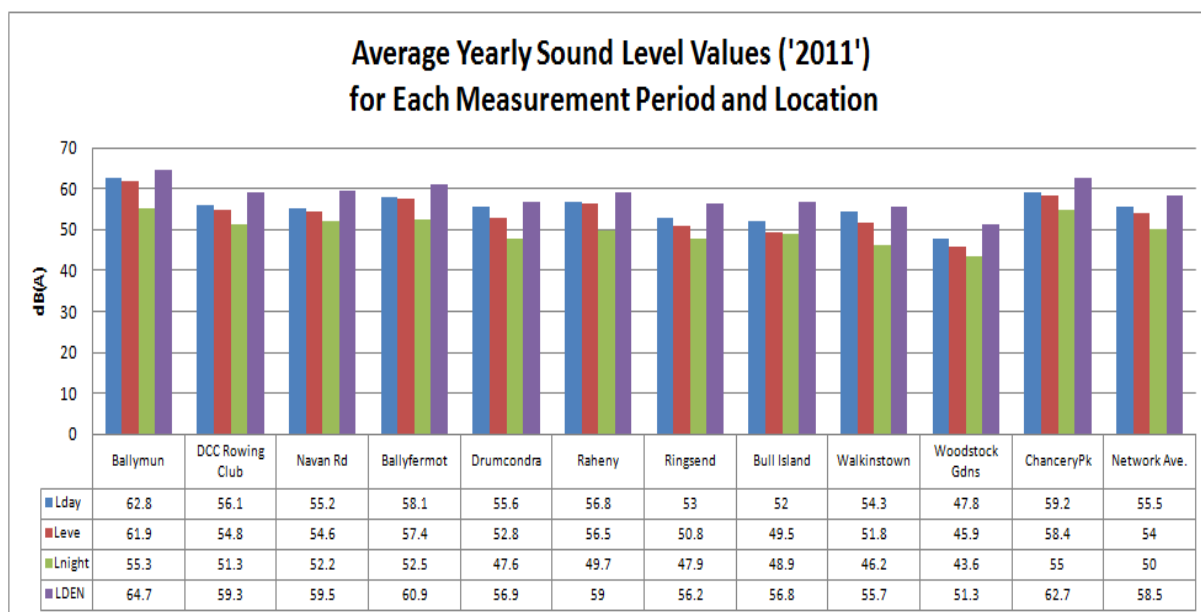


Fig.4



Measurement Results

The ambient sound monitoring network measures all sound from all sources thus giving an indication of the amount of sound the general population is exposed to from the hustle and bustle of daily life. Although alluded to previously, it is worth stating again that the ambient sound monitoring network measures sound levels in decibels (dB(A)). ***It does not measure noise.*** Noise is usually defined as "unwanted sound". "Noise" and "sound" are often erroneously interchanged. However 'Noise Annoyance', is a term generally used for all negative feelings such as disturbance, dissatisfaction, displeasure, irritation and nuisance (Guski 1999, Quis, 2002). Adverse effects of noise occur when intended activities of the individual are disturbed. The sound level of the acoustic stimulus, the time of its occurrence, its time domain, its frequency spectrum and its informational content modify the reaction. During sleep, however, unconscious activation of the autonomous system takes place without cognitive control, due to direct interaction between the hearing nerve and higher structures of the central nervous system. Noise indicators such as Lden and Lnight, in this respect, describe the exposure situation. **(Dr. Wolfgang Babisch, Expert Panel on Noise, EEA).**

Over the four years of continuous measurements it is apparent that traffic is the dominant sound sources at most sites. Hourly sound values 'shadow' traffic volumes as they vary throughout the day. This can be seen from the daily variation charts to the back of this report.

As already mentioned, weather also has an important influence on sound measurements. As with last year, there was a similarity between the average monthly wind speeds and average monthly sound levels. The relatively high sound levels in early January and December could be attributed in part to the number of days experiencing high winds and/or rain.

Comparison of the Network Lden values with last year shows little change in 2012 values over 2011. On an individual site by site comparison, again there are only marginal changes, with the highest change in Lden value of plus 1.1dB at Chancery Park and -1.3dB in Walkinstown.

Again this year, Ballymun is the site with the highest Lden values, followed by the Chancery Park – a City Centre location.

Difference between 2012 and 2011 values

(Minus values in dB(A), indicates a decrease on 2011)

As can be seen from *figure 5*, the Network average difference between the Lden values for years 2011 and 2012 is negligible at -0.5dB. The magnitude of this decrease across all parameters would not be noticeable to the general public. Generally a three decibel reduction/increase would just barely be noticeable.

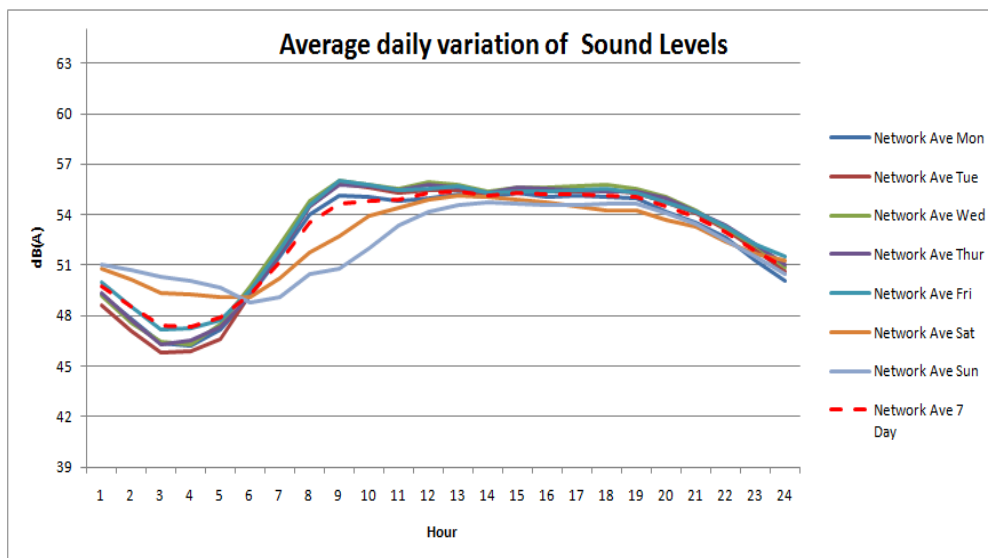
Chancery Park was the only site to indicate an Lden increase just greater than 1dB. Last year at this site there was 1dB decrease in sound levels. Again these variations could be considered marginal.

	Fig 5			
	2012-2011			
	Lday	Leve	Lnight	LDEN
Ballymun	0.7	0.6	0.7	0.6
DCC Rowing Club	0.0	-0.1	-0.4	-0.3
Navan Rd	-0.5	-0.4	-0.5	-0.5
Ballyfermot	-0.5	-0.6	-0.4	-0.5
Drumcondra	0.4	0.4	0.4	0.4
Raheny	0.1	0.1	1.2	0.6
Ringsend	-0.4	-0.7	-0.9	-0.8
Bull Island	-0.3	-0.8	-1.4	-1.1
Walkinstown	-0.9	-1.0	-1.8	-1.3
Woodstock Gdns	-0.2	-0.5	-0.1	-0.2
ChanceryPk	1.7	0.8	0.9	1.1
Blessington Basin	0	0	0	0
Network Ave.	-0.2	-0.5	-0.5	-0.5

Variation of Sound Levels

The site summaries 'Average LAeq' (sound levels) provide a more detailed view of how sound levels vary from hour to hour throughout the average day and between the different days of the week. During the average weekday sound levels (along with traffic levels) start rising at 6 a.m. After approximately 9 a.m. sound levels at most sites level off until 9pm when they start to fall. It is interesting to note as with previous years, early Saturday and Sunday morning sound levels are higher than the same periods during the week. The peak sound levels on weekend mornings arise between ten and eleven a.m. It is thought these differences are due to different social activities at these times with less traffic on the road on late Saturday and Sunday mornings and more traffic coming from late night social events early Saturday and Sunday mornings. There was only slight difference between the days of the week in relation to which had the highest sound levels, with Wednesday, Thursday and Fridays, being similarly highest and Mondays having the lowest week day sound levels. The lowest network average daily sound levels were recorded on Sundays.

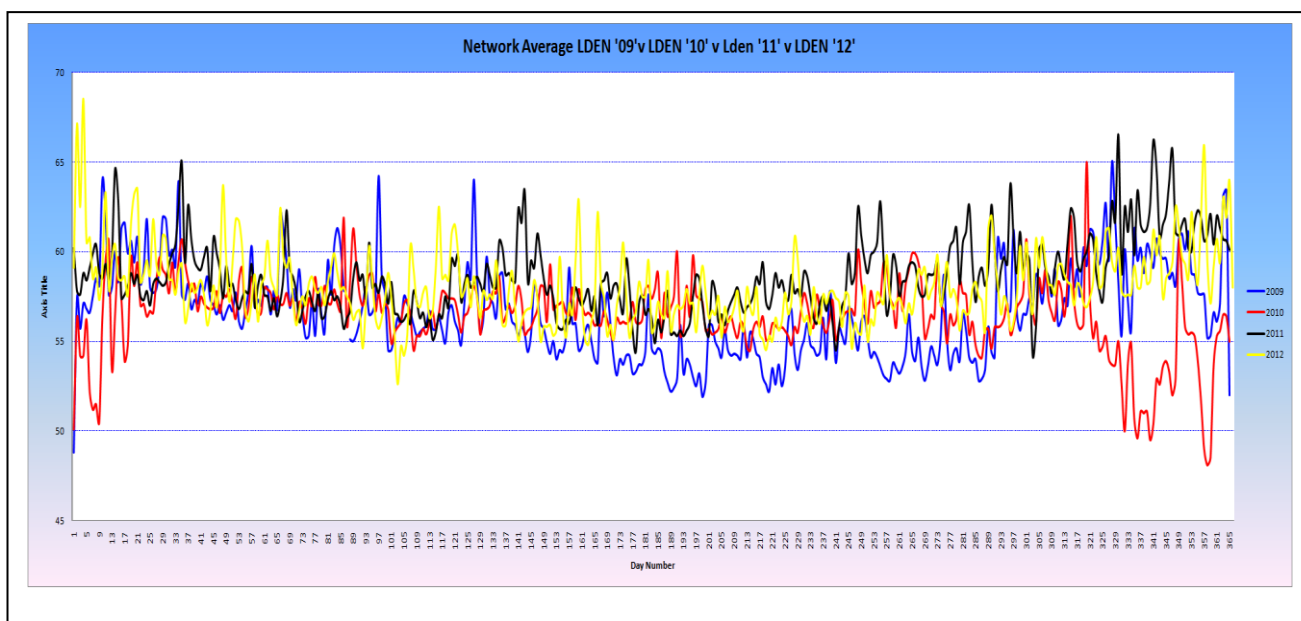
Fig.7



The top three sites with the lowest daytime sound values were Woodstock Gardens and Bull Island, with Ringsend and the new site at Blessington Basin tying for third. The top three sites with the highest daytime sound values were Ballymun, Chancery St. and Ballyfermot – for the third year in a row. The sites with the lowest night time sound values were Woodstock Gardens, Walkinstown and Blessington Basin. The sites with the highest night time sound values were, Ballymun, Chancery Park and Ballyfermot, which displaced Navan Road from last year.

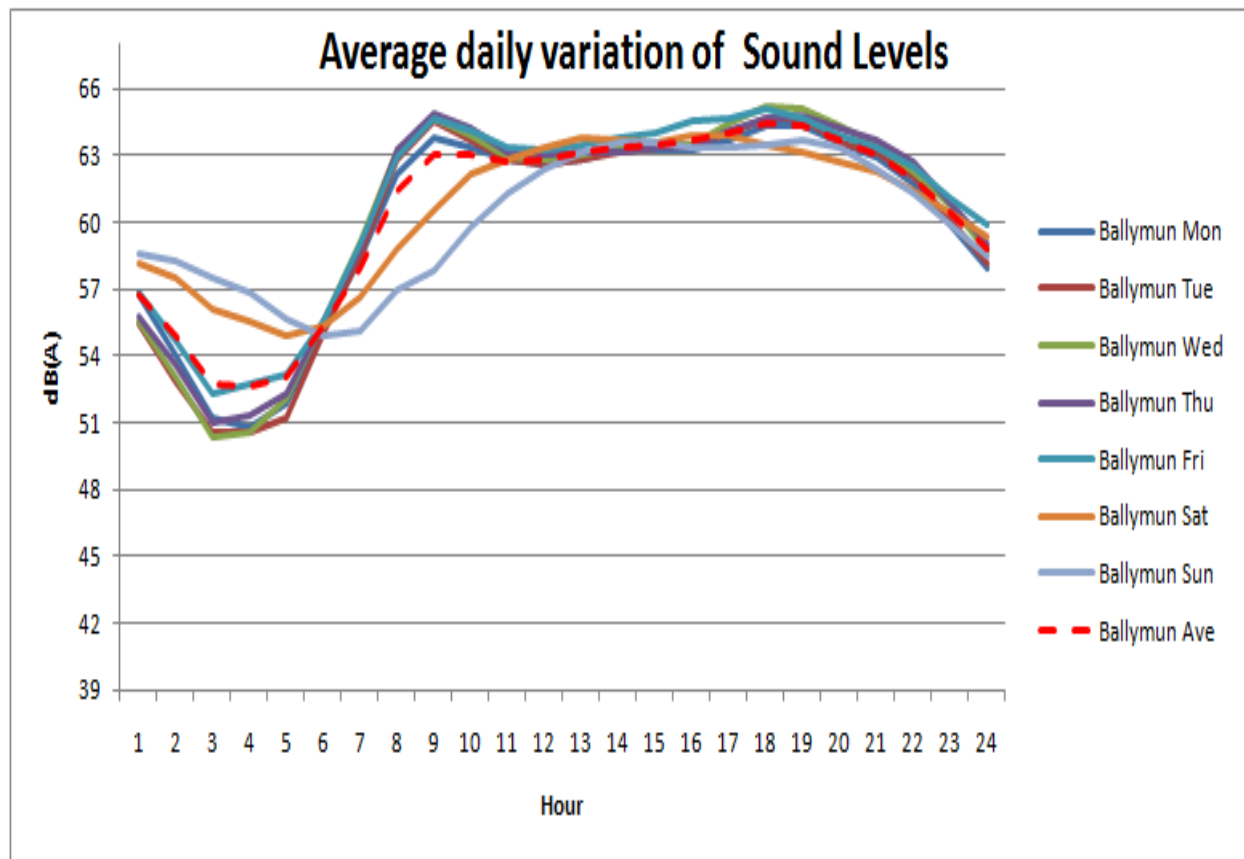
The Monthly Charts to the rear of this report present a detailed view of how average daily sound levels change from day to day and month to month. In 2012, the Network's highest average monthly sound levels occurred in December, followed by November and March. The Network's average monthly lowest levels were experienced in February followed by January and July.

Fig.6

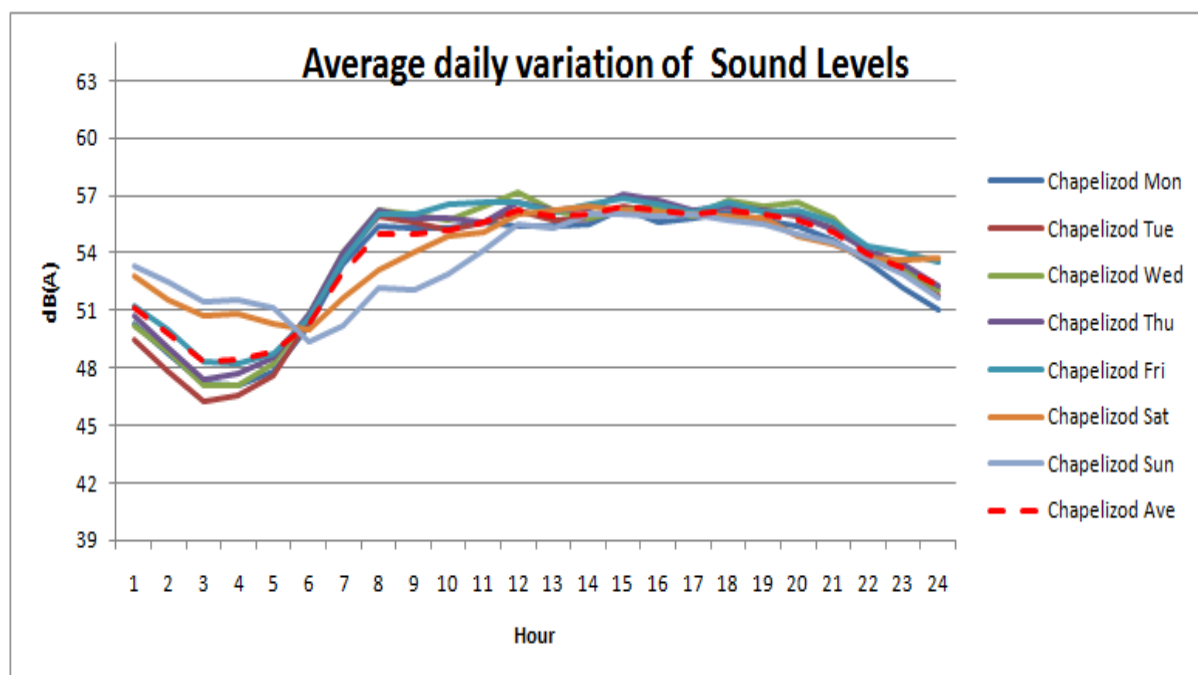


Average Daily Summary Charts

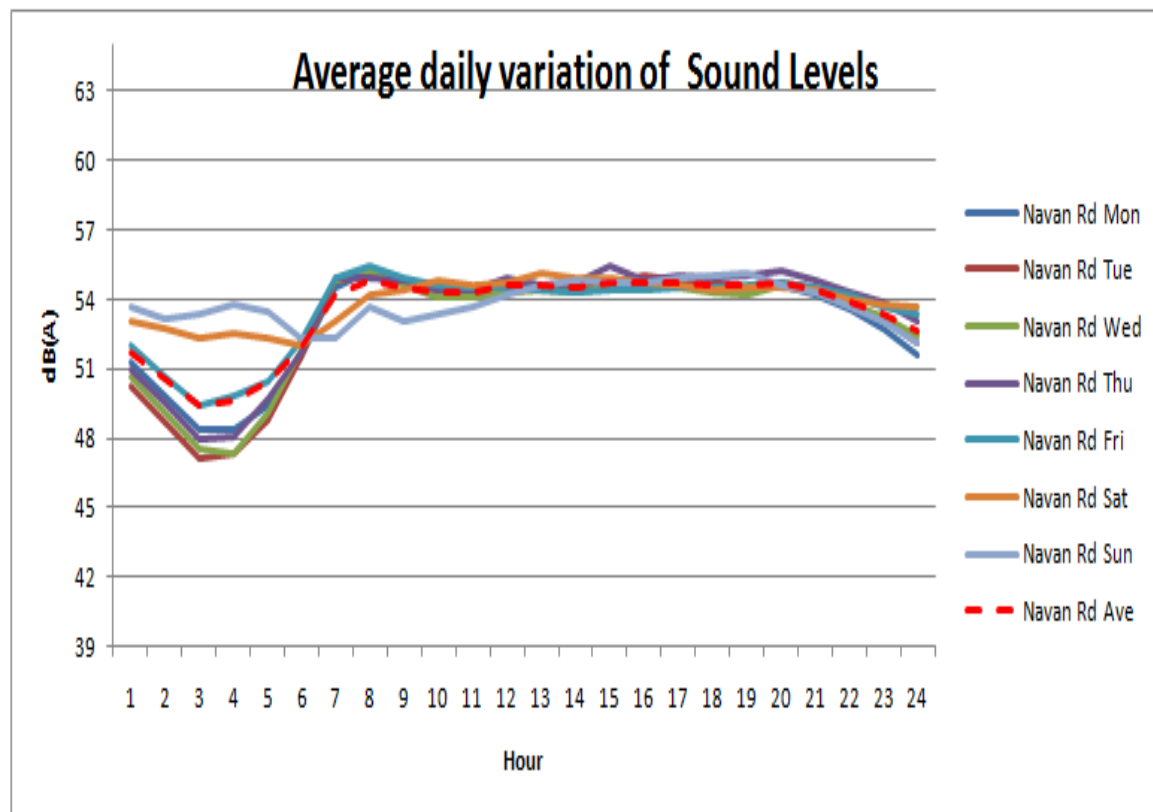
BALLYMUN



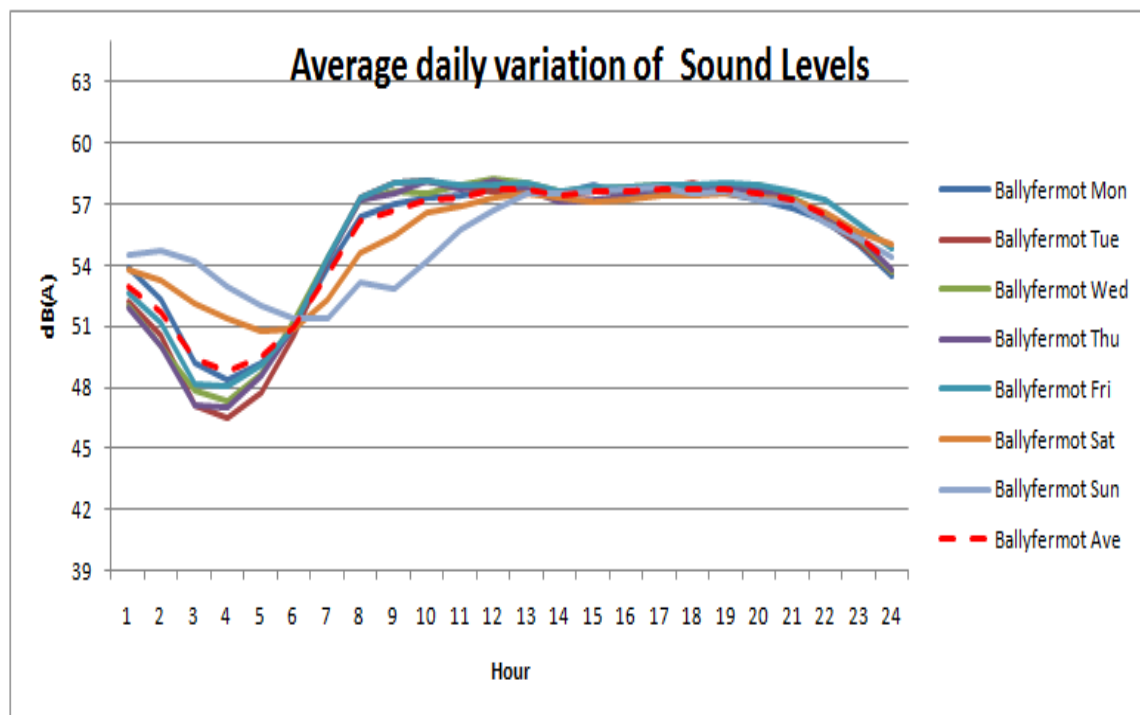
CHAPELIZOD



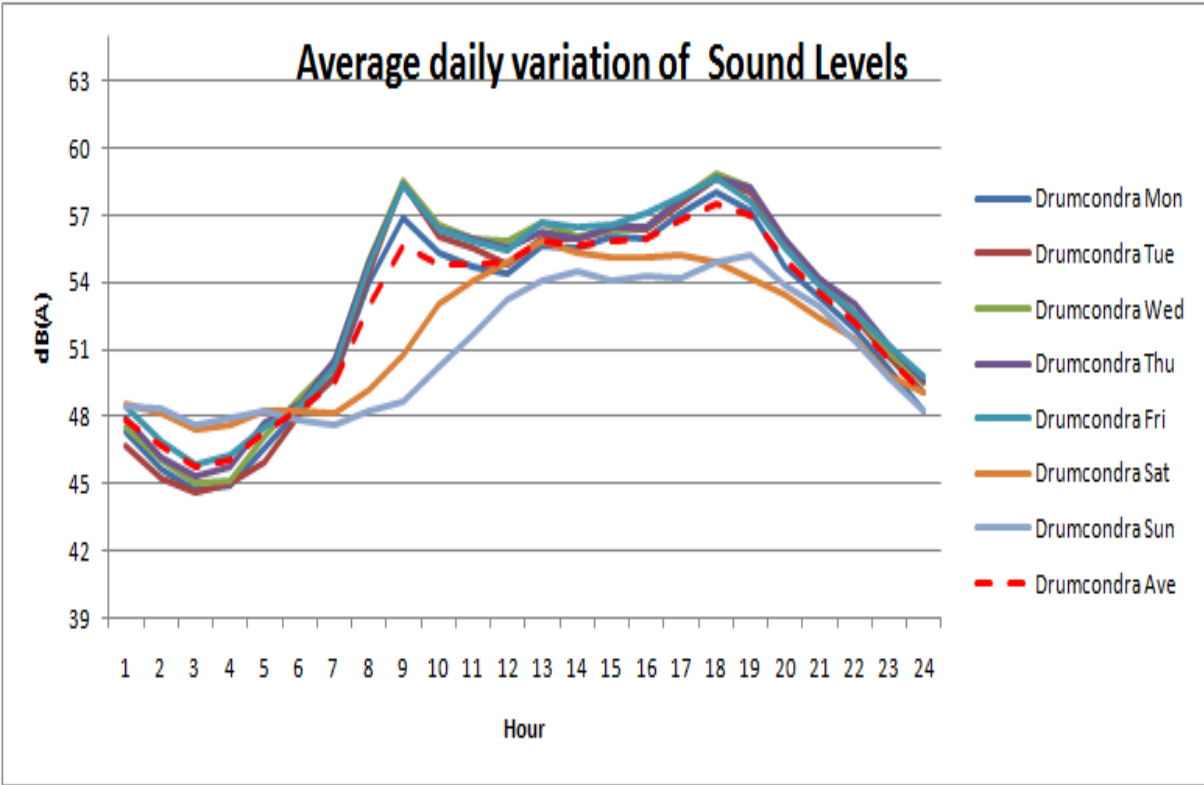
NAVAN RD.



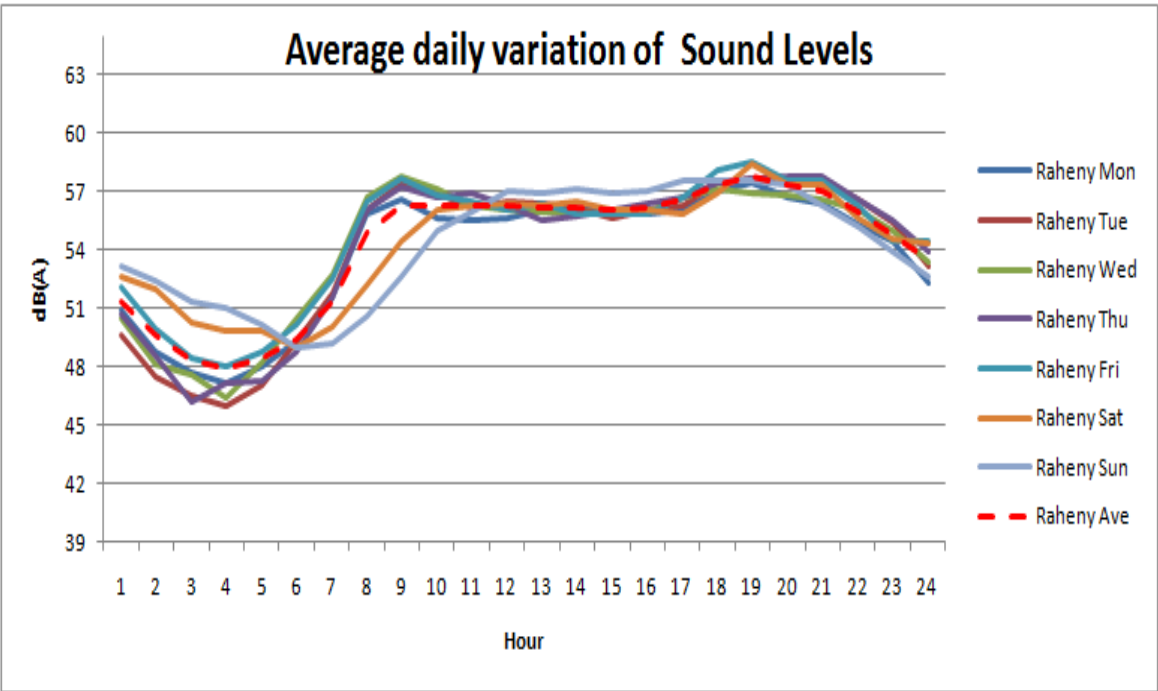
BALLYFERMOT



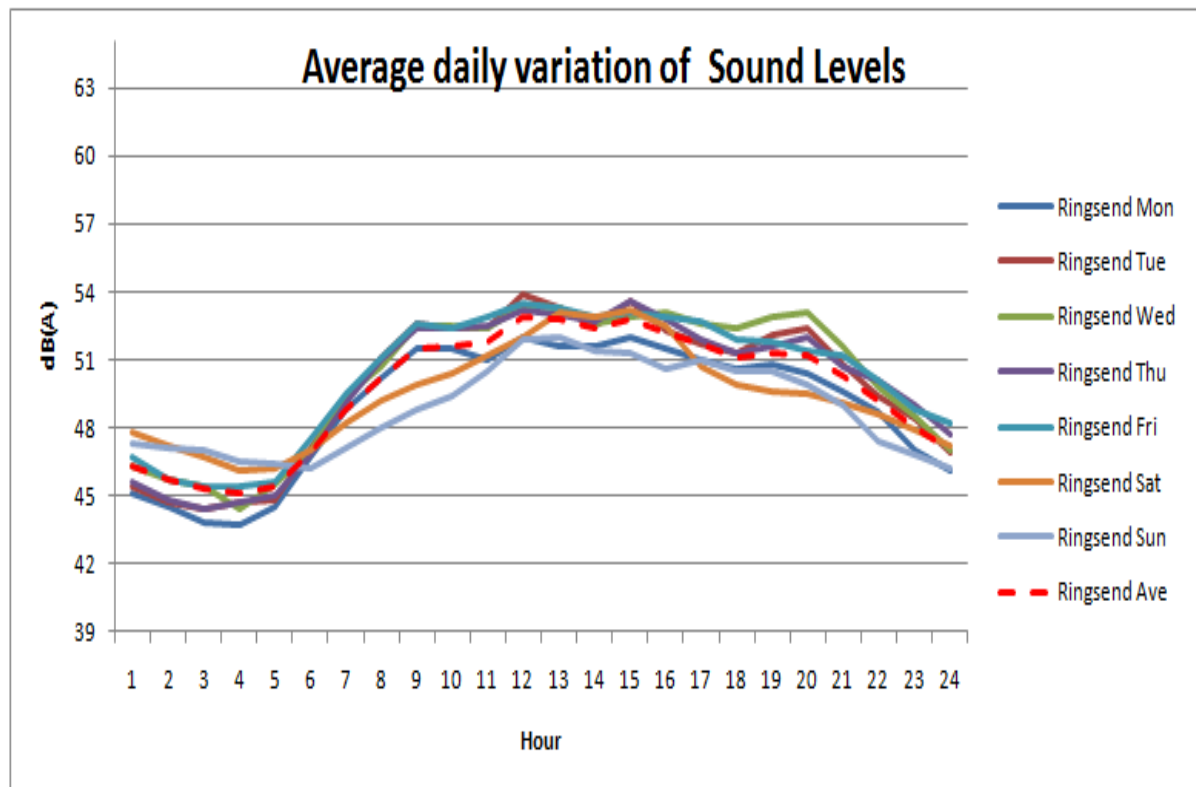
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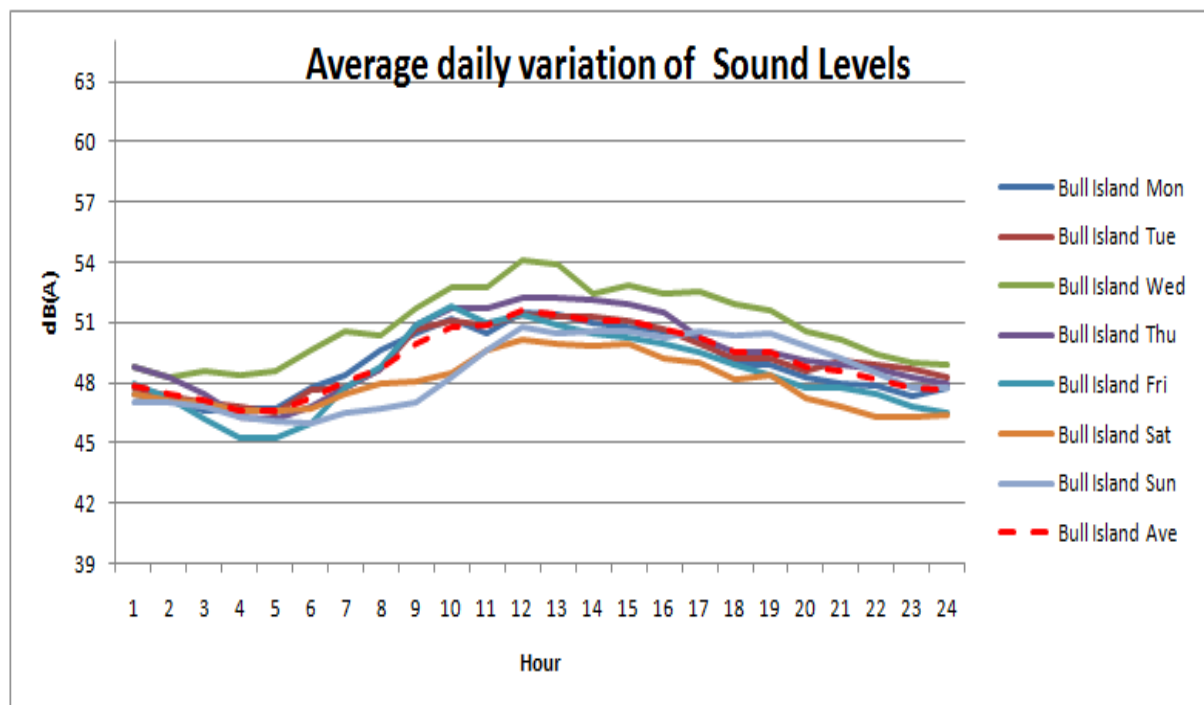
RAHENY



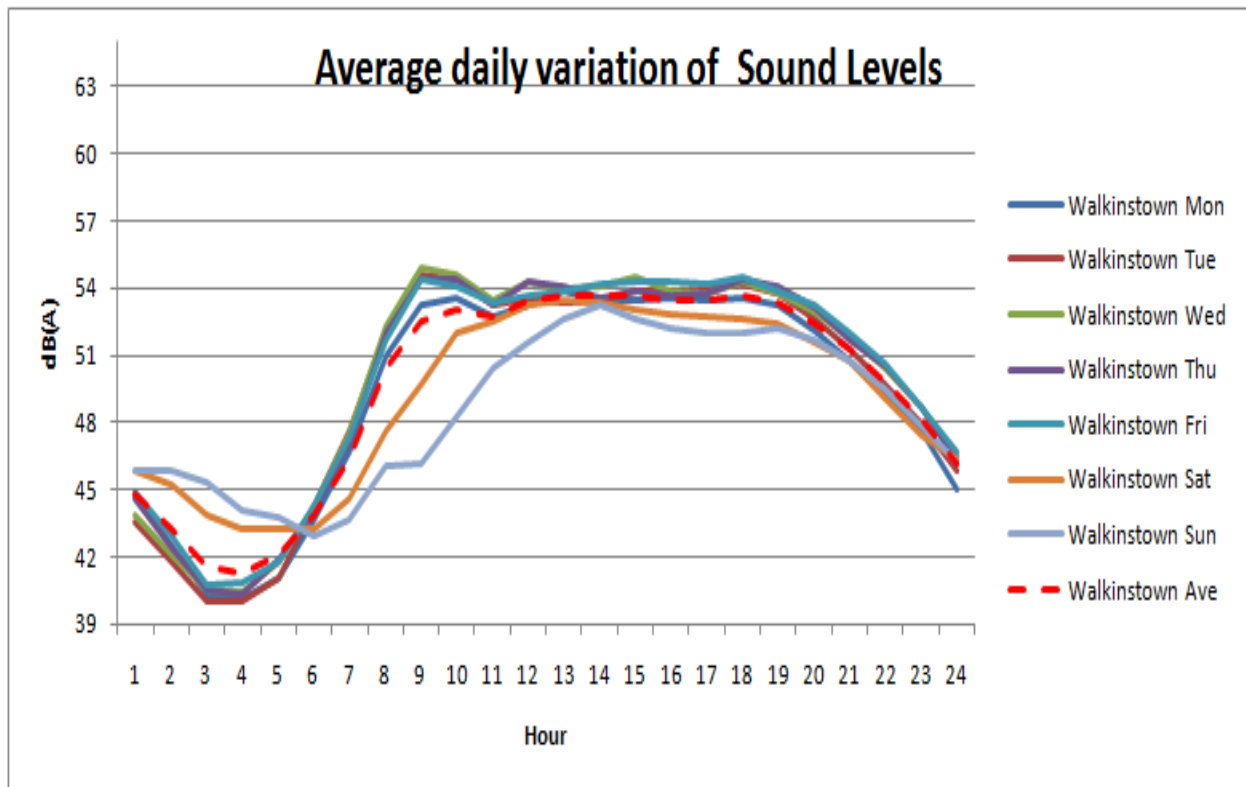
RINGSEND



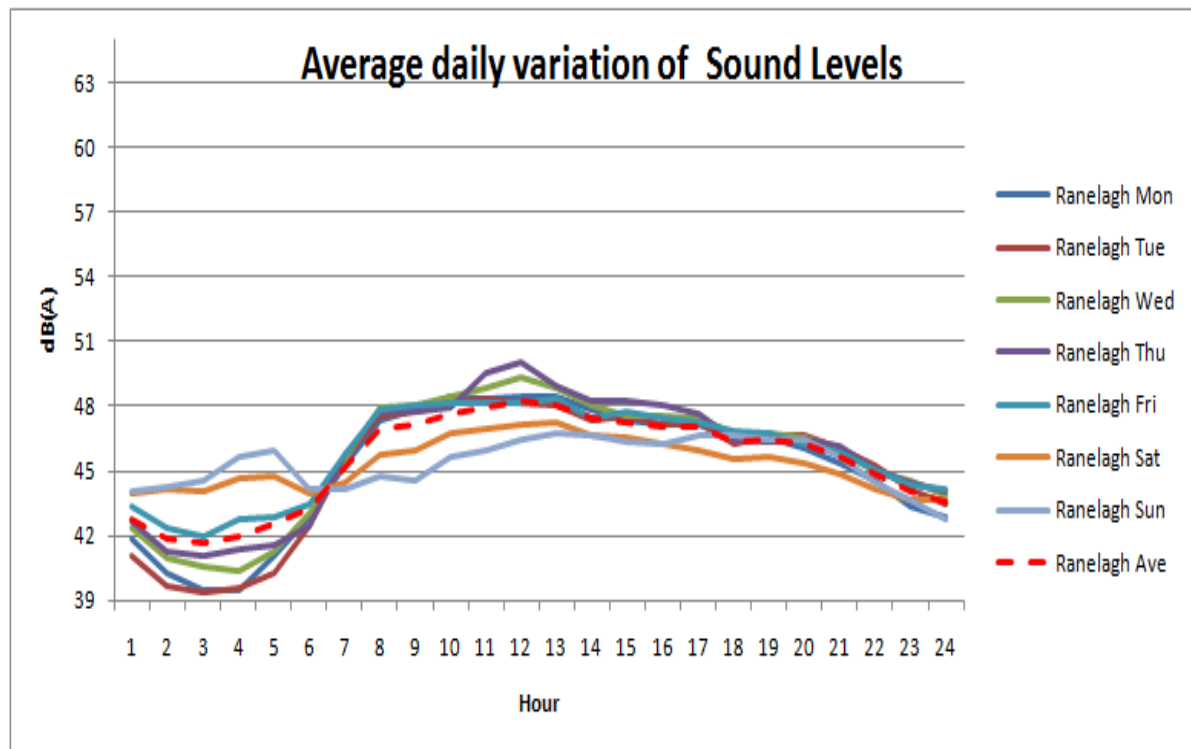
BULL ISLAND



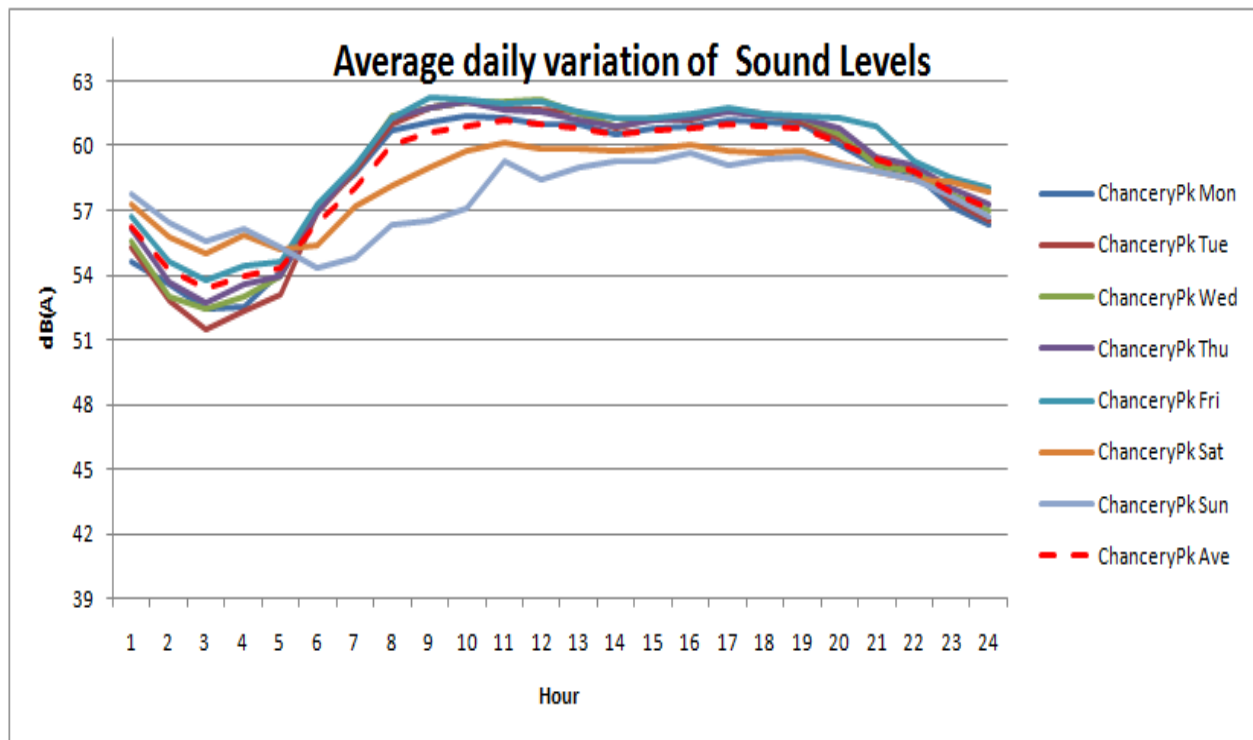
WALKINSTOWN



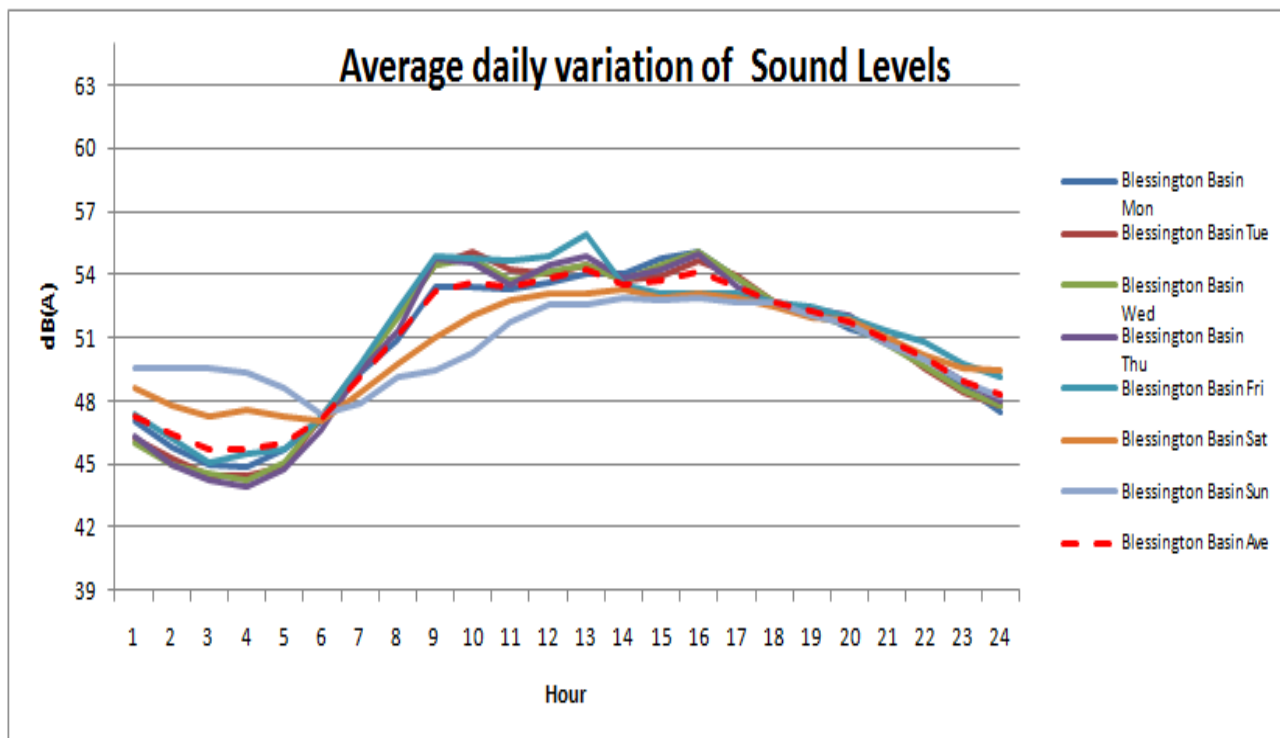
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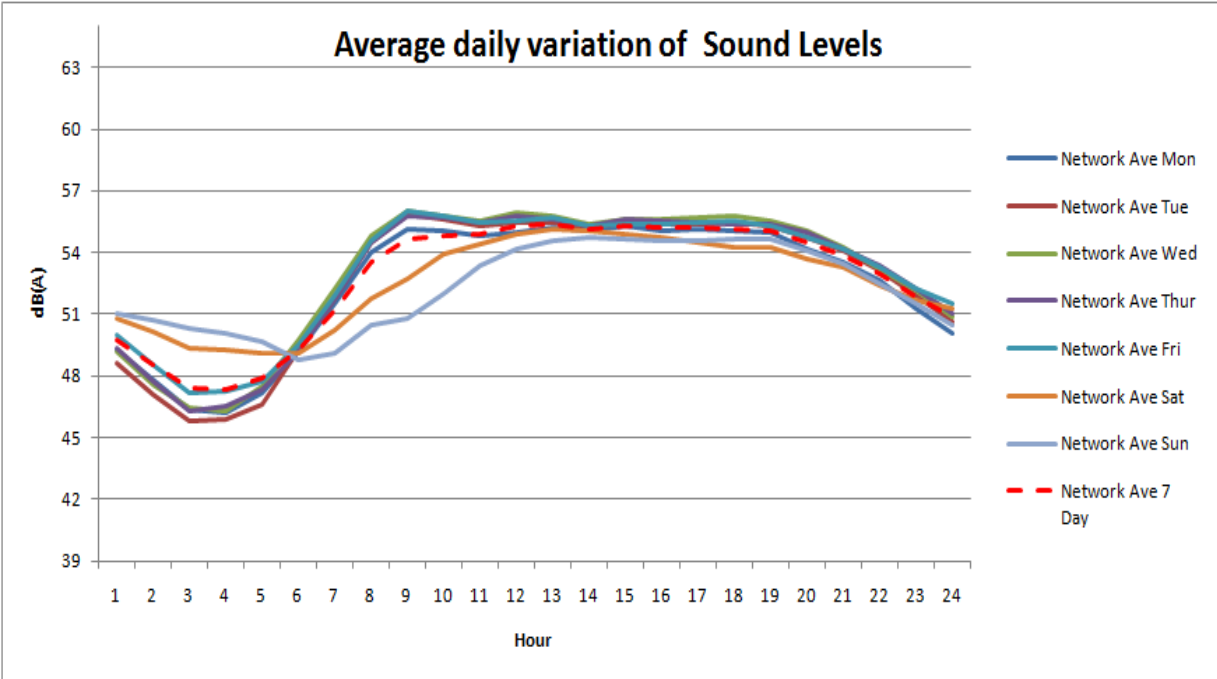
CHANCERY PARK



Blessington Basin



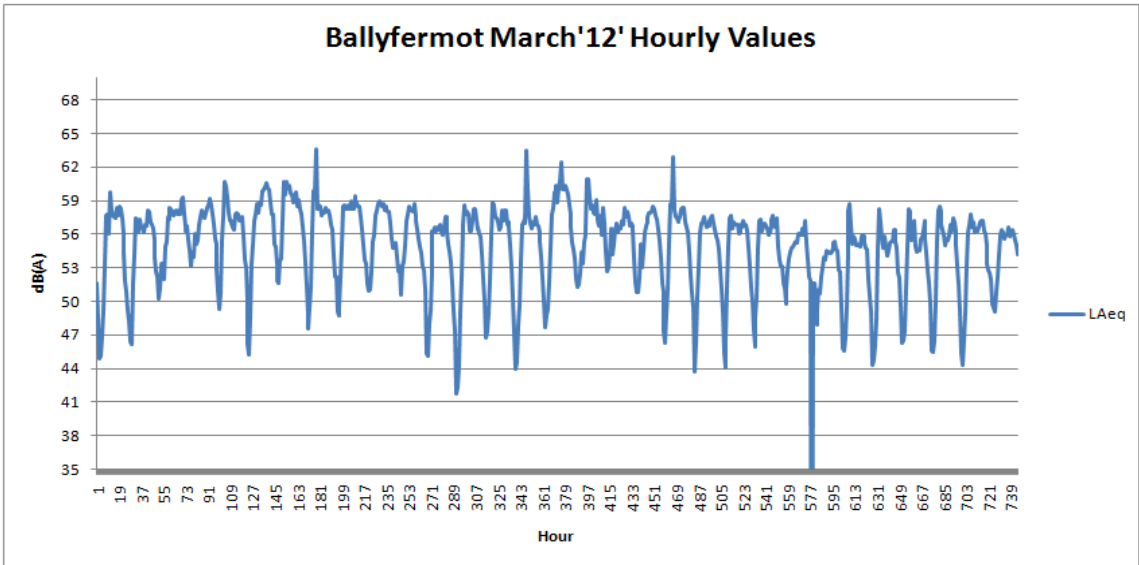
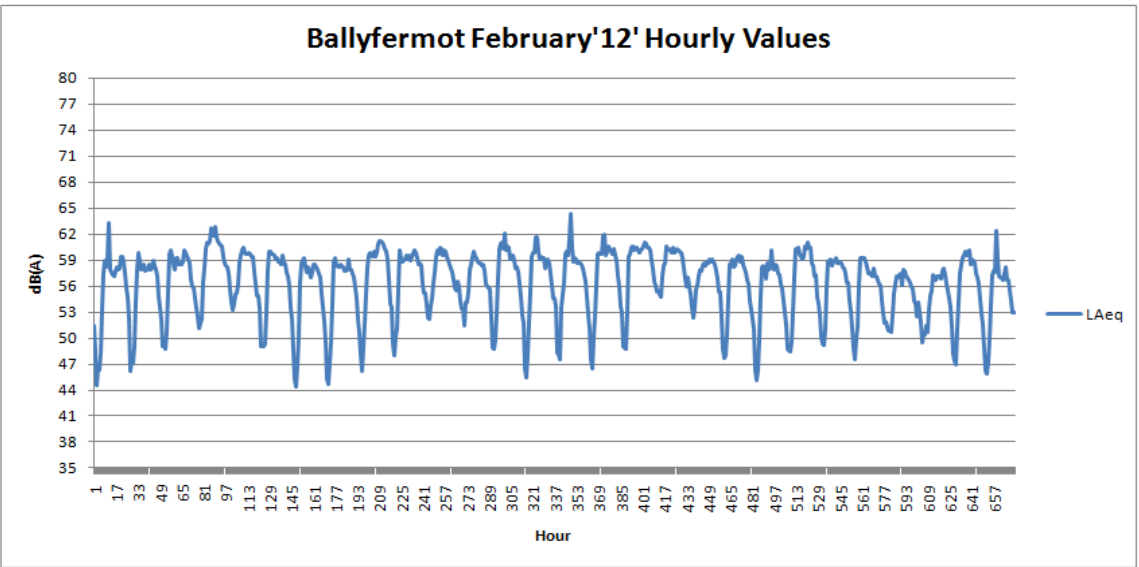
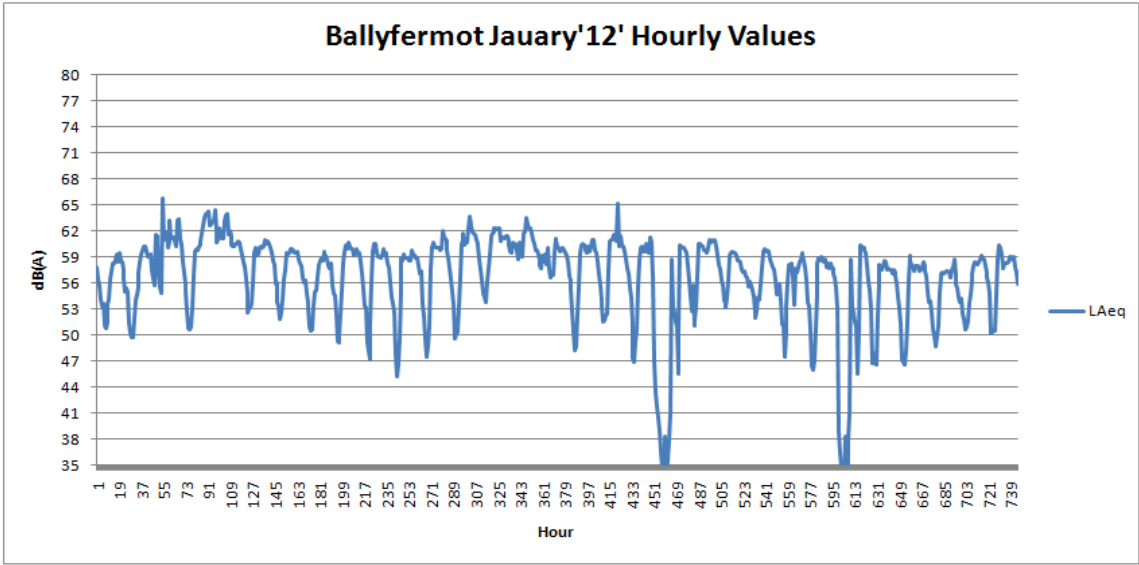
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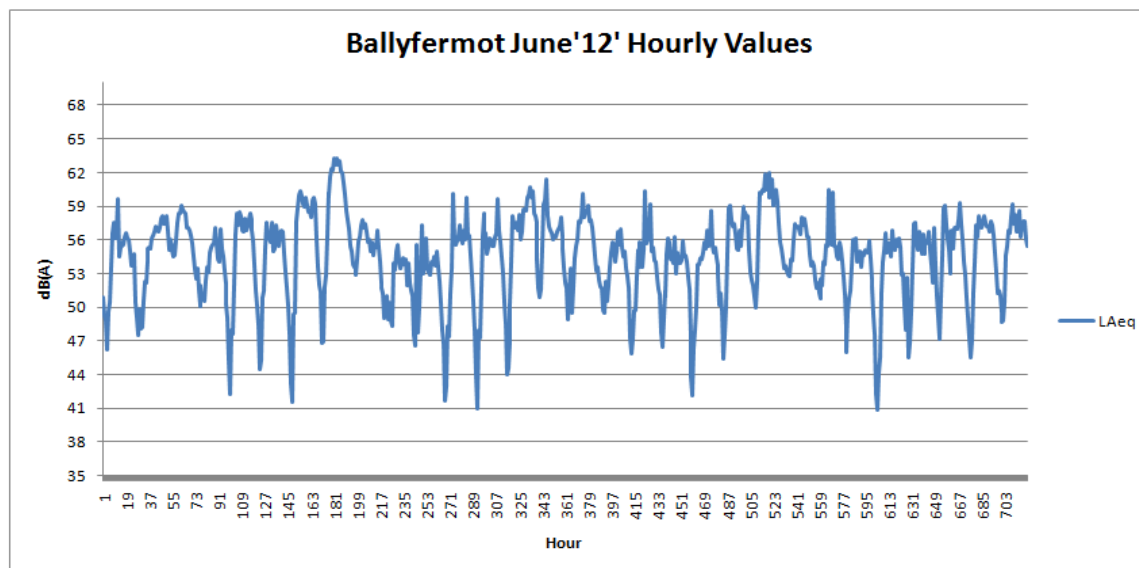
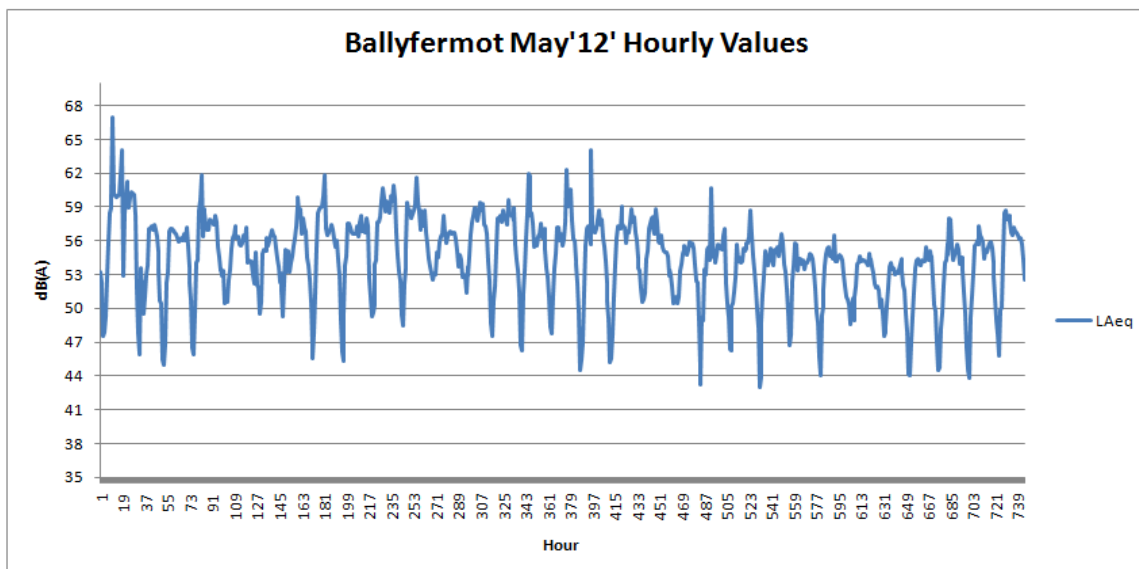
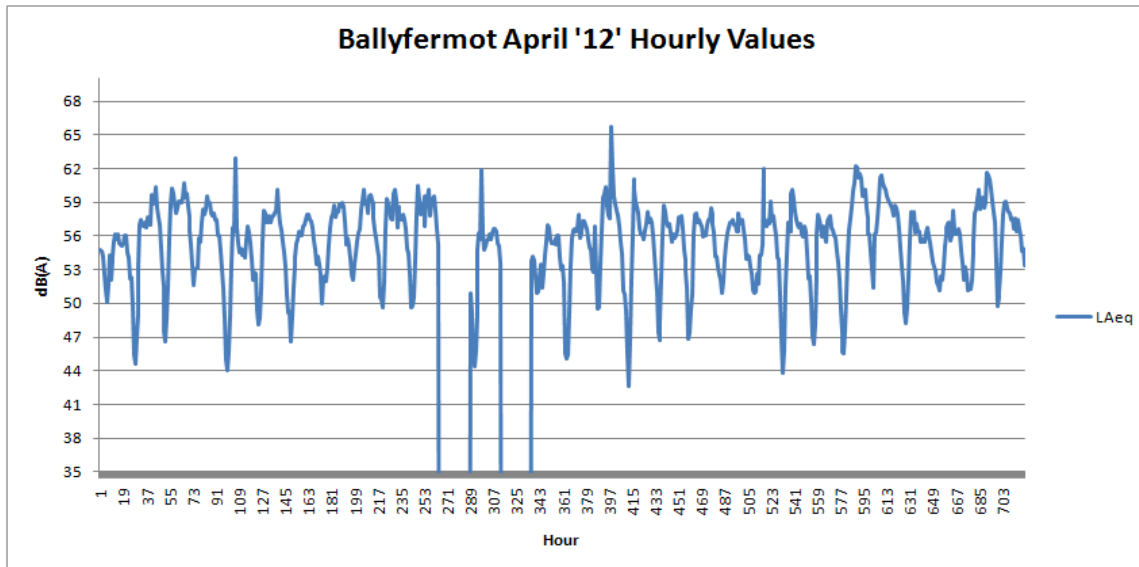


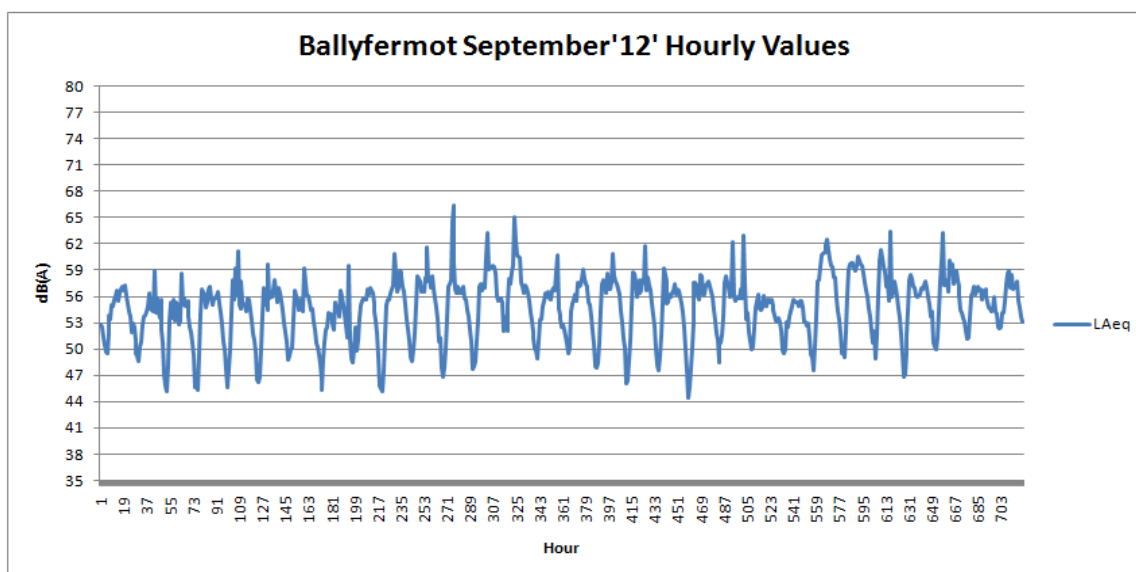
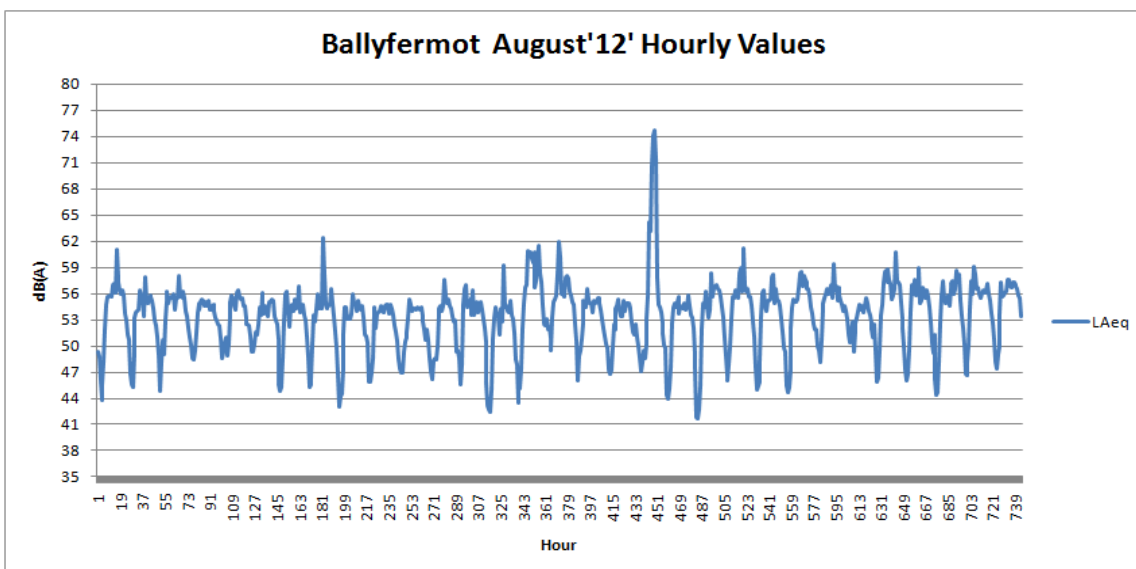
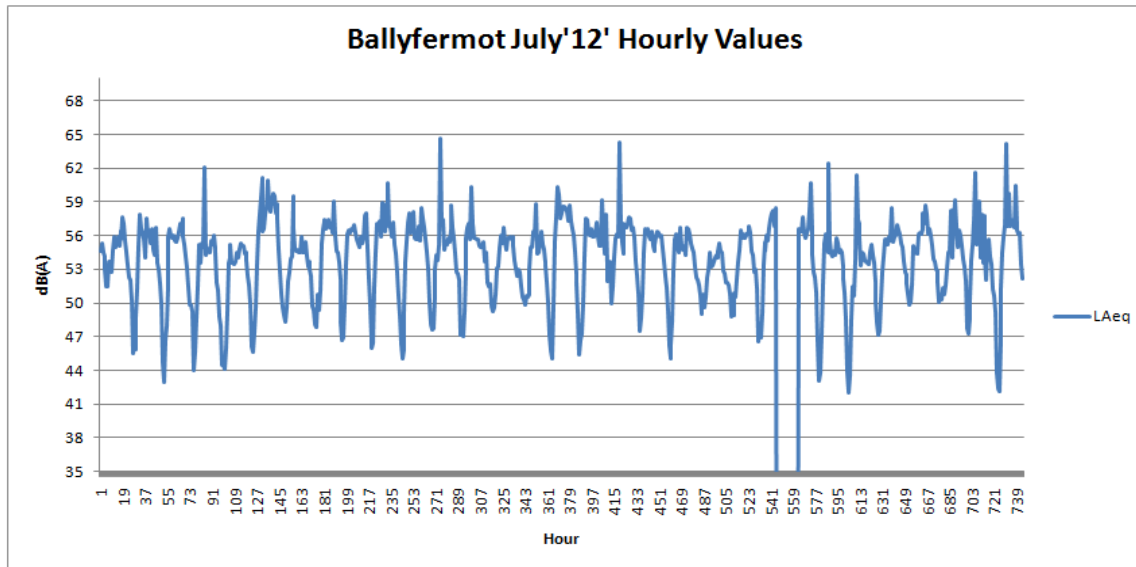
Monthly Summary Charts

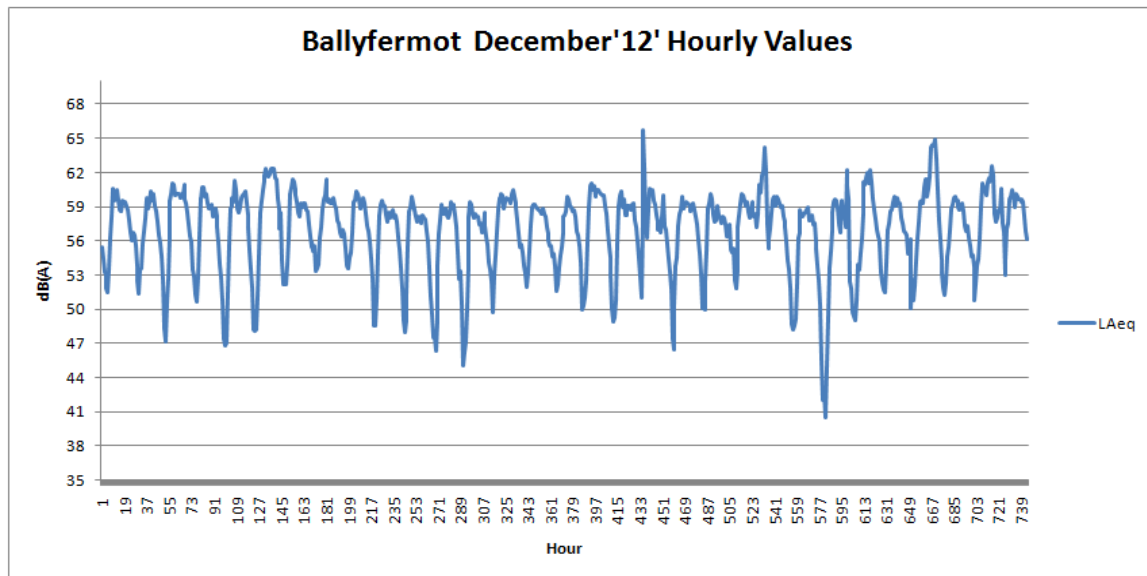
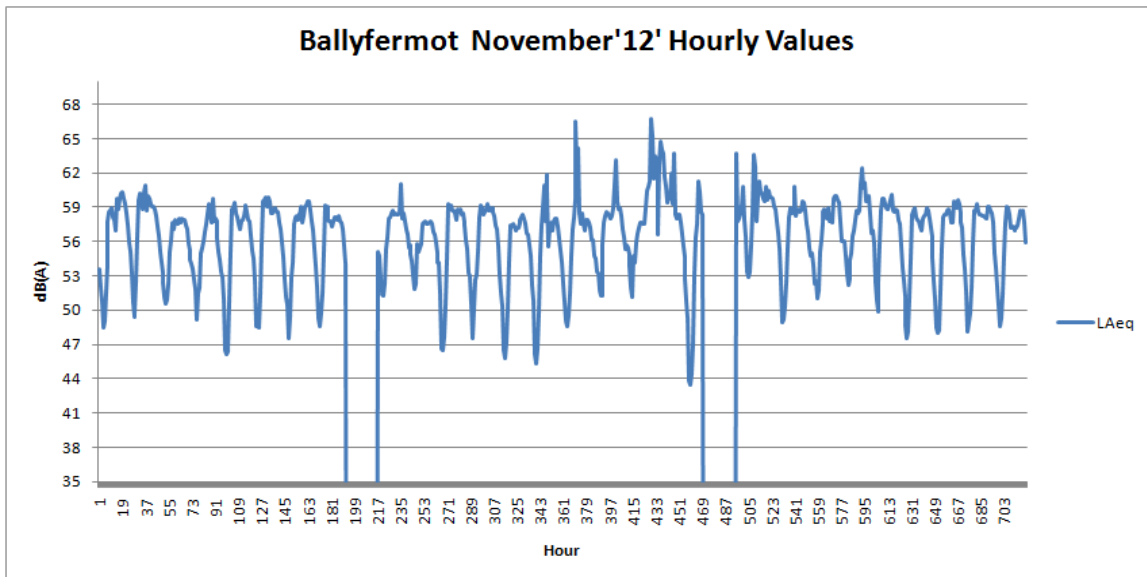
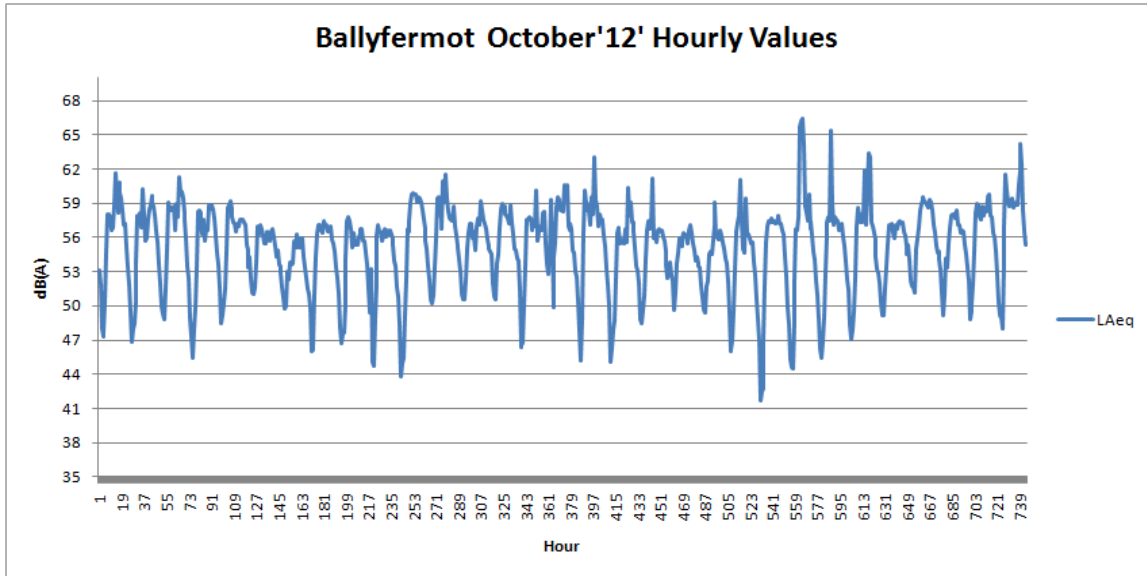
BALLYFERMOT CIVIC CENTRE
BALLYFERMOT ROAD
DUBLIN 10





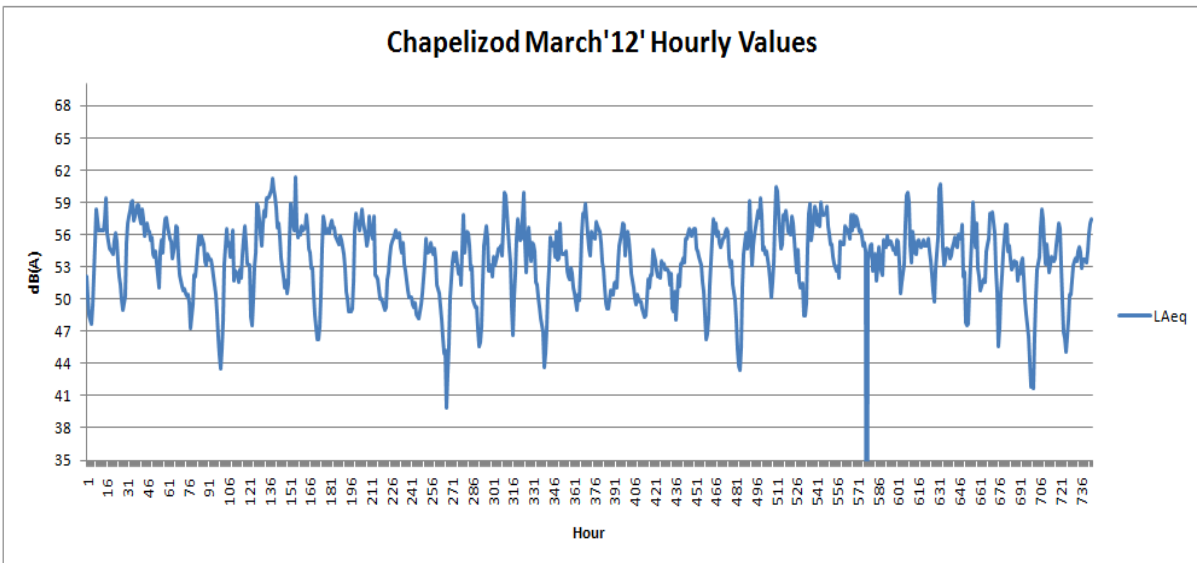
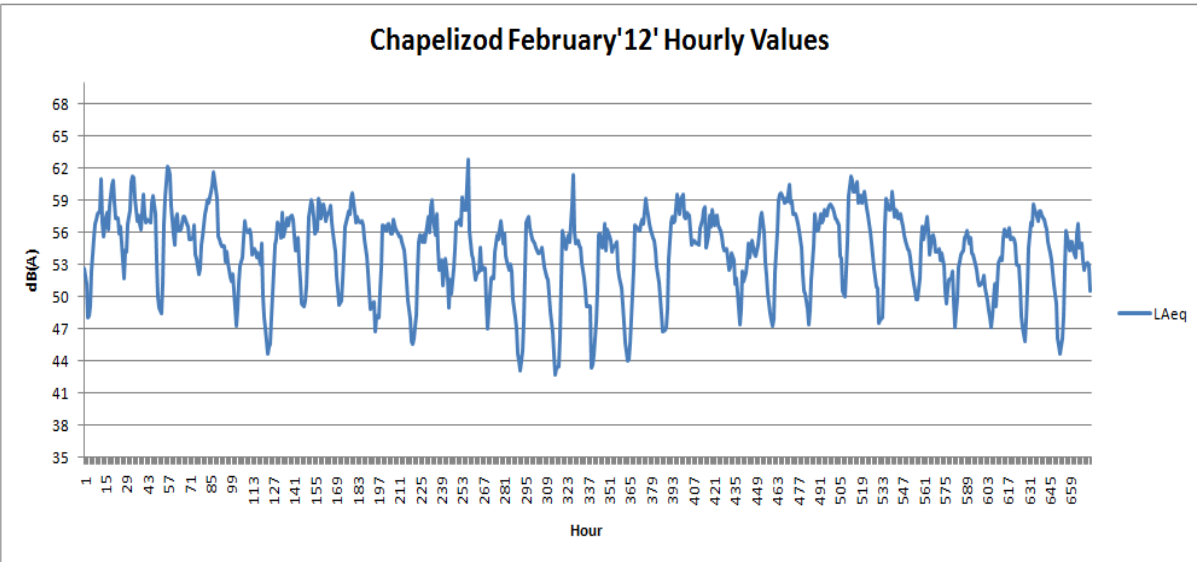
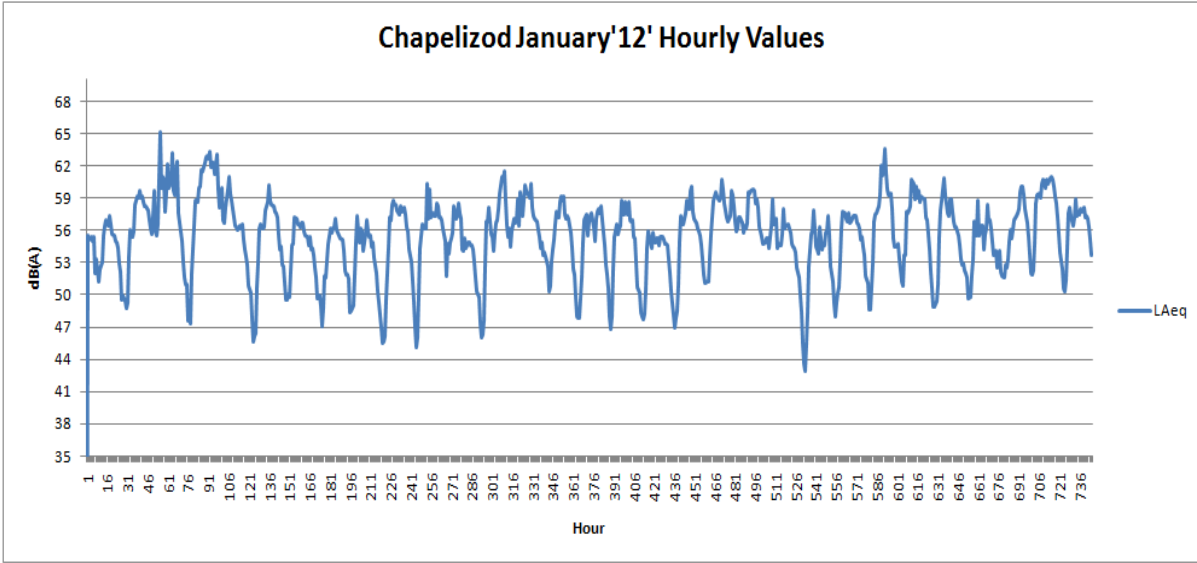


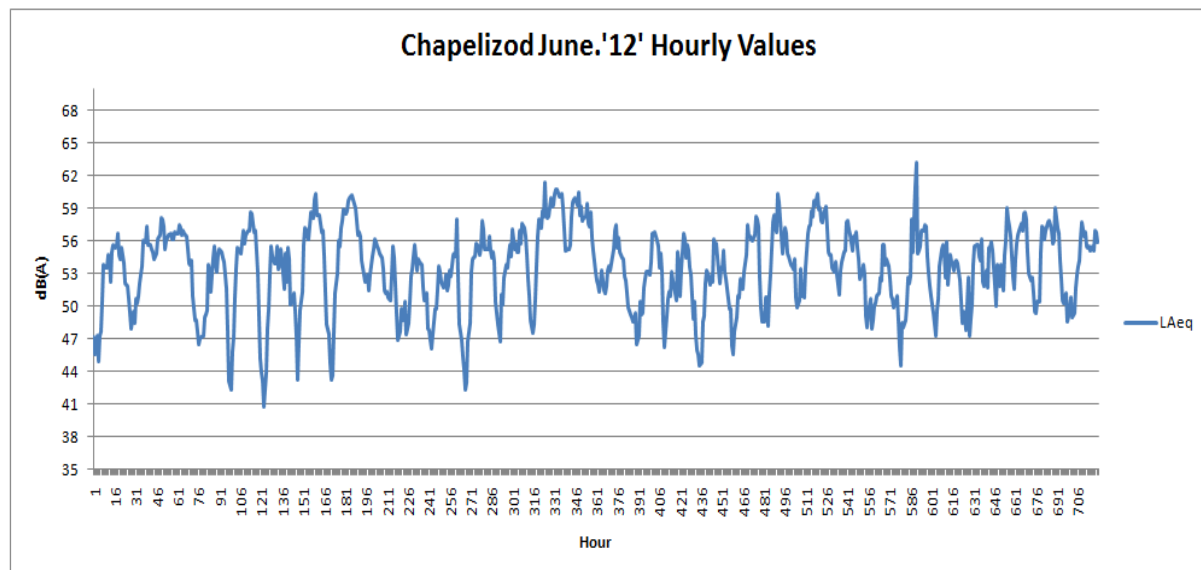
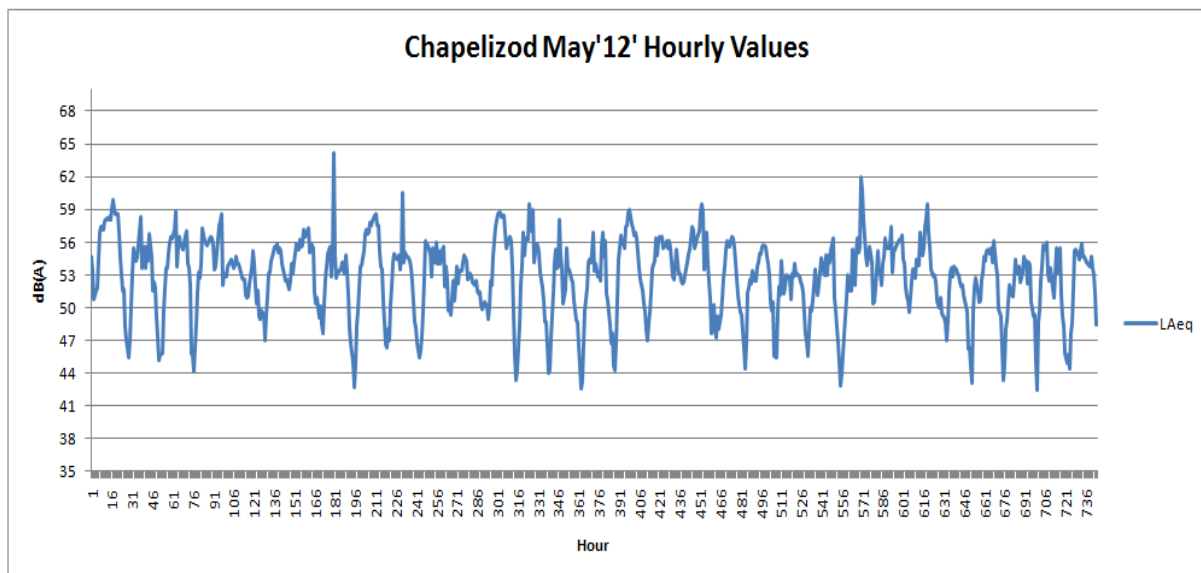
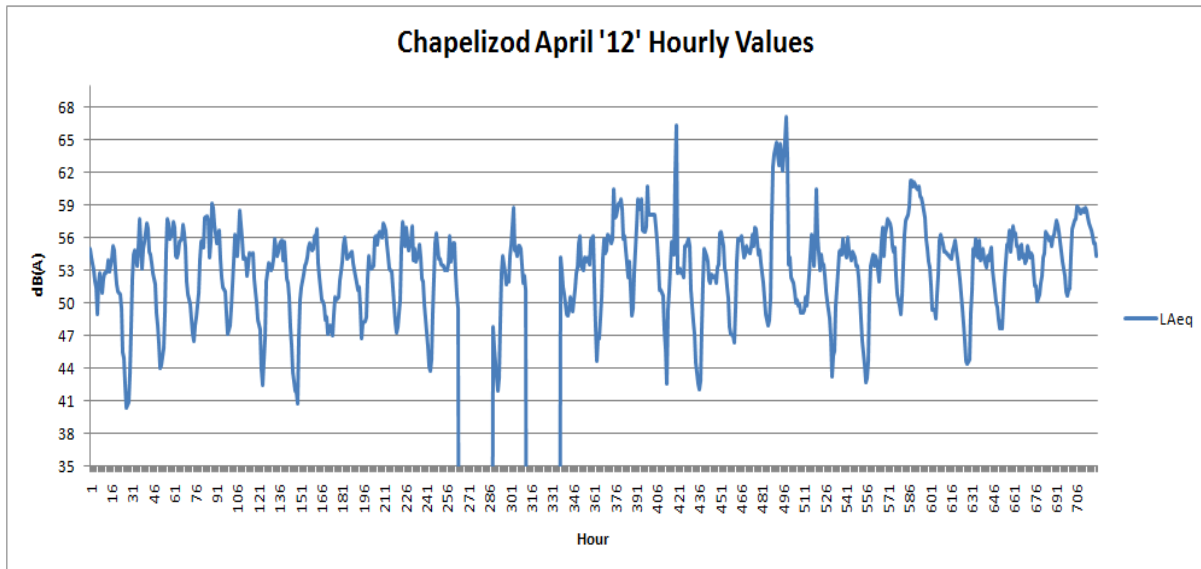


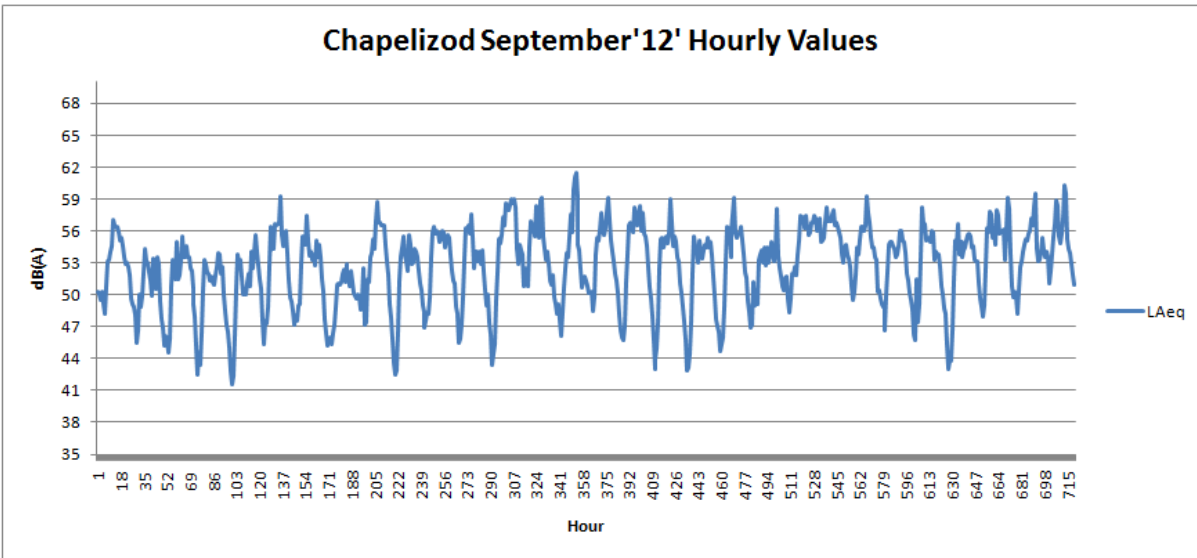
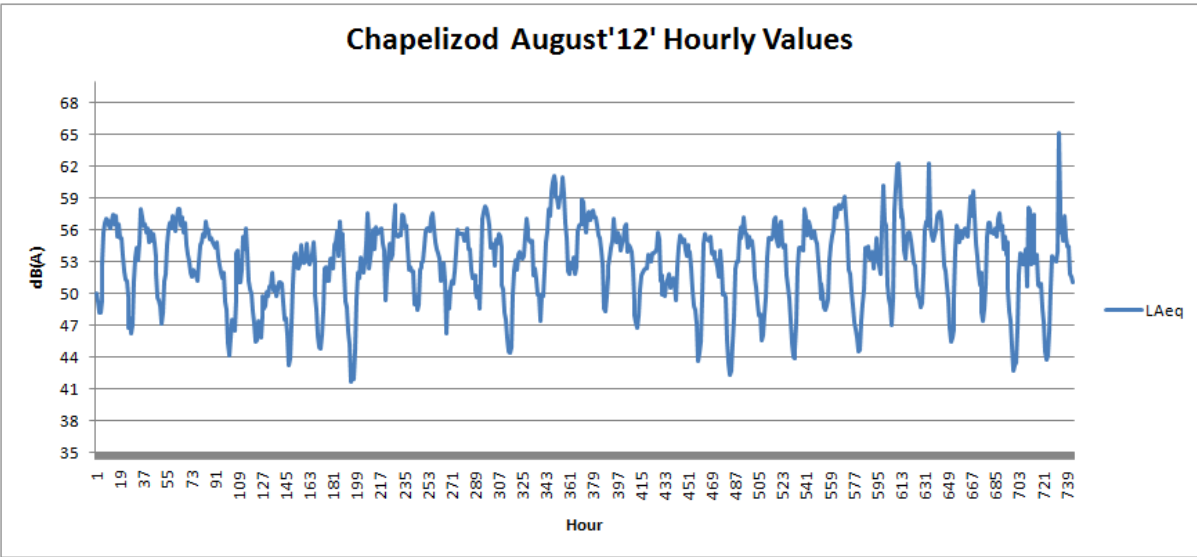
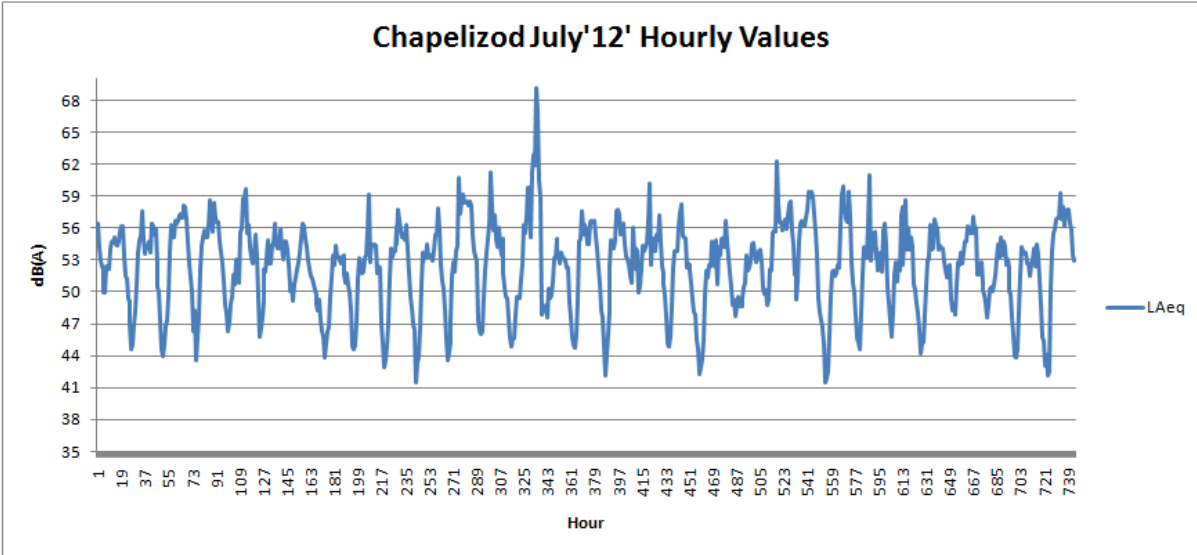


DUBLIN CITY COUNCIL ROWING CLUB
CHAPELIZOD ROAD
DUBLIN 8

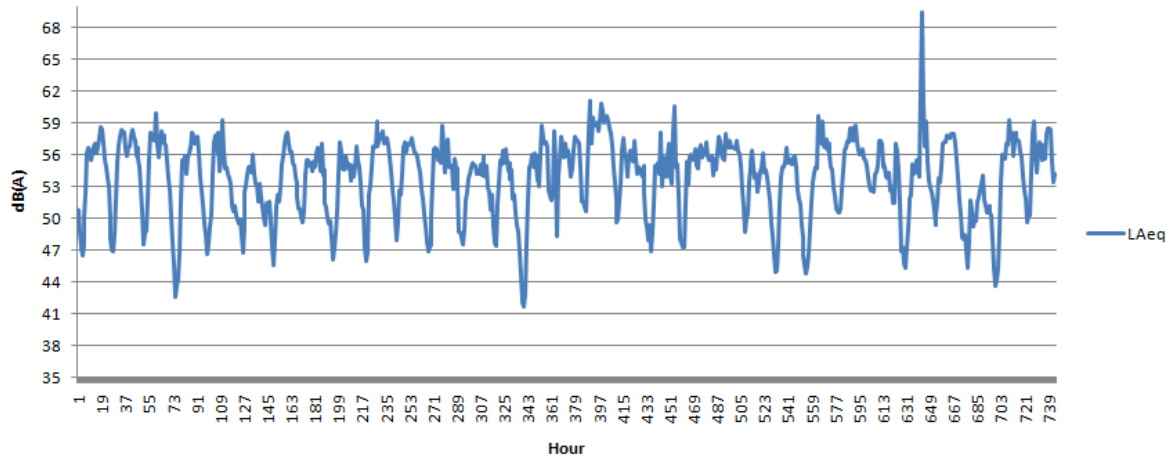




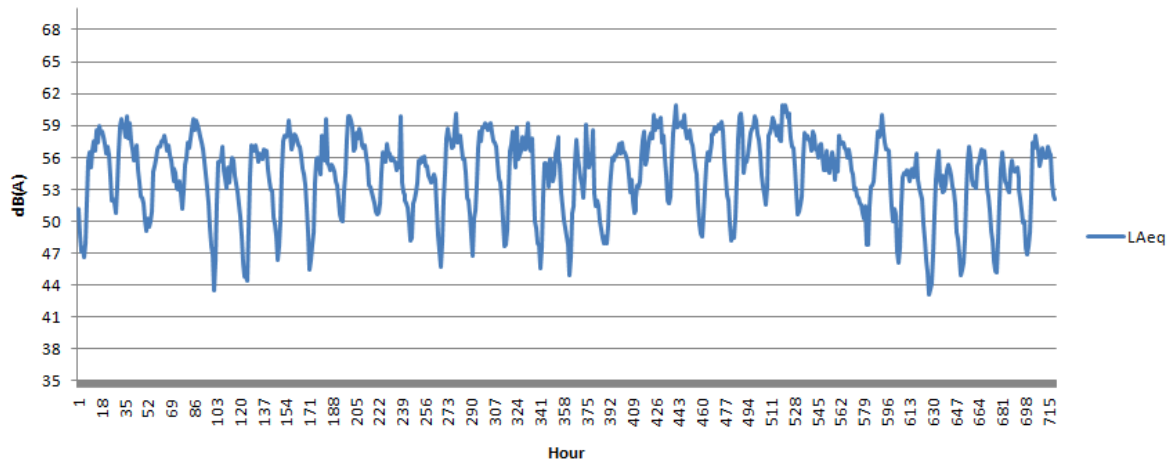




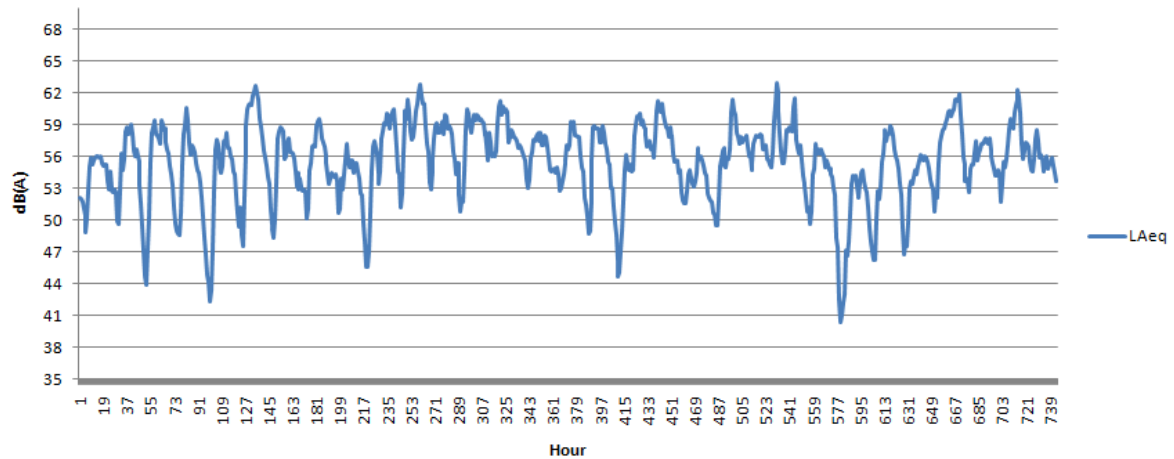
Chapelizod October'12' Hourly Values



Chapelizod November'12' Hourly Values

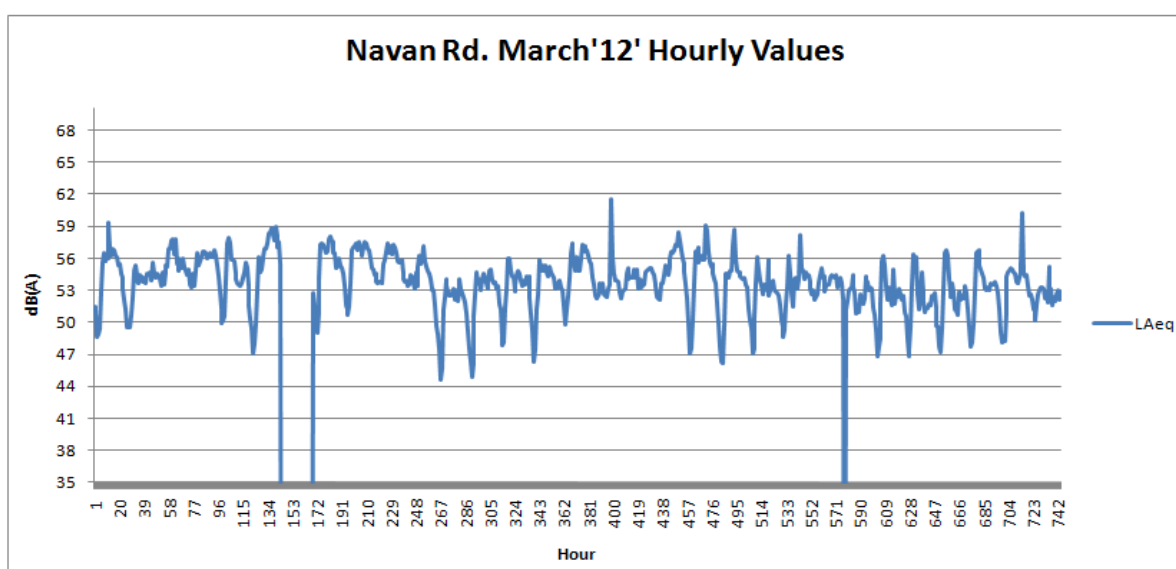
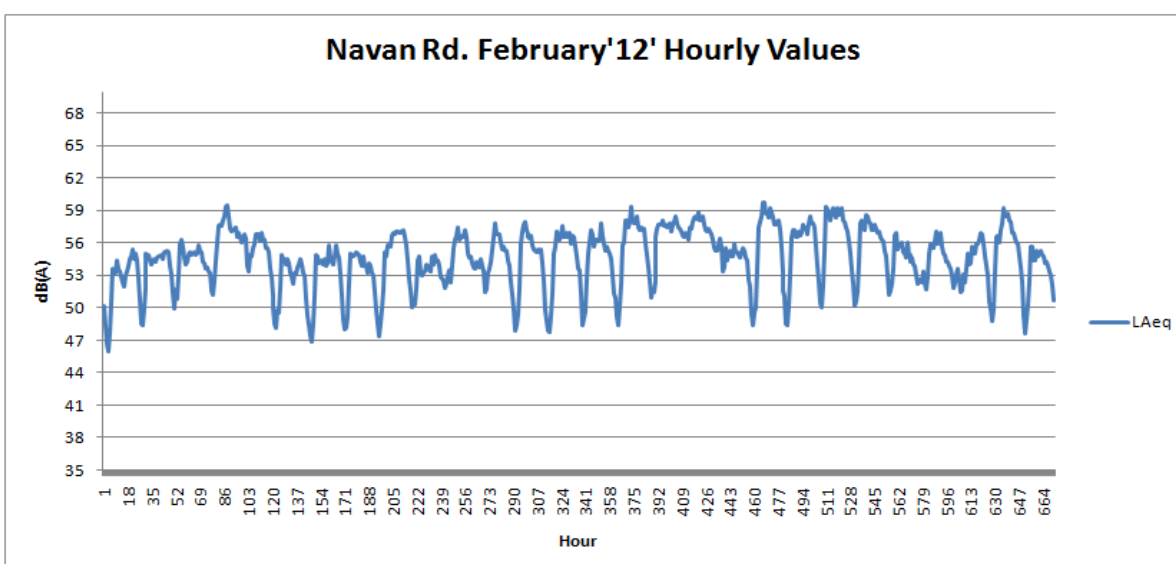
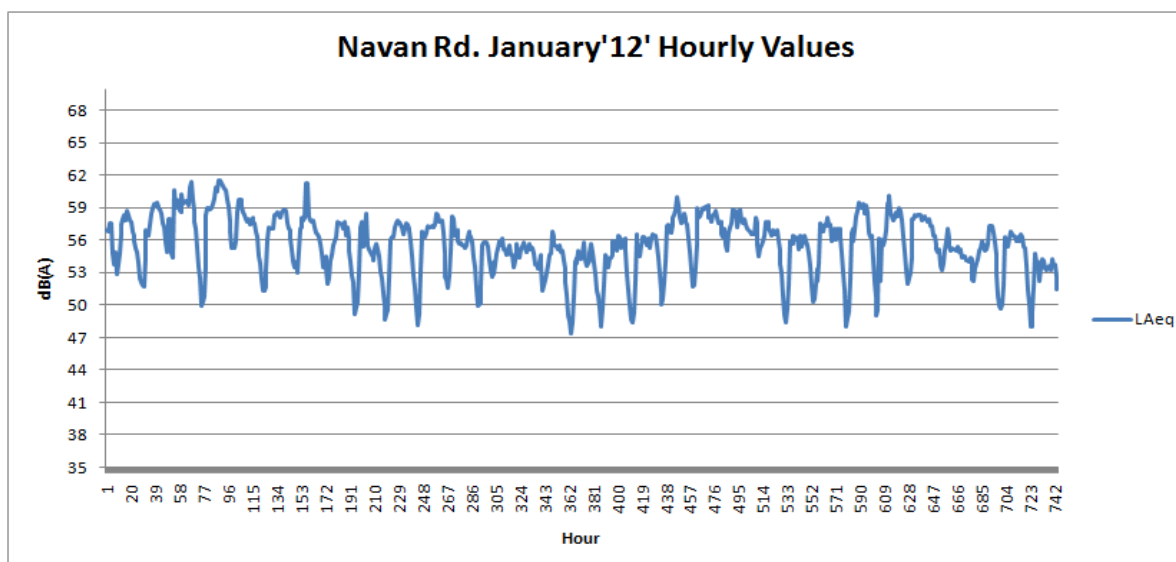


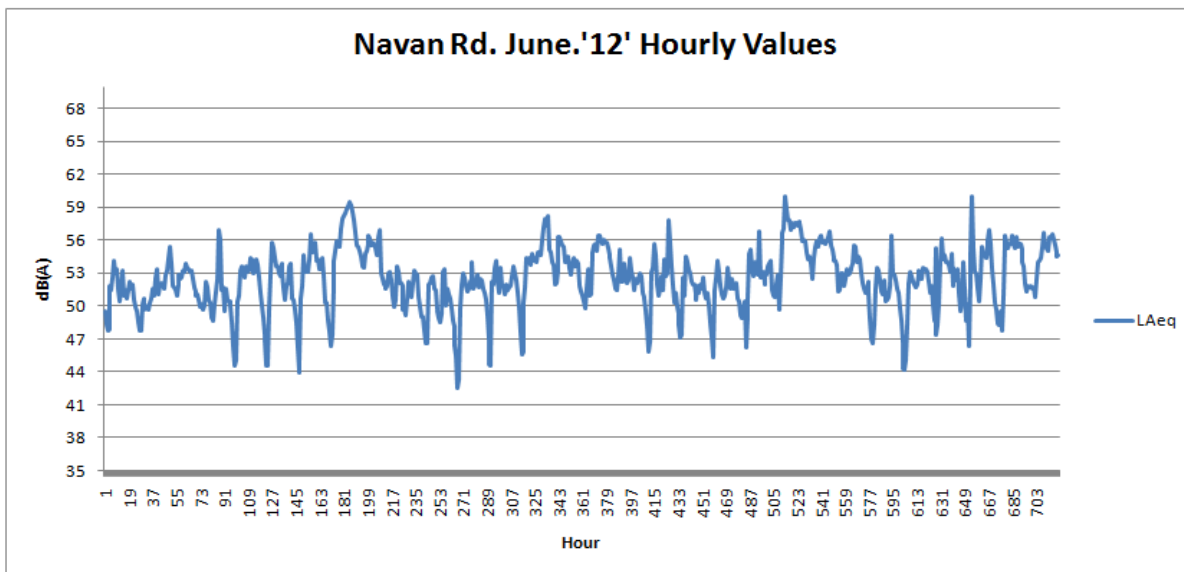
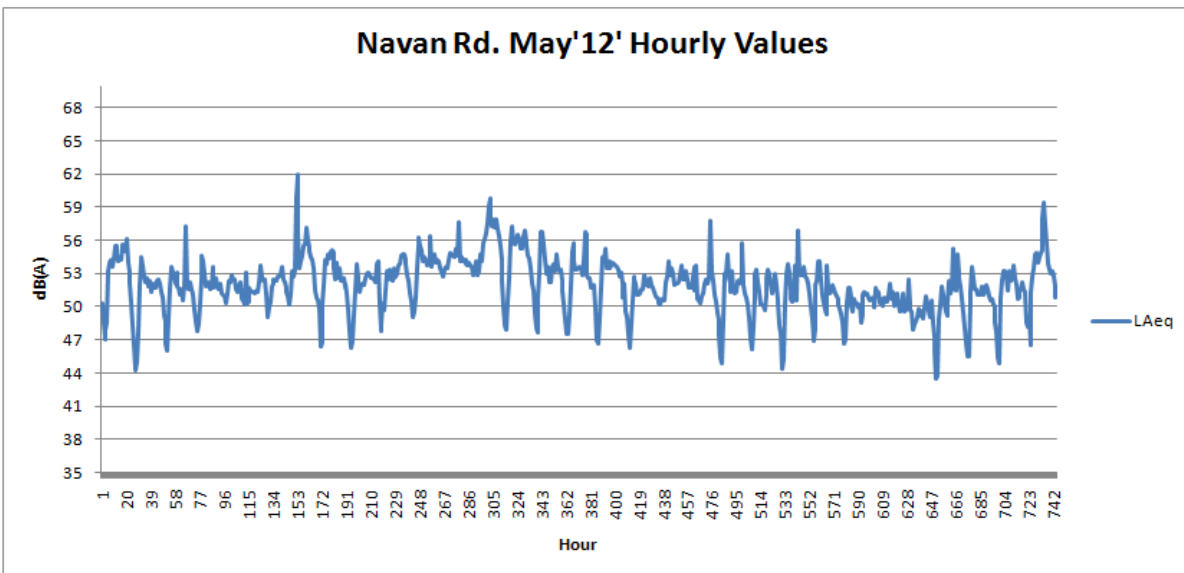
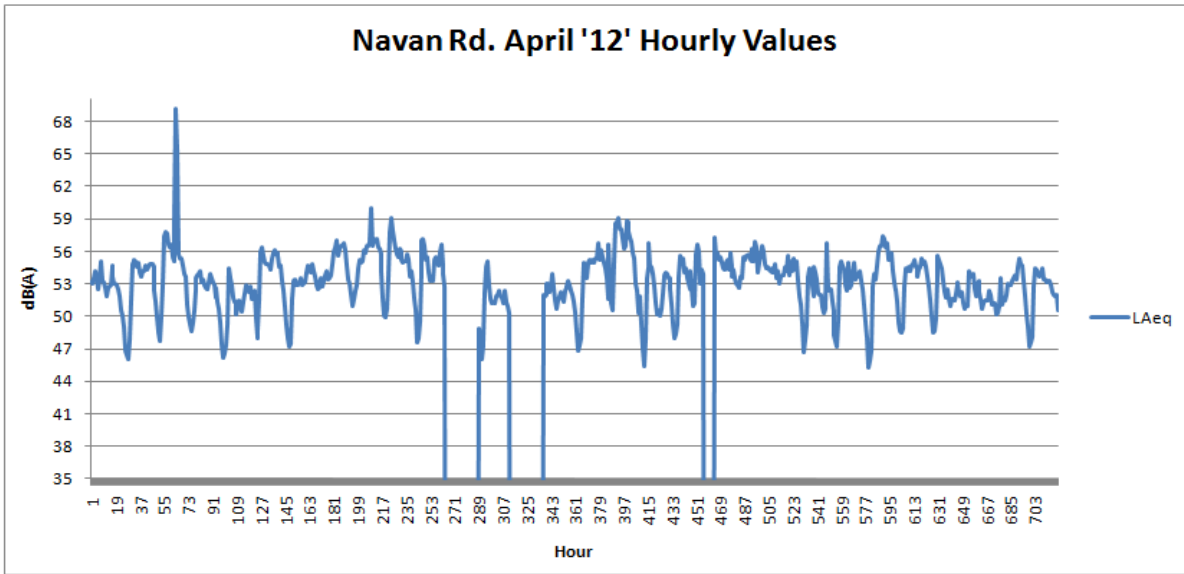
Chapelizod December'12' Hourly Values

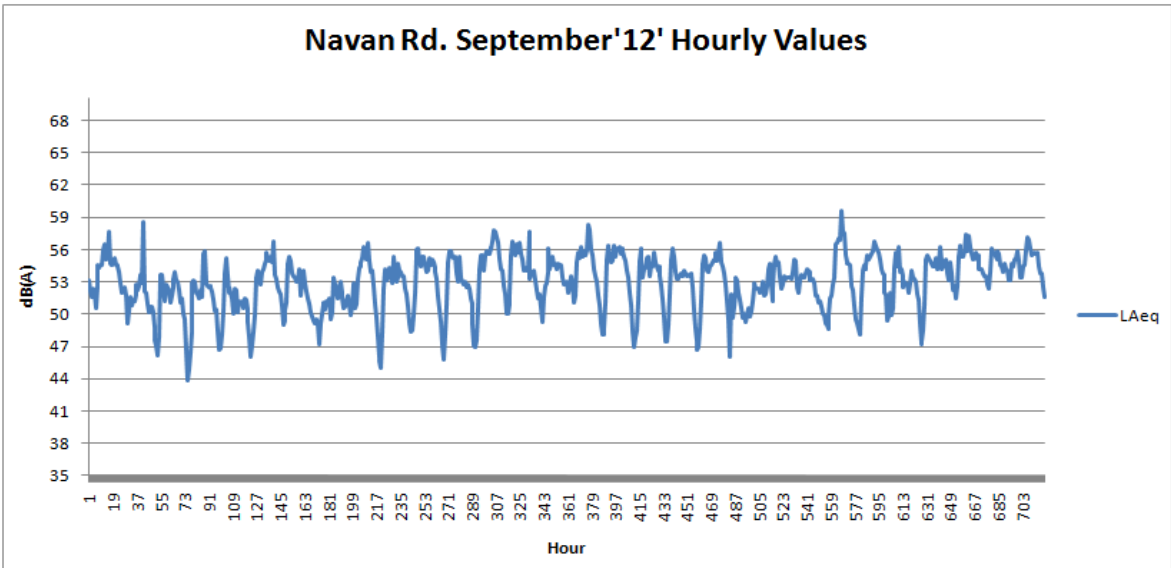
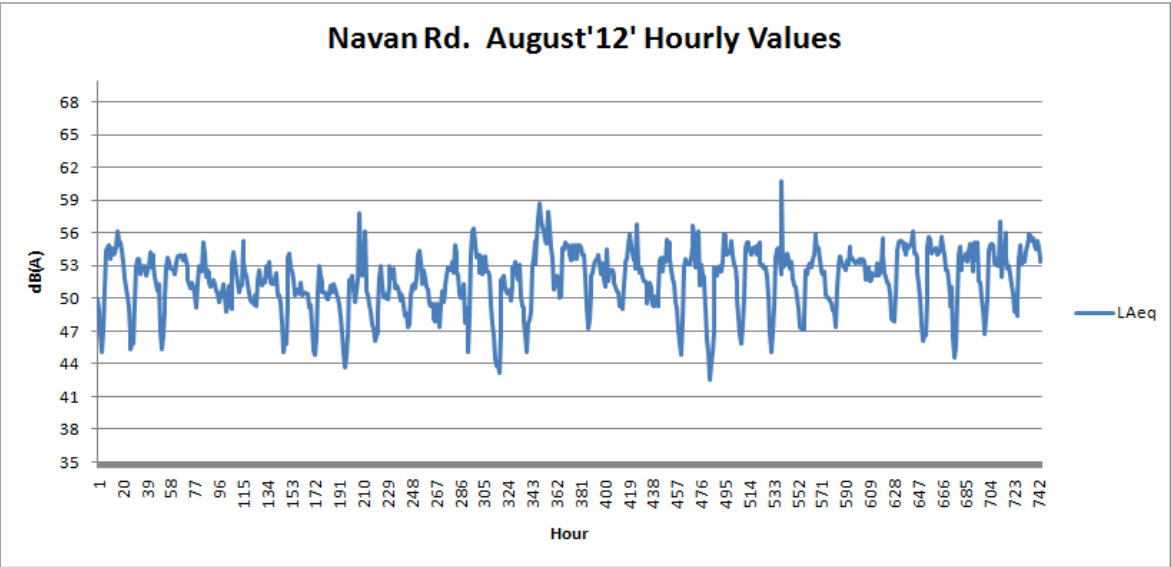
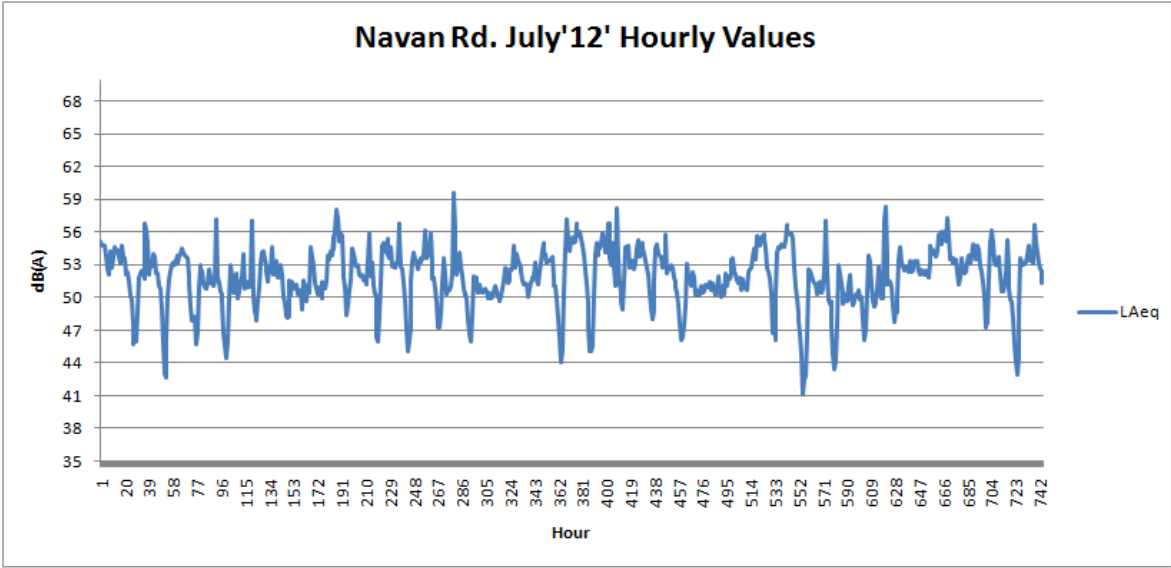


ASHTOWN GROVE
NAVAN ROAD
DUBLIN 7

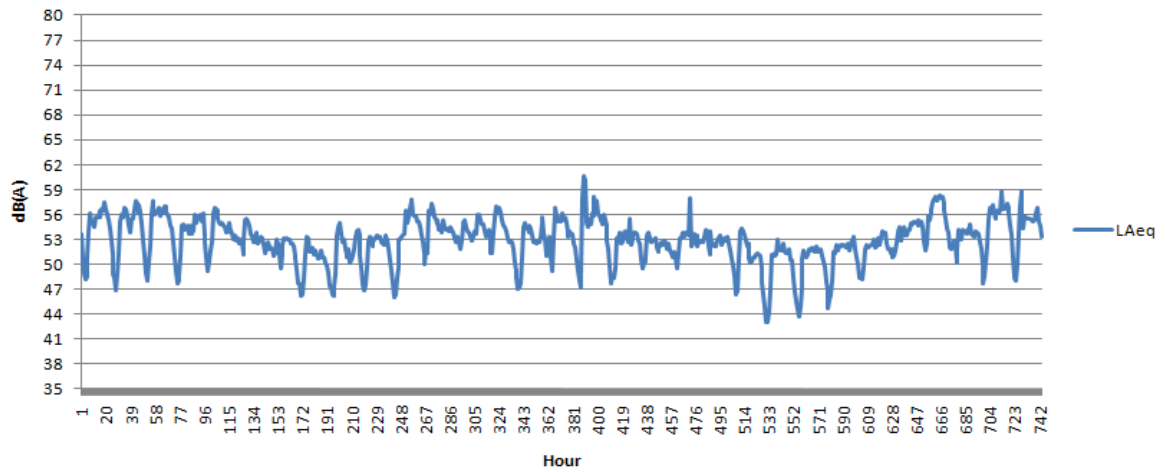




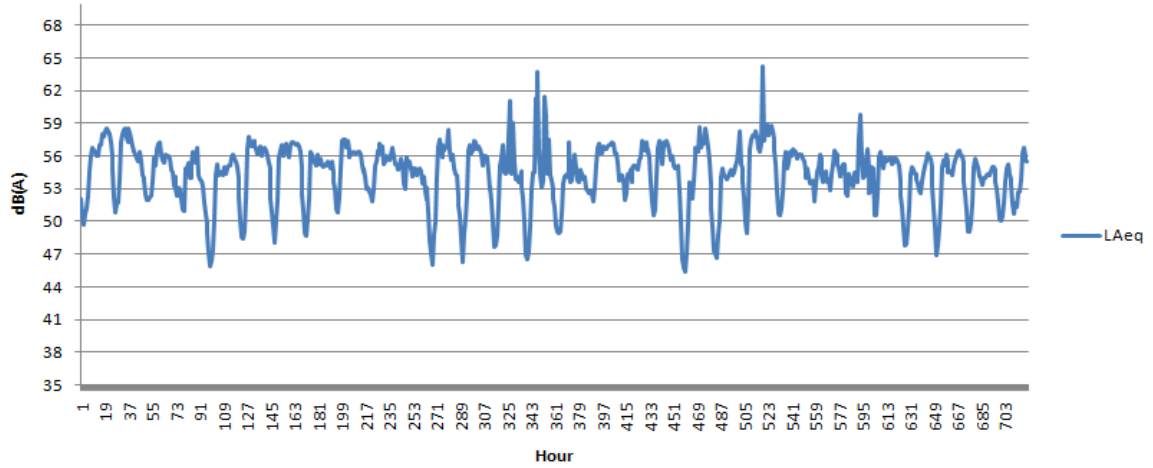




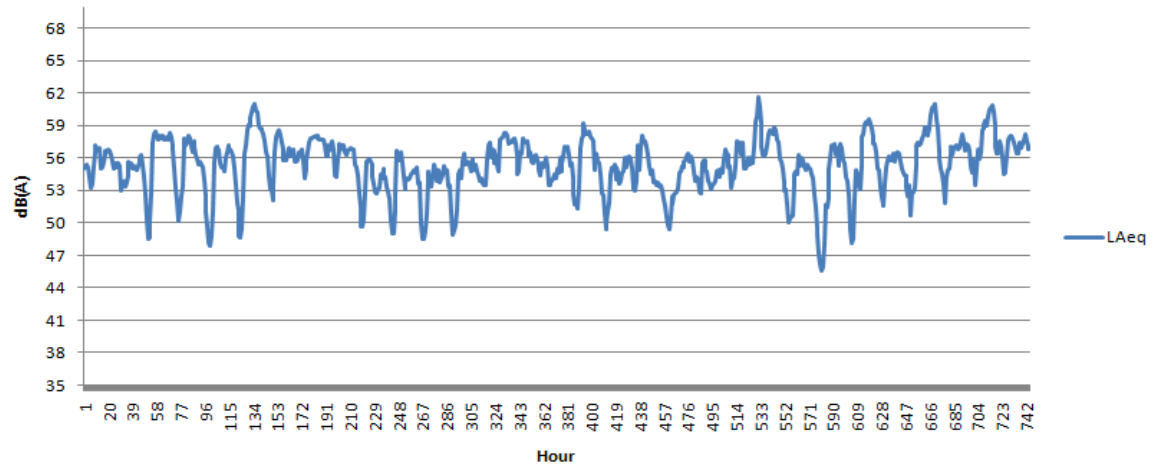
Navan Rd. October'12' Hourly Values



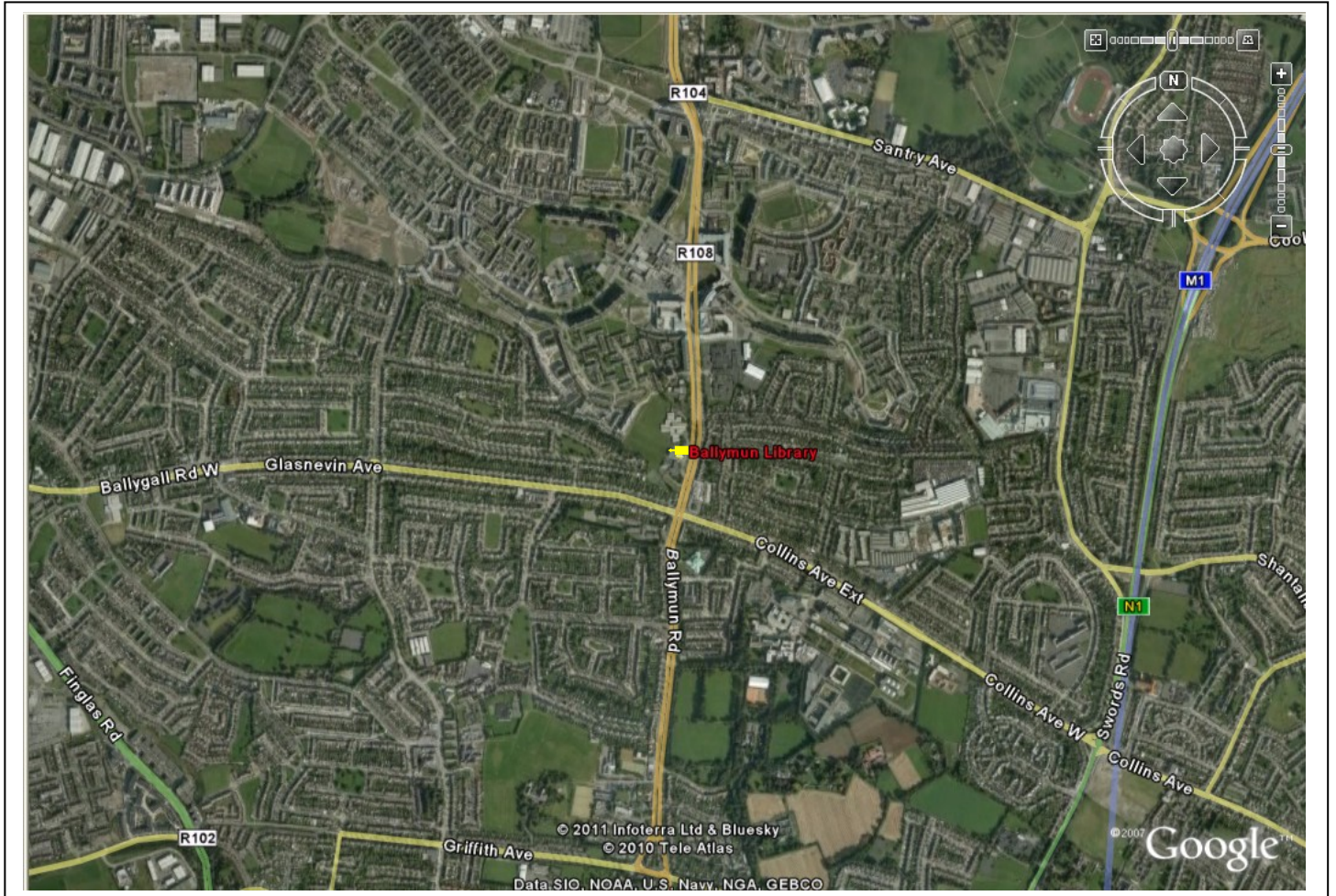
Navan Rd. November'12' Hourly Values

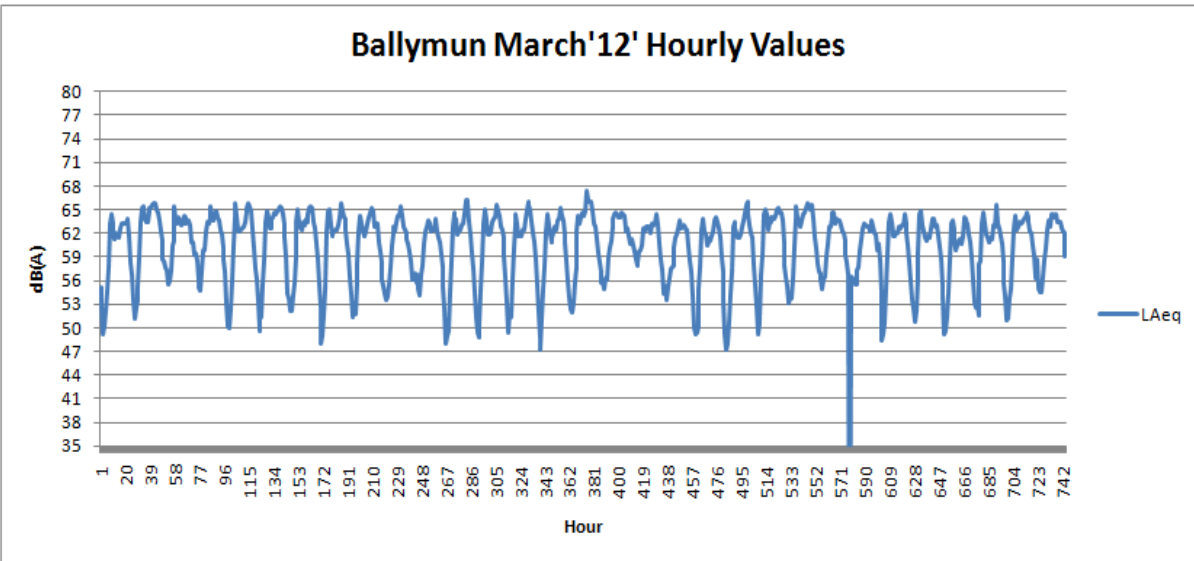
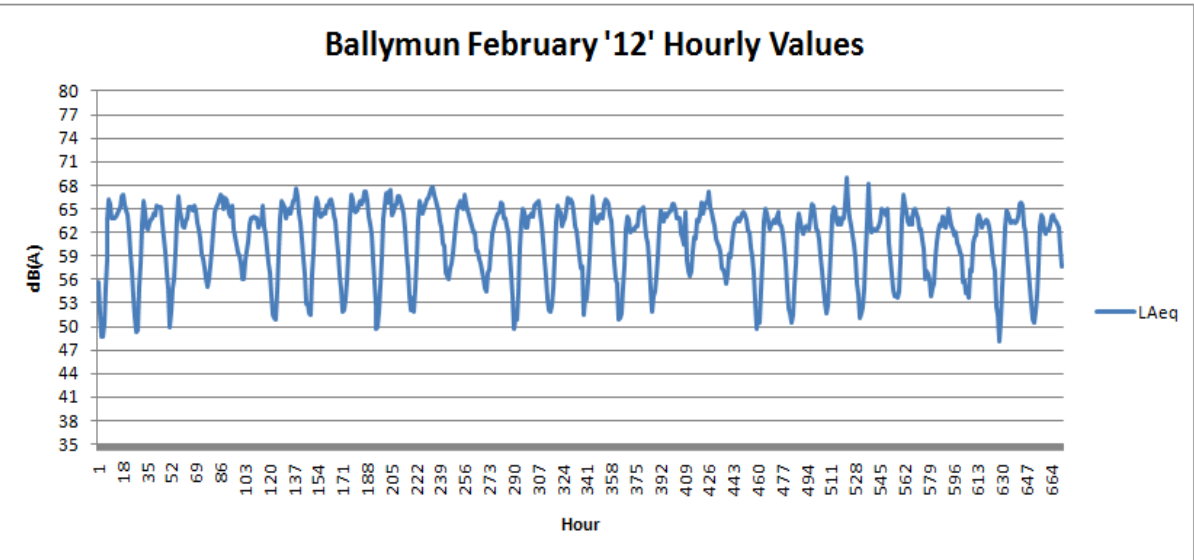
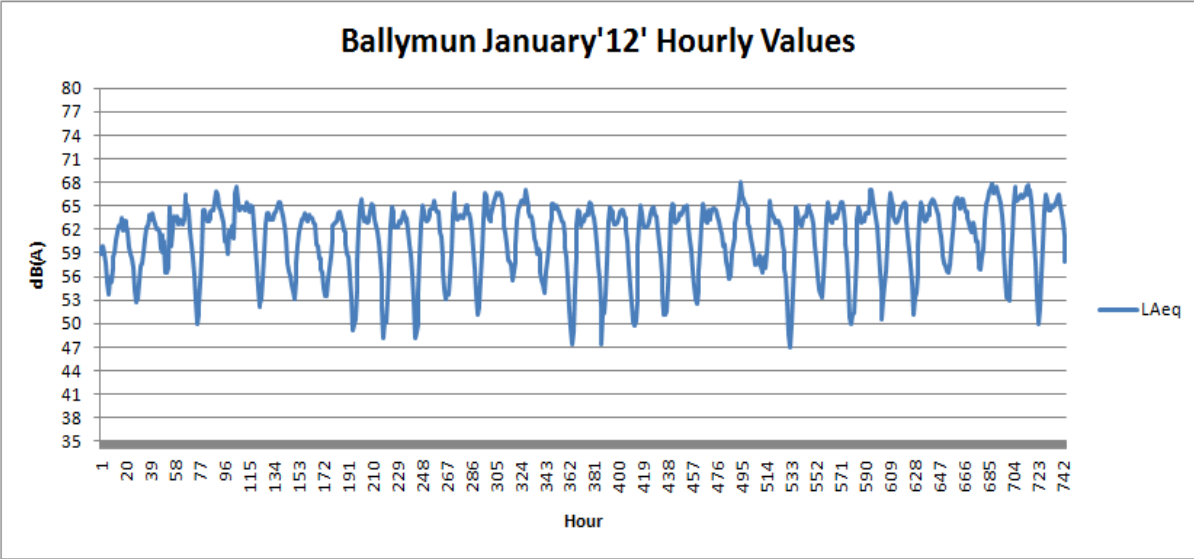


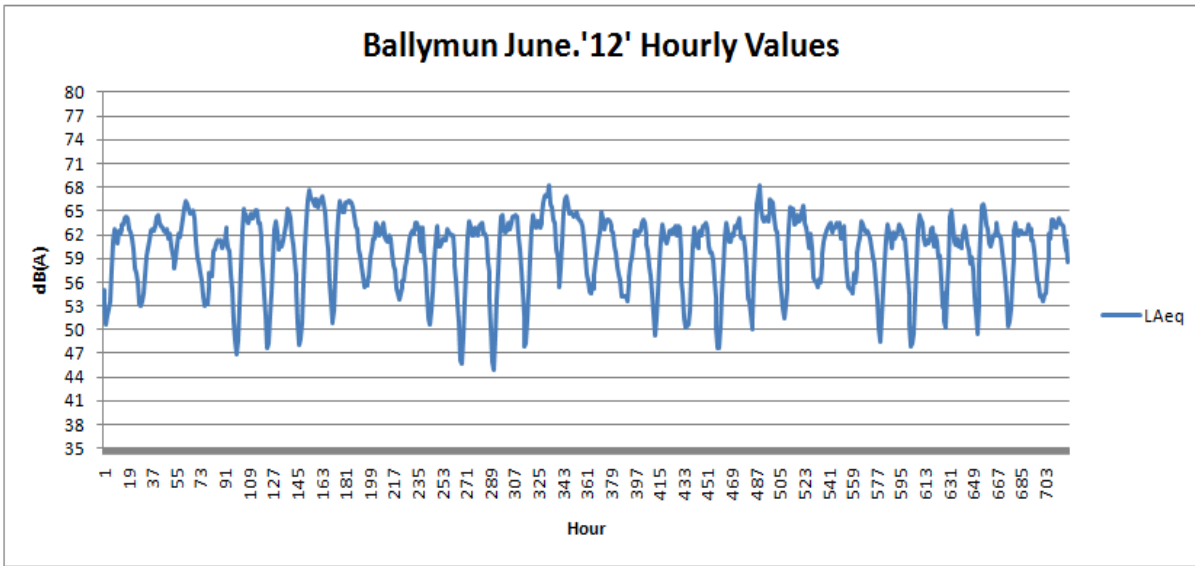
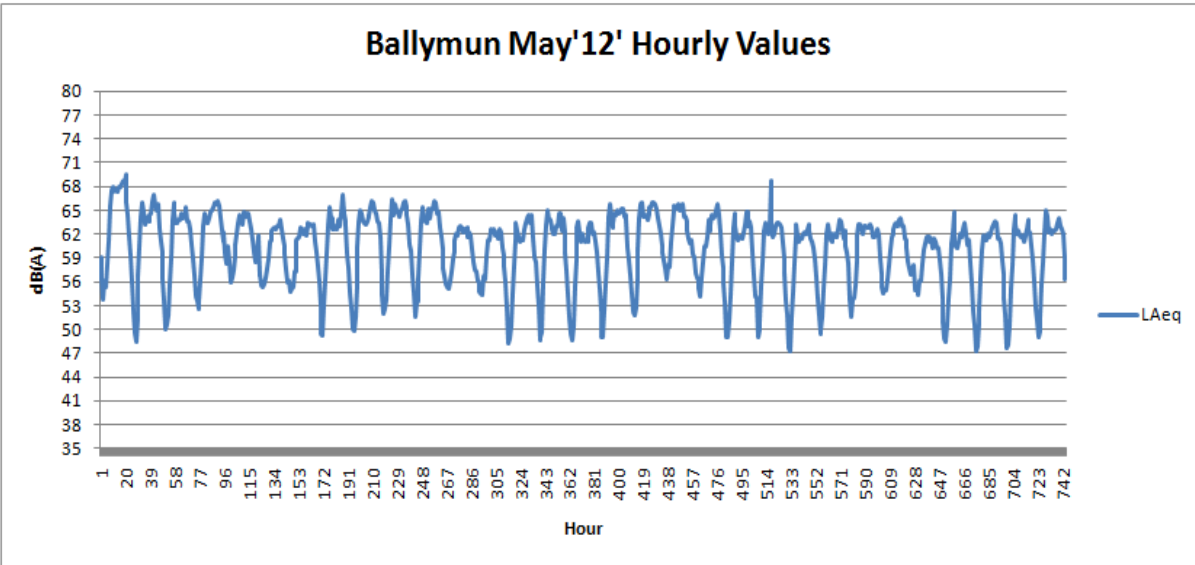
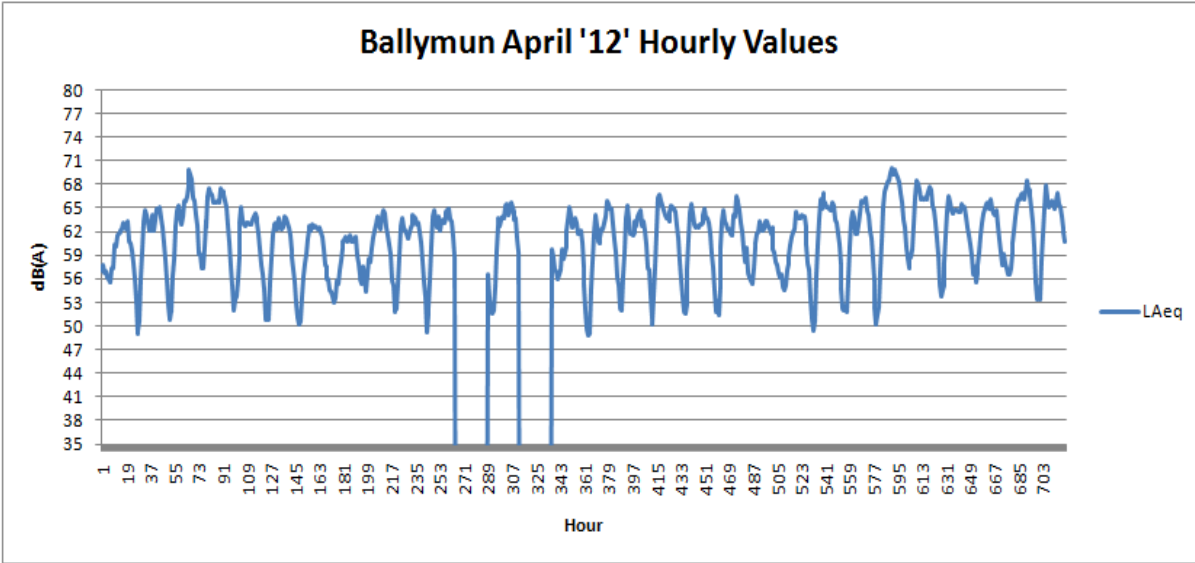
Navan Rd. December'12' Hourly Values

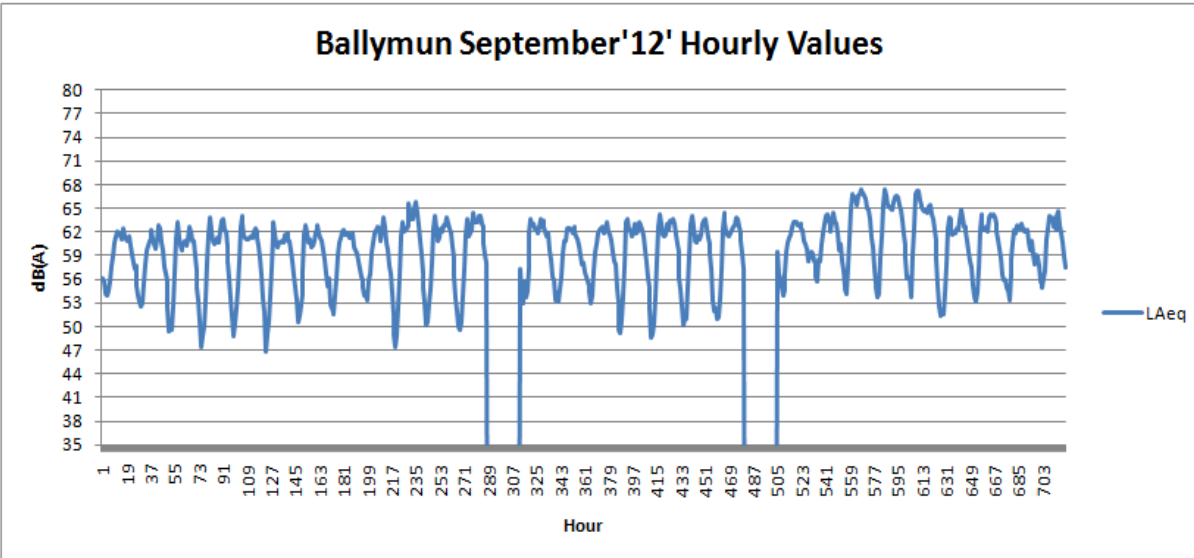
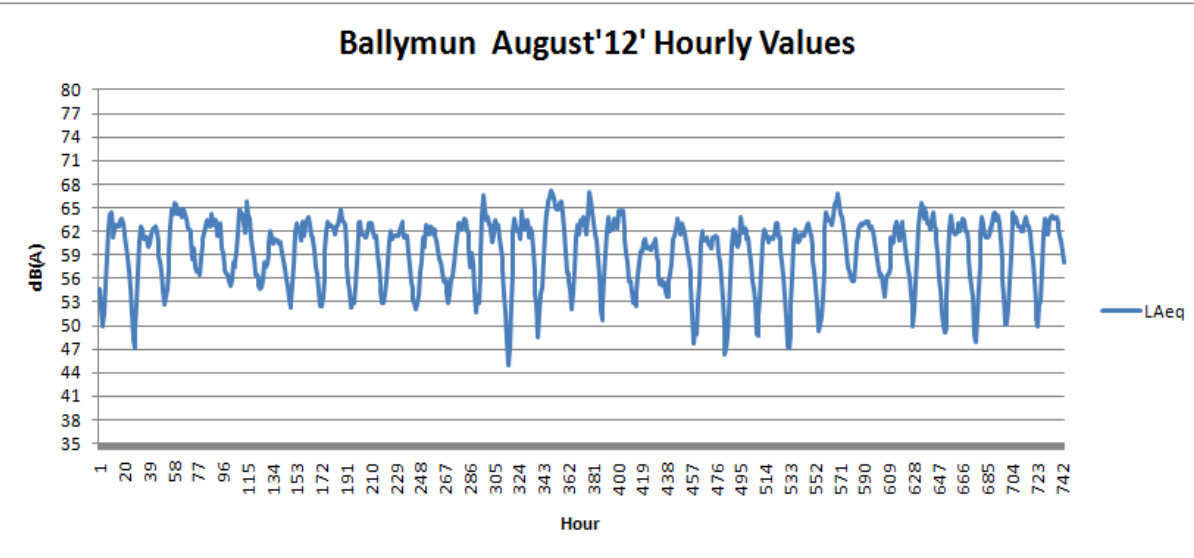
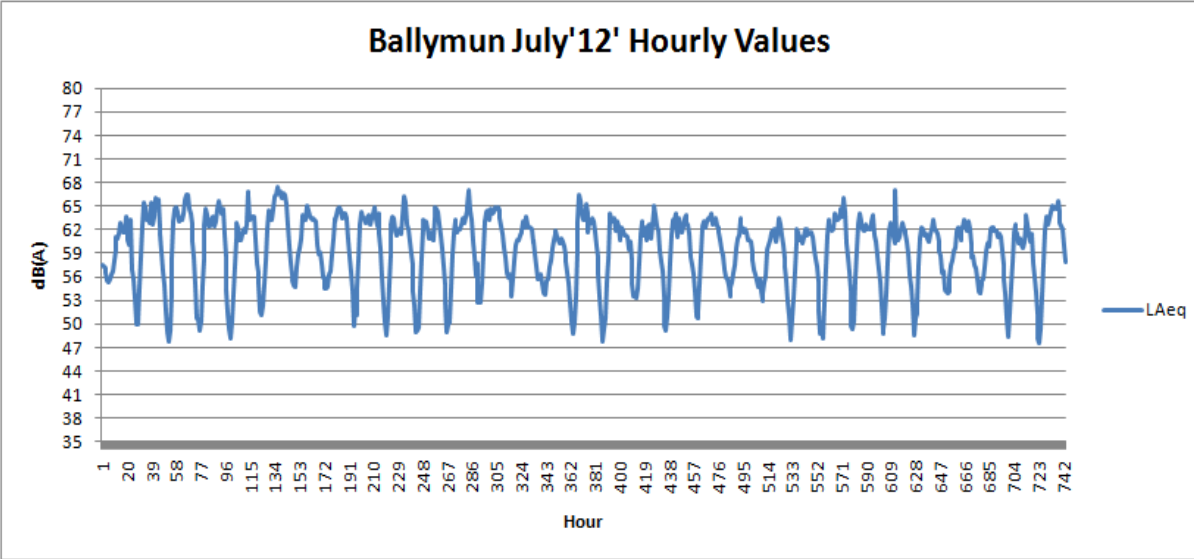


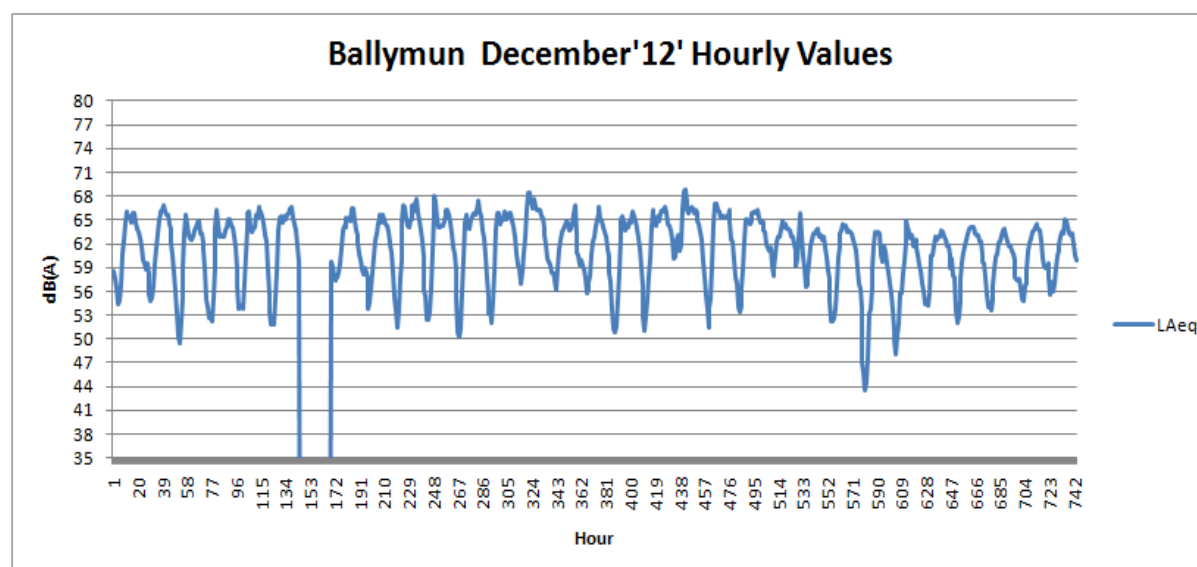
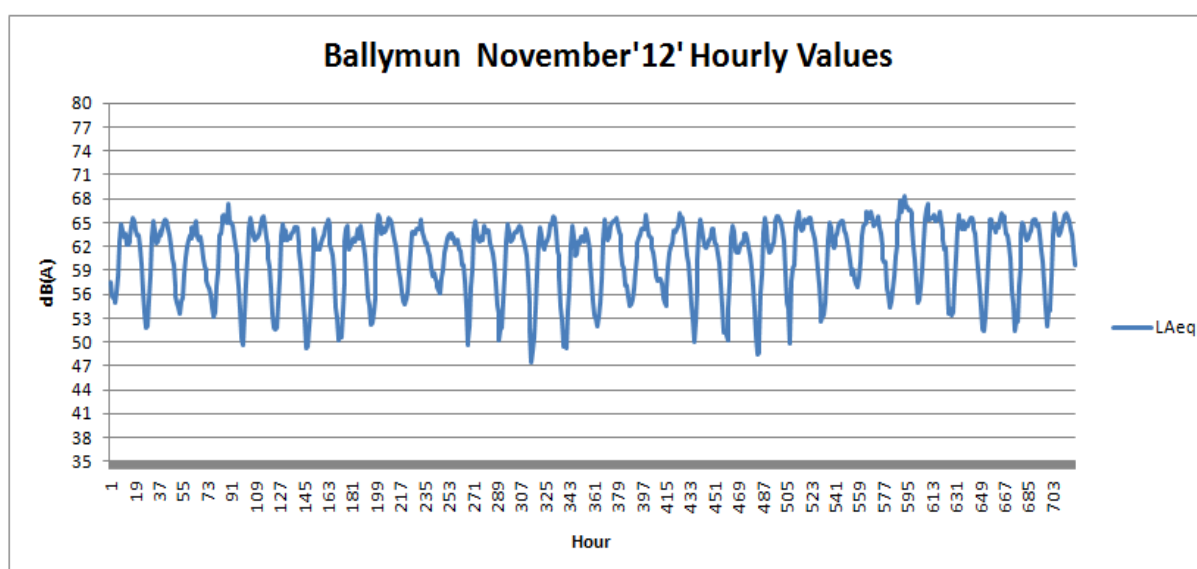
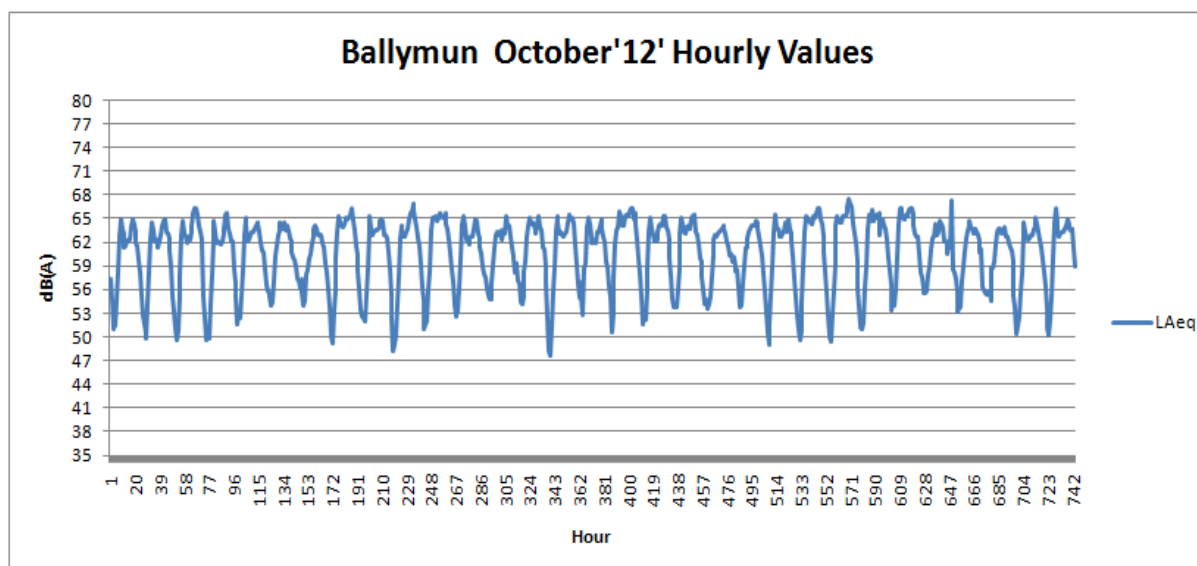
BALLYMUN LIBRARY
BALLYMUN ROAD
DUBLIN 11





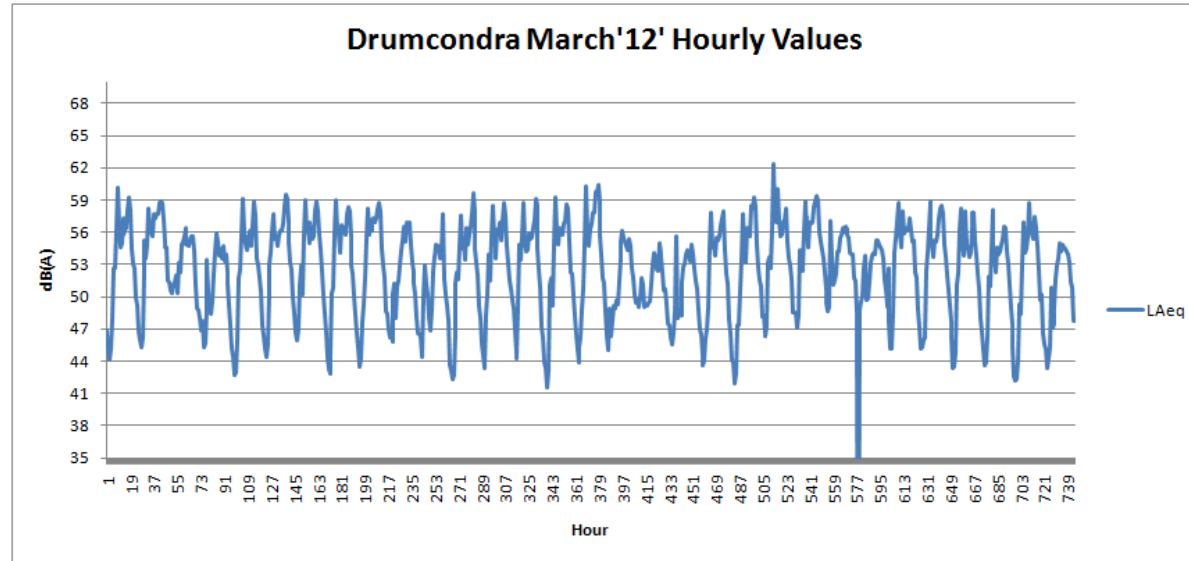
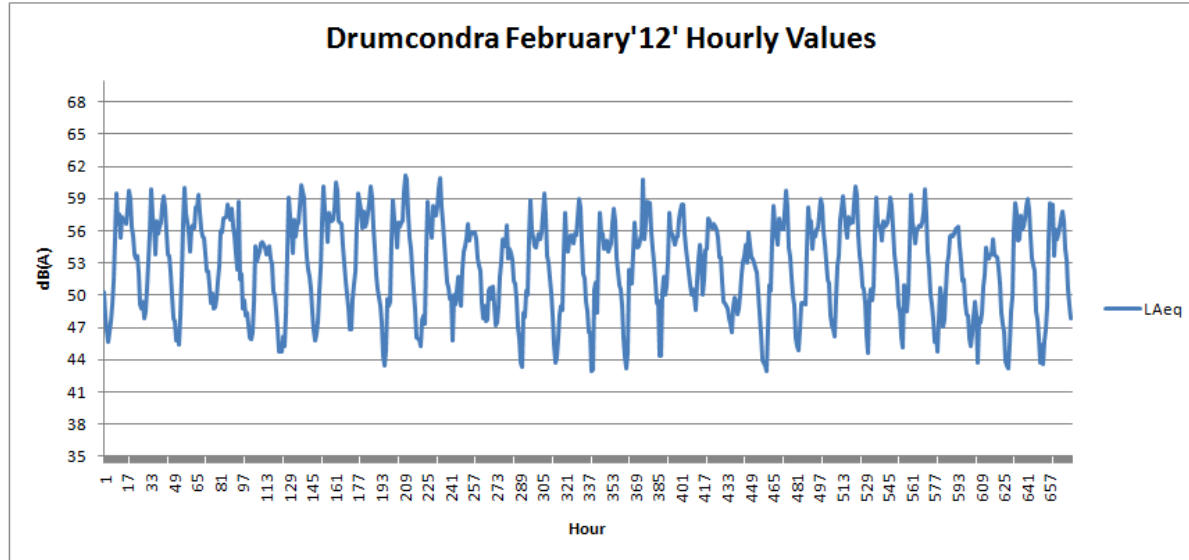
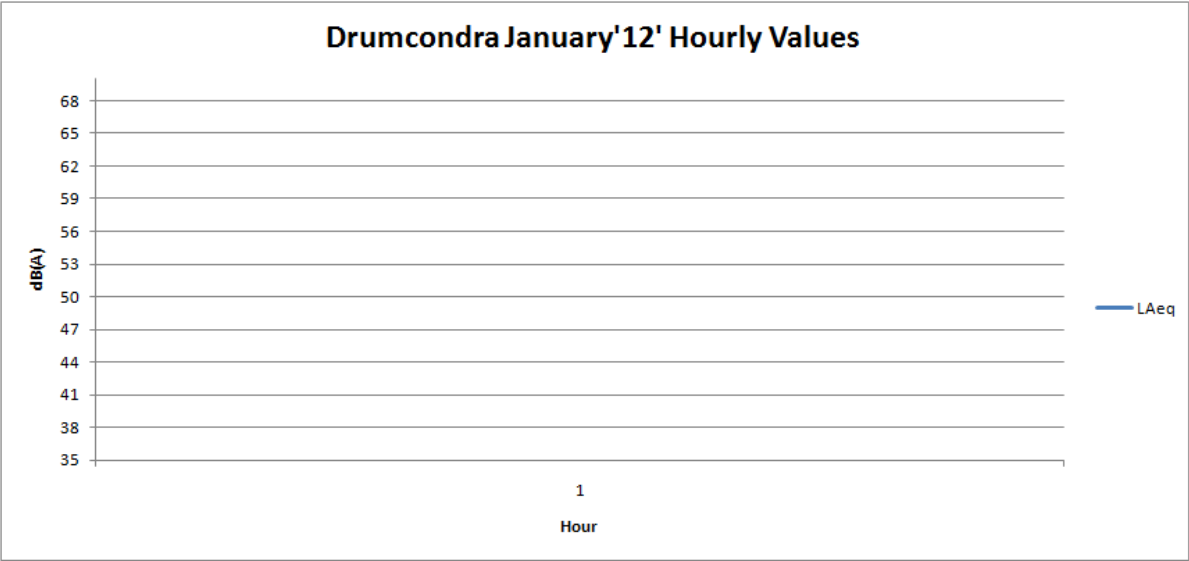


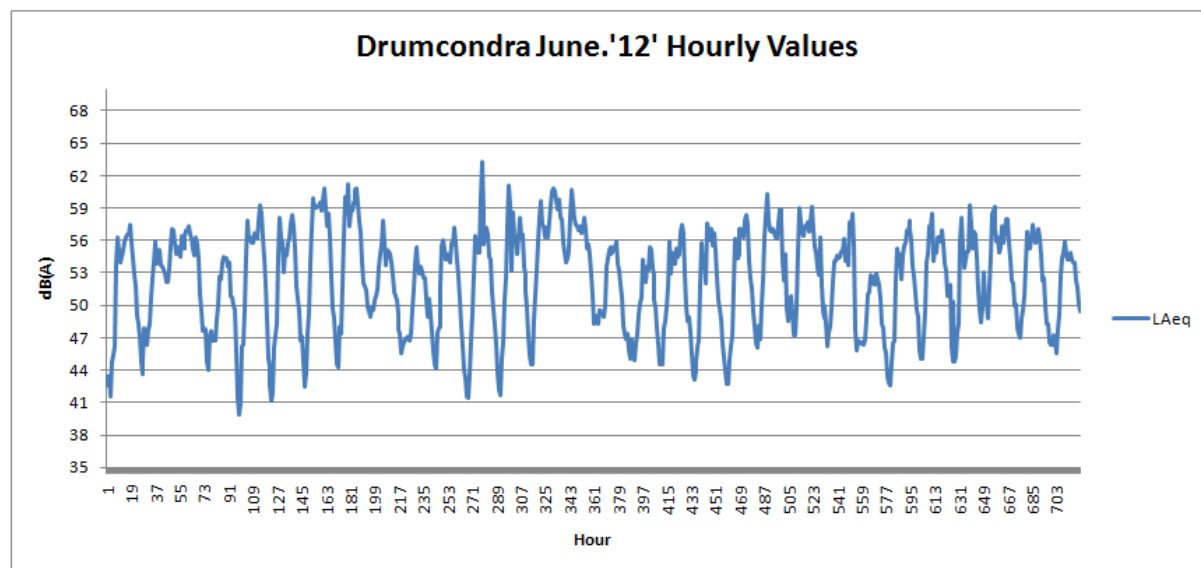
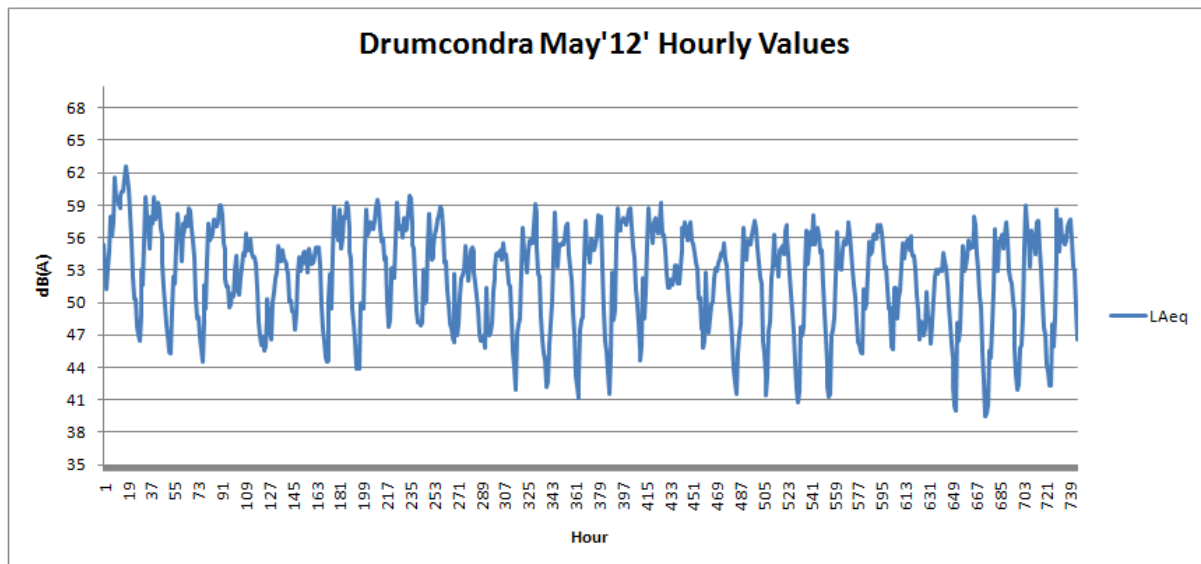
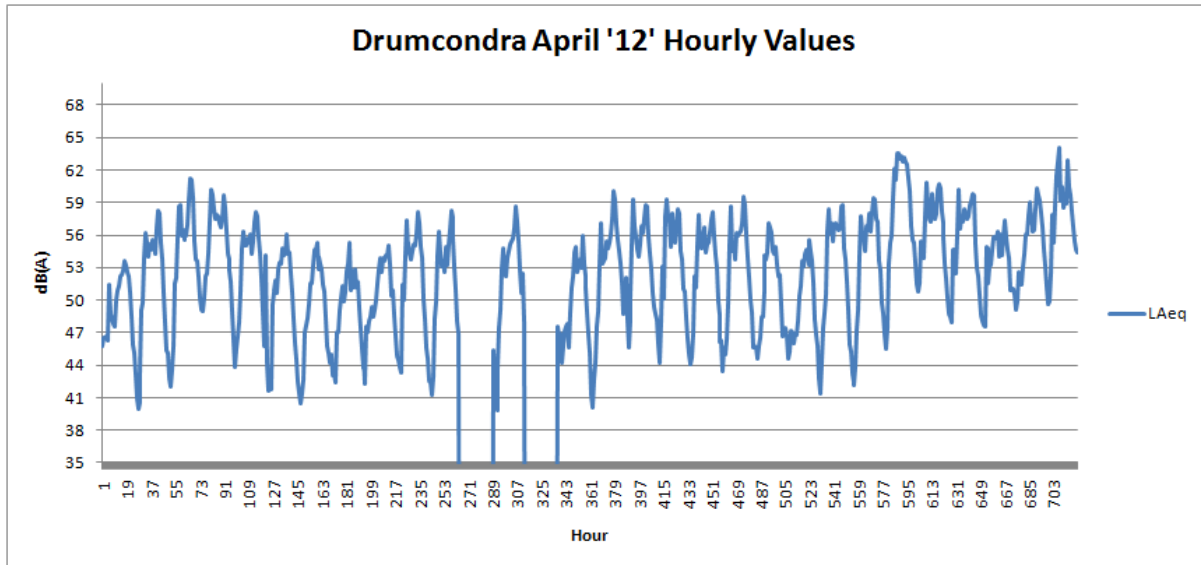


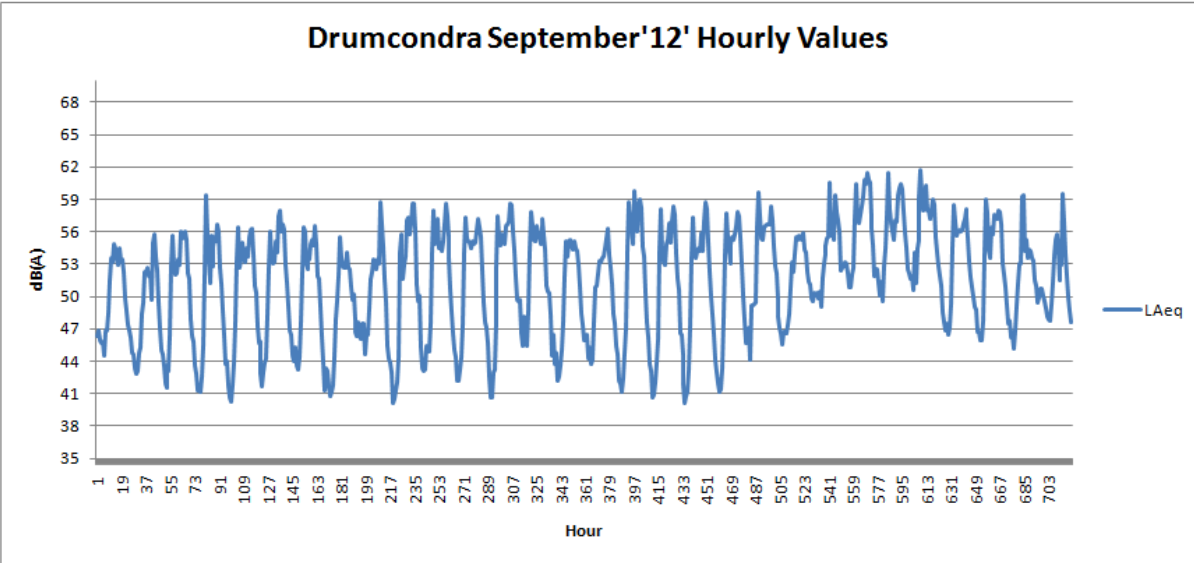
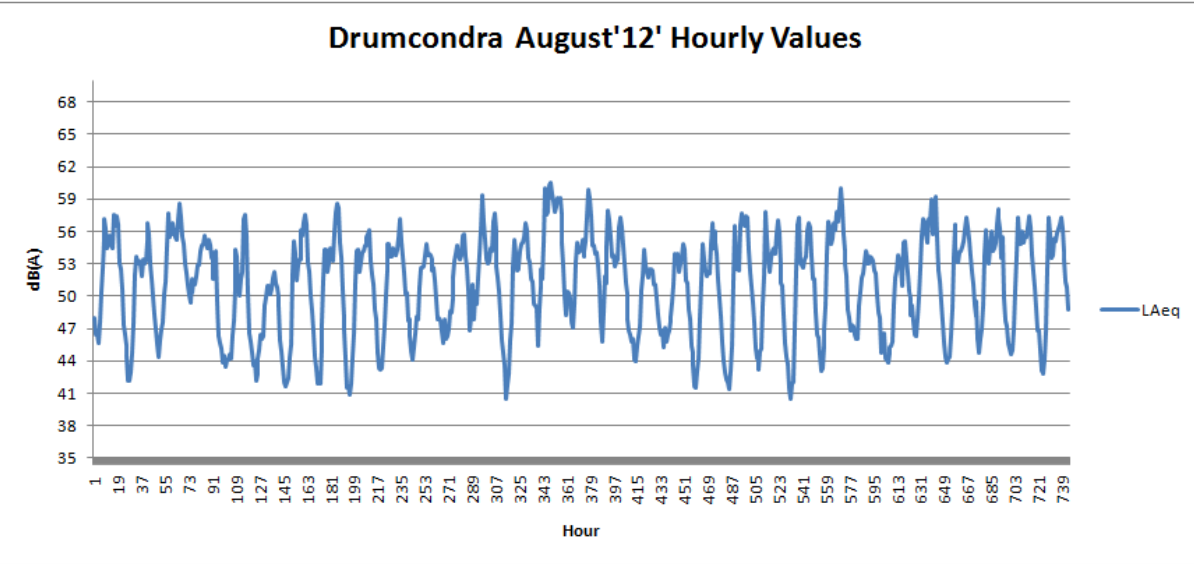
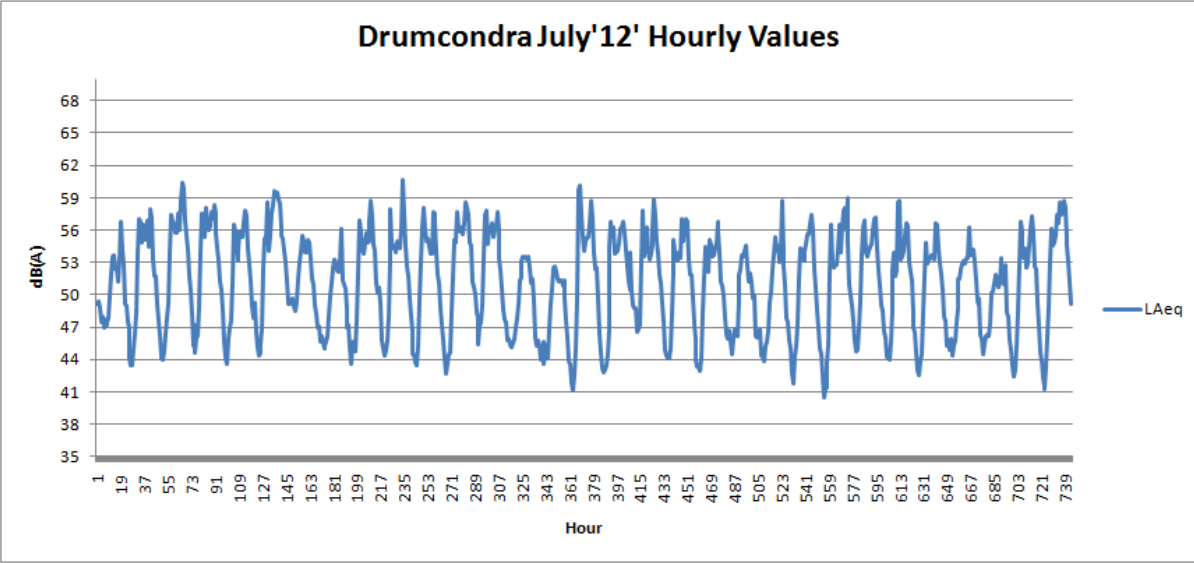


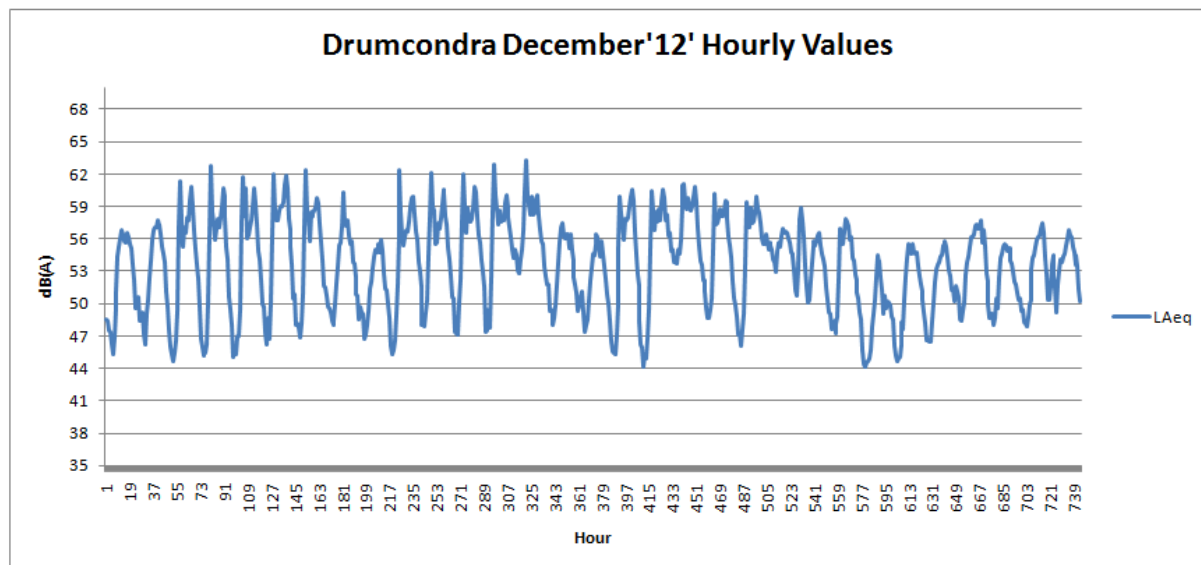
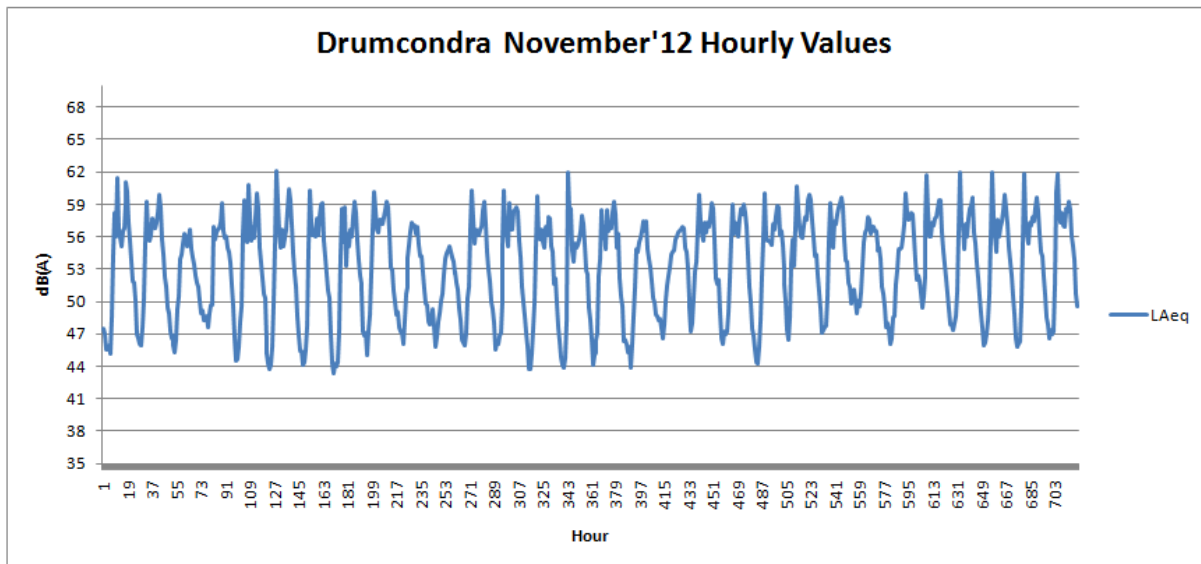
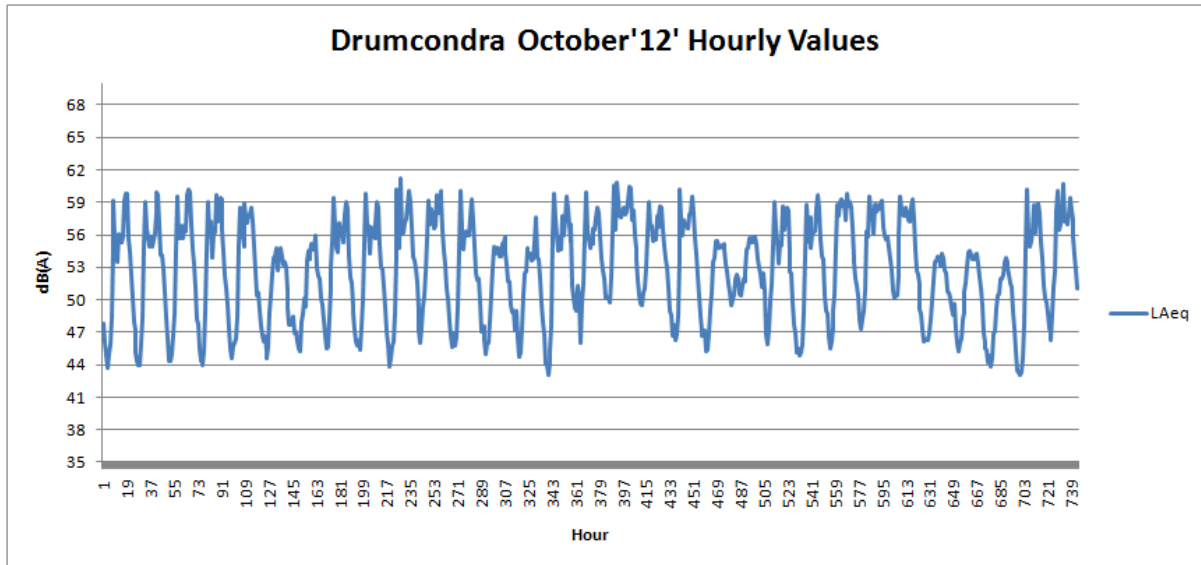
DRUMCONDRA LIBRARY
MILLMOUNT AVENUE
DUBLIN 9





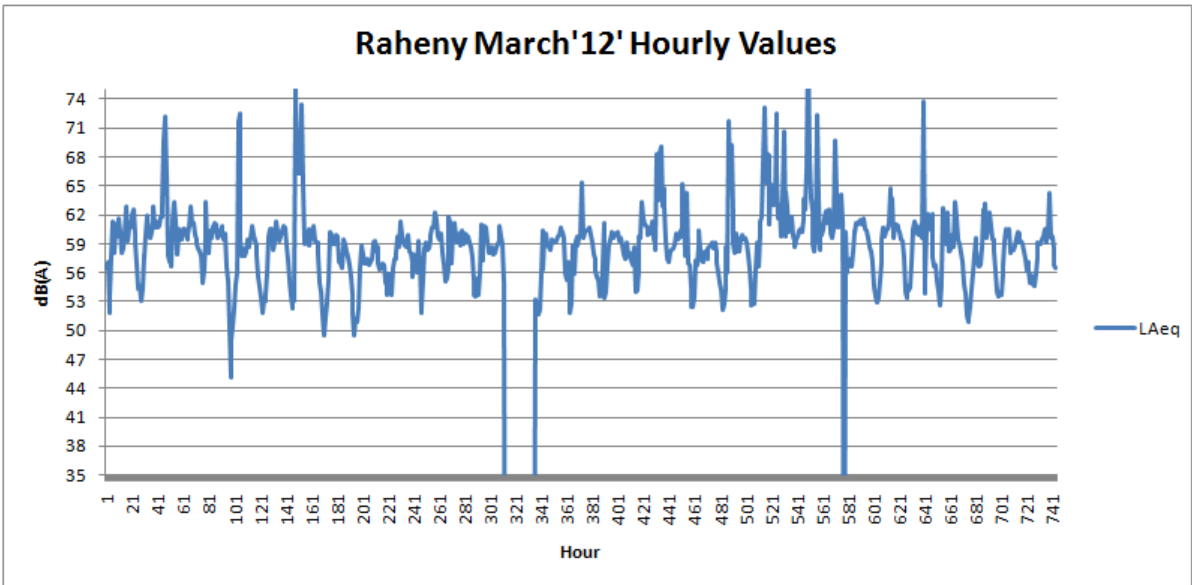
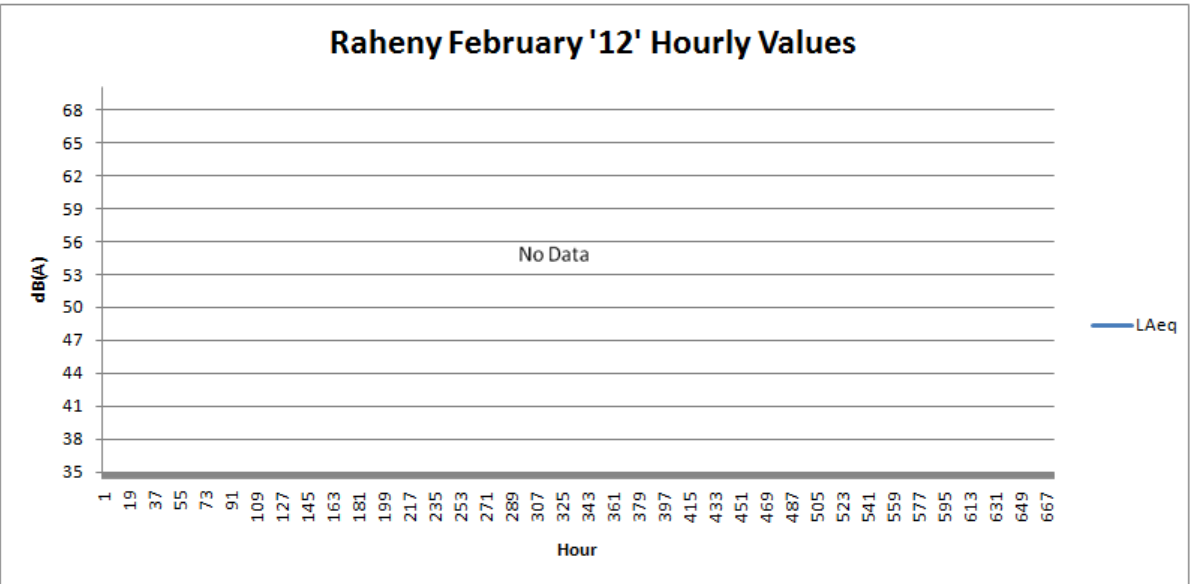
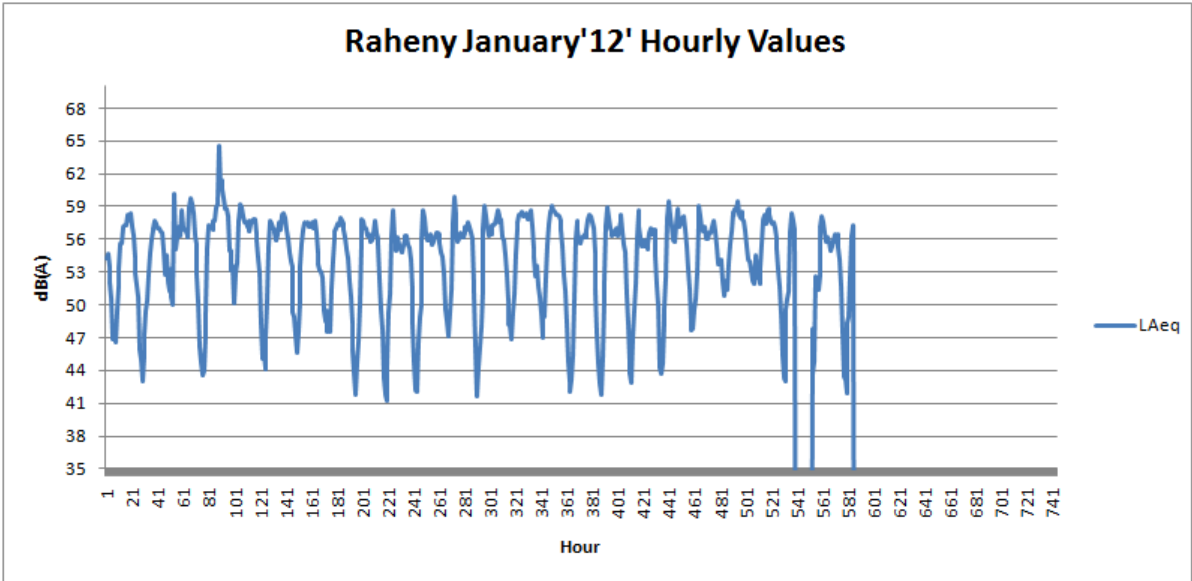


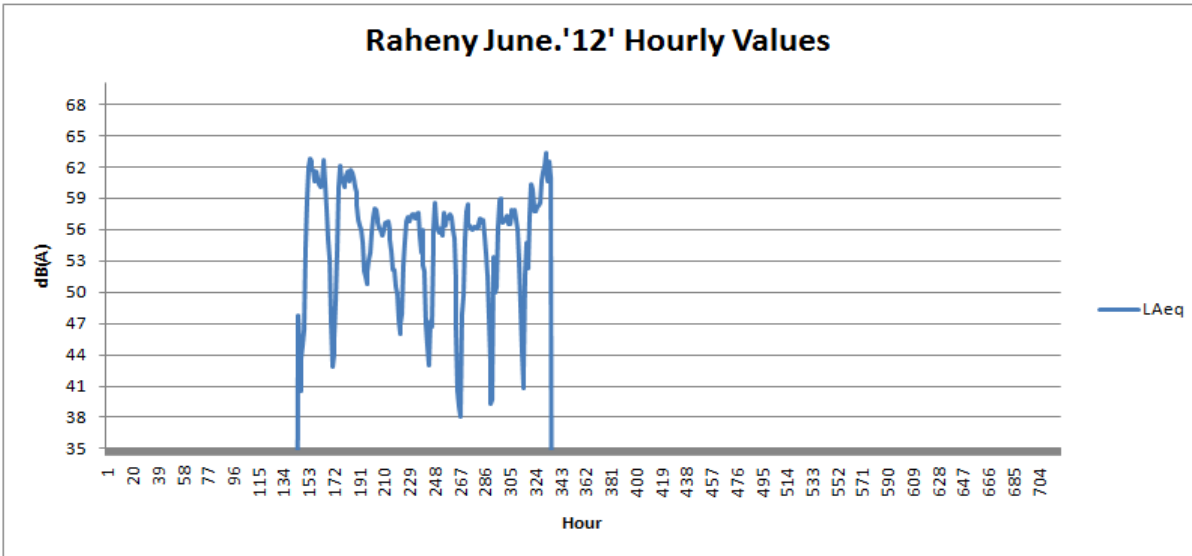
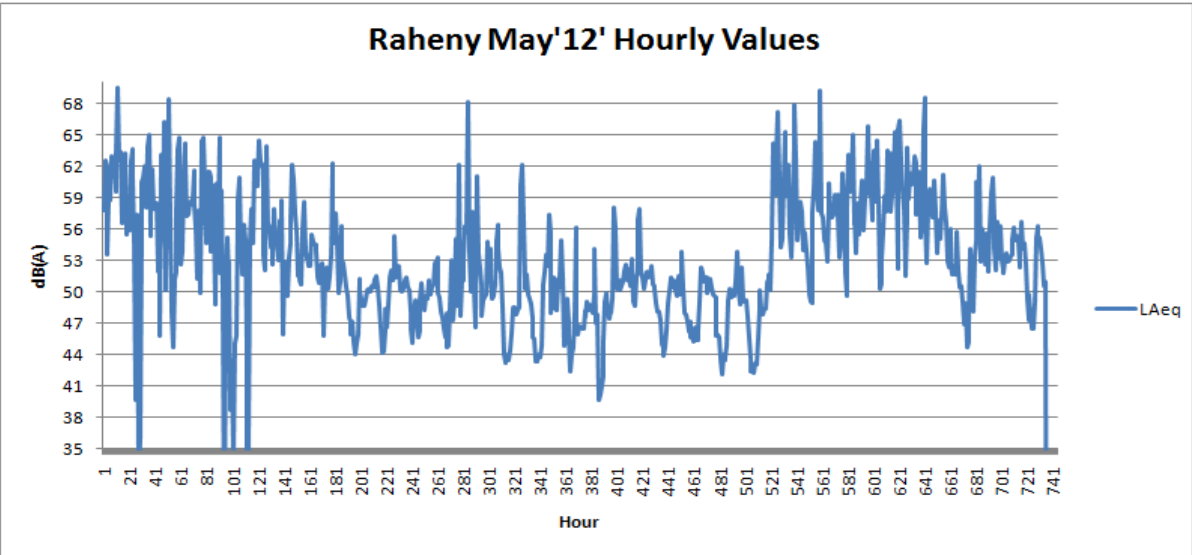
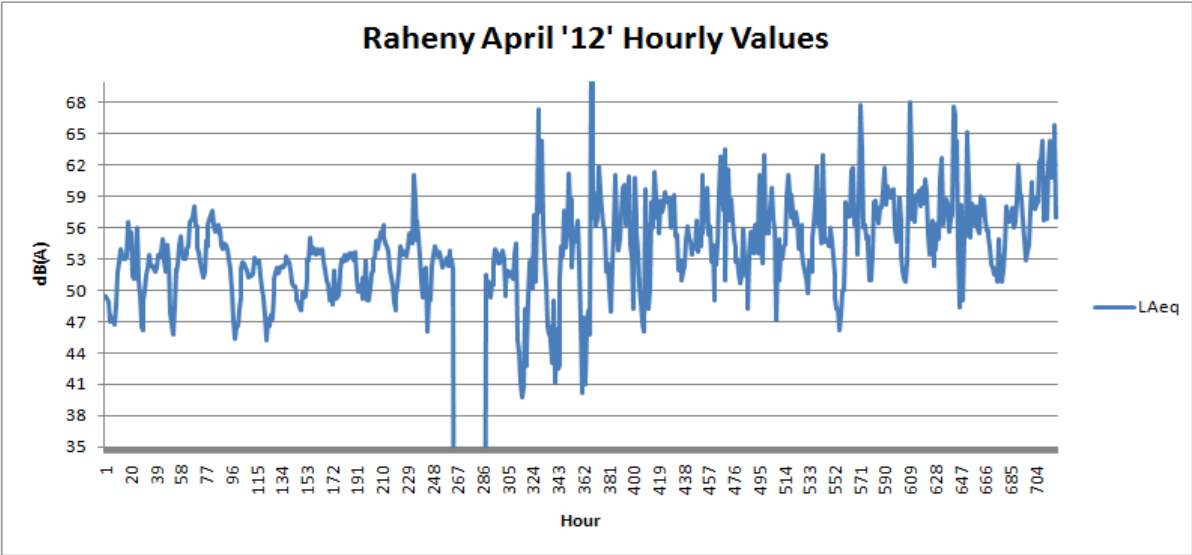


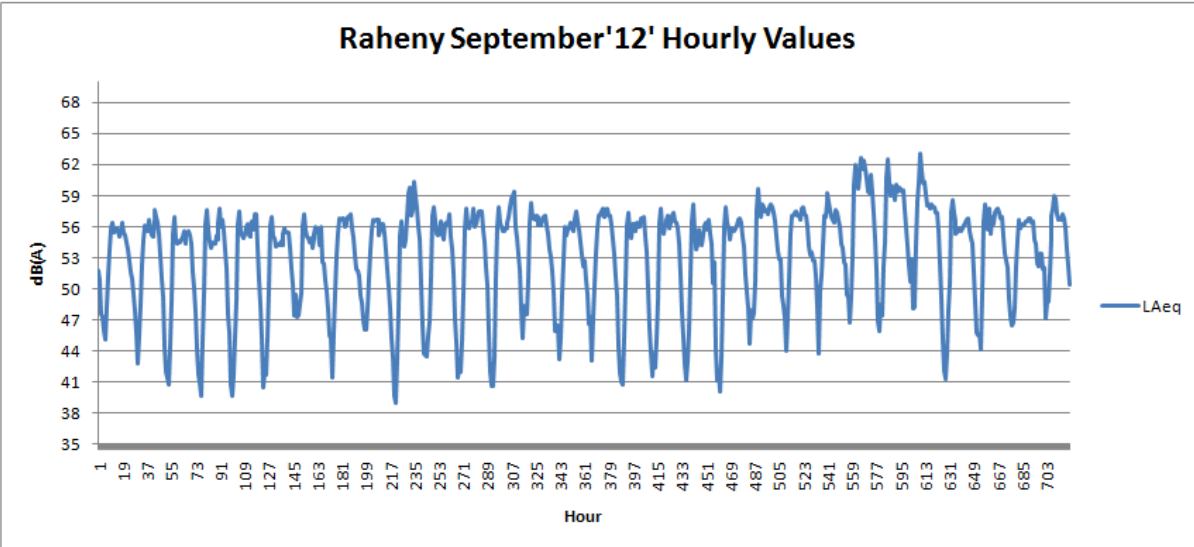
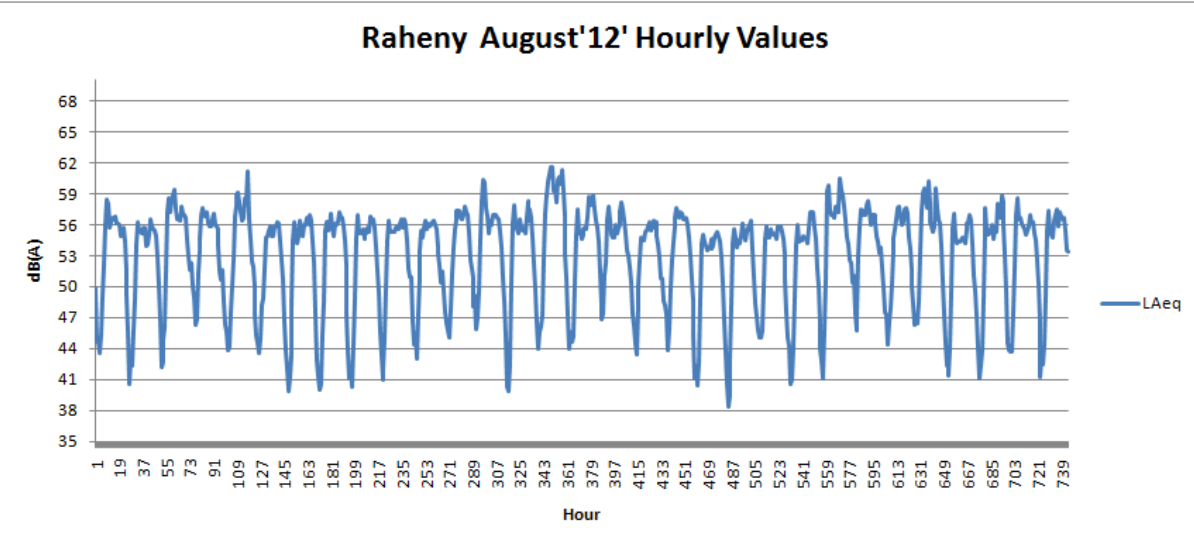
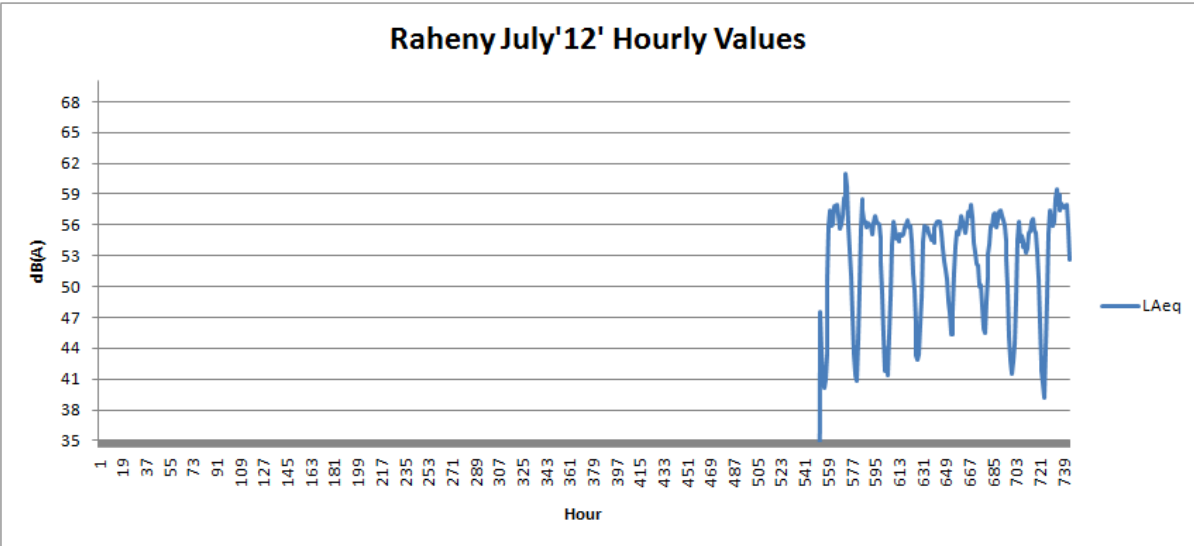


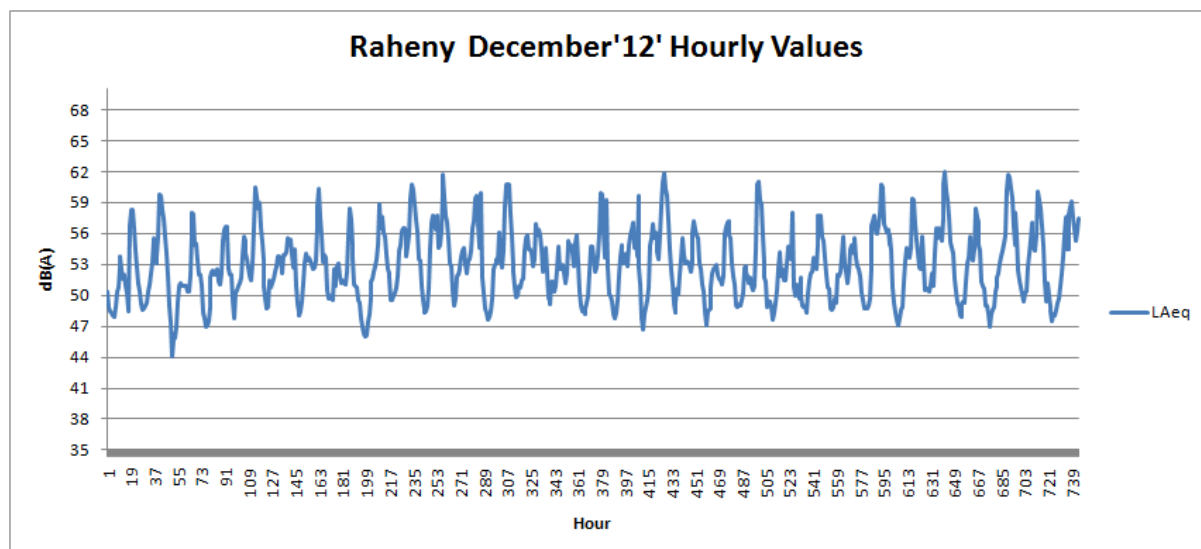
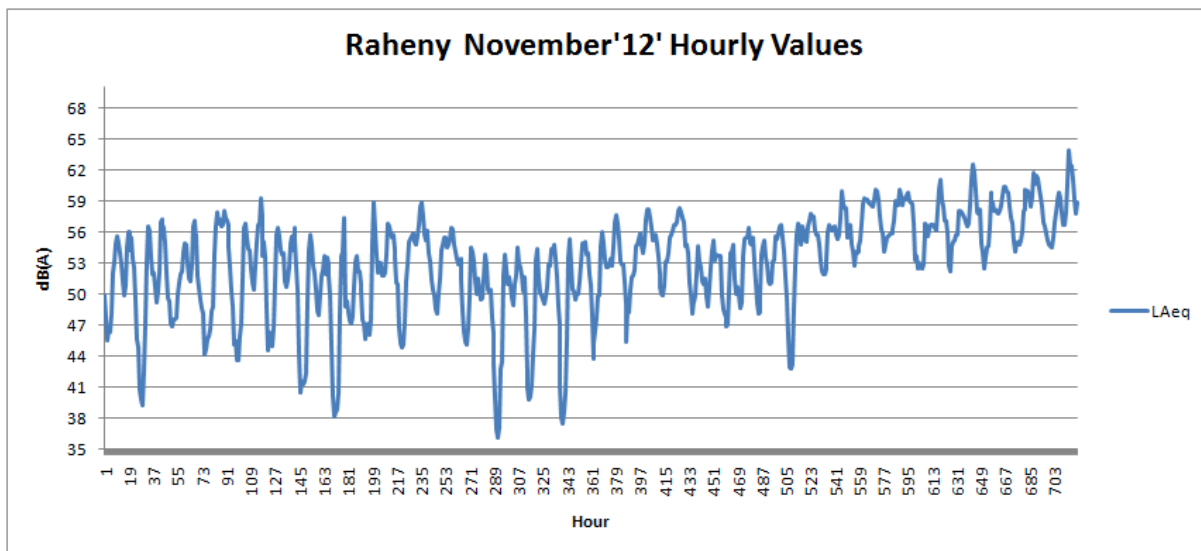
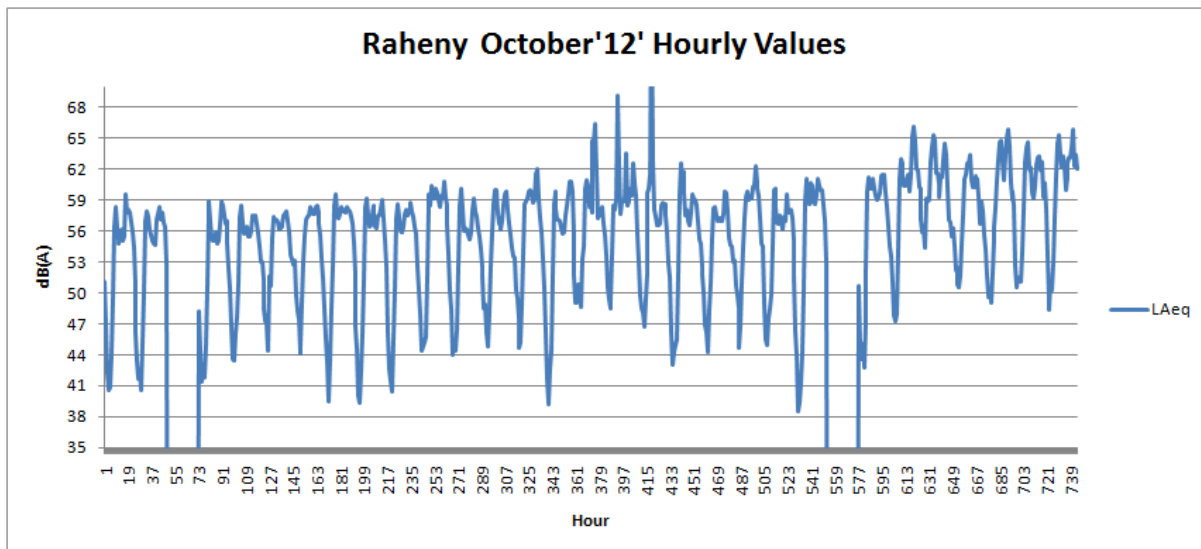
RAHENY LIBRARY
HOWTH ROAD
DUBLIN 5





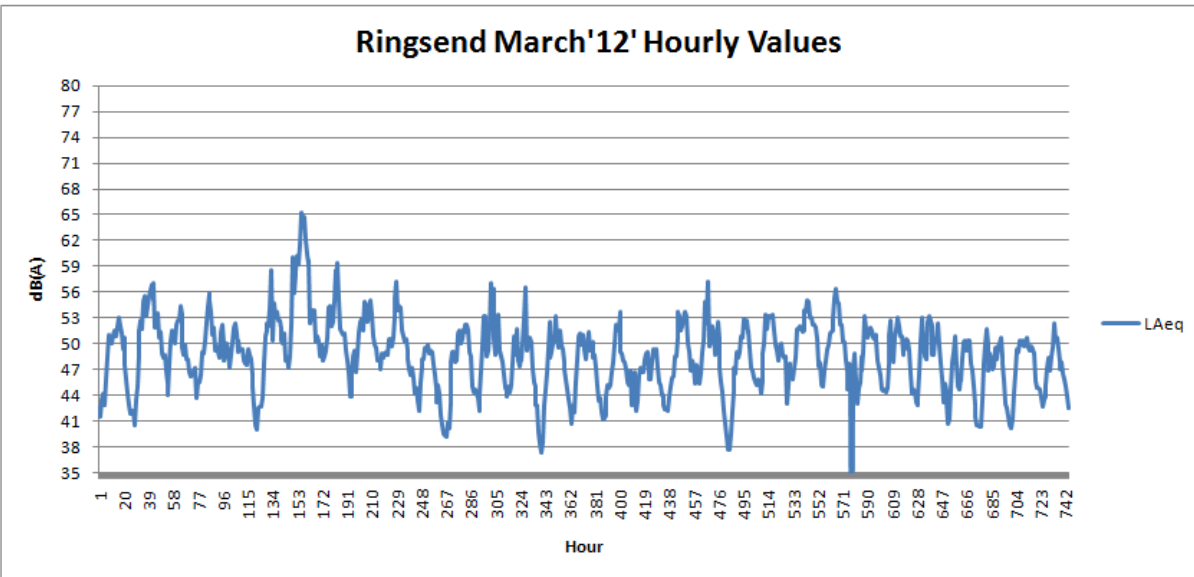
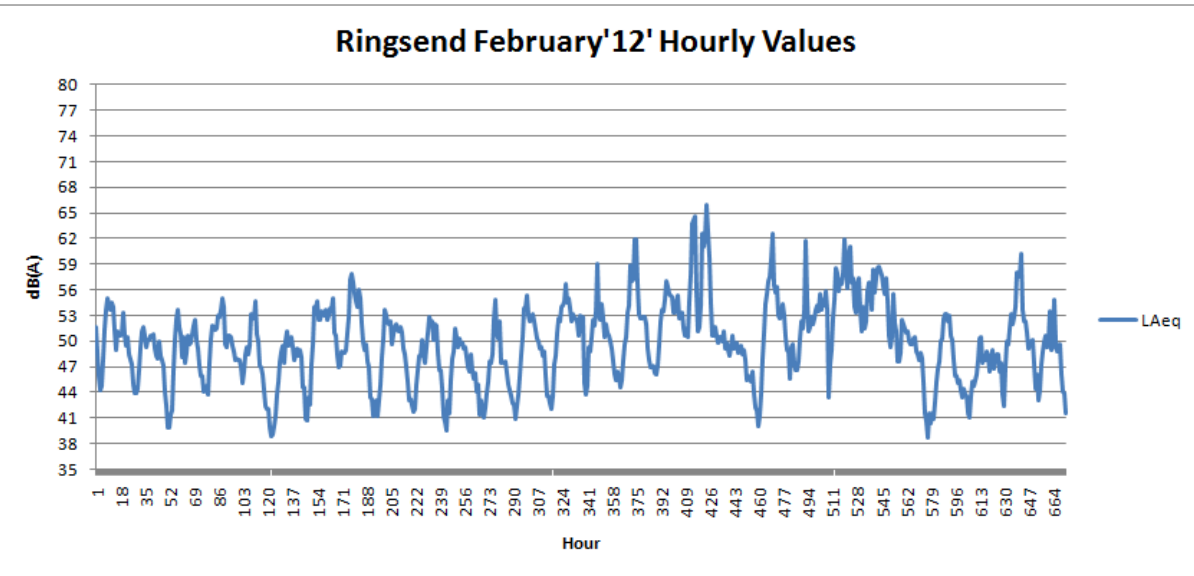
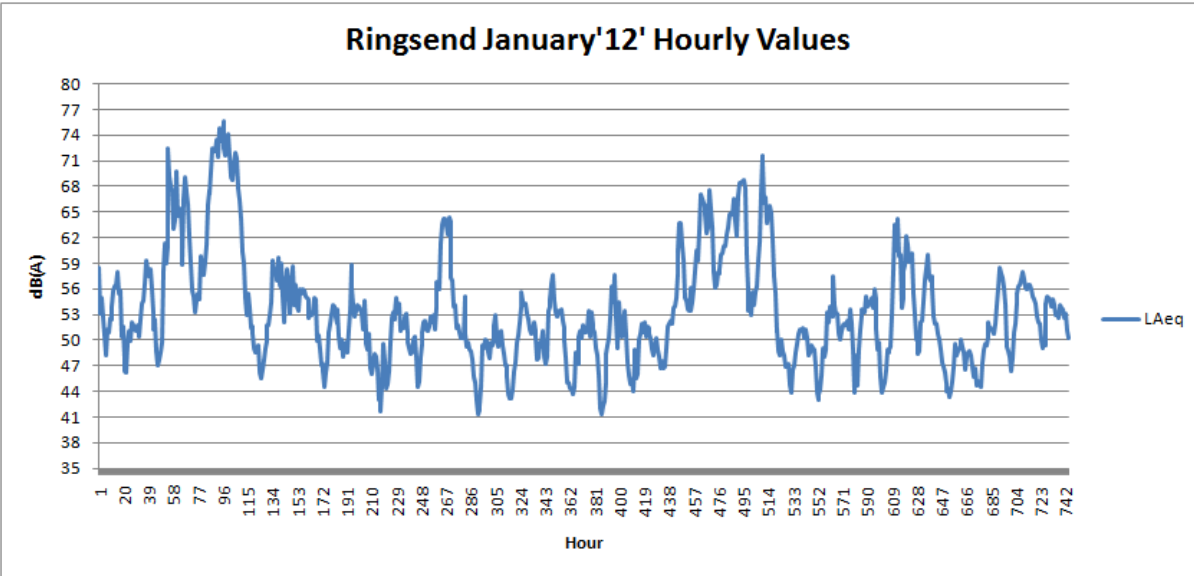


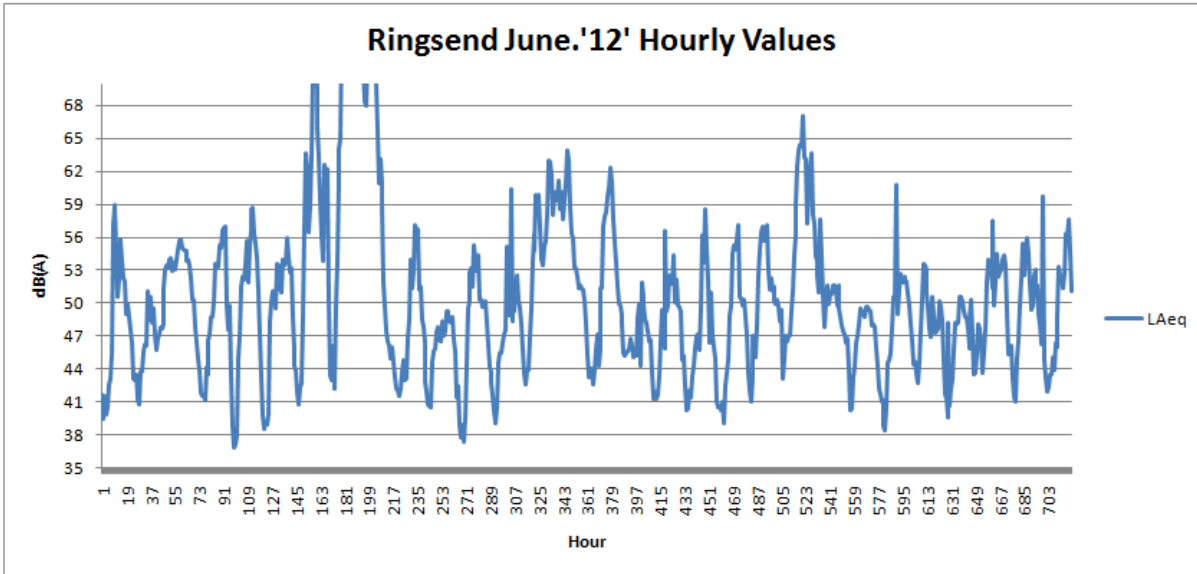
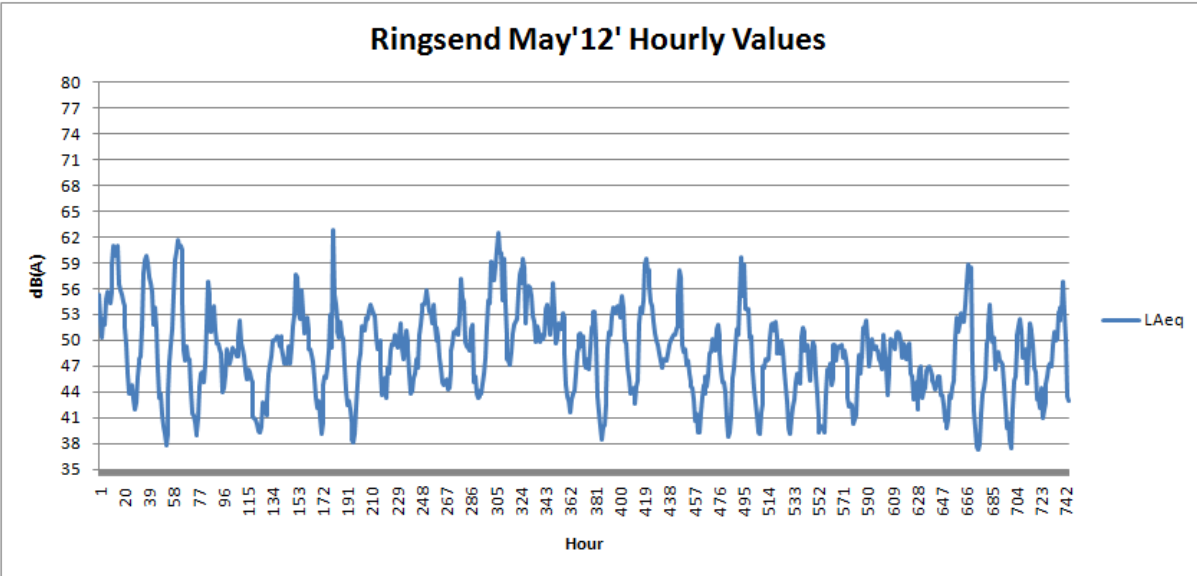
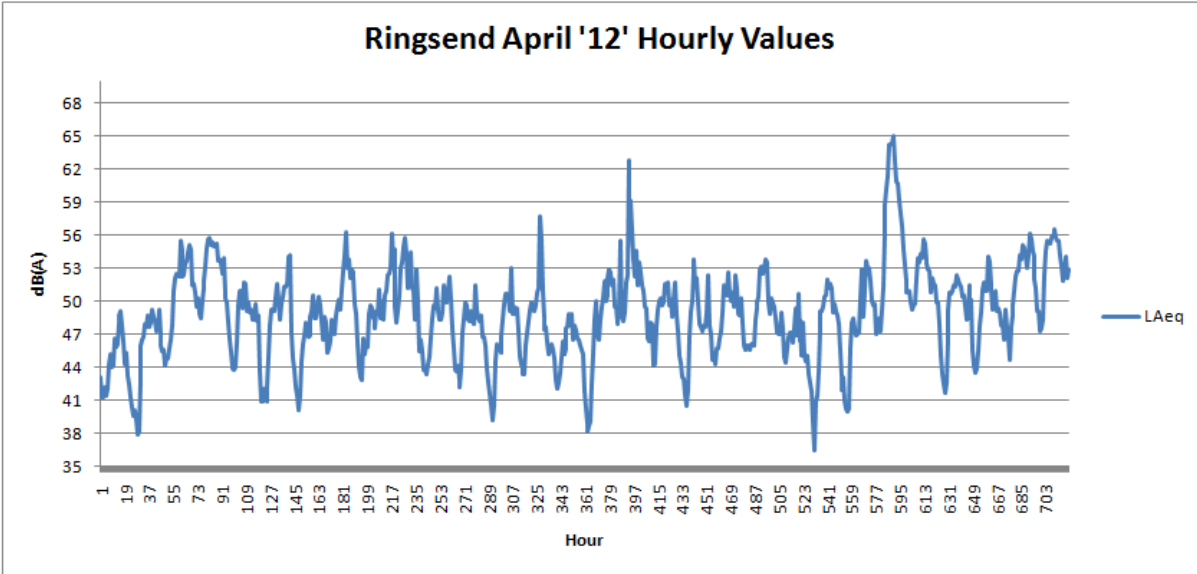


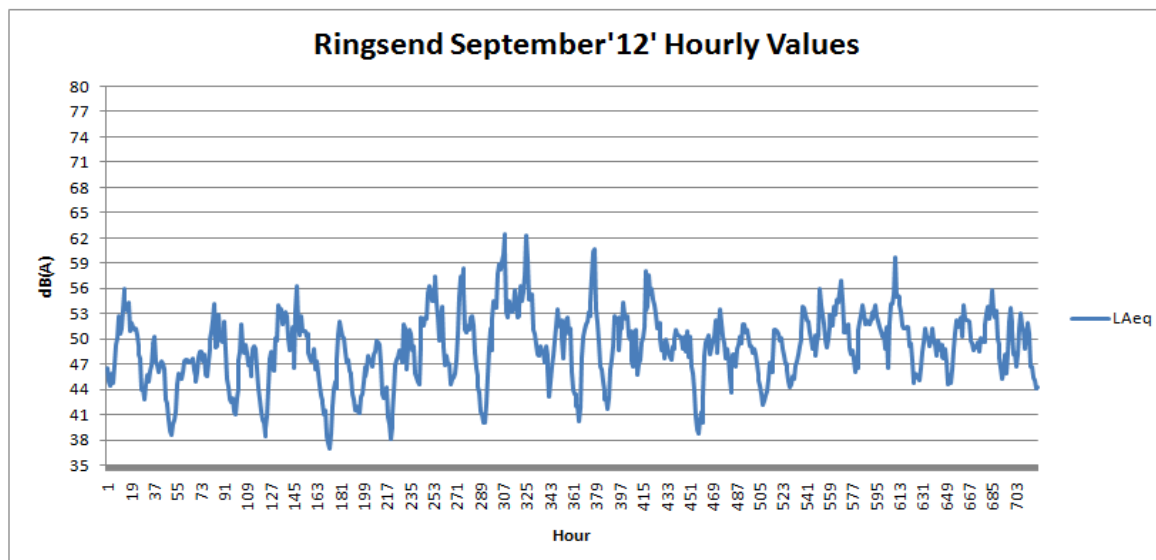
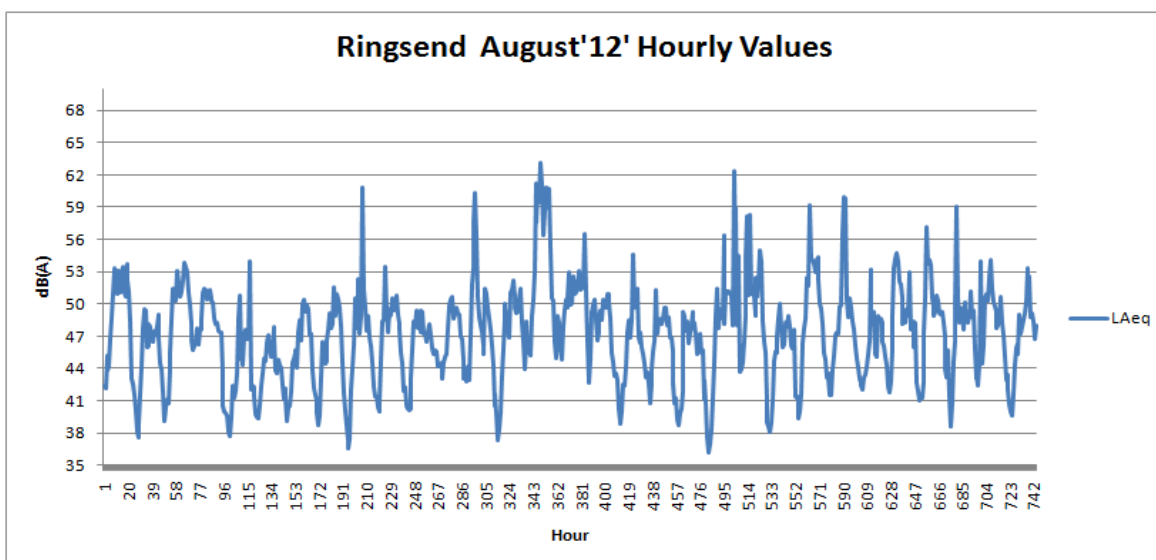
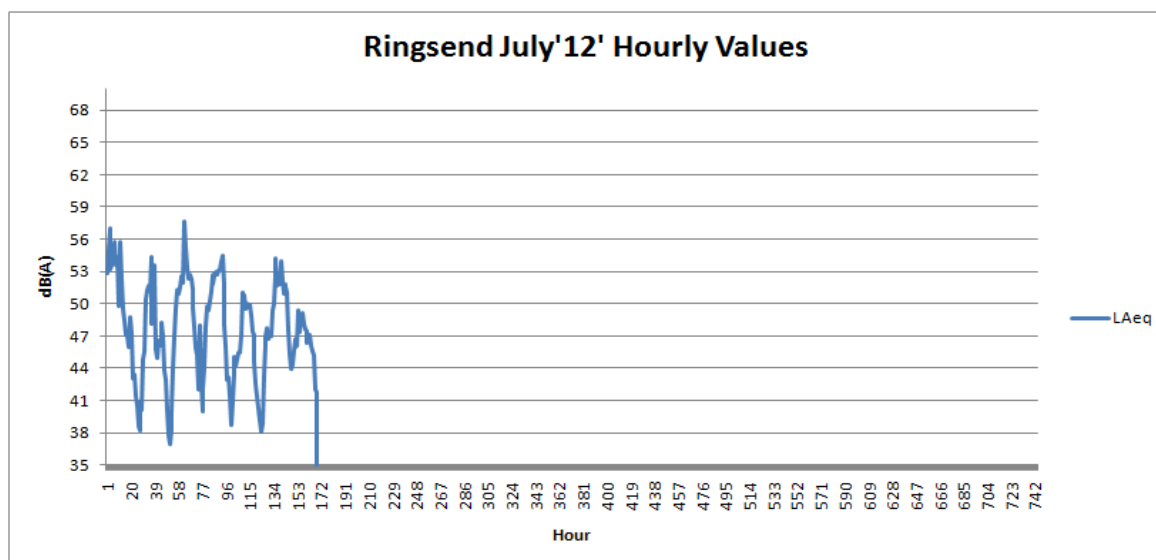


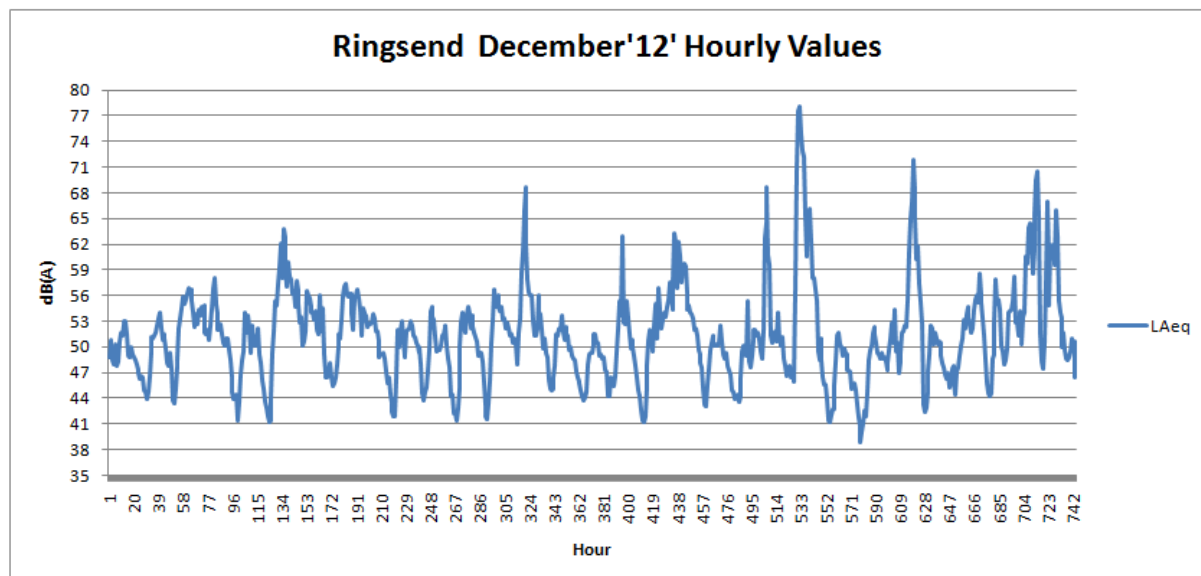
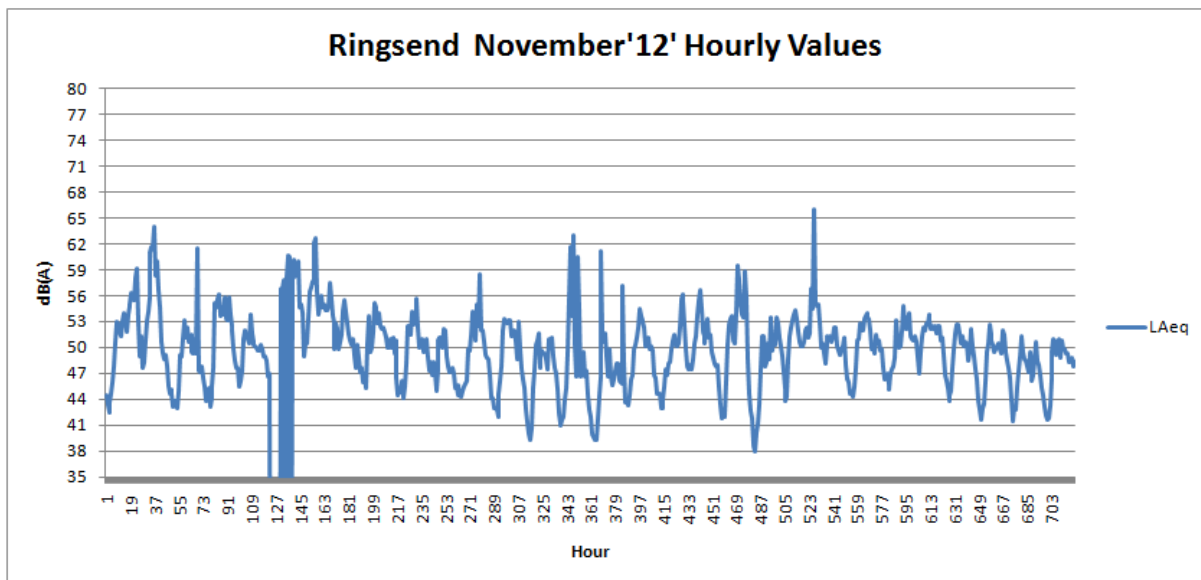
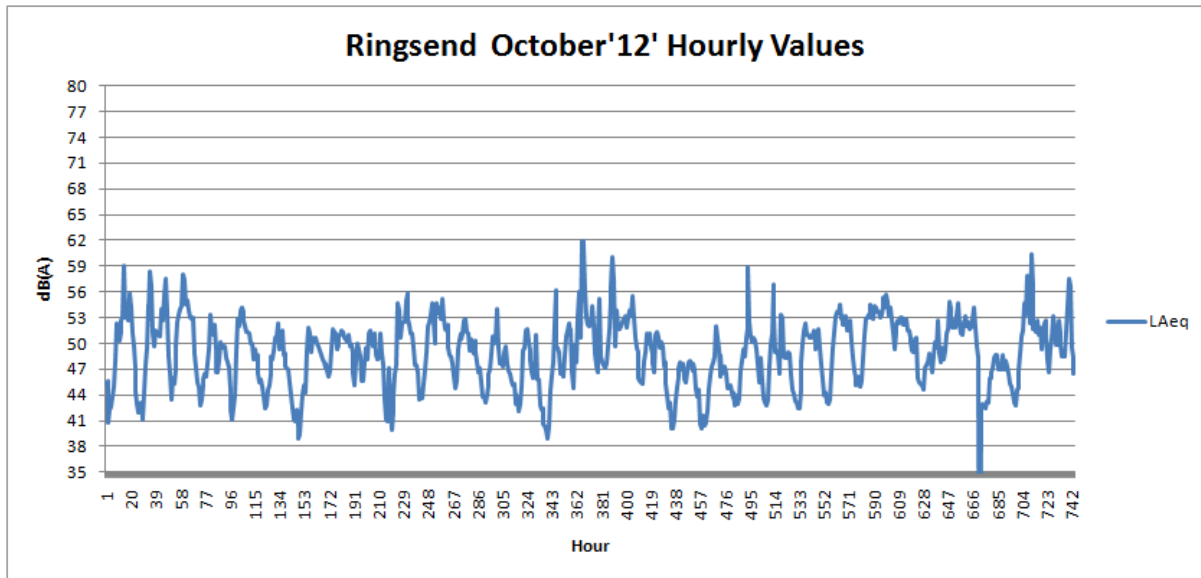
IRISHTOWN SPORTS CENTRE
RINGSEND
DUBLIN 4





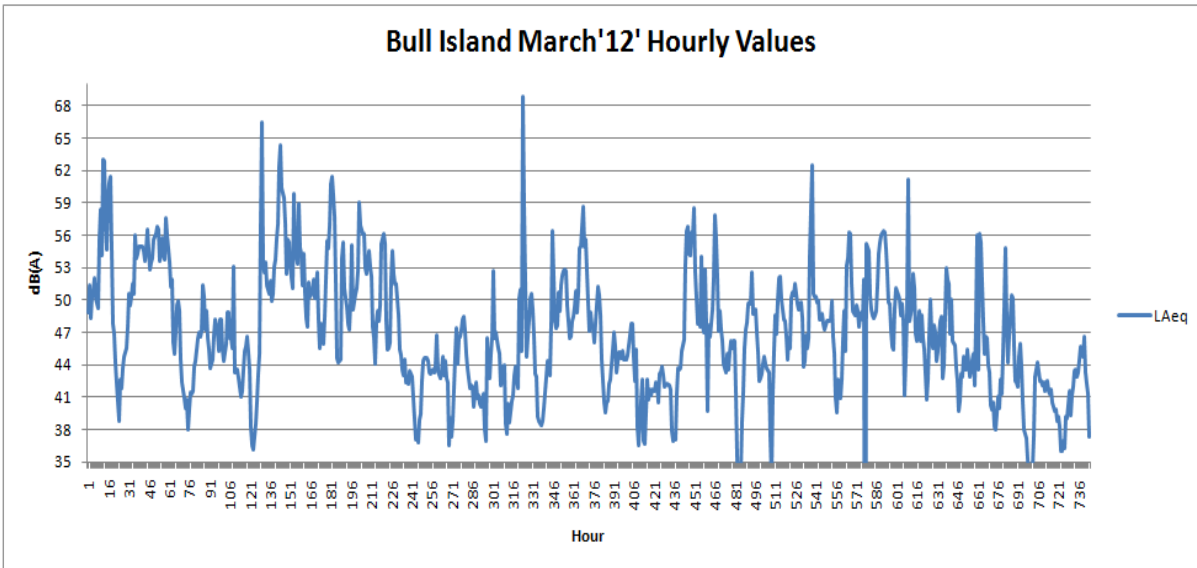
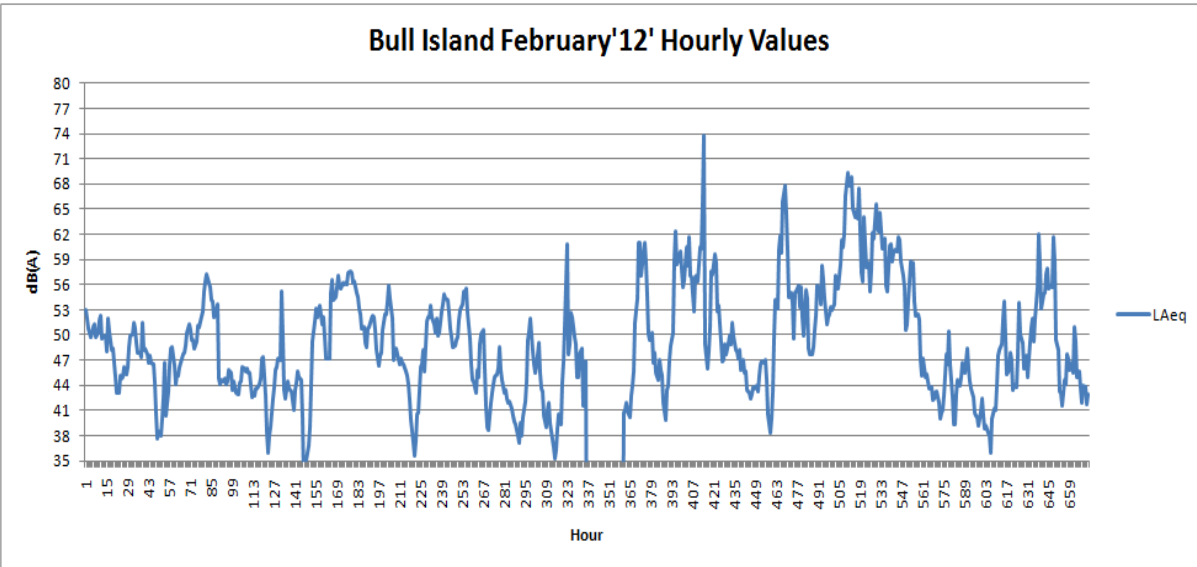
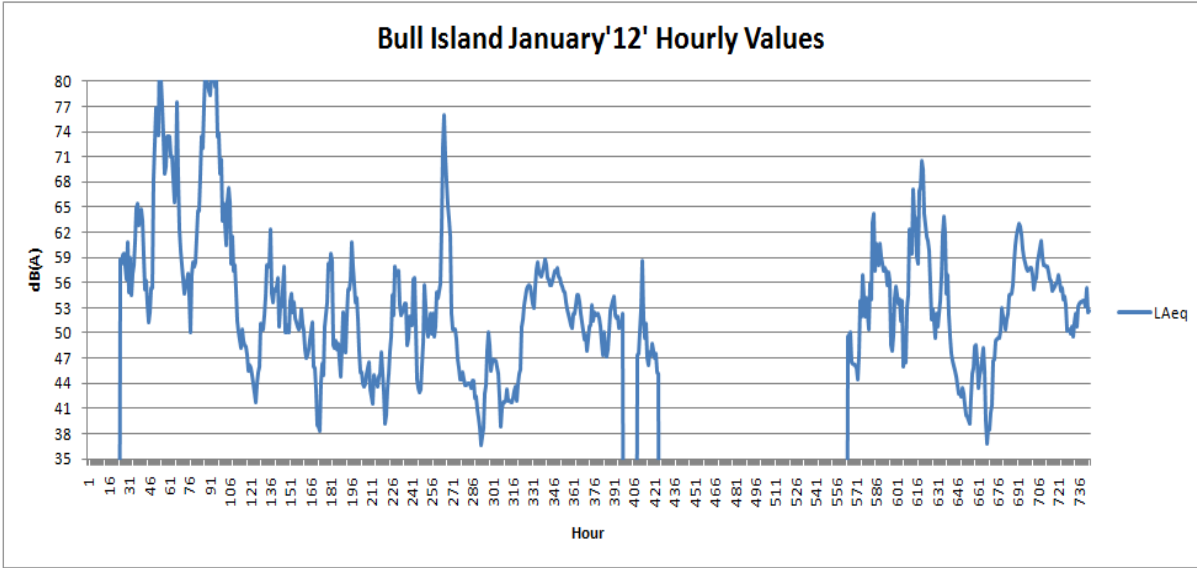


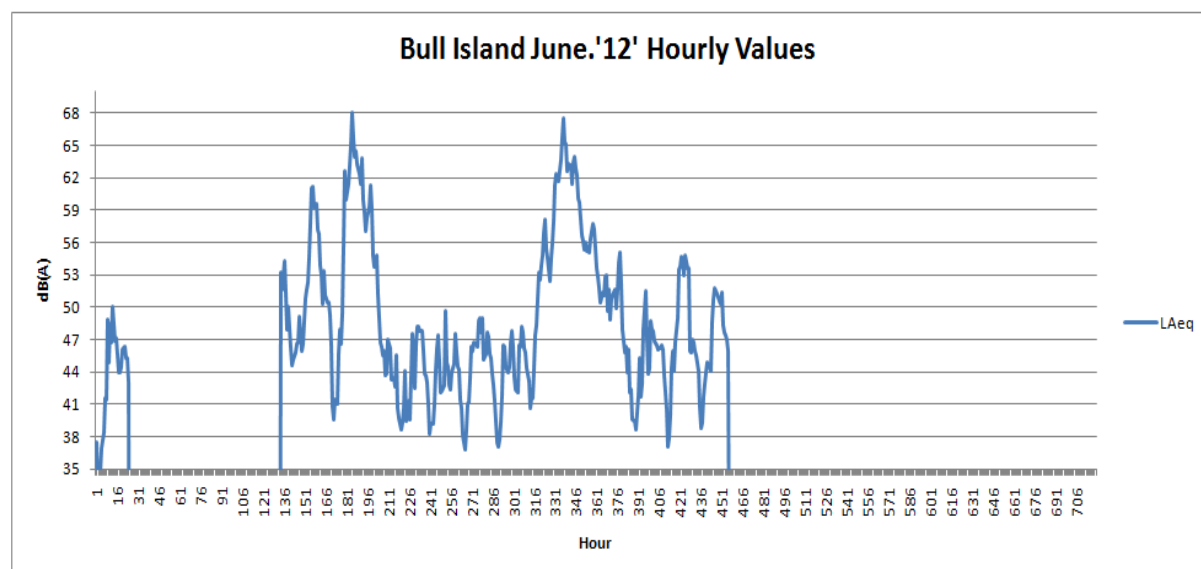
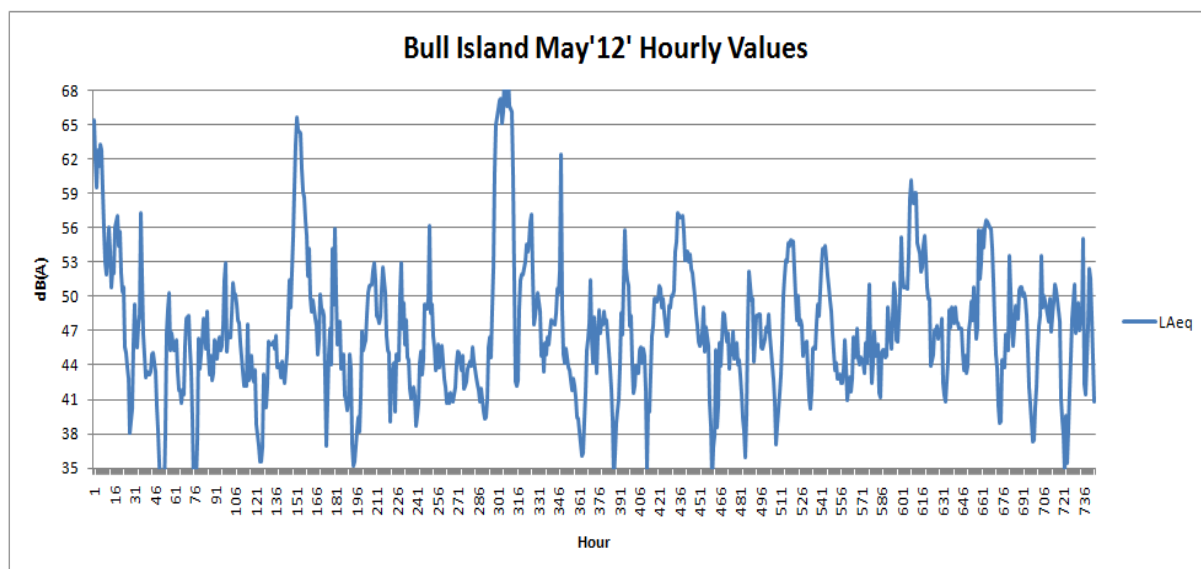
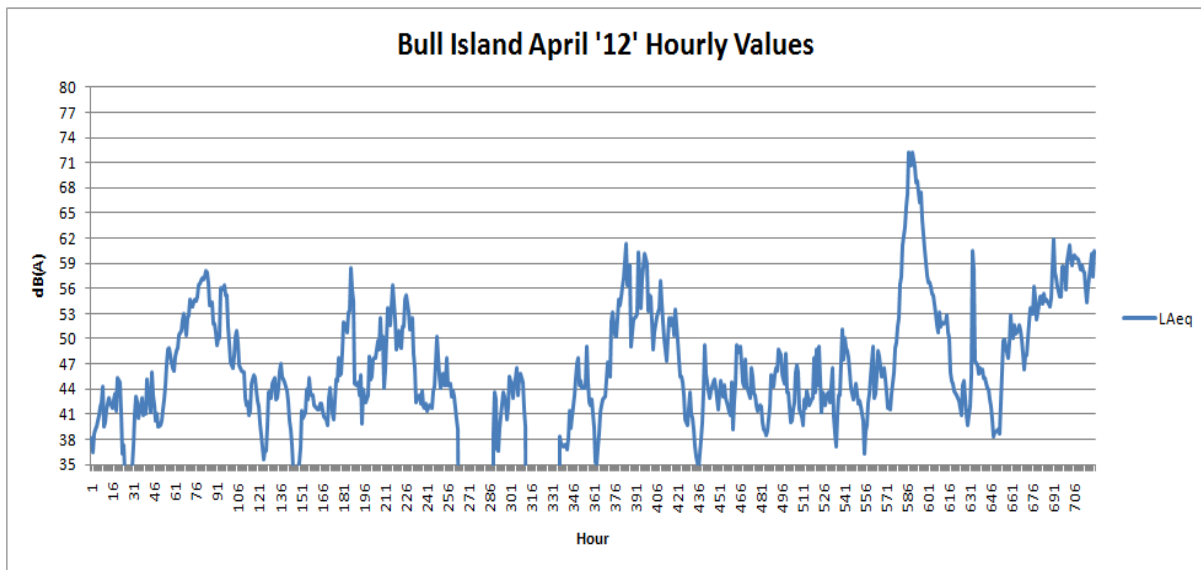


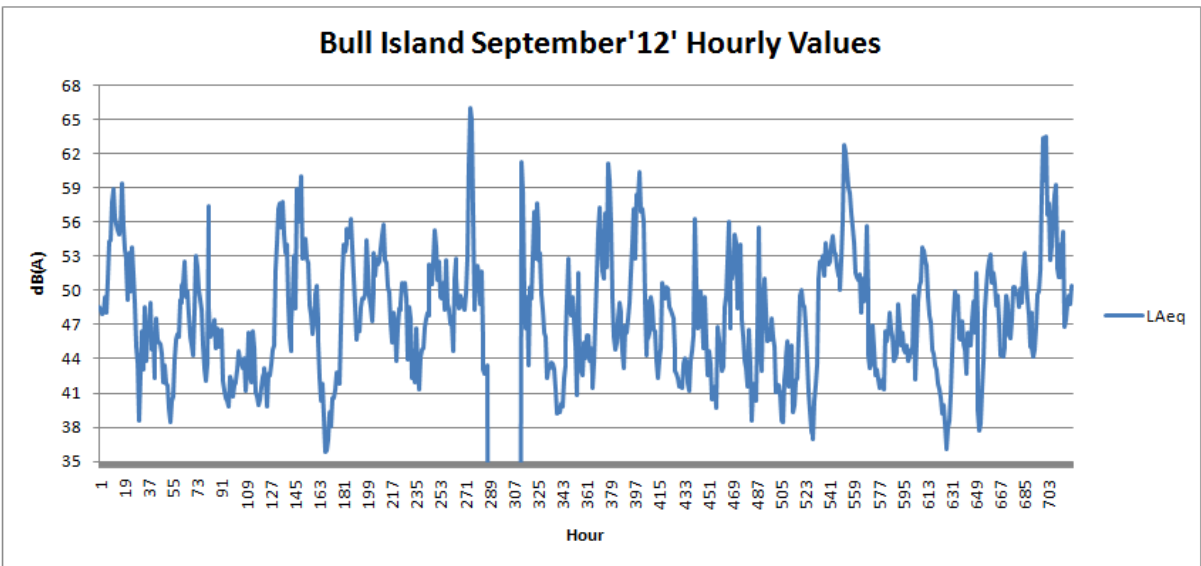
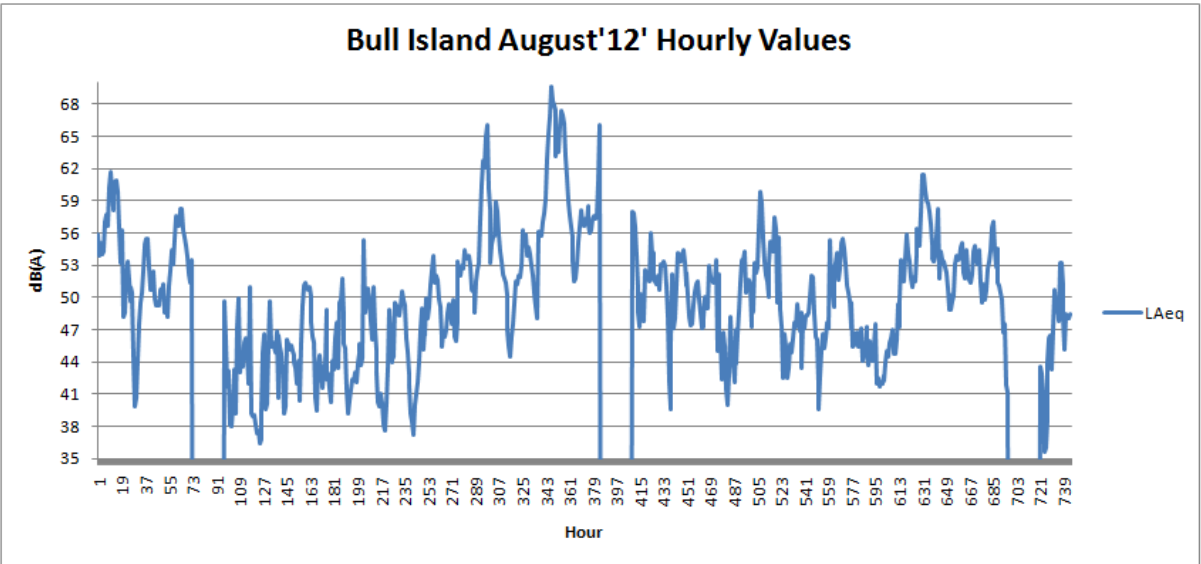
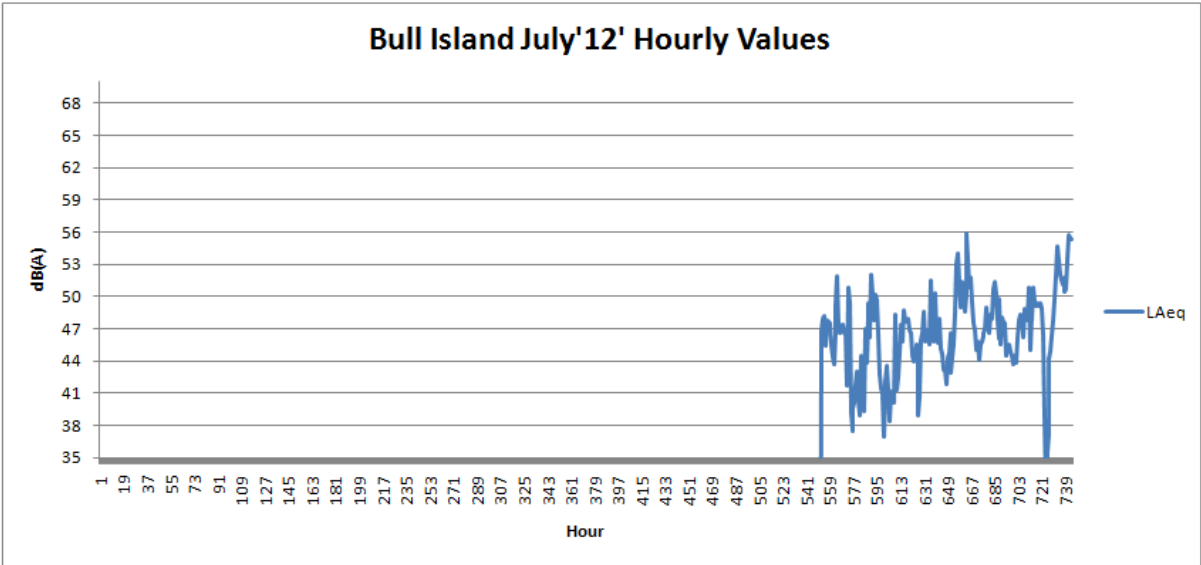


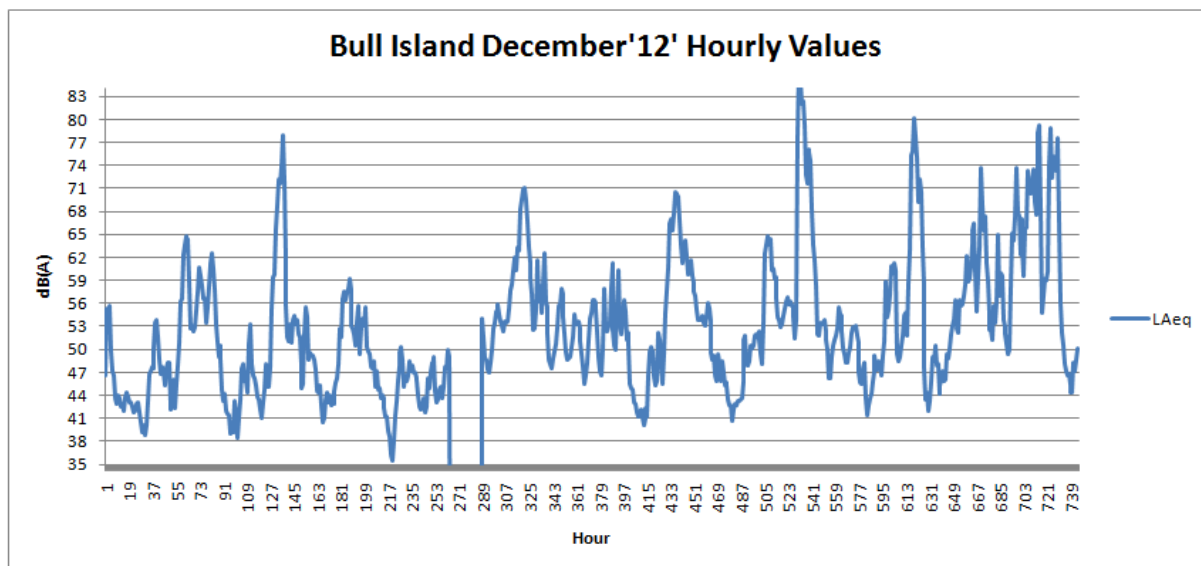
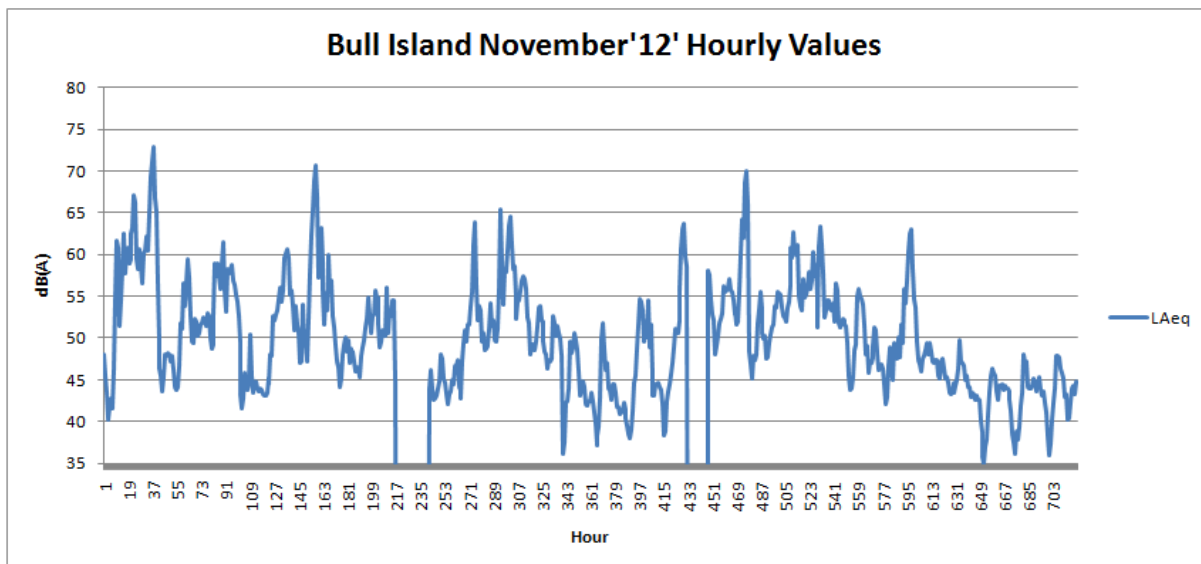
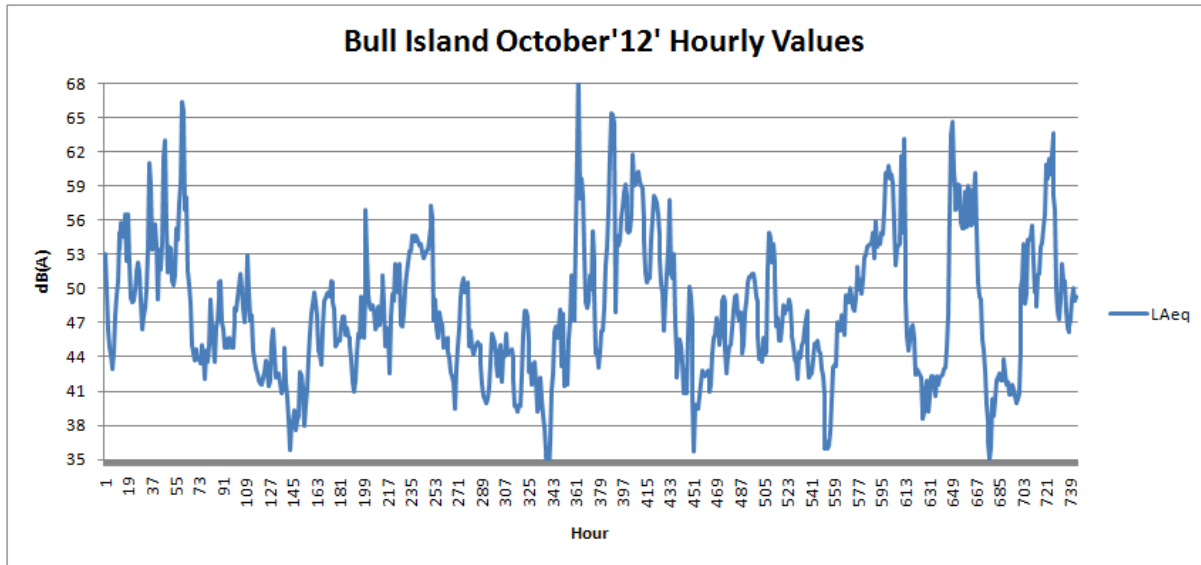
BULL ISLAND INTERPRETATIVE CENTRE
BULL ISLAND
DUBLIN 3





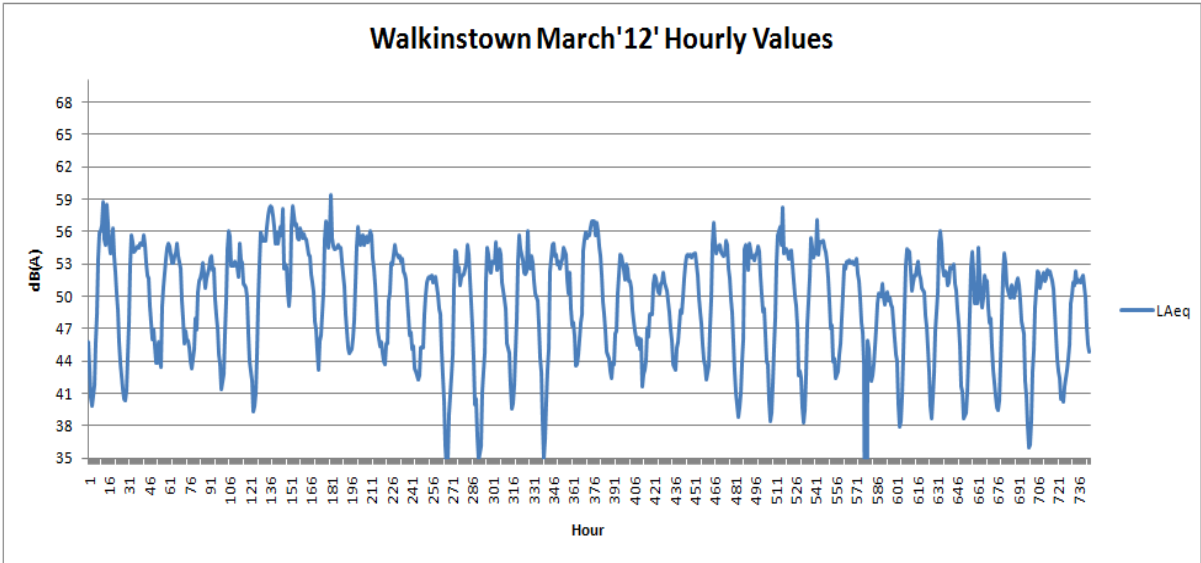
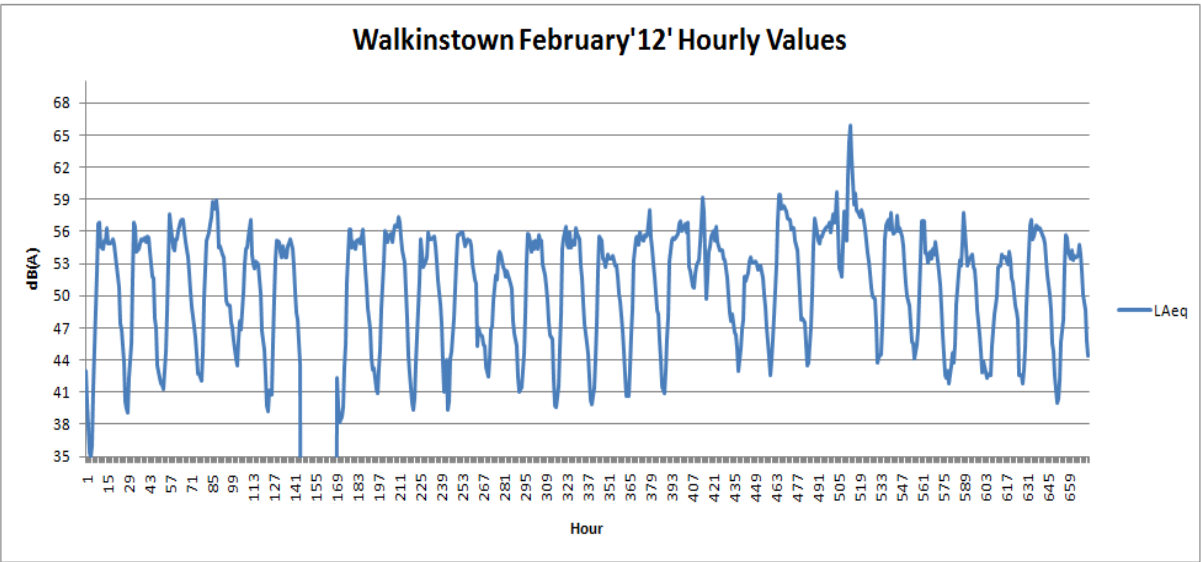
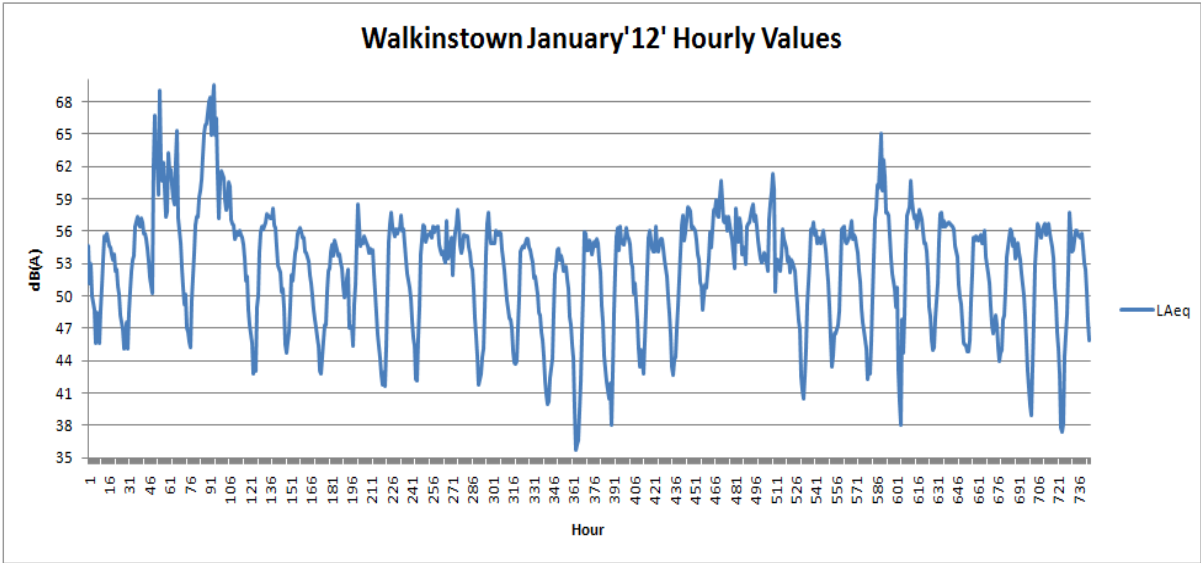


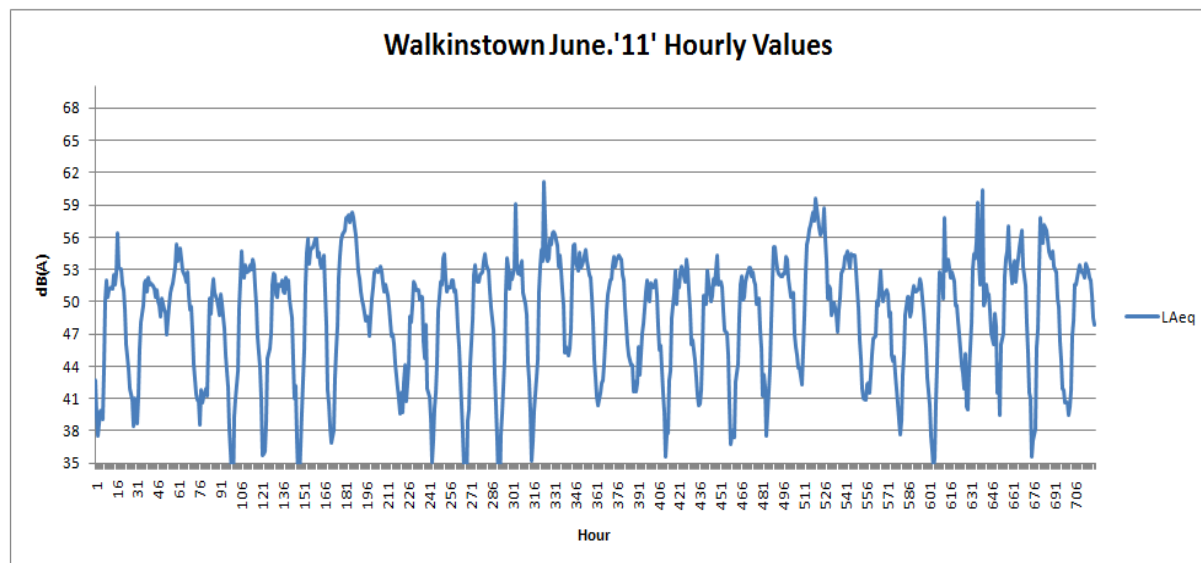
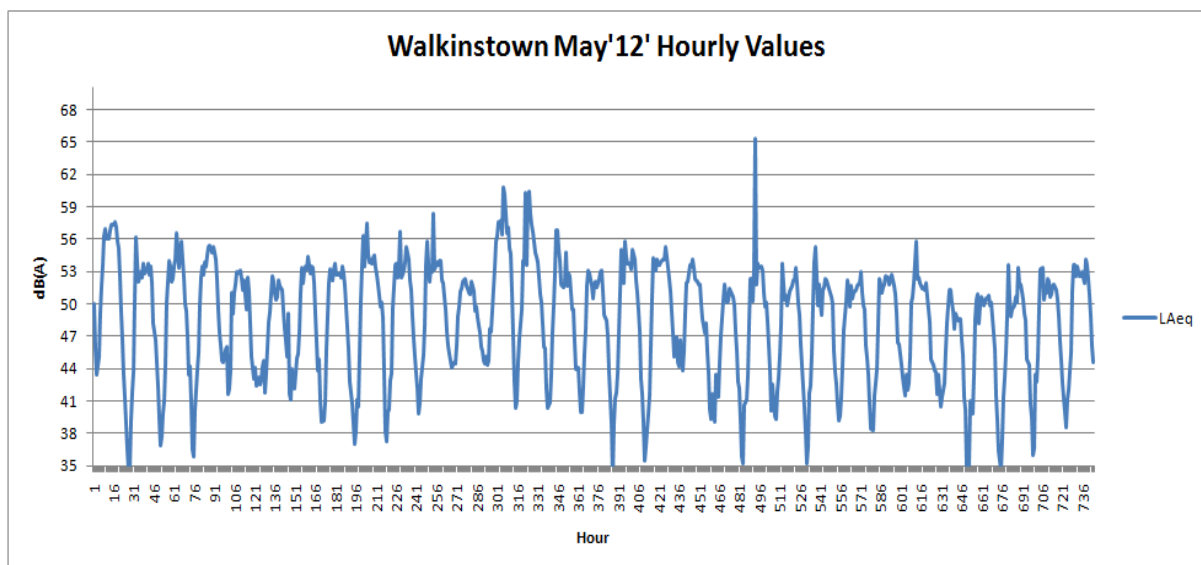
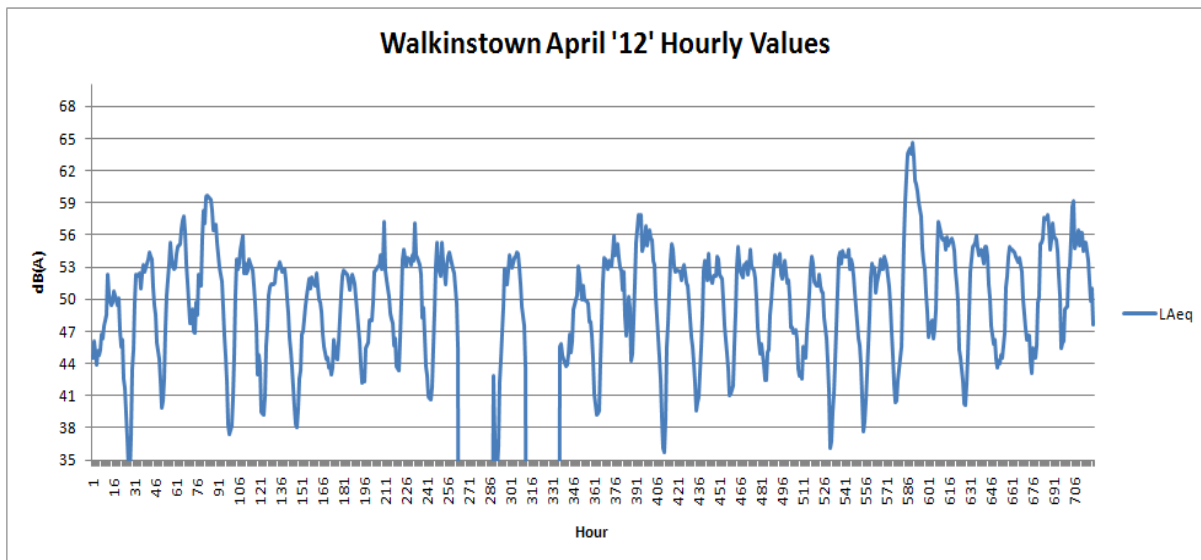


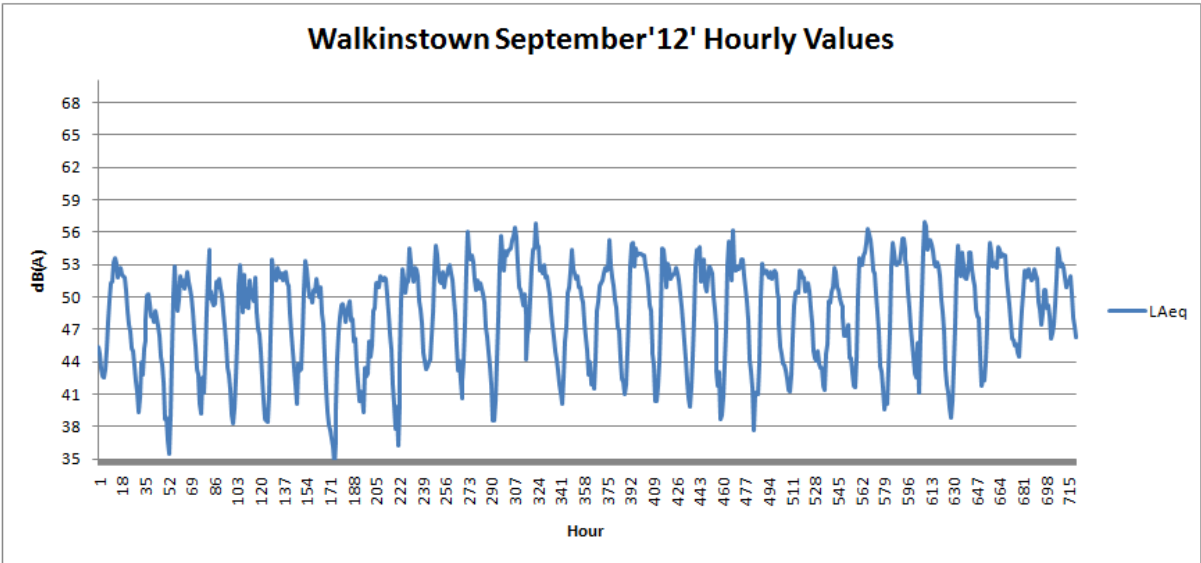
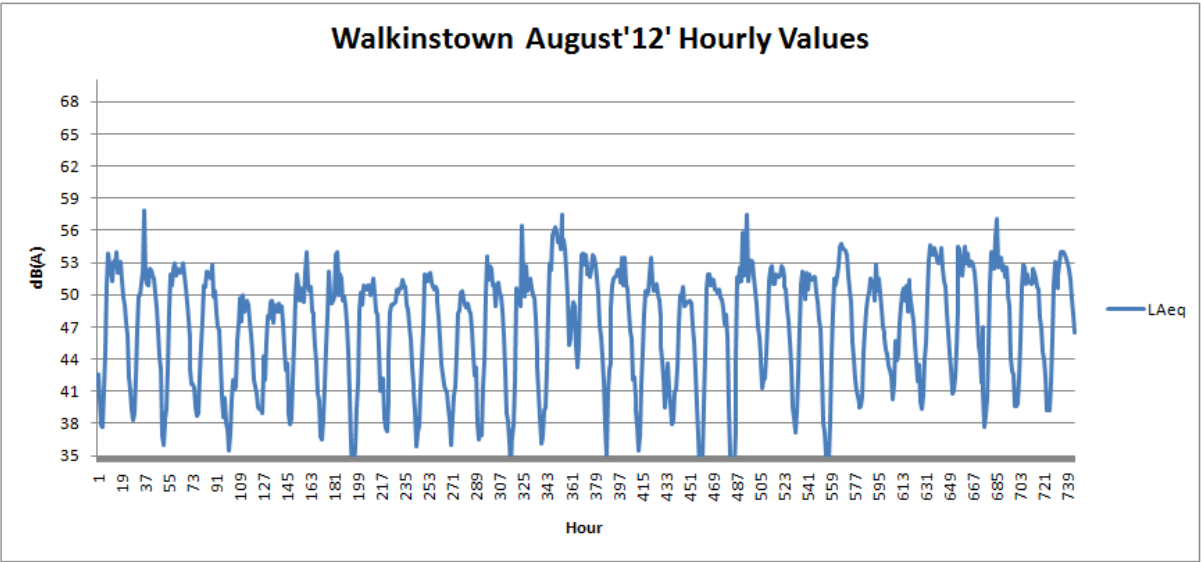
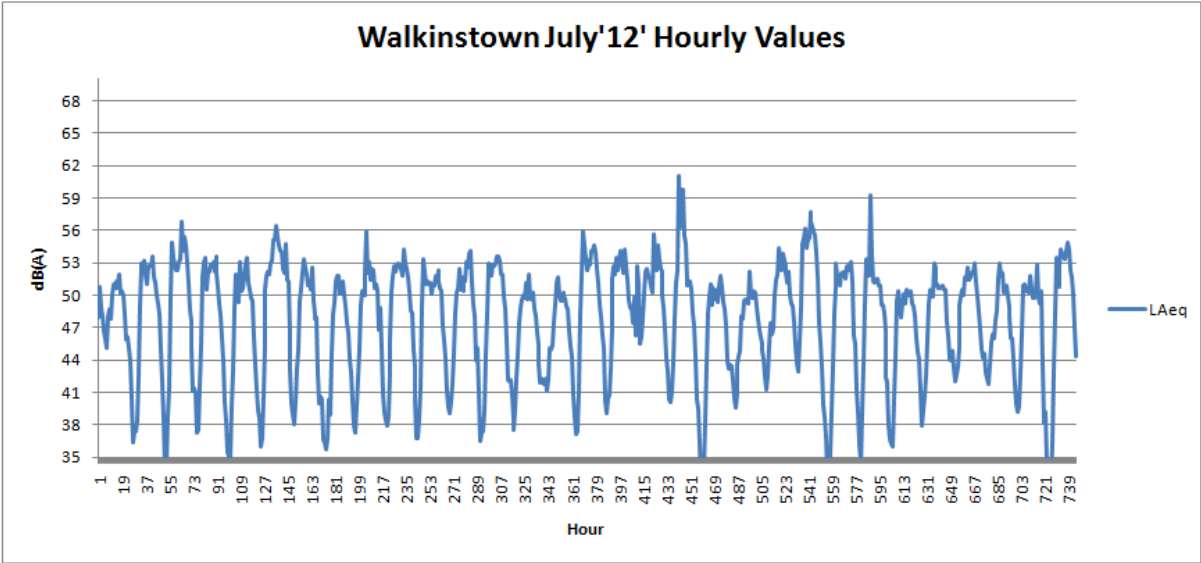


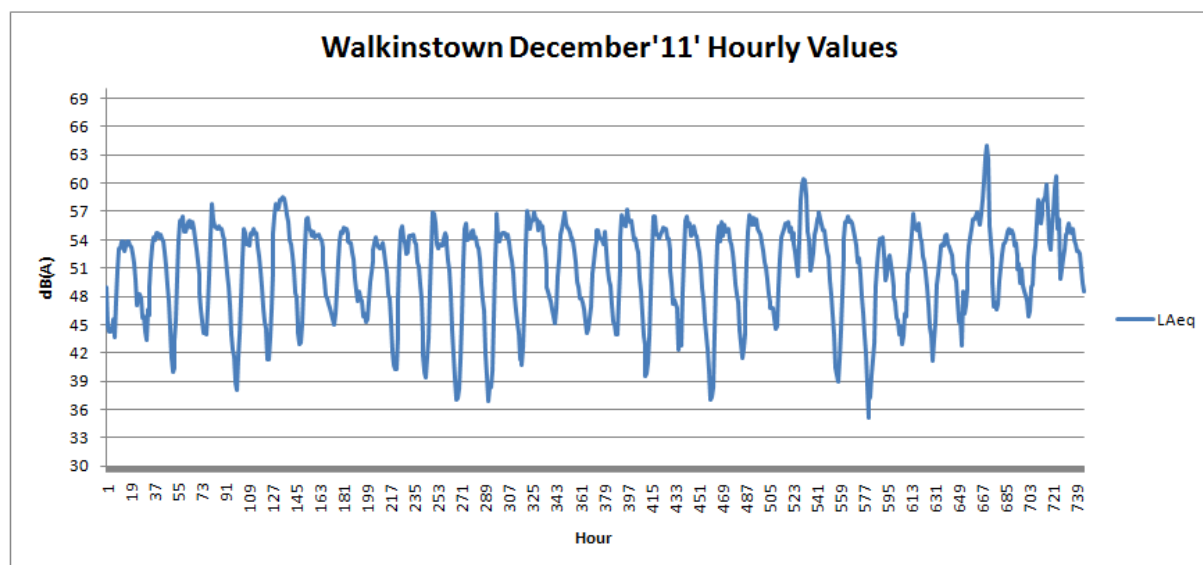
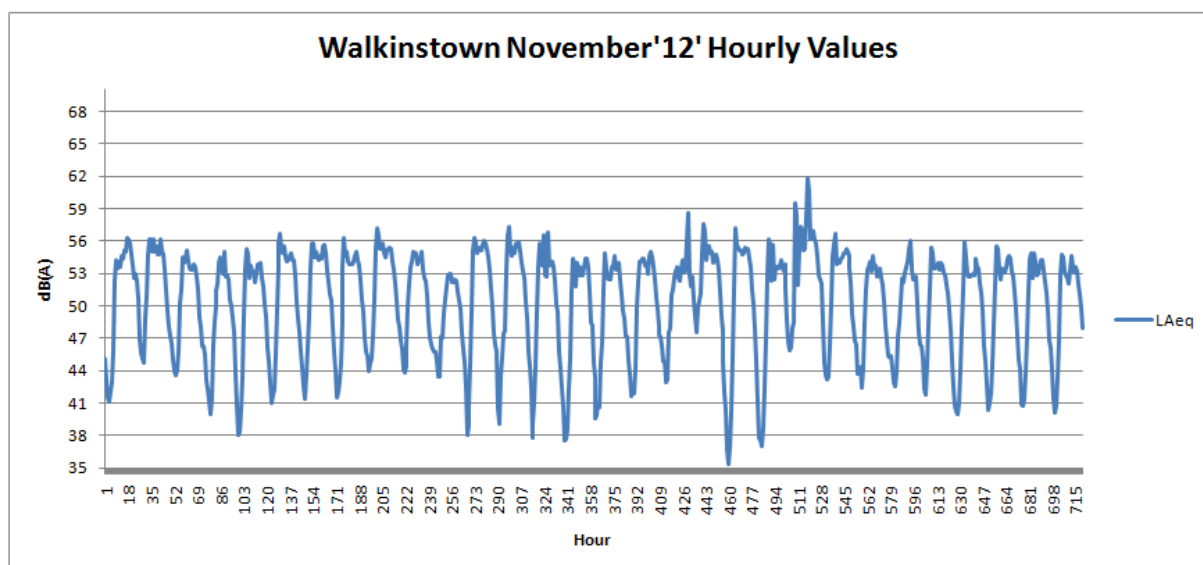
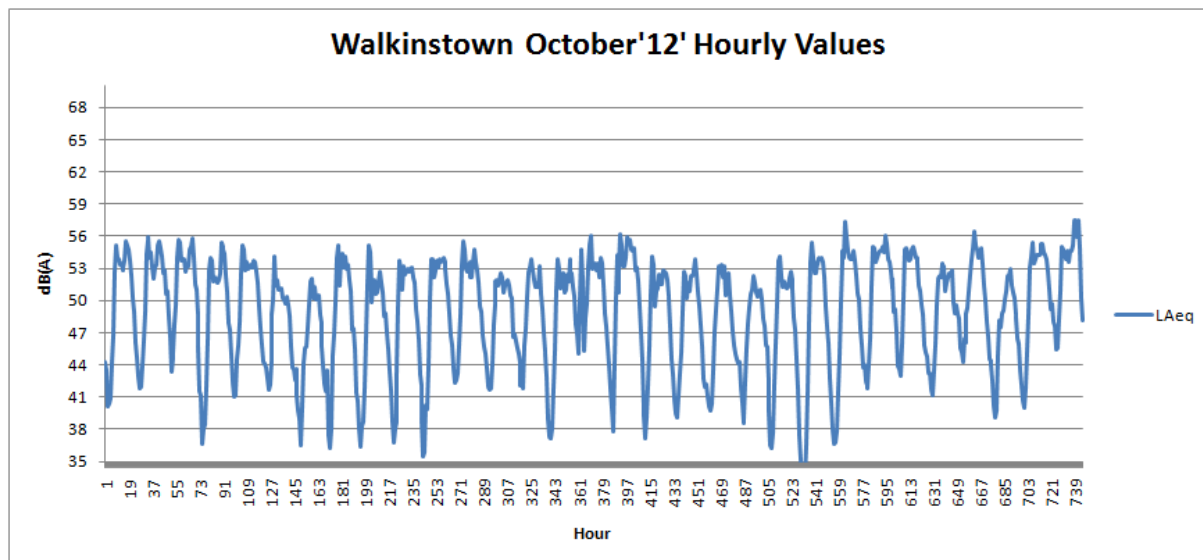
WALKINSTOWN LIBRARY
PERCY FRENCH ROAD
DUBLIN 12





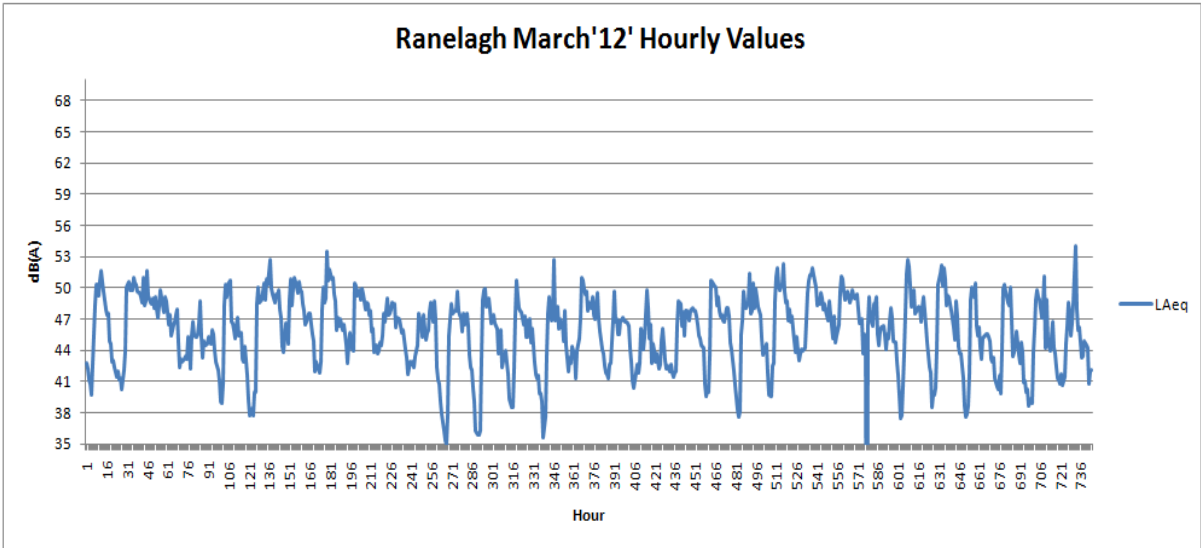
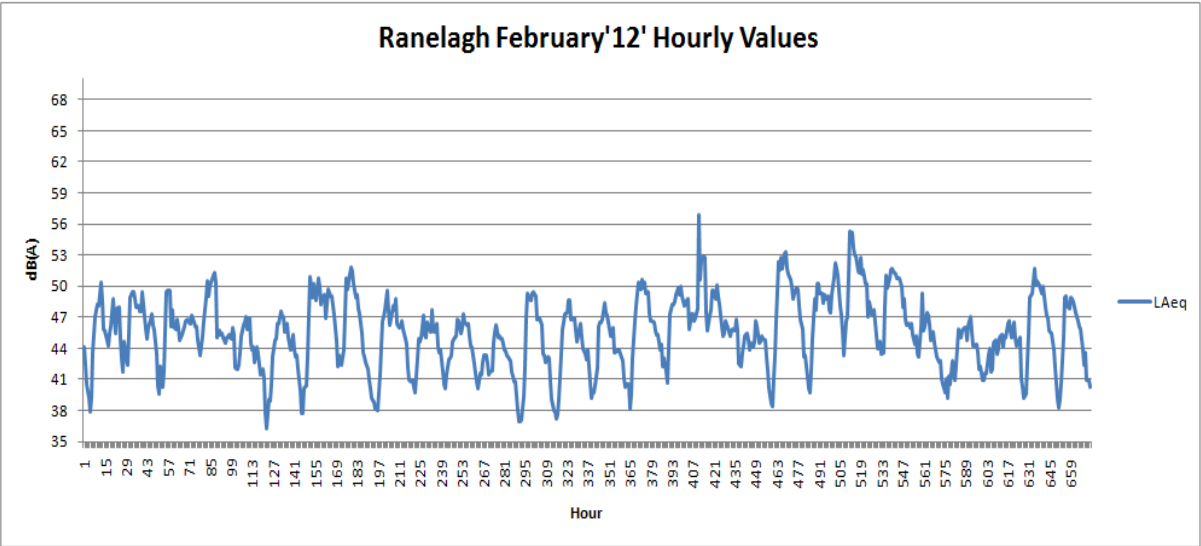
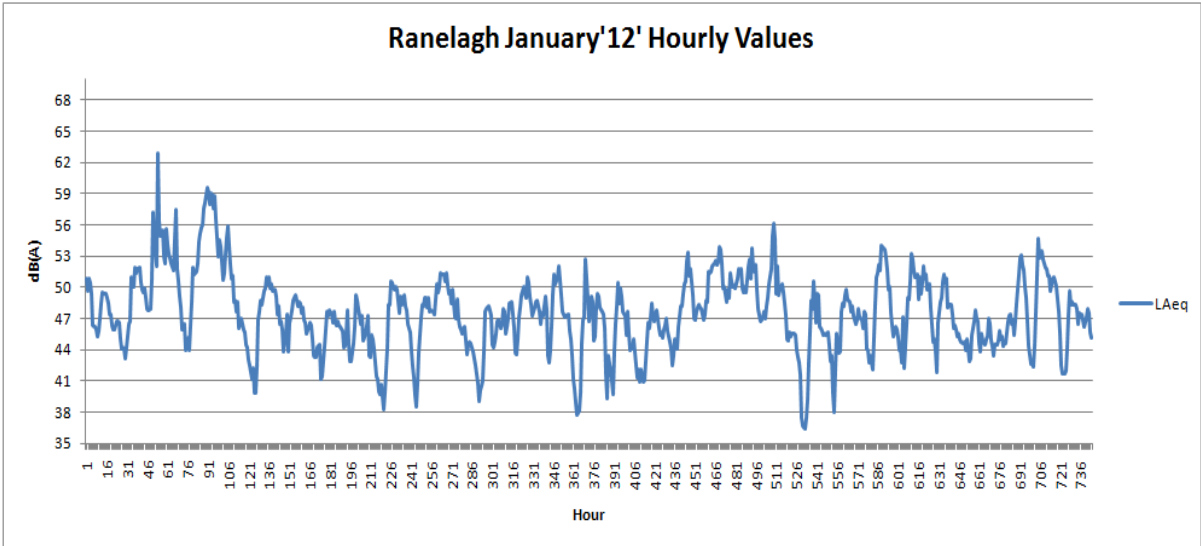


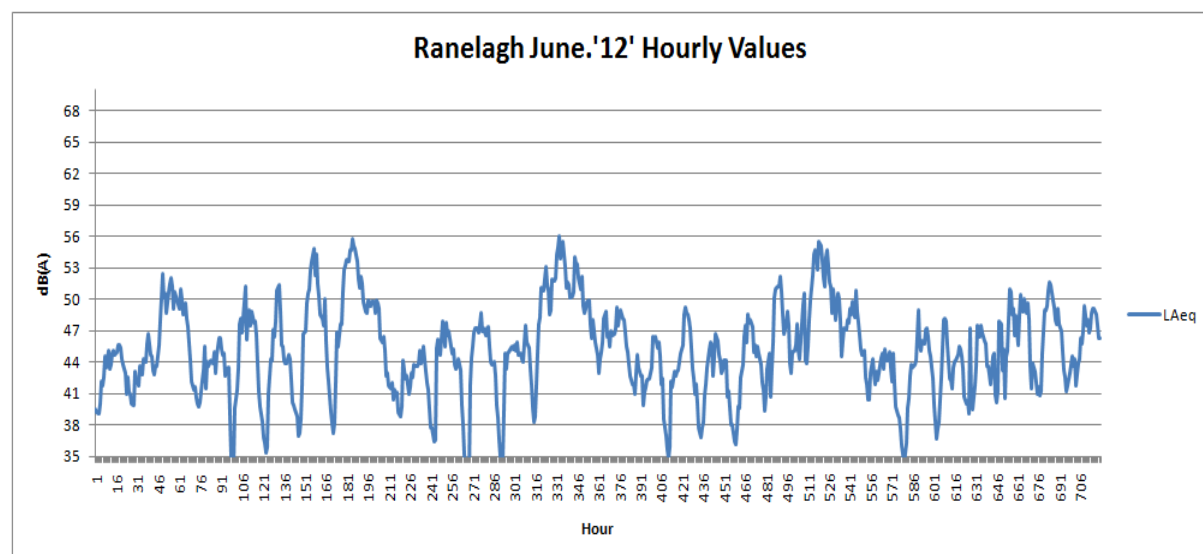
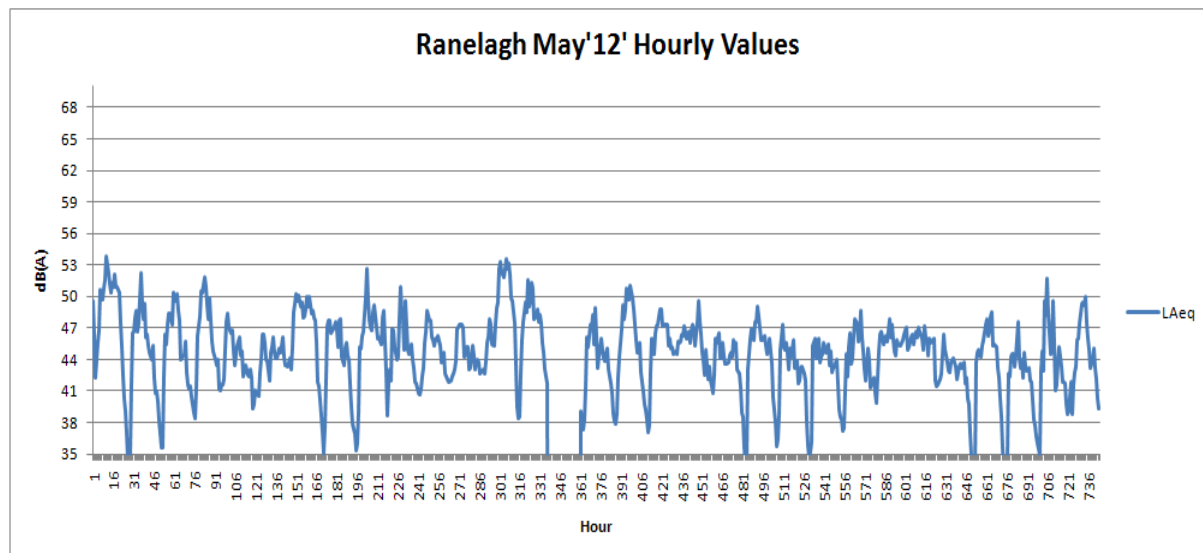
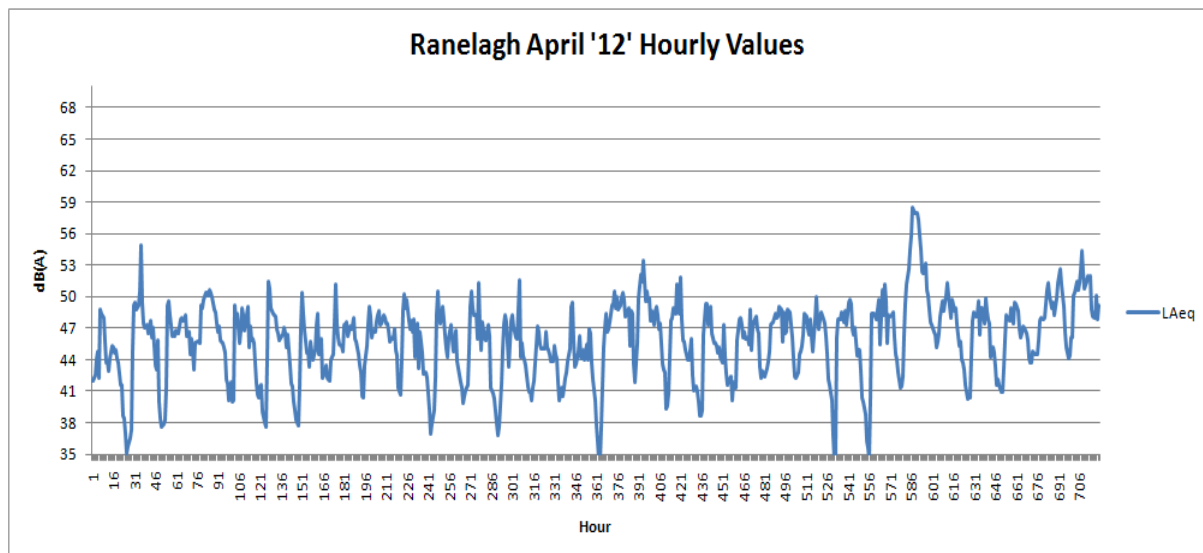


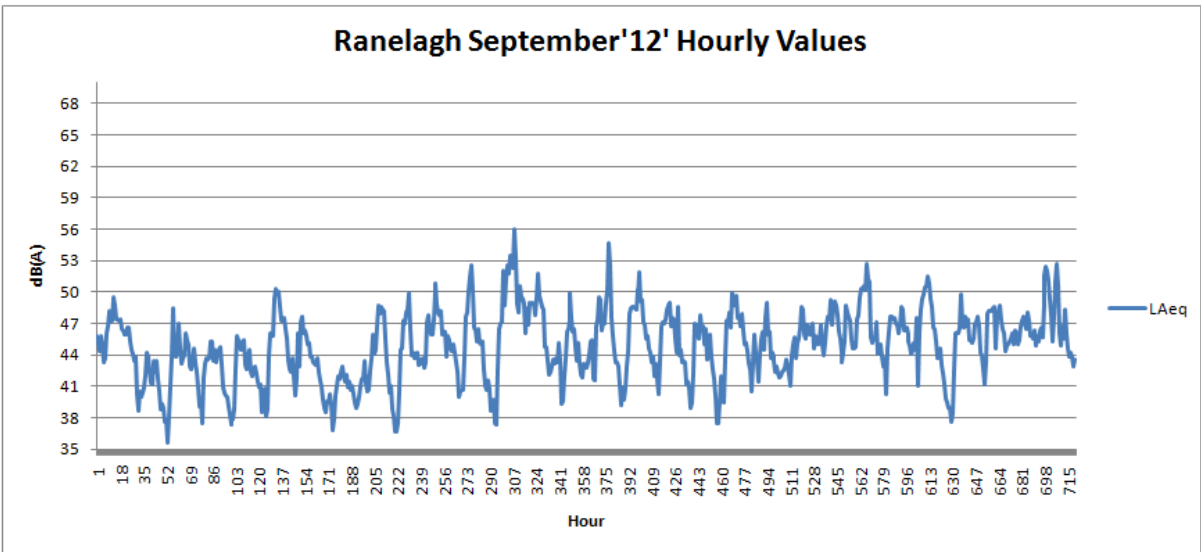
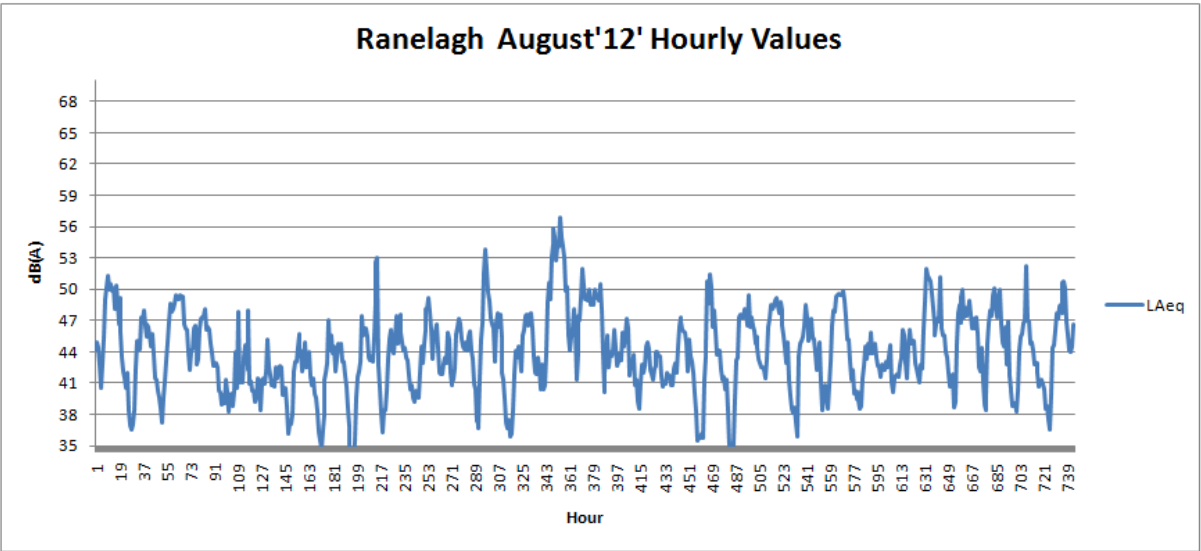
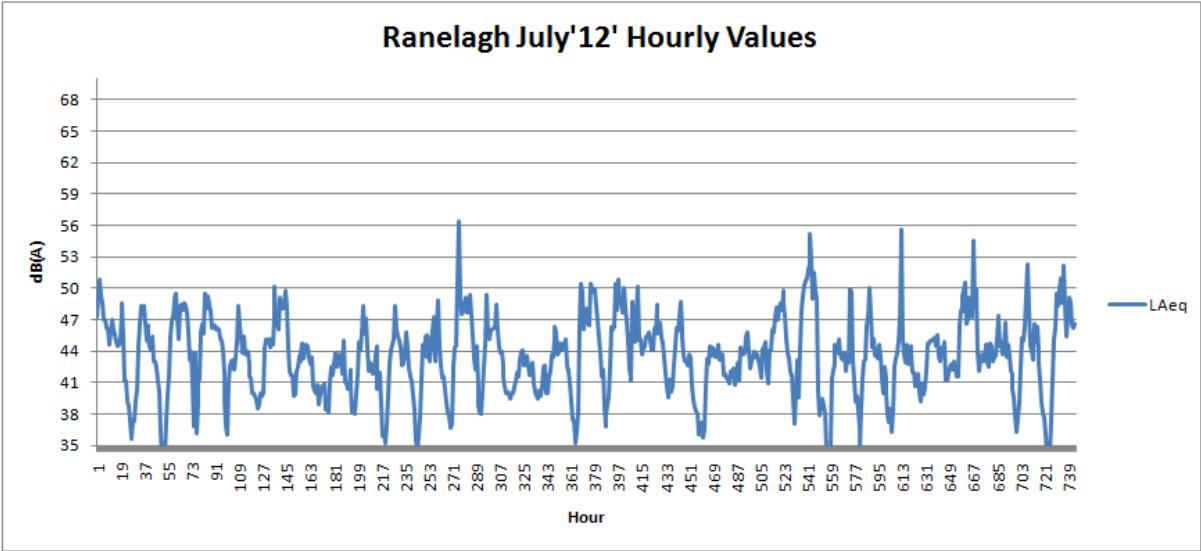


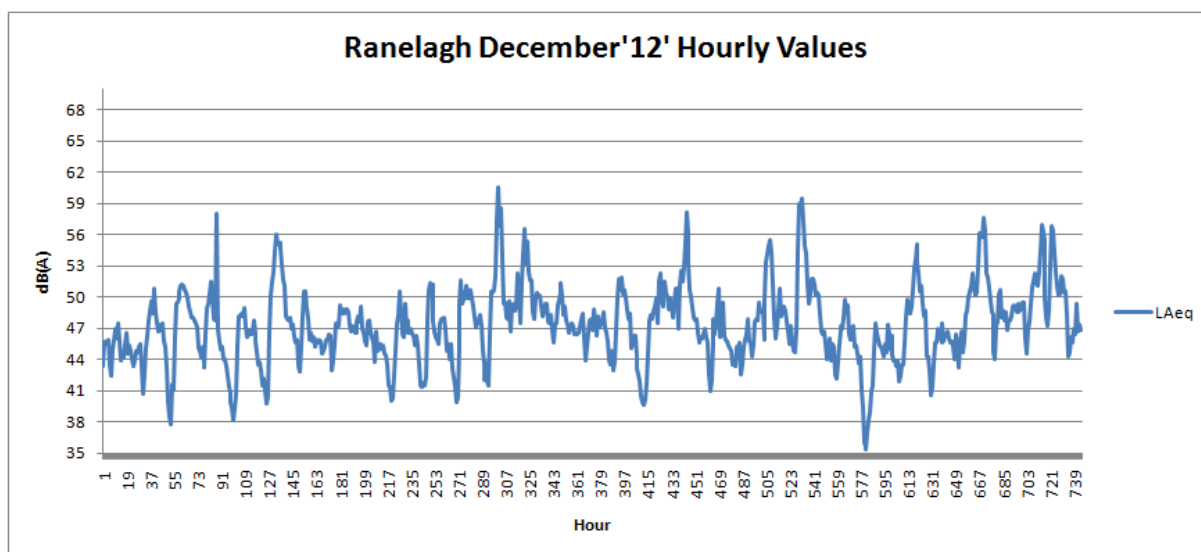
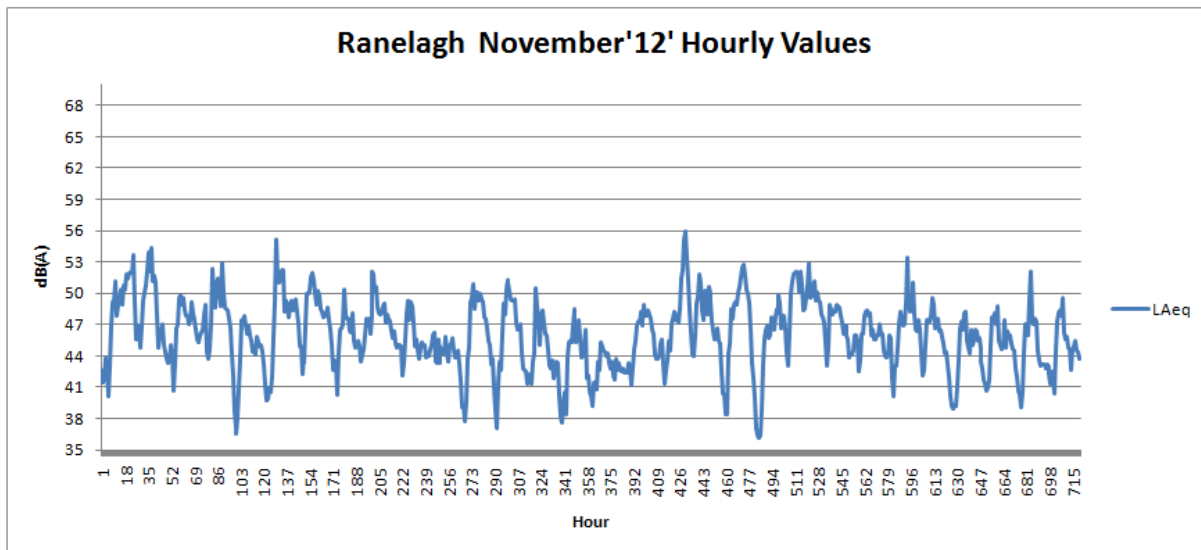
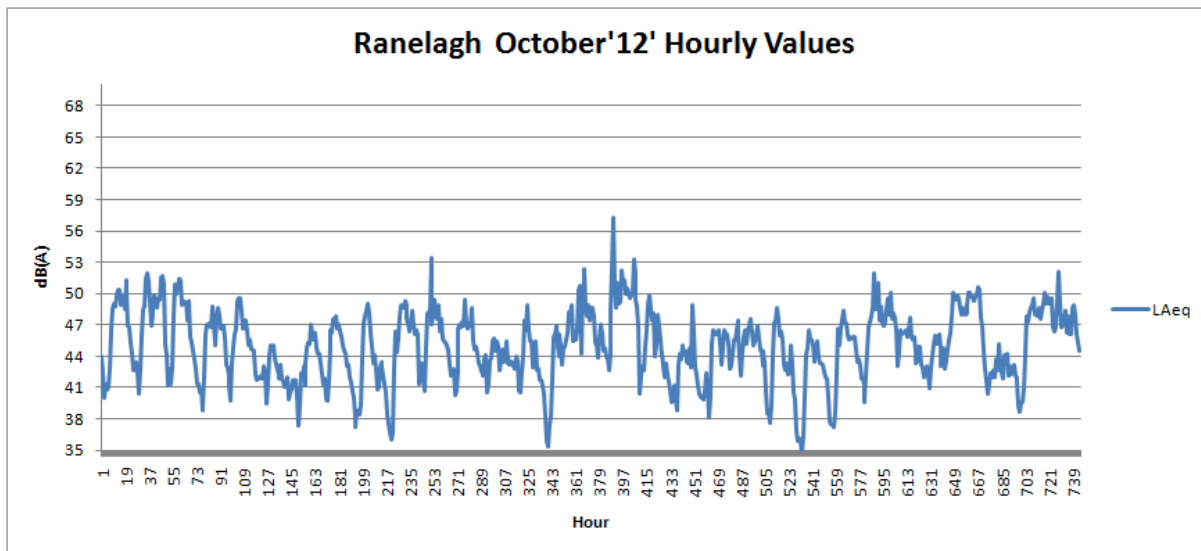
WOODSTOCK STOCK GARDENS
RANELAGH
DUBLIN 6



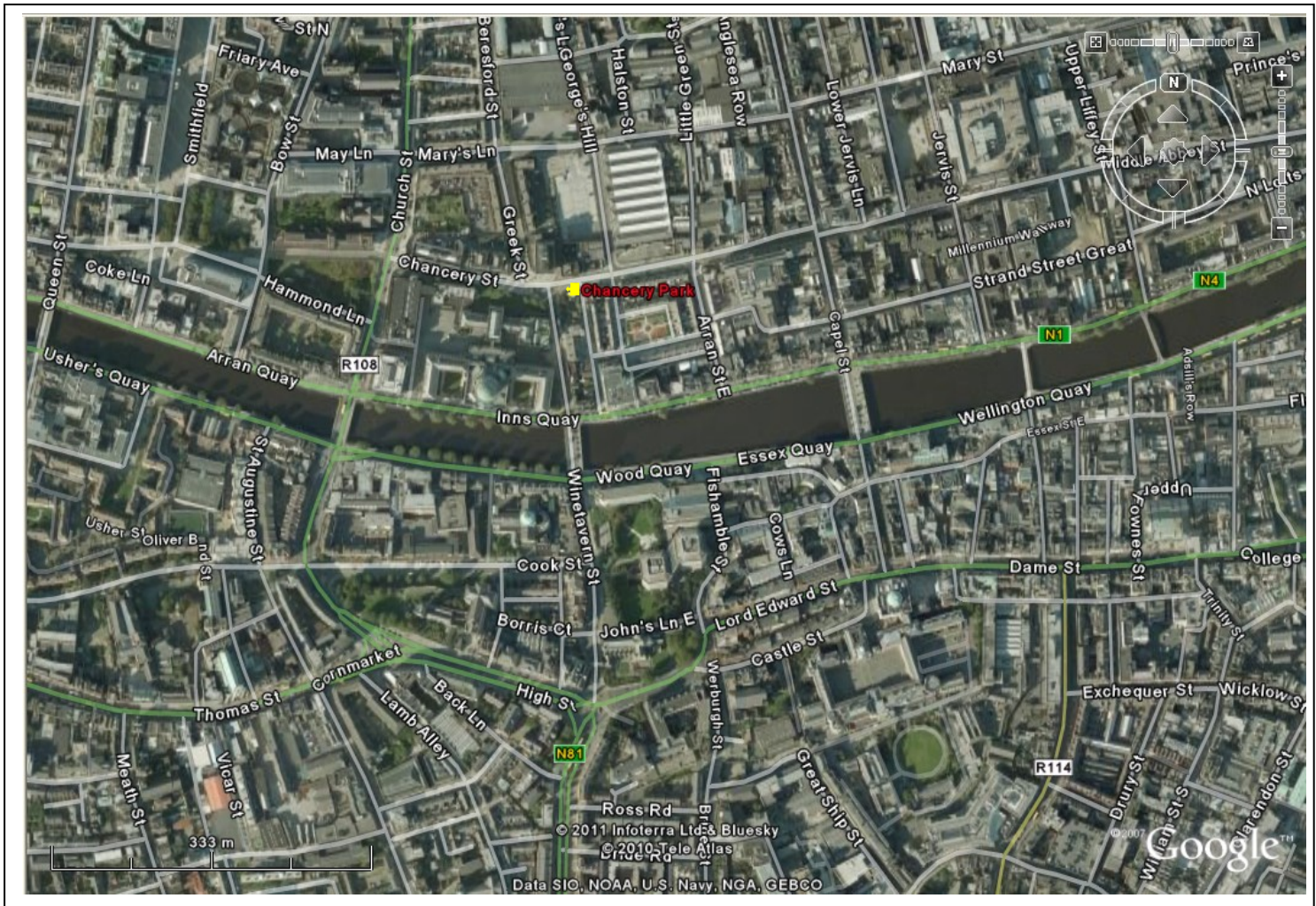


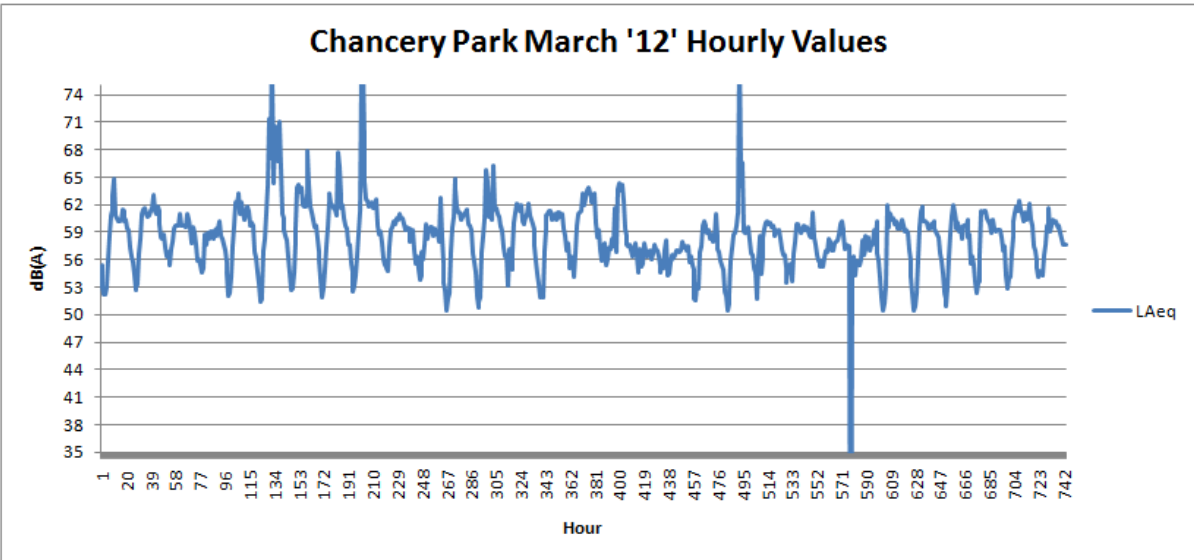
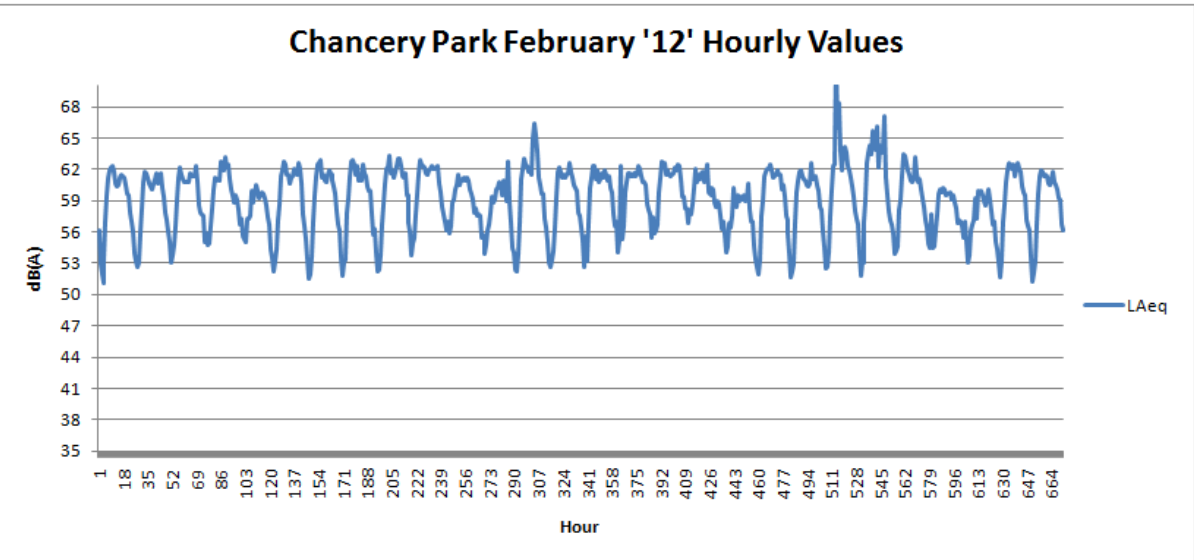
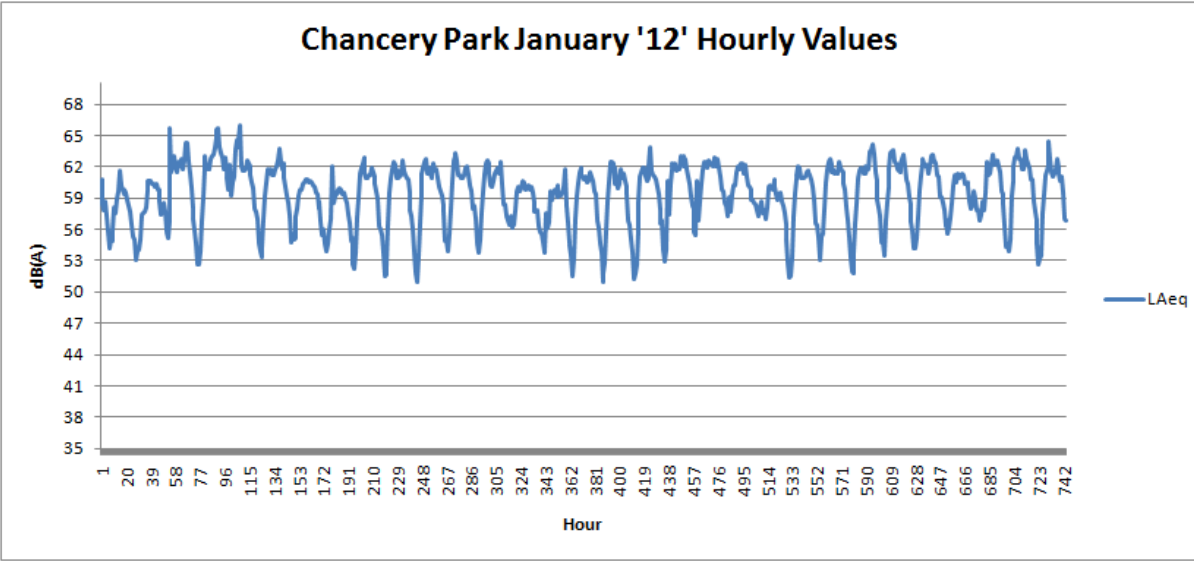




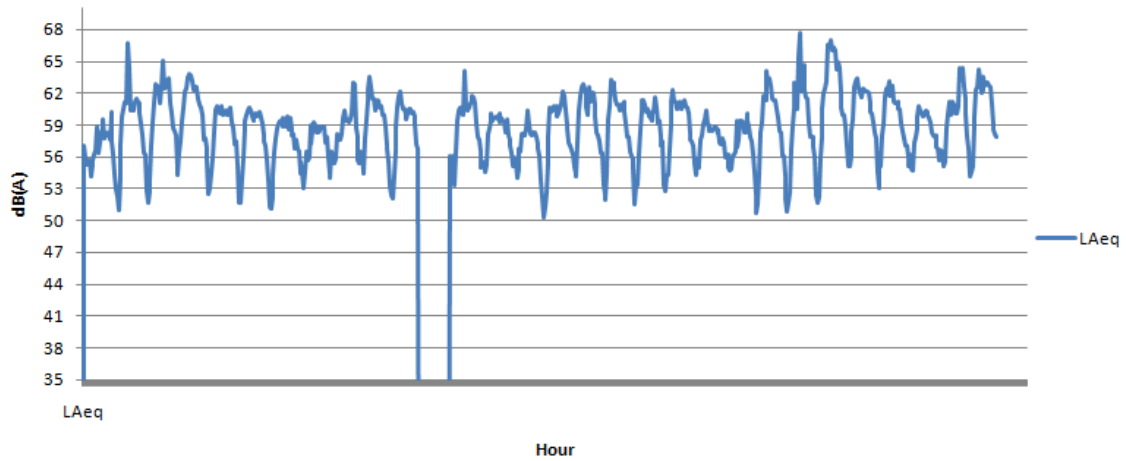


CHANCERY PARK
CHANCERY ST.
DUBLIN 1

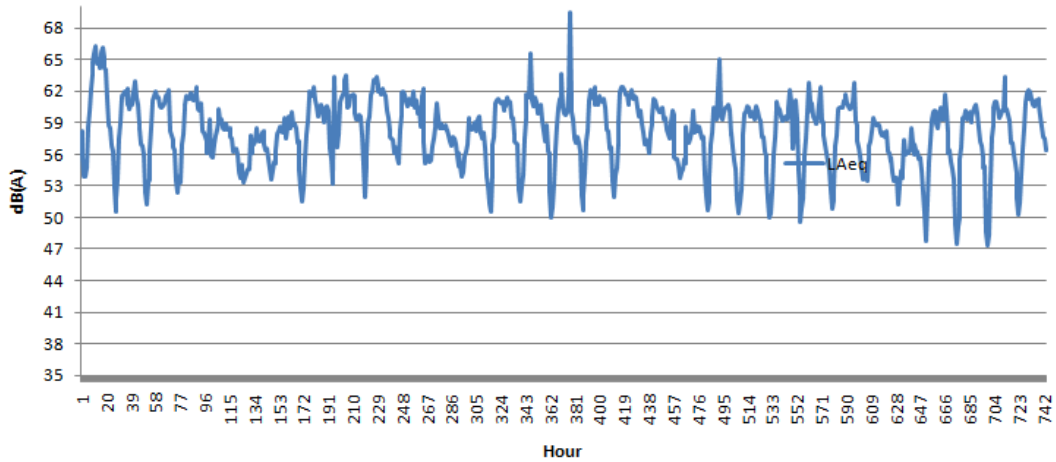




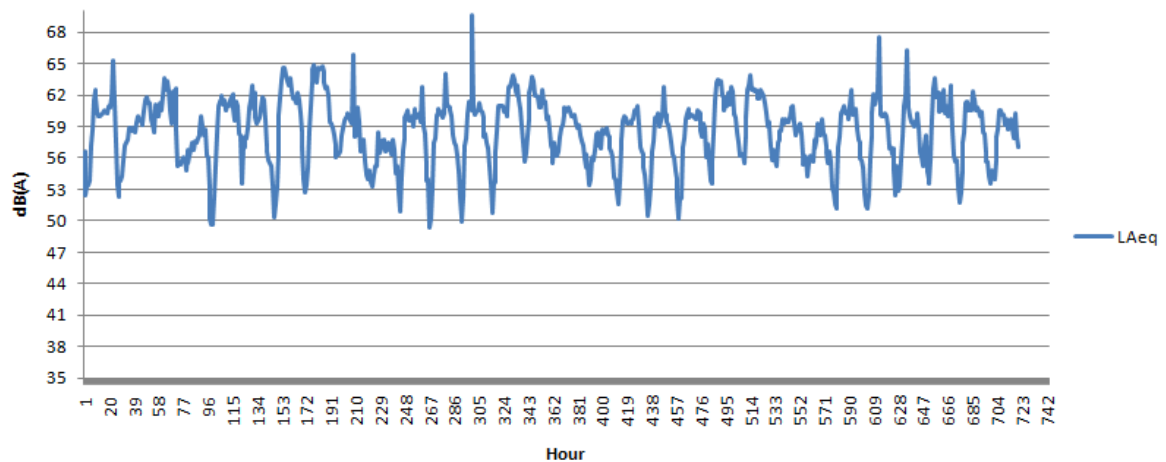
Chancery Park April '12' Hourly Values

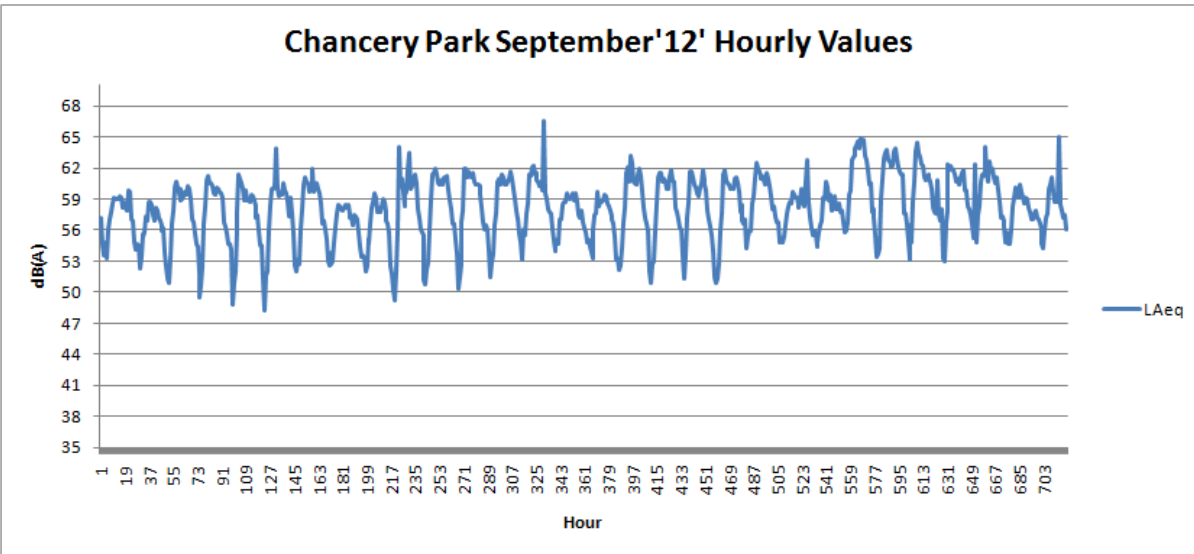
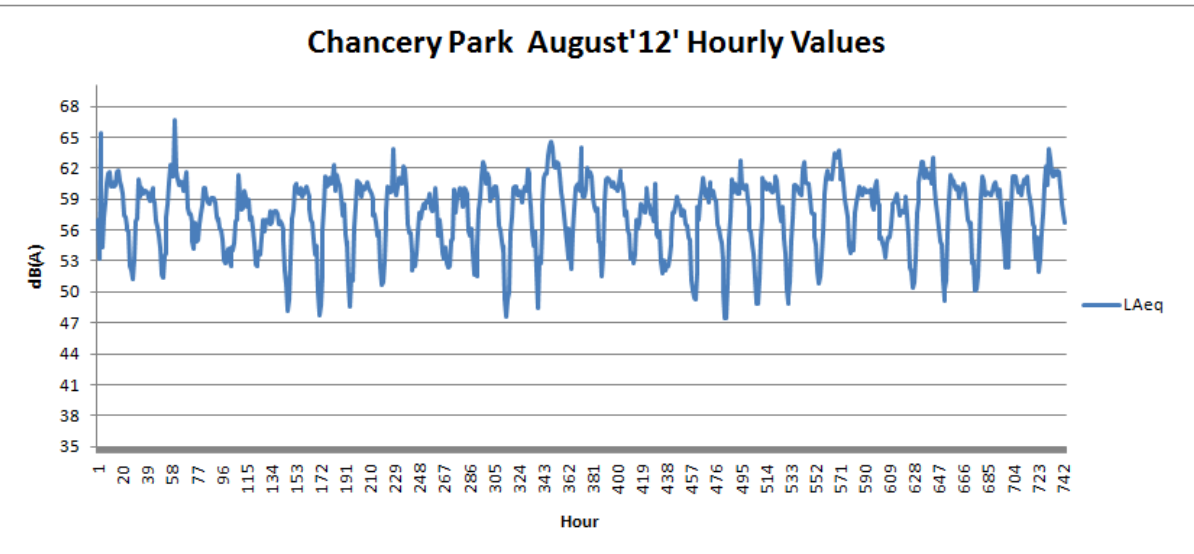
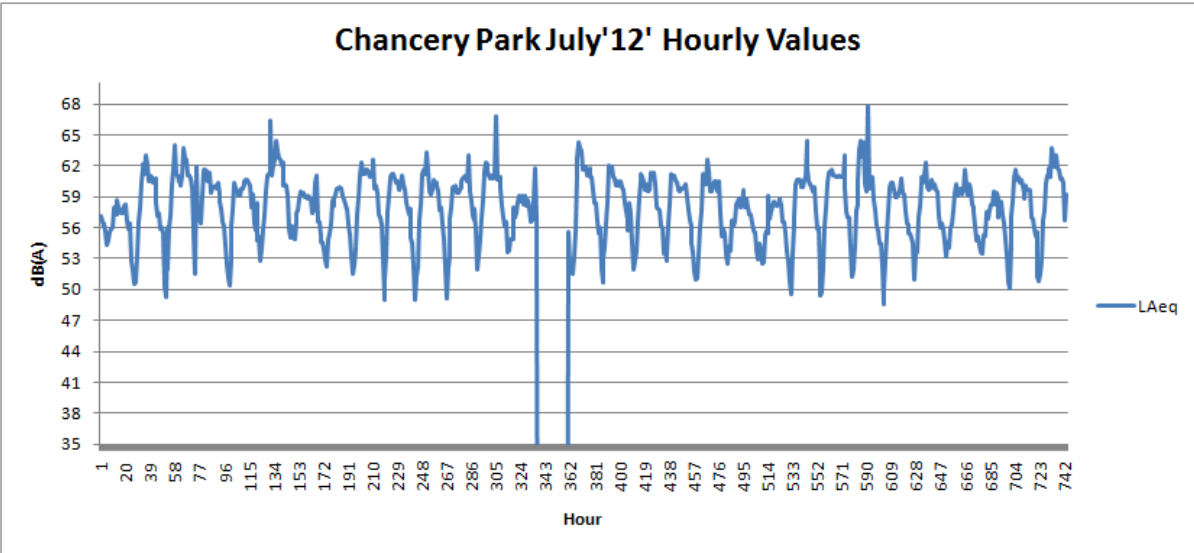


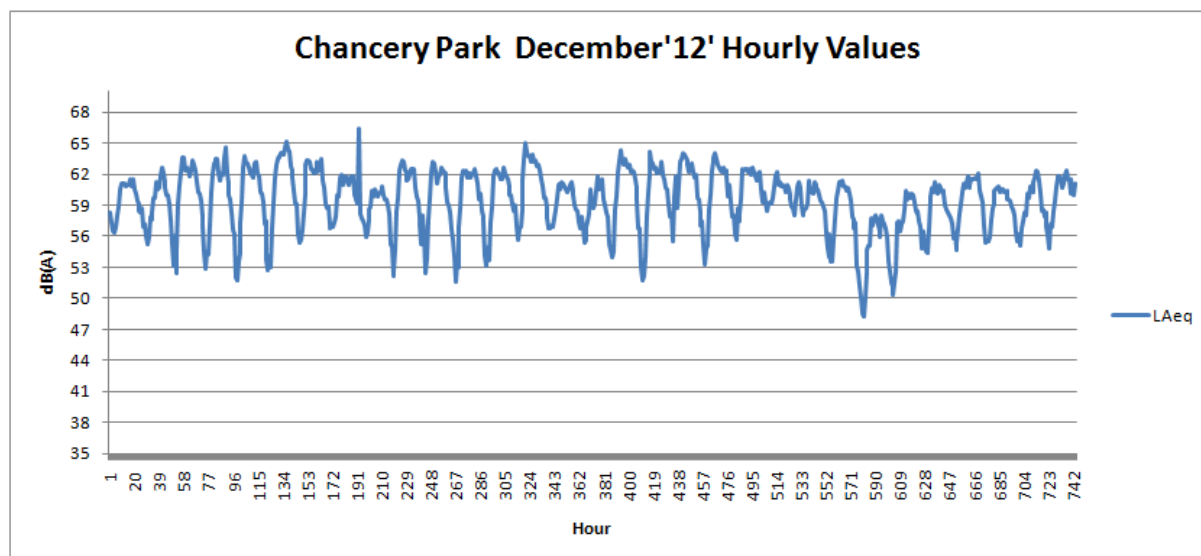
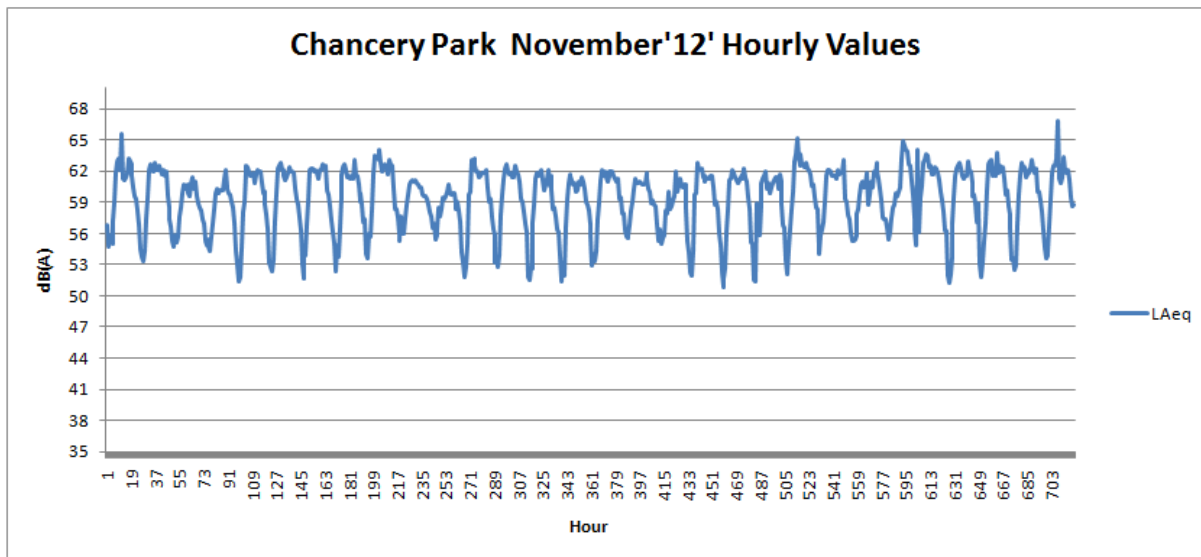
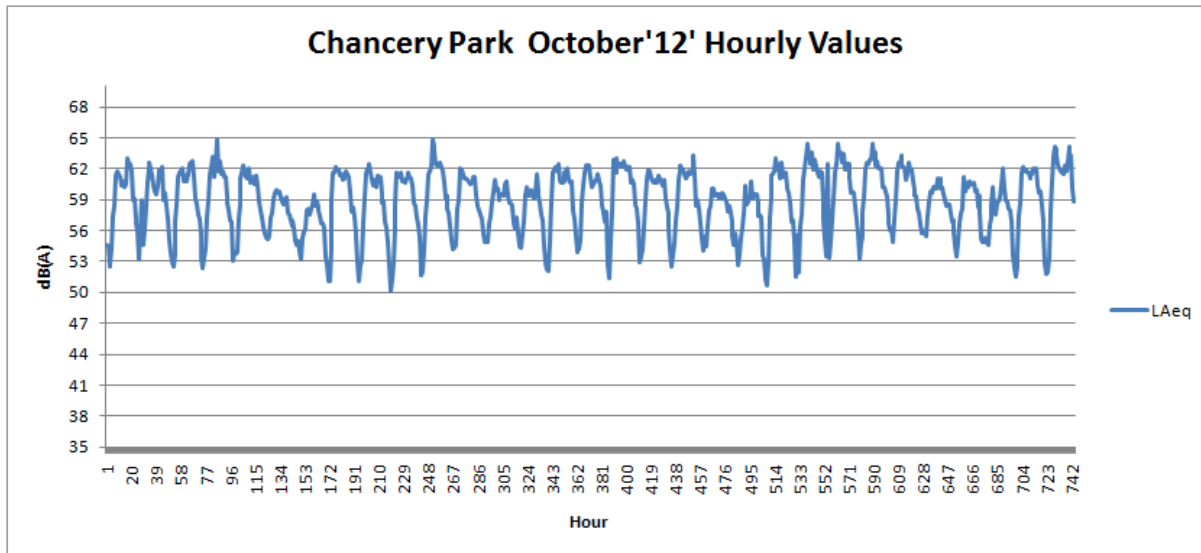
Chancery Park May '12' Hourly Values



Chancery Park June '12' Hourly Values

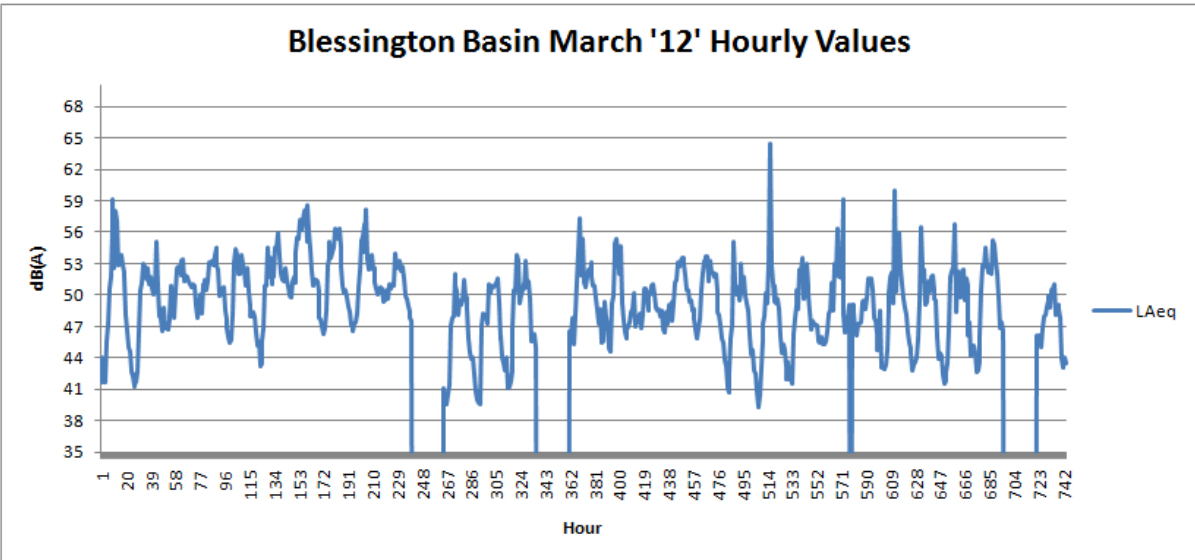
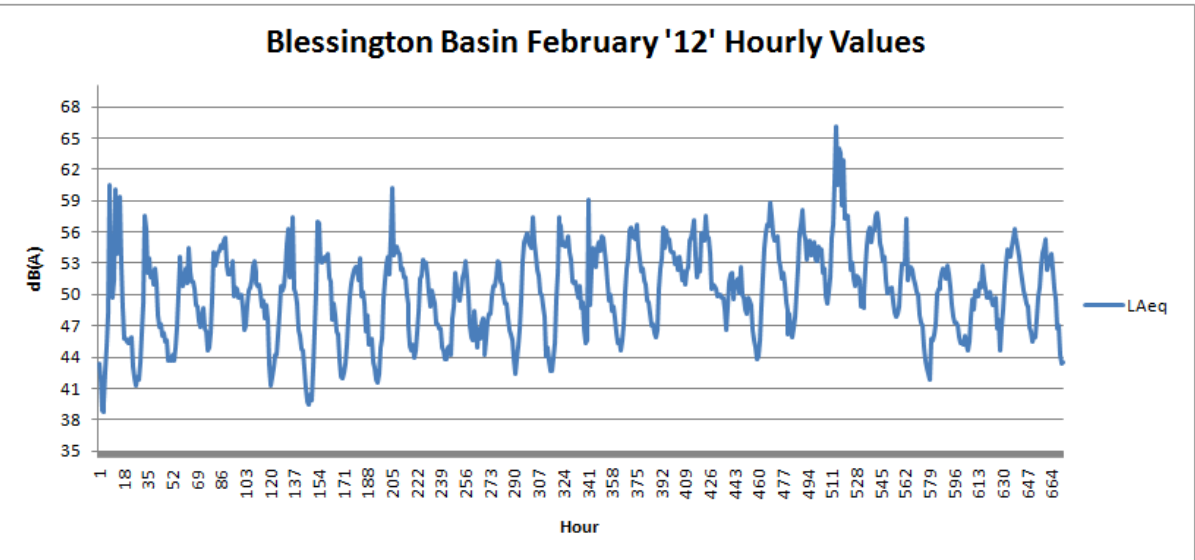
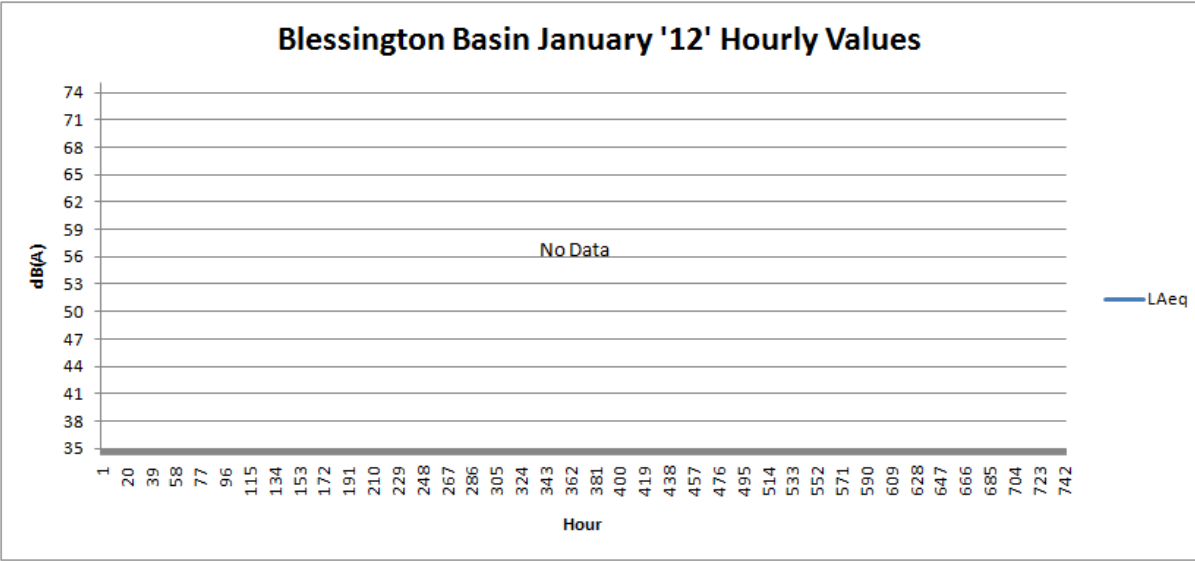


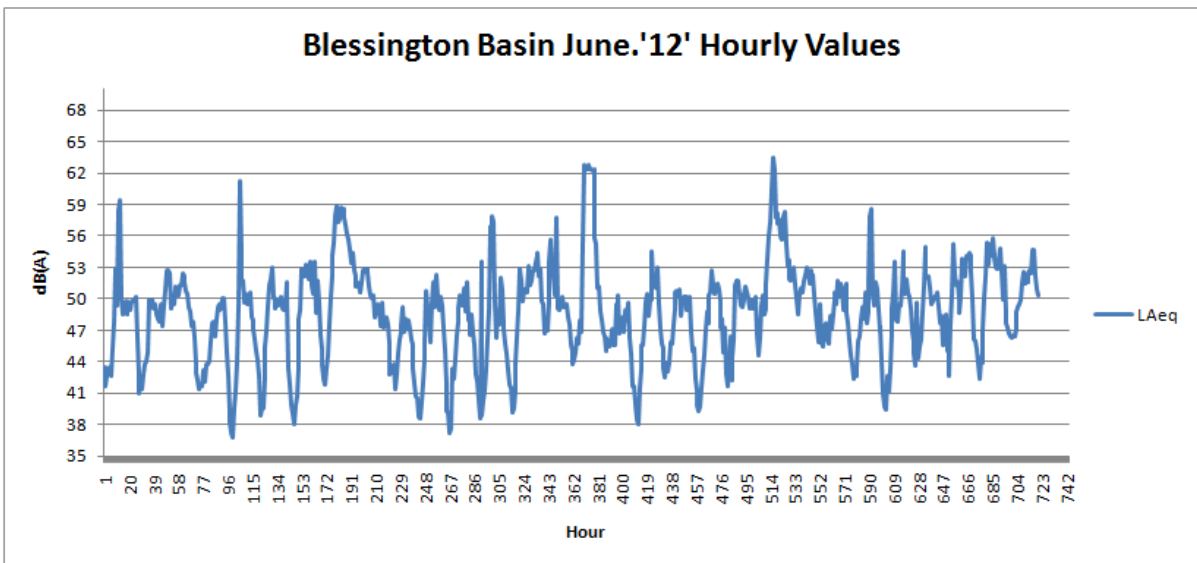
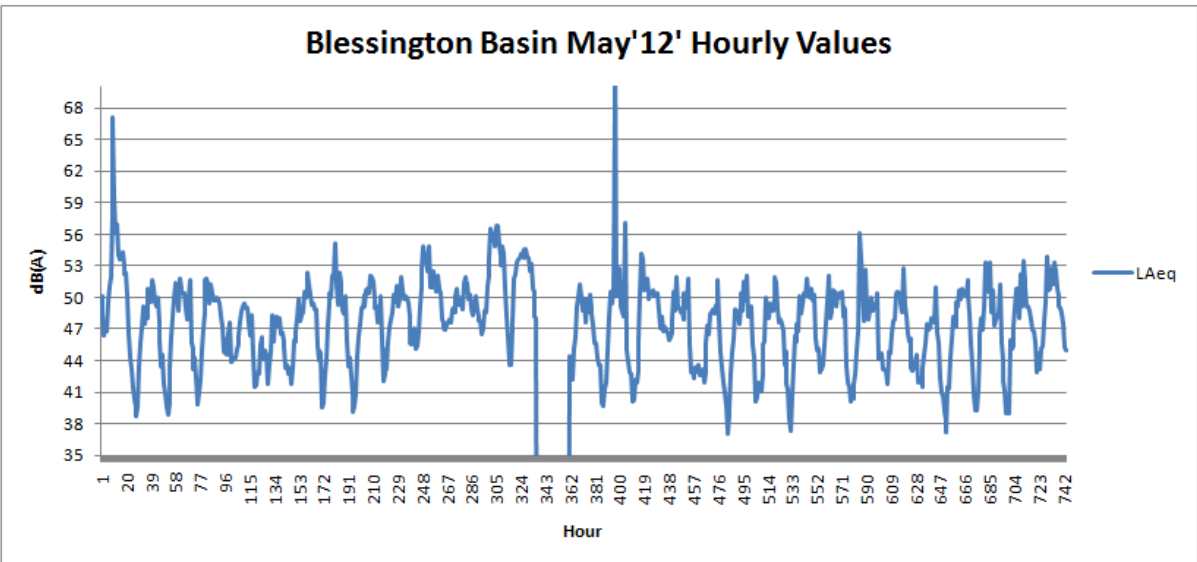
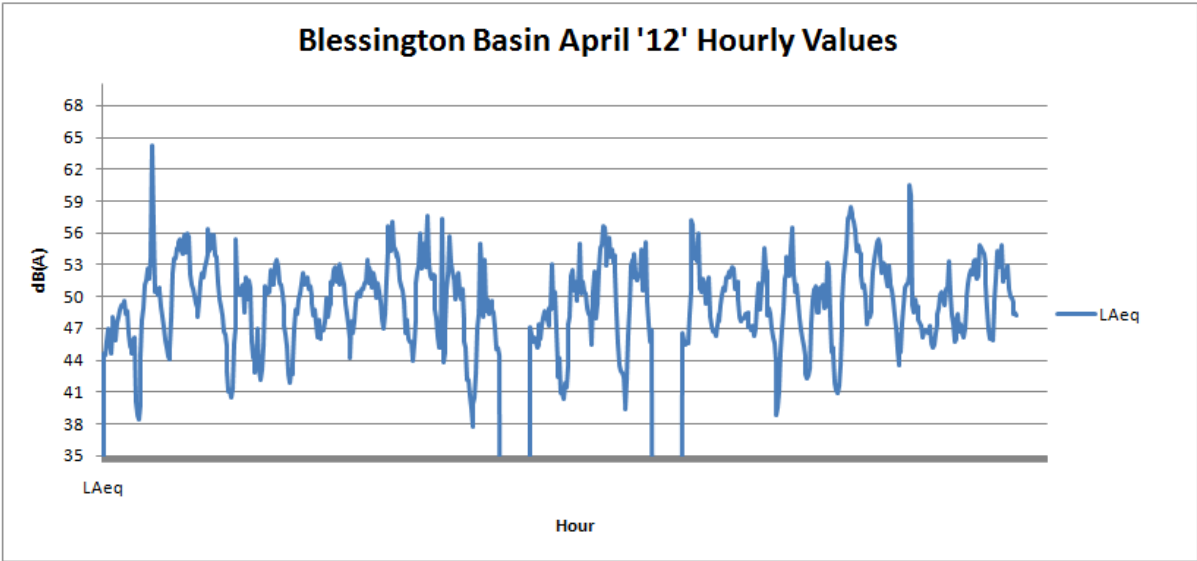


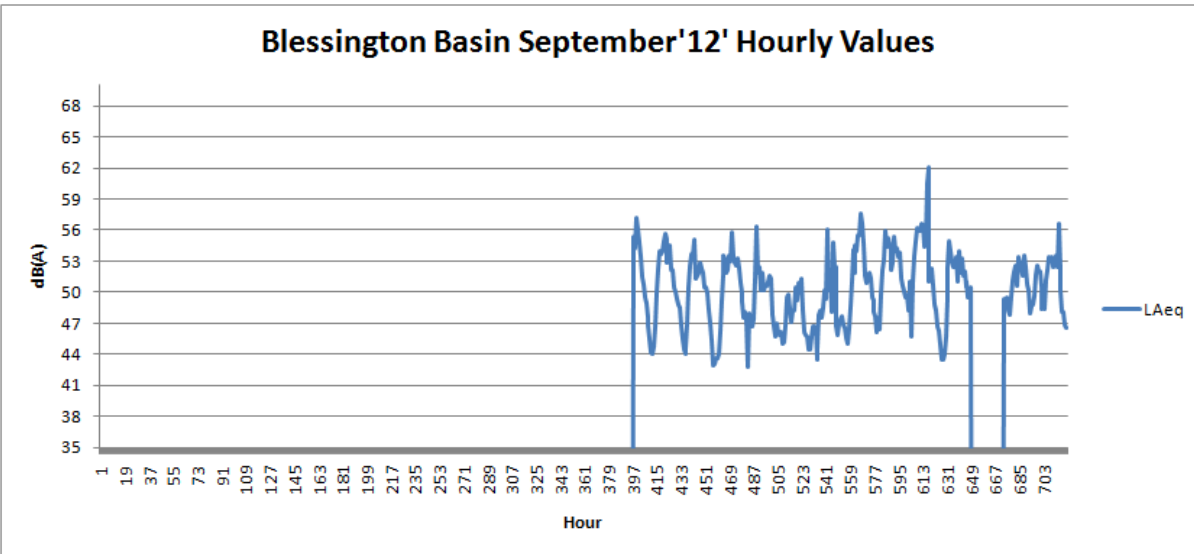
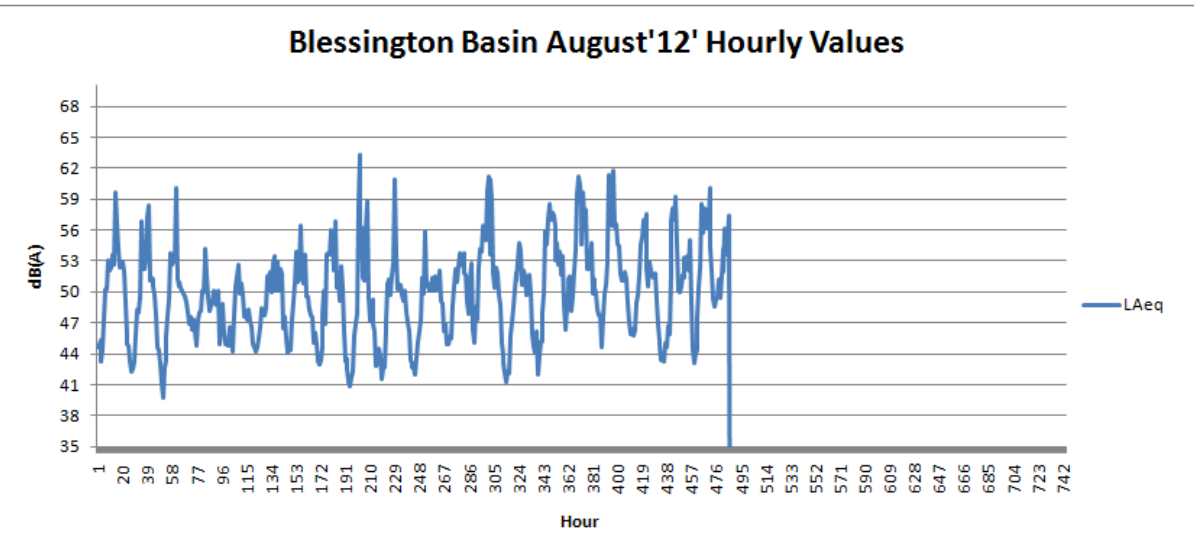
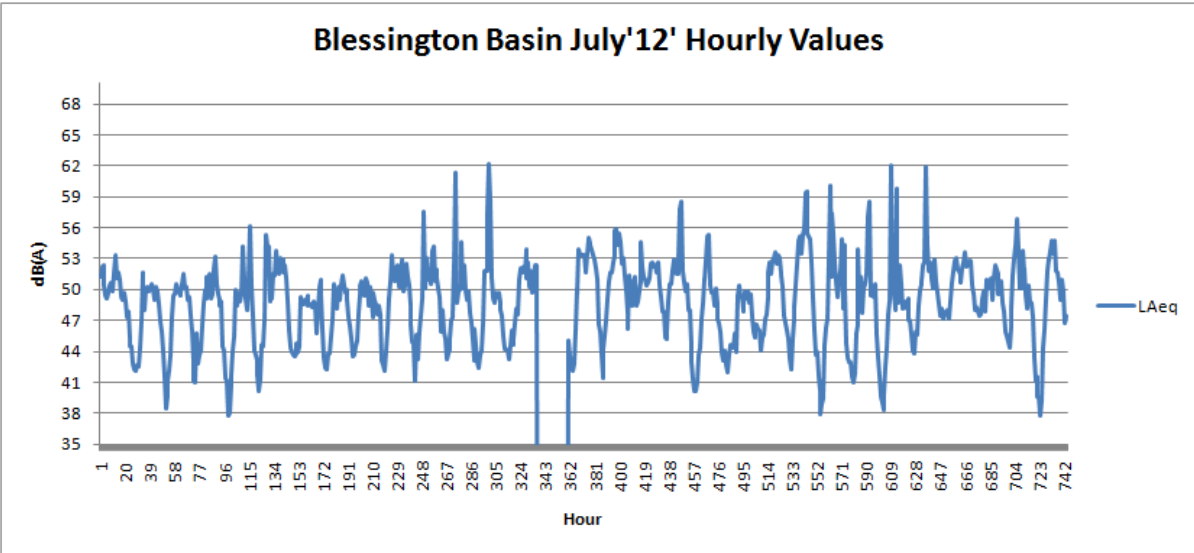


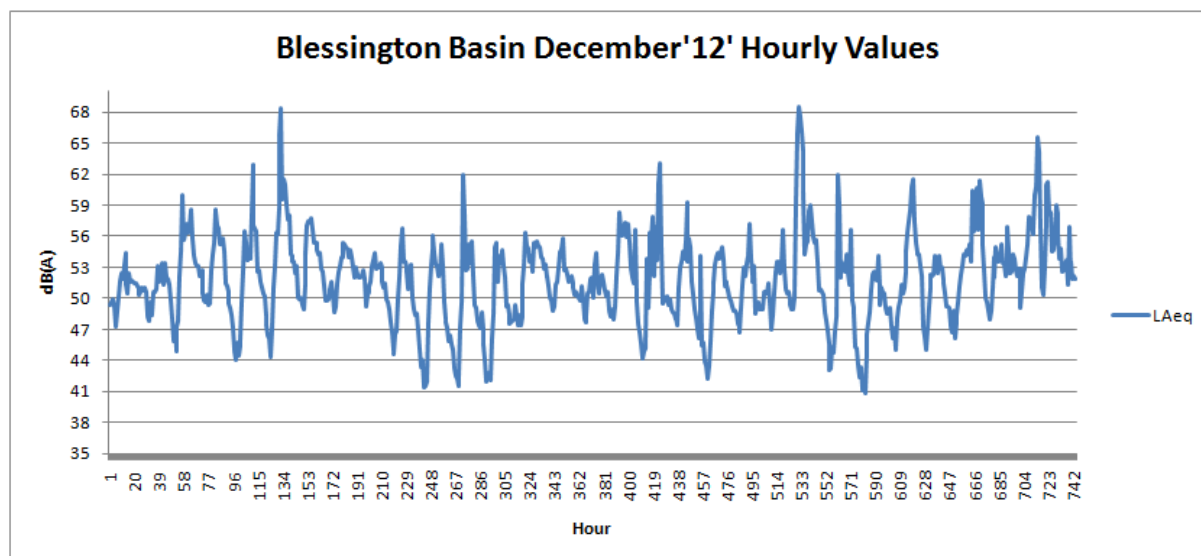
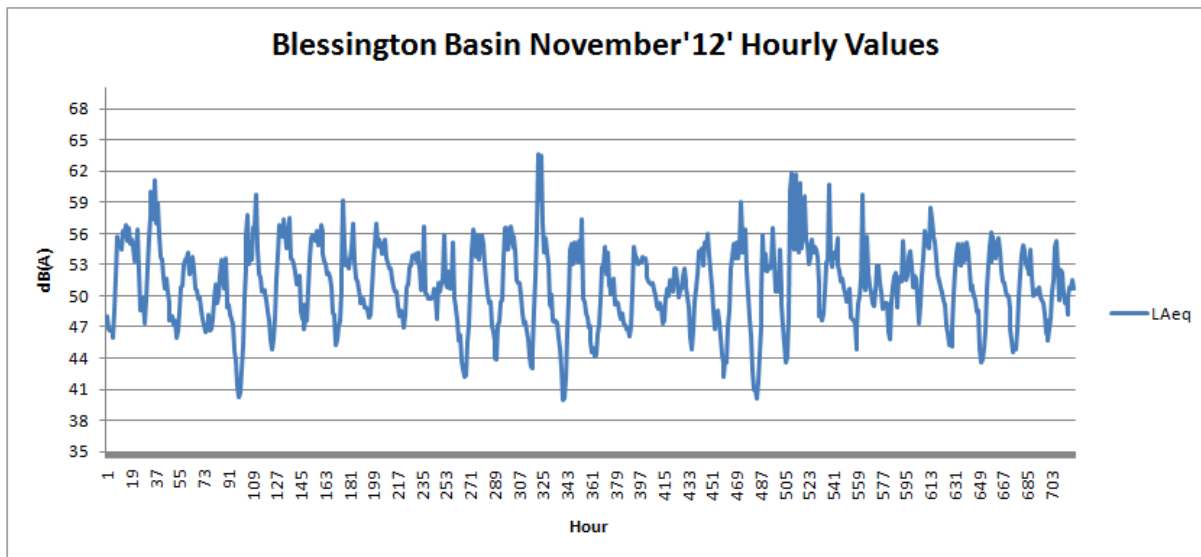
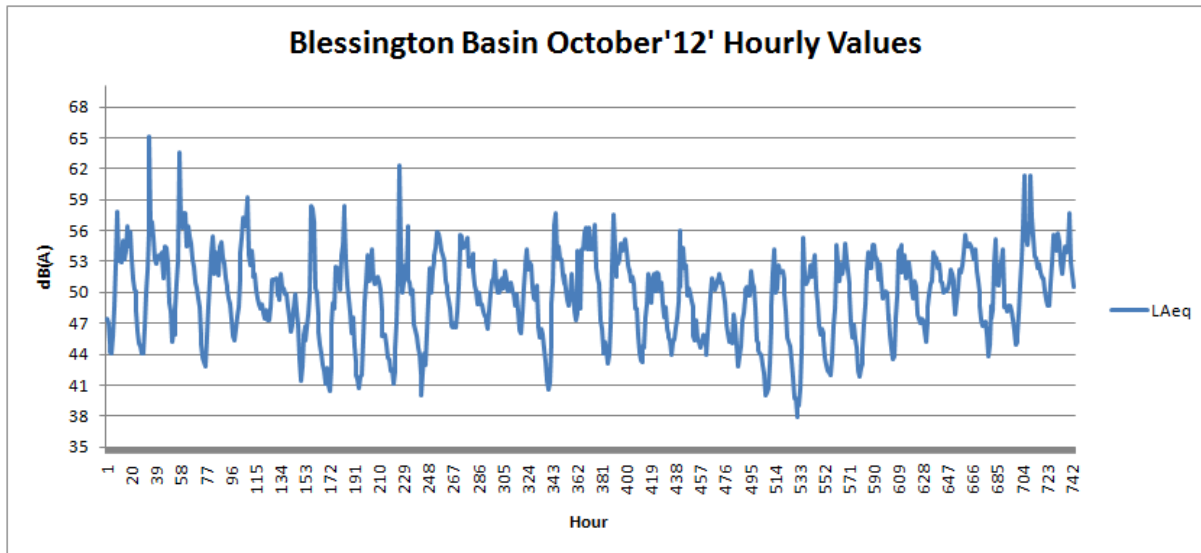
Blessington Basin
Blessington St.
DUBLIN 1













Baile Átha Cliath
Dublin City

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