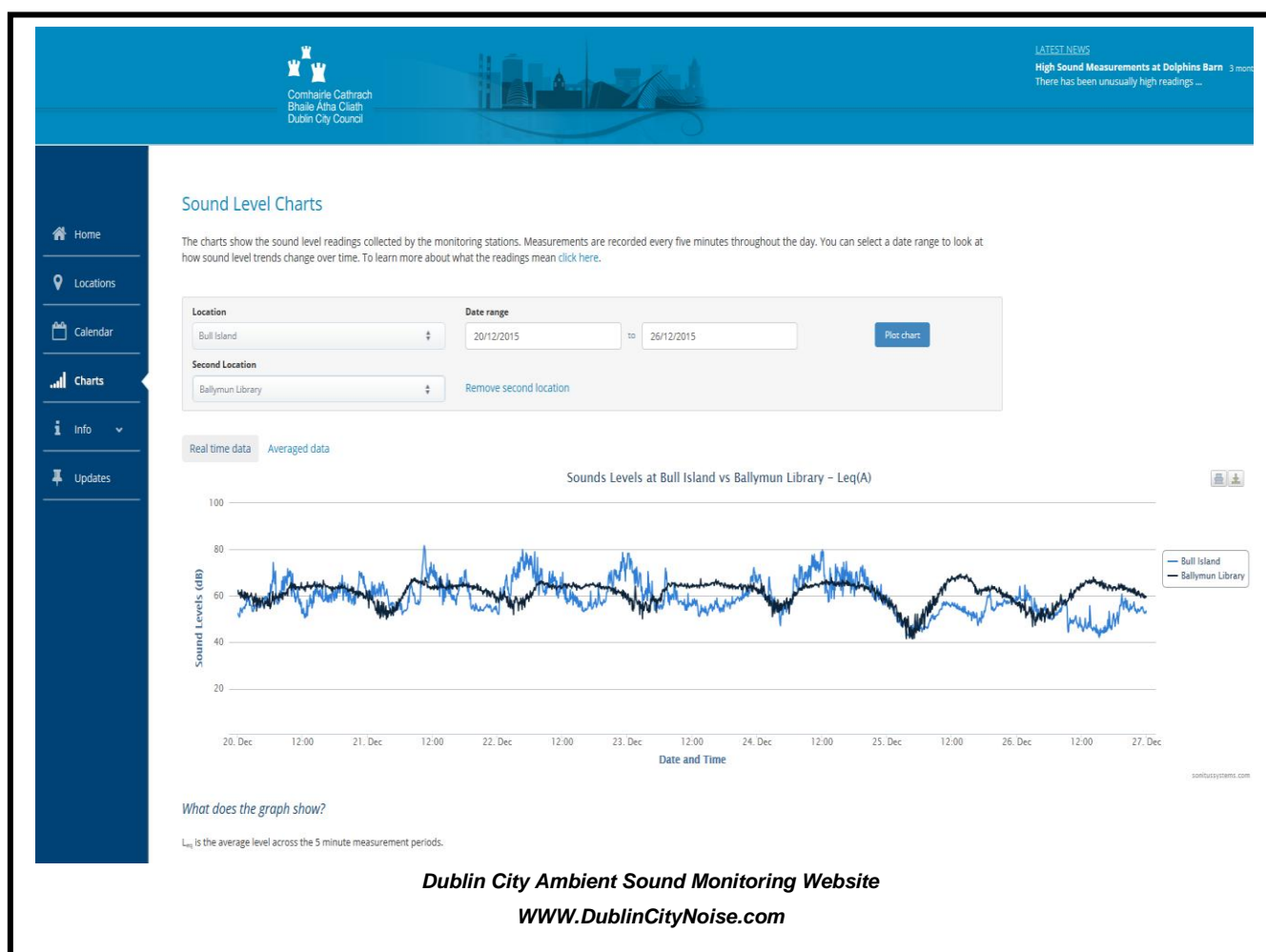


# DUBLIN CITY COUNCIL

## AMBIENT SOUND MONITORING NETWORK

### Annual Report 2015



*Produced by*  
**Traffic Noise & Air Quality Unit,**  
**Environment and Transportation Department,**  
**Dublin City Council.**

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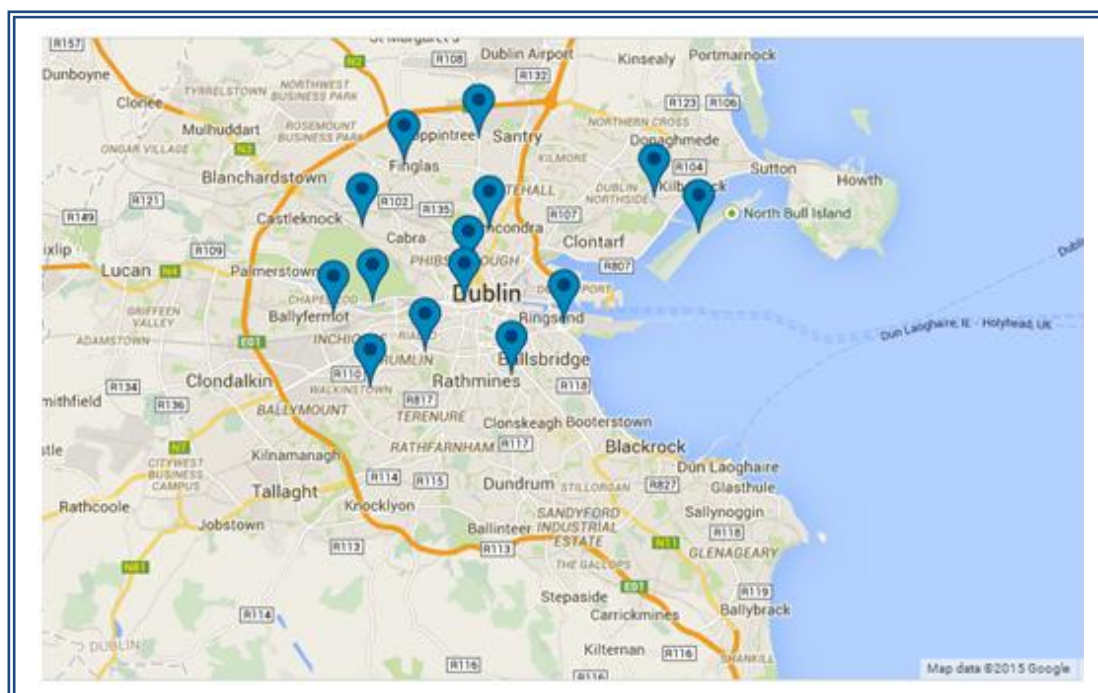
## Introduction

This is the seventh Annual Report for the Dublin City Ambient Sound Monitoring Network. Dublin City Council commenced the installation of a permanent ambient sound monitoring network in 2009.

Currently the monitoring network comprises of 14 sites. No new sites have been added to the network this year but there is an active search on for suitable locations in both the north and south inner city.

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. It does not measure 'Noise Levels' – See 'What is Noise?'

**Fig. 1 Sound Monitoring Sites -**



Sites are selected so that, in so far as is possible, no single dominant sound source, such as major roads, road junctions, industrial sources etc. have a disproportionate influence on the outdoor ambient sound levels being measured. Hence the difficulty in identification of suitable sites in the inner city.

The network currently consists of 14 monitoring locations. These are:-

- 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 St, D1, Blessington Basin
- Millmount Avenue, D9,
- Percy French Road, D12, Walkinstown Library.
- Ringsend, D4, Irishtown Stadium.
- Woodstock Gardens, Ranelagh, D6.
- Chancery Park, Dublin 1, Public Park.
- Dolphin's Barn, Crumlin Rd, Dublin 8.
- Mellows Park, Finglas, Dublin 11.

## What is Noise?

There is a subtle difference, which can lead to a misunderstanding, in relation to noise and the actual sound we hear. Noise is often defined as unwanted sound. As such, it is a subjective response or value judgement in relation to a sound stimulus. This 'judgement' can be influenced by the sound level of the acoustic stimulus, the time of its occurrence, its time domain, its frequency spectrum and its informational content. An authoritative report published in the UK in 1963 – known as the Wilson report, defined noise as “sound which is undesired by the recipient”. The Report also noted that it is well known that the actual loudness of a noise is not by itself a measure of whether it will give rise to annoyance or complaint.

What turns a 'physical sound measurement' into a 'subjective noise level' causing annoyance is dependent on the context within which the observer hears the sound/noise. As such, quoting sound levels without putting them into context is somewhat meaningless. This report provides a site location map for each site in order to enable the reader to put the site and its measurements into the context of its physical surroundings i.e. – is it close to a main road, is it in the City or suburbs, is it a Quiet Area? It also defines the time periods over which the measurements are taken.

## Dublin City Council Sound Monitoring Website

Our website dedicated to displaying near real-time ambient sound monitoring was thoroughly revamped in 2014 in order to make it more user friendly. One can now see current sound levels at a glance, but can get further historical data by clicking on the provided links and 'drilling down' further into the data. Links are also provided, leading to information as to what the measurement parameters mean and Information on acoustics in general. The revamp of the site was carried out by its original designers – Sonitas Systems, a Trinity College campus company who have also developed the hardware used in the monitoring network. Dublin City Council's collaboration over the years with Trinity College and Sonitas Systems has been of mutual benefit. We would like to feel that this collaboration has enabled Dublin City to continue to be one of the leading cities, not just in Ireland but in Europe, in relation to making available information to the public on long term continuous ambient sound monitoring. Near real time monitoring data can be found at our website link:

<http://www.dublincitynoise.com>. General information on noise, acoustics and associated links can also be found there.

## Monitoring Network

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. The averaging of measured data has been carried out logarithmically rather than normal arithmetical averaging. This is in line with the International Standards Organisation 'Recommendation 1996' in relation to long term measurements. The use of this method tends to assign a greater influence on the

overall average by higher sound levels for the period being measured. For example, an arithmetical average of four sound levels such as 50dB, 50dB, 50dB and 70dB will result in a 55dB average. Averaged logarithmically these values produced a result of 64.1dB. Therefore it is critical that our sound monitors are so located that no one sound source dominates the sound measurements that could unduly skew the average ambient measurements.

## **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 those that currently exist for air quality.

## **Measurement Parameters**

The European Commission requires the use of a parameter called the Lden (Sound Level for Day, Evening and Night) for population exposure assessment. This measurement parameter of *Day-evening-night level* is a descriptor of average daily sound levels throughout a full year, 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. Its one drawback is that it is based on annual average calculations. Therefore, one has to have annualised data before one can use it in any assessments. Our monitoring network fulfils this criteria. Therefore, our assessments of Dublin's environmental acoustic quality is not solely dependent on mathematical computer modelling. The Lden parameter is not a suitable parameter for the assessment of local noise complaints. Average values, or maximum or minimum values over specific periods of time would be more suited for this use.

## **Areas with desirable\undesirable or low\high sound levels**

The Dublin City Council Noise Action Plan December 2013 – November 2018 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. It also proposes that 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 World Health Organisation Night Noise Guidelines (NNG) for Europe**

These guidelines propose a **Night Noise Guideline (NNG)** ultimate target of 40dB Lnight outside. An interim target (IT) of 55 dB Lnight, outside is recommended '*in the situations where the achievement of the NNG is not feasible in the short run for various reasons*' - WHO.

## 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 monitor calibration was discarded. There was no instance of vandalism at any of the sites.

## Sound Sources

Since commissioning our network in 2009, the measurements indicate that under normal conditions the dominant sound source in Dublin is traffic. 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. The average daily summary charts (pages 16 - 23) display double peaks, one between 7-9 a.m. and one between 5-7p.m. These characteristics are similarly to traffic flow patterns on major roads. The charts that do not reflect these characteristics represent areas that are influenced by more natural sounds – sites such as Bull Island.

Weather also has a major influence on our sound measurements. In 2015, more than previous years, very high winds and heavy rain were experienced over a number of periods throughout the year. These episodes are picked up as high sound levels in the hourly and monthly summary charts, (pages 25 -109). Again this year, Bull Island measurements displayed relatively high sound levels during these weather episodes. It is therefore important to note comments already made in relation to differences between noise levels and sound levels.

The monitoring site locations are displayed on maps to the rear of this report and provide an indication as to the type of areas in which they are situated. Bull Island, as previously mentioned, tends to be the most erratic site, in that there is no readily discernable pattern to the measured levels – more so this year than previous years. This site is impacted more by the time of the tides and weather rather than sounds from traffic and human activity. Both Bull Island and Blessington Basin sites are designated 'Quiet Areas' and monitoring at these locations will continue into the foreseeable future in order to assess any deterioration in ambient sound levels.

Fig.2

## Summary of Results

Set out in *fig.2* is a comparison of the Network averages from 2012 to 2015. Day time, night time and LDEN levels for 2015 were identical to 2014's values.

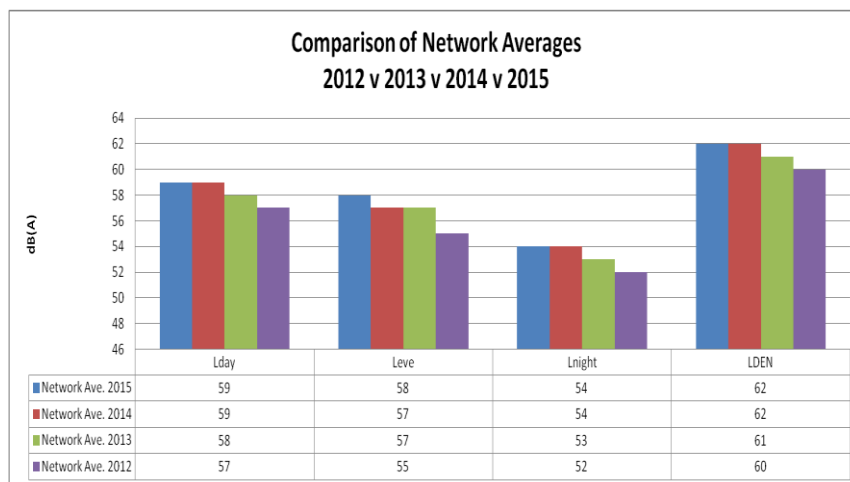
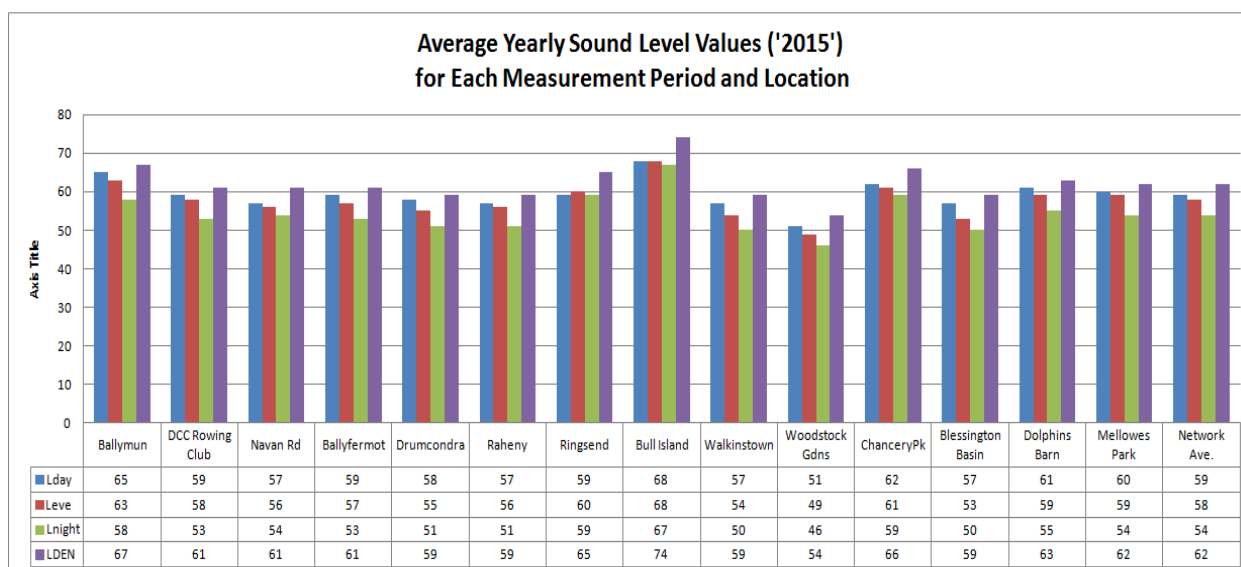


Figure 3 provides more detail on individual site measurements. The measurements for the year 2015 indicate that four locations – Ballymun, Ringsend, Chancery Pk. and Bull Island exceeded the undesirable values of 55dB night, with night time values of 58dB (A), 59dB (A), 59dB (A) and 67dB (A) respectively. This also meant that the WHO NNGL interim target for exterior night time level of 55dB (A) was also exceeded at these sites, although the network average as a whole was below this level with a value of 54dB (A). One site – Woodstock Gardens in Ranelagh, met the desirable criteria for night time levels. All sites were below the undesirable daytime levels of 70dB (A).

Again this year Bull Island's sound level is interesting in that this locality has been designated as a 'Quiet Area'. It is considered that the relatively high sound levels measured are due to high winds and wave sounds during the atypical weather events during the year. As already mentioned, the logarithmical averaging of sound measurements tends to assign a greater influence on the overall average by higher sound levels for the period being averaged, even if that period is as long as a year. Indeed the weather seemed to have a greater impact on the traditionally quieter areas measurement's such as Raheny, Ranelagh, Ringsend, and Blessington Basin, and to a lesser extent Walkinstown. See charts on pages 16 - 23.

Fig.3



## Measurement Results

As mention previously, the monitoring network is not a 'noise monitoring' network. The network measures and monitors actual sound - from all sources. No assessment is made as to whether it is unwanted or not. Only when a comparison is made, for instance in this report, with some valid criteria, can a judgement be made as to whether the sound levels are desirable or not. Bull Island is a case in point. It has produced some of the highest sound levels measured of all the monitoring locations. This is due to high winds and rolling waves. As mentioned in last year's annual report, most people would consider the sound from high winds and rolling waves as bracing and refreshing while going for a walk along the beach and would actually enjoy being exposed to such sound. Therefore it has to be borne in mind that the ambient sound monitoring network measures all sound from all sources thus

giving an indication of the amount of sound - not noise, the general population is exposed to from the hustle and bustle of daily life.

This seventh year of continuous measurements has confirmed the view 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 in the daily summary charts (page 16-23).

As already mentioned, weather also has an important influence on sound measurements. Exceptional wet and windy episodes were experienced in 2015 - even greater than those of 2014. These periods had a significant influence on the network measurements. On our website ([www.dublincitynoise.ie](http://www.dublincitynoise.ie)) we have included average wind and temperature values and an indication as to likelihood of rain, alongside average daily sound values. These can be viewed through the 'Calendar View' page.

Comparison of the Network Lden values with last year shows no change in 2015 values over 2014. On an individual site by site comparison, the Lden for Ballymun, Chapelizoid, Raheny, Ringsend, Chancery Park, Blessington Basin, and Mellows Park were identical to last year, (2014). Bull Island, Navan Road and Dolphins Barn were higher than 2014 results, whereas Ballyfermot, Drumcondra, Walkinstown and Woodstock Gardens were lower. The average difference between day time and night time levels across the network is 5dB (A).

## **Sound Level Variations**

The average daily 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. This year it is interesting to note the even more 'erratic' sound levels at Raheny, Ranelagh, Bull Island, Ringsend, Blessington Basin, and to a lesser extent Walkinstown, where weather seemed to have a greater impact on the traditionally quieter areas measurement's - see charts on pages 16 -23.

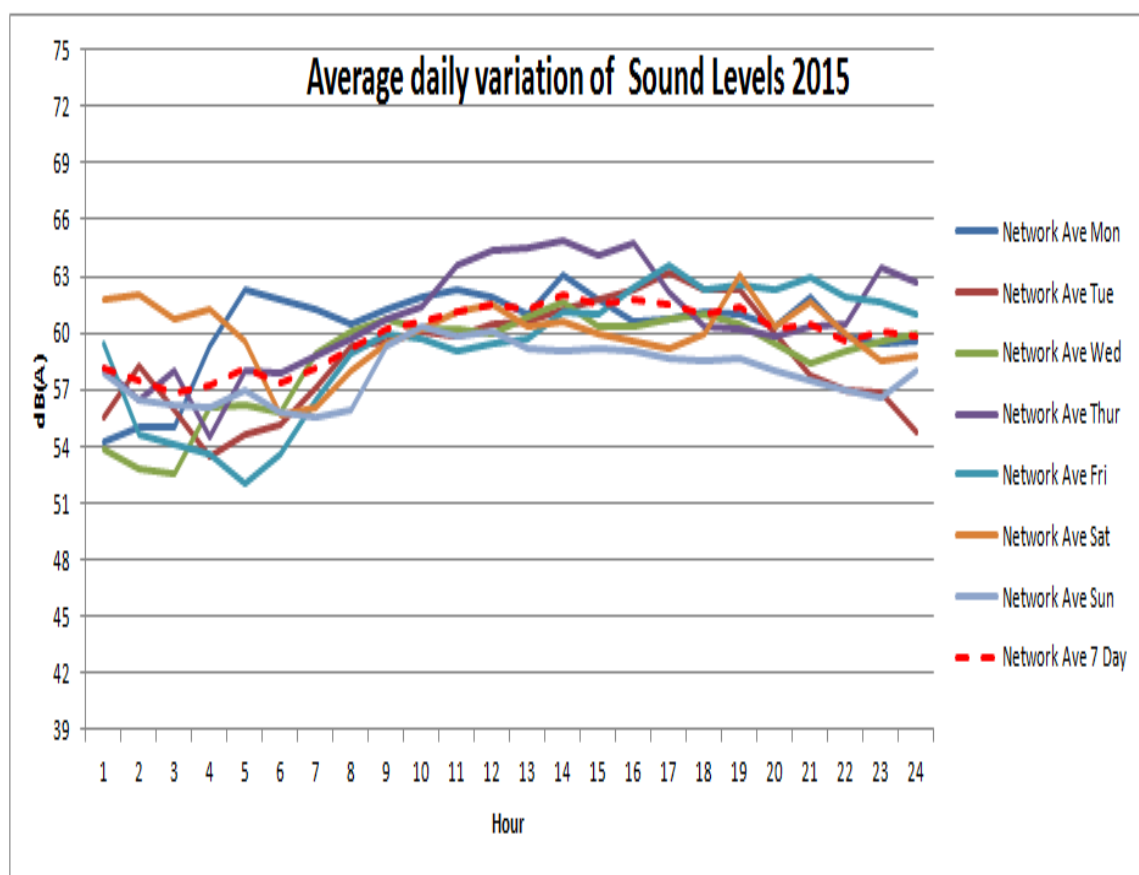
The site with the lowest daytime sound values was Woodstock Gardens followed by Navan Road, Raheny, Walkinstown and Blessingthon Basin all tying for second spot. The three sites with the highest daytime sound values were Bull Island, Ballymun and Chancery Park – the same as the previous two years. The site with the lowest night time sound value was Woodstock Garden followed by Blessington Basin and Walkinstown. The sites with the highest night time sound values were, Bull Island followed by Ringsend and Chancery Park. This is the first time Ballymun has dropped out of the highest top three night time rankings.



The locations with the largest difference between day time and night time levels were Ballymun, Drumcondra, Walkinstown and Blessington Basin, all with a difference of 7 decibels. The location with the smallest difference was Ringsend - 0dB, followed by Bull Island (1dB), Navan Road (3dB) and Chancery Park(3dB).

The 'Monthly Charts' presented to the rear of this report provide a detailed view of how average daily sound levels change from day to day and month to month. In 2015 the Network's highest average monthly sound levels occurred in January, followed by February and March. The Network's average monthly lowest levels were experienced in July, followed by June and September. The median value is provide on the 'Hourly Value Charts'. This is represented by a red horizontal line which marks the mid-point of the hourly data above and below which 50% of the data would reside, if arranged from the lowest value to the highest value. Extreme values have less of an impact on medians value than on average values.

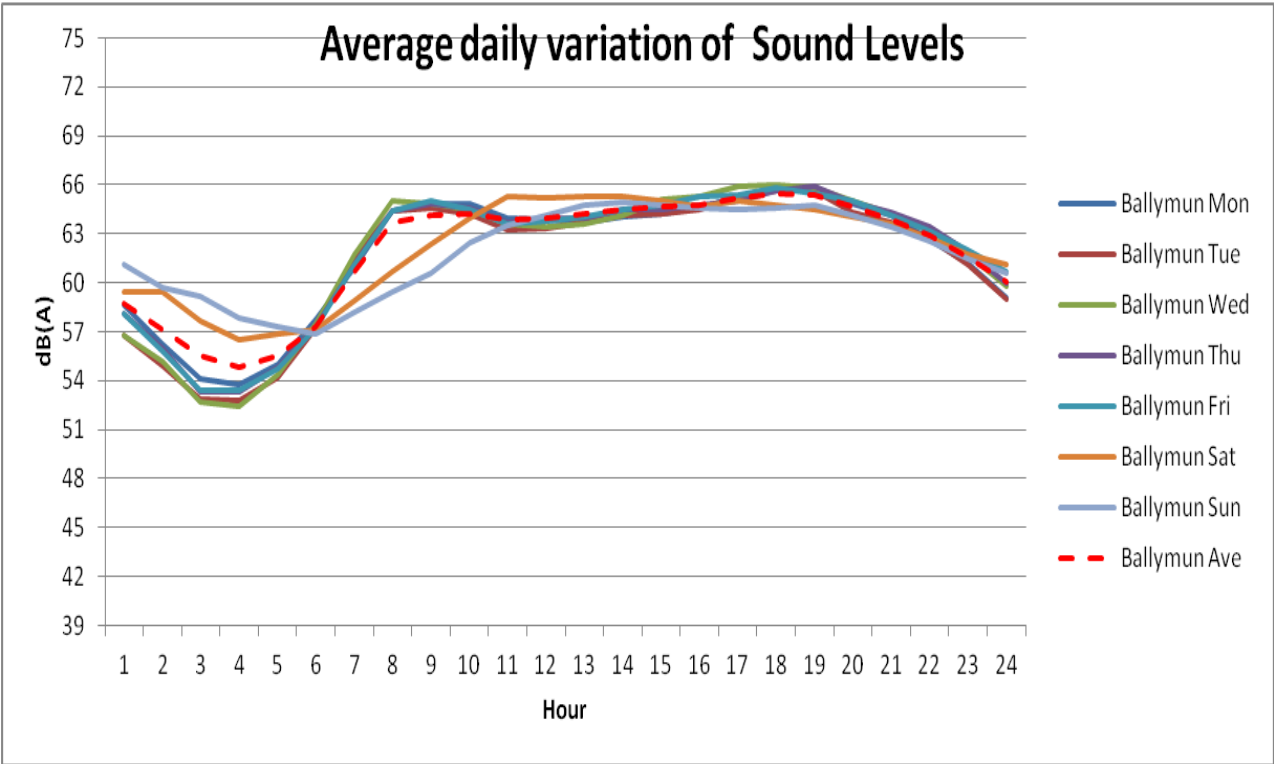
Fig.4



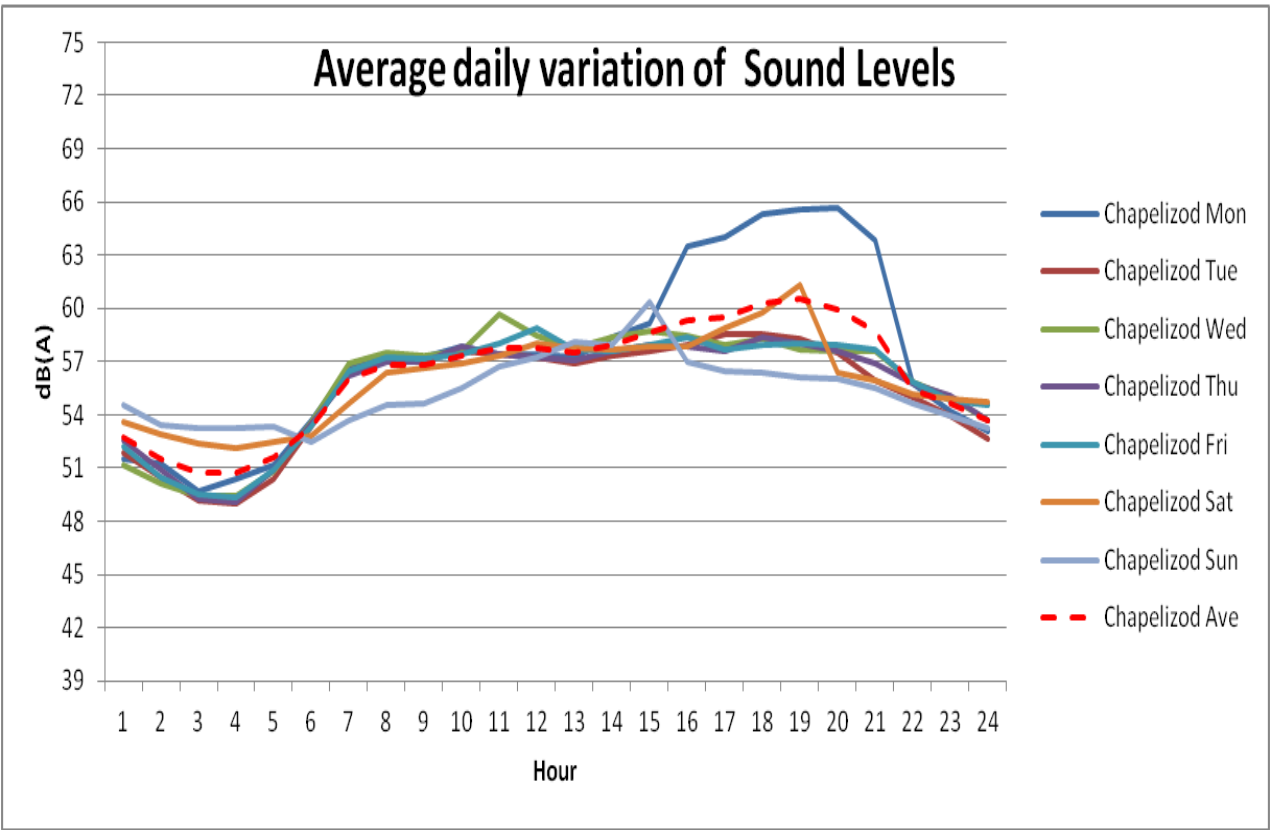


## **Average Daily Summary Charts**

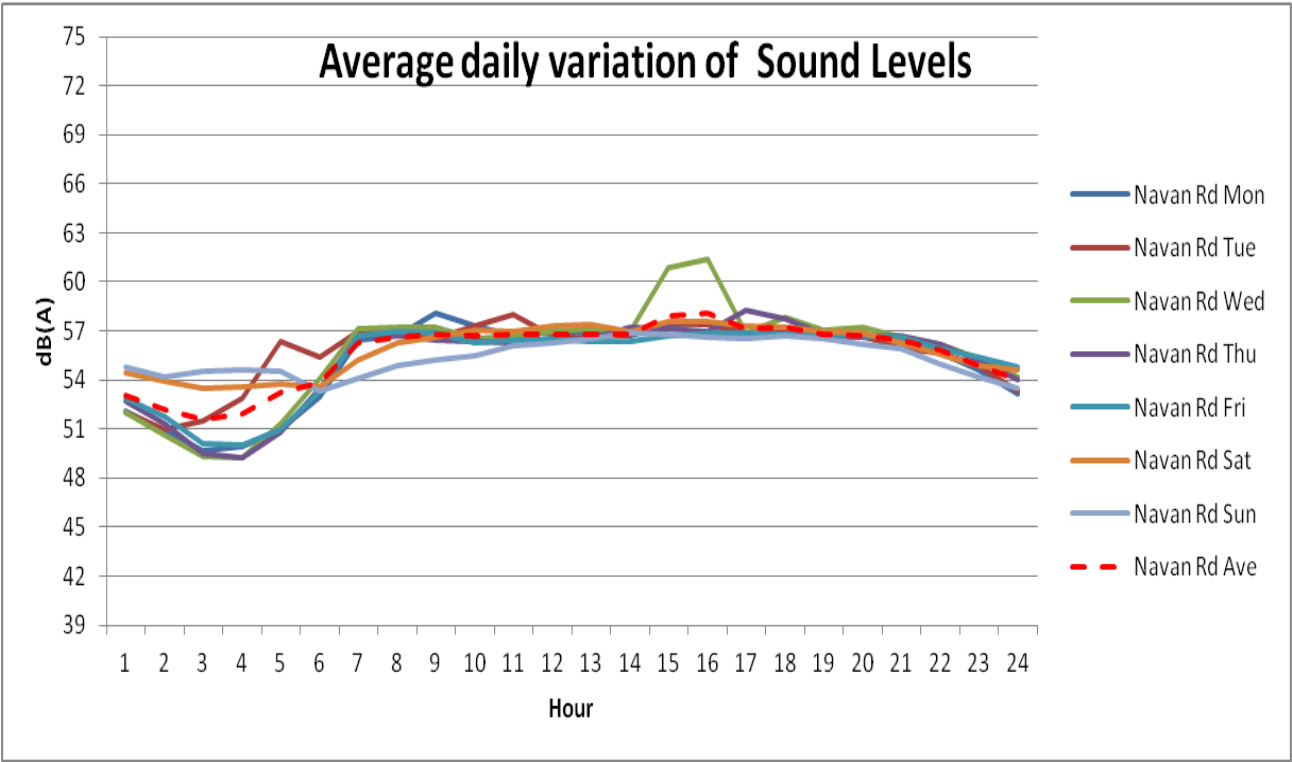
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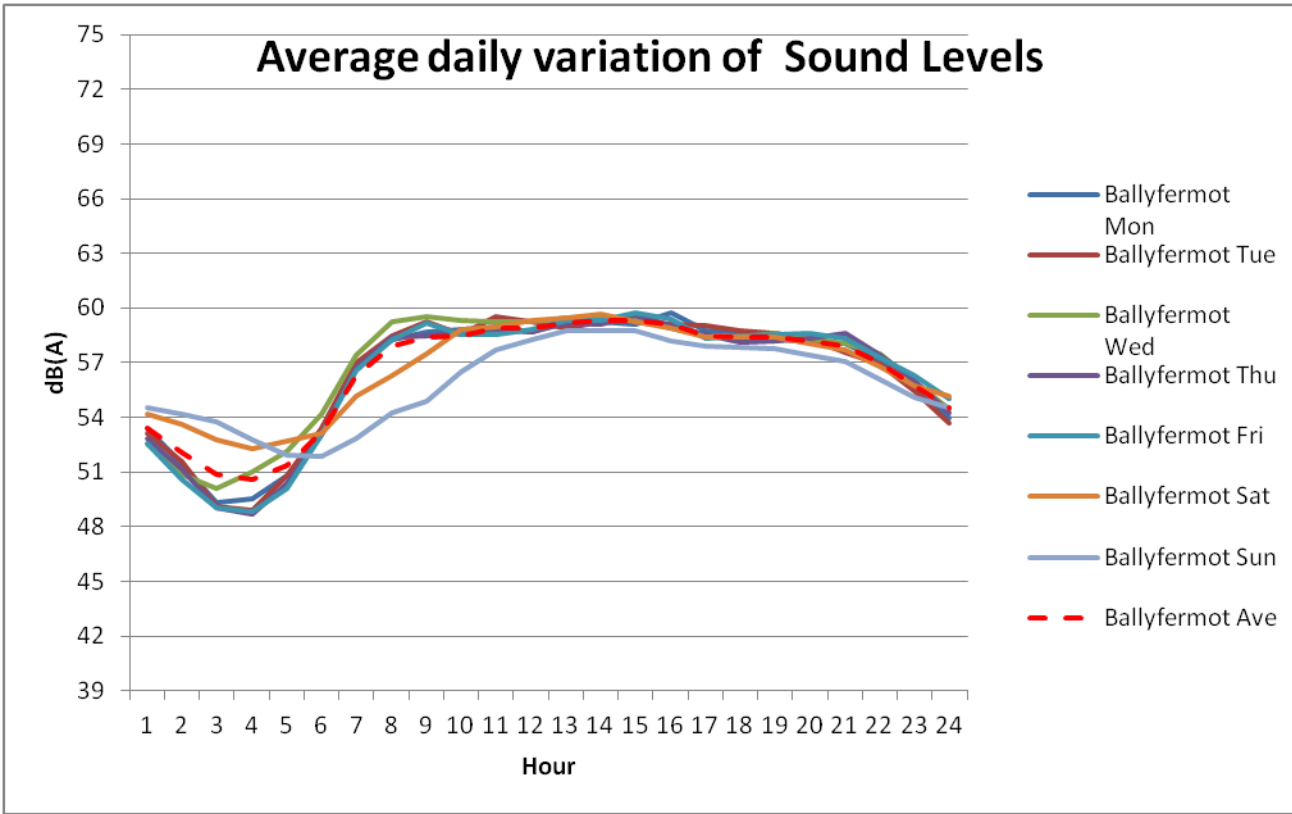
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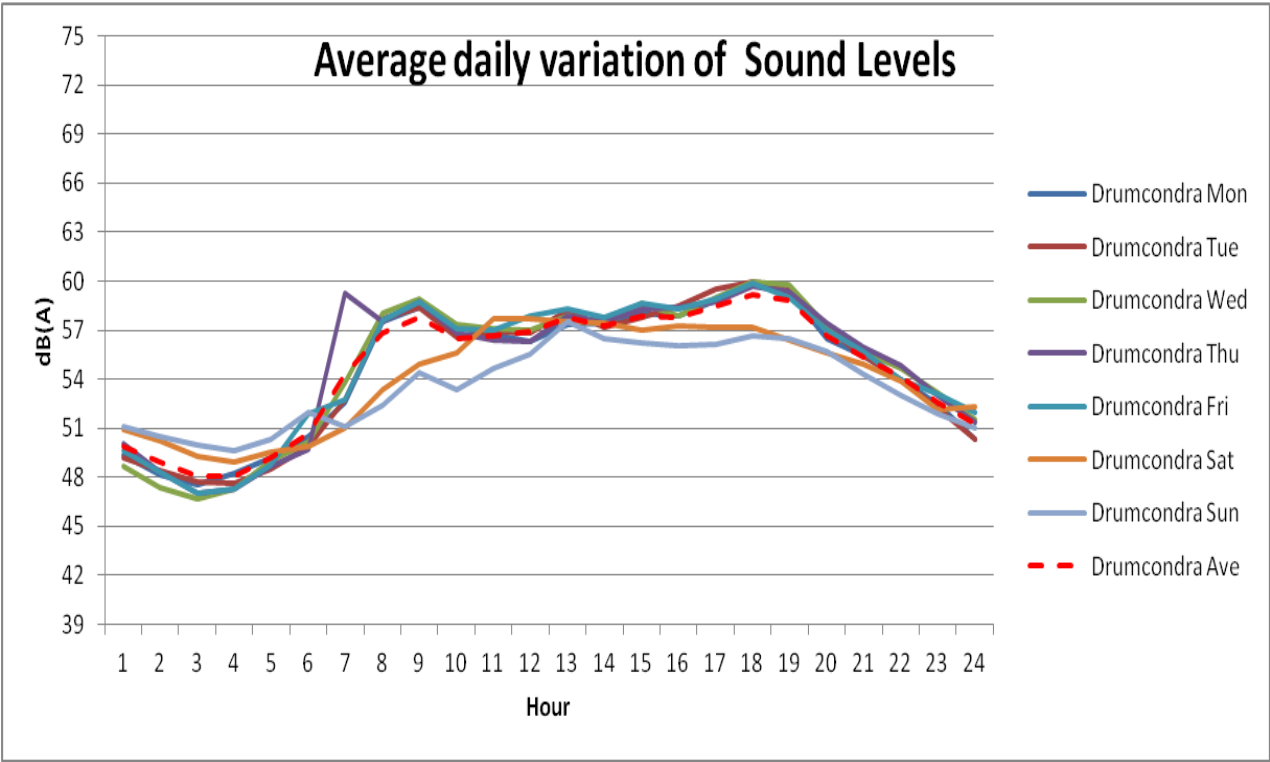
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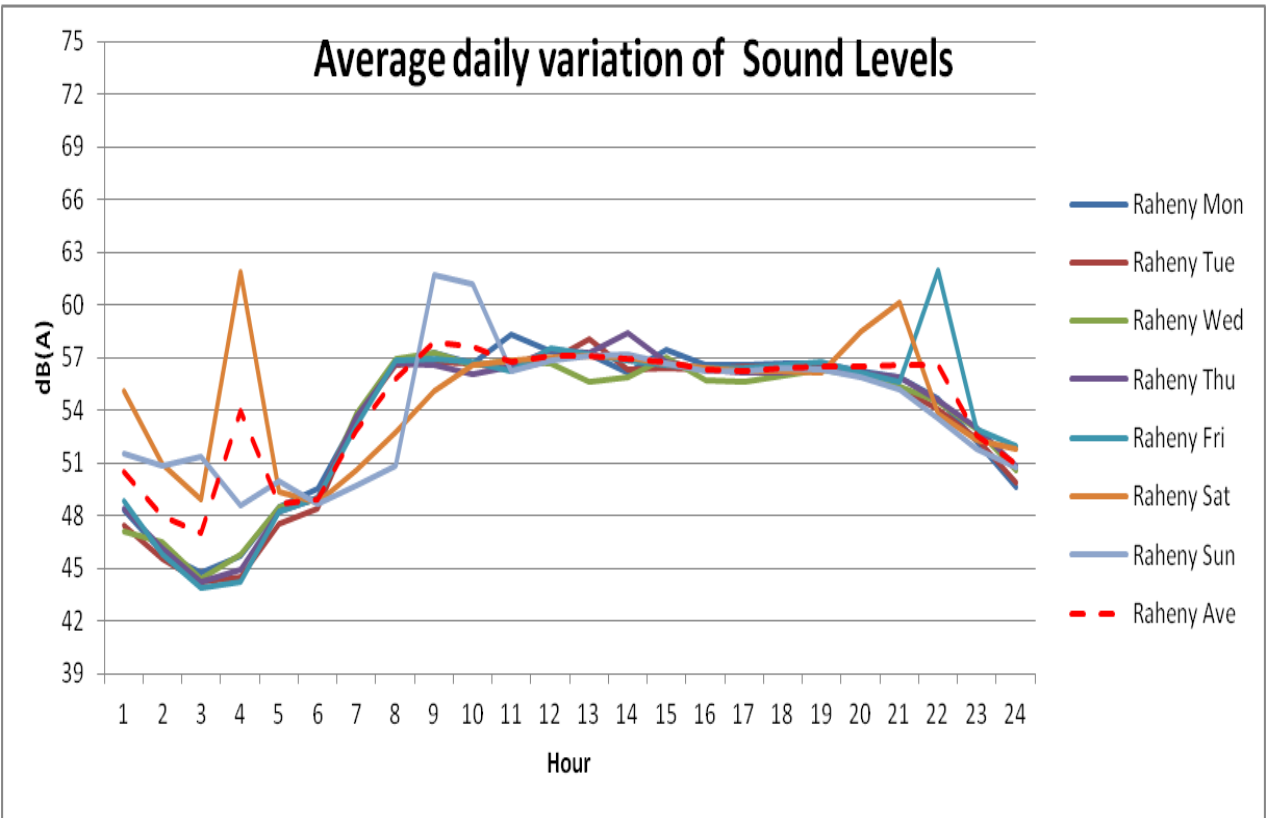
BALLYFERMOT



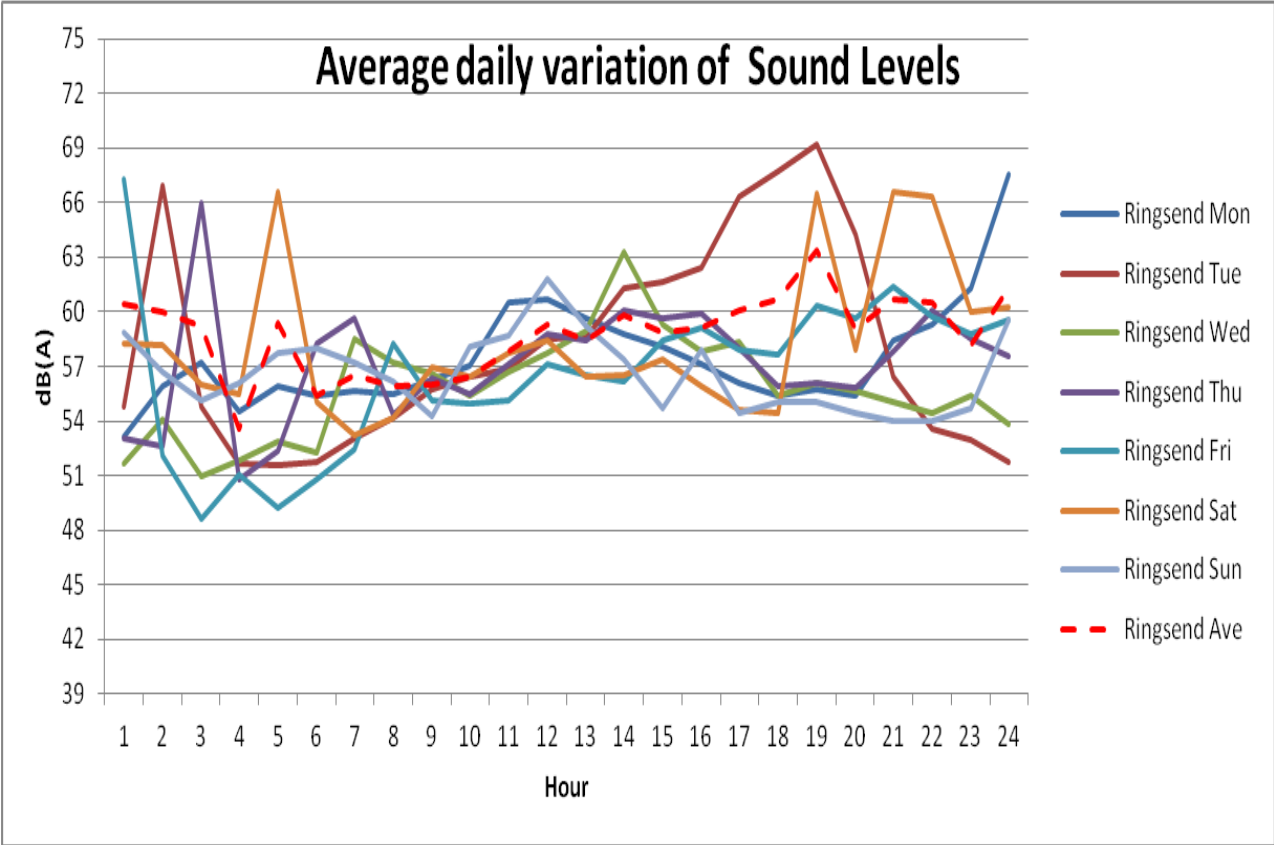
DRUMCONDRA



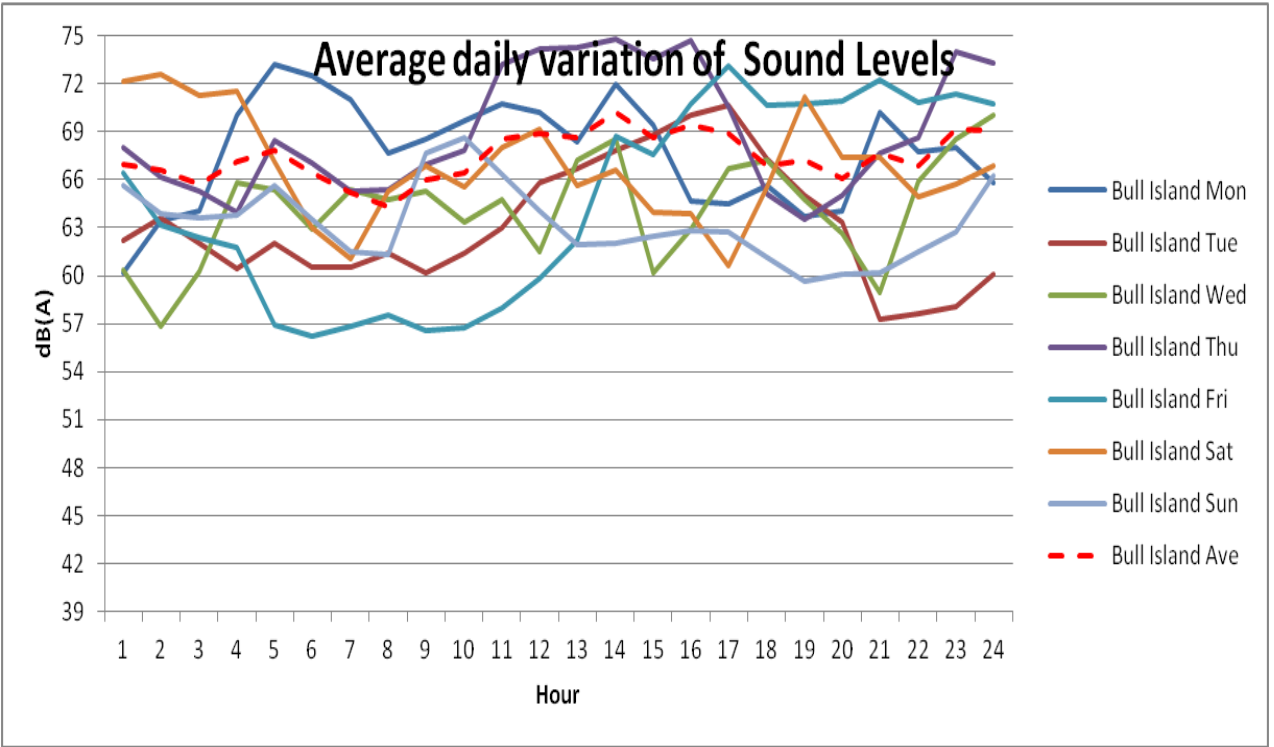
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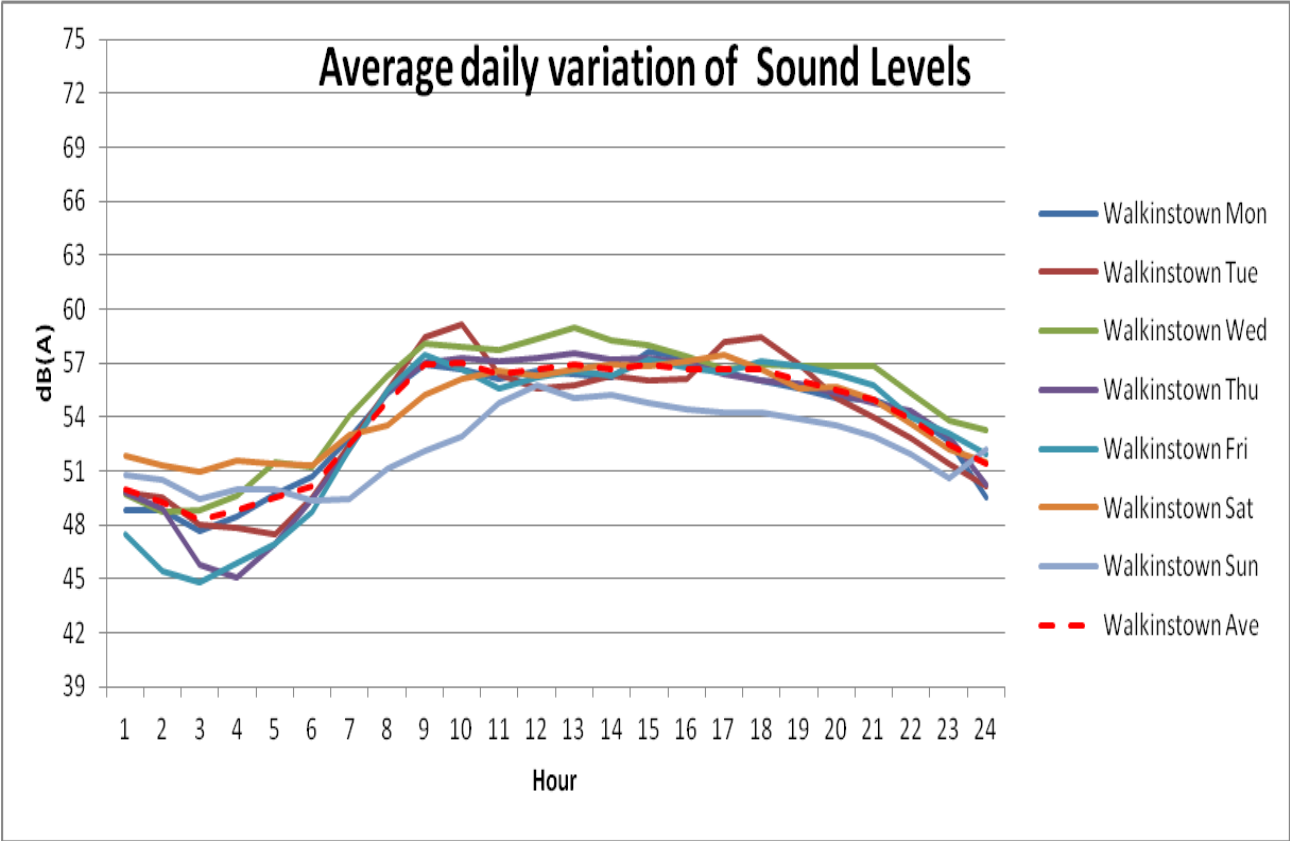
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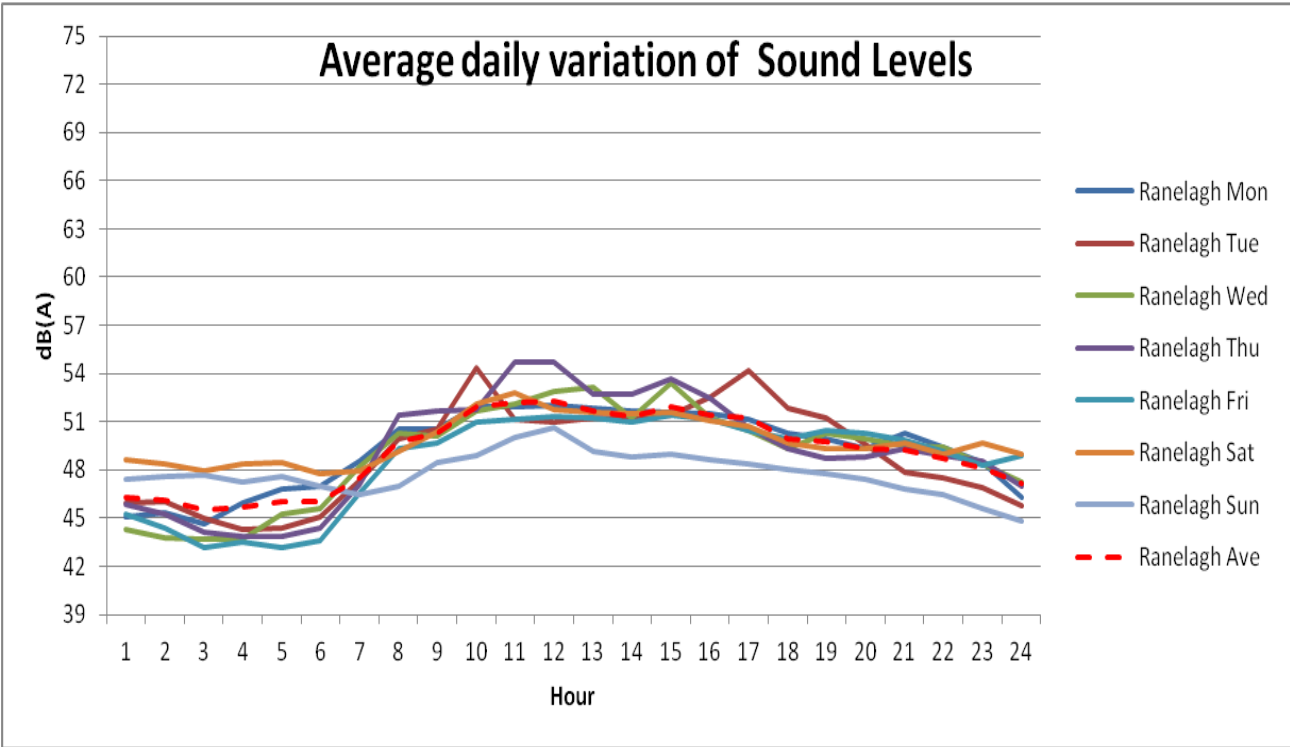
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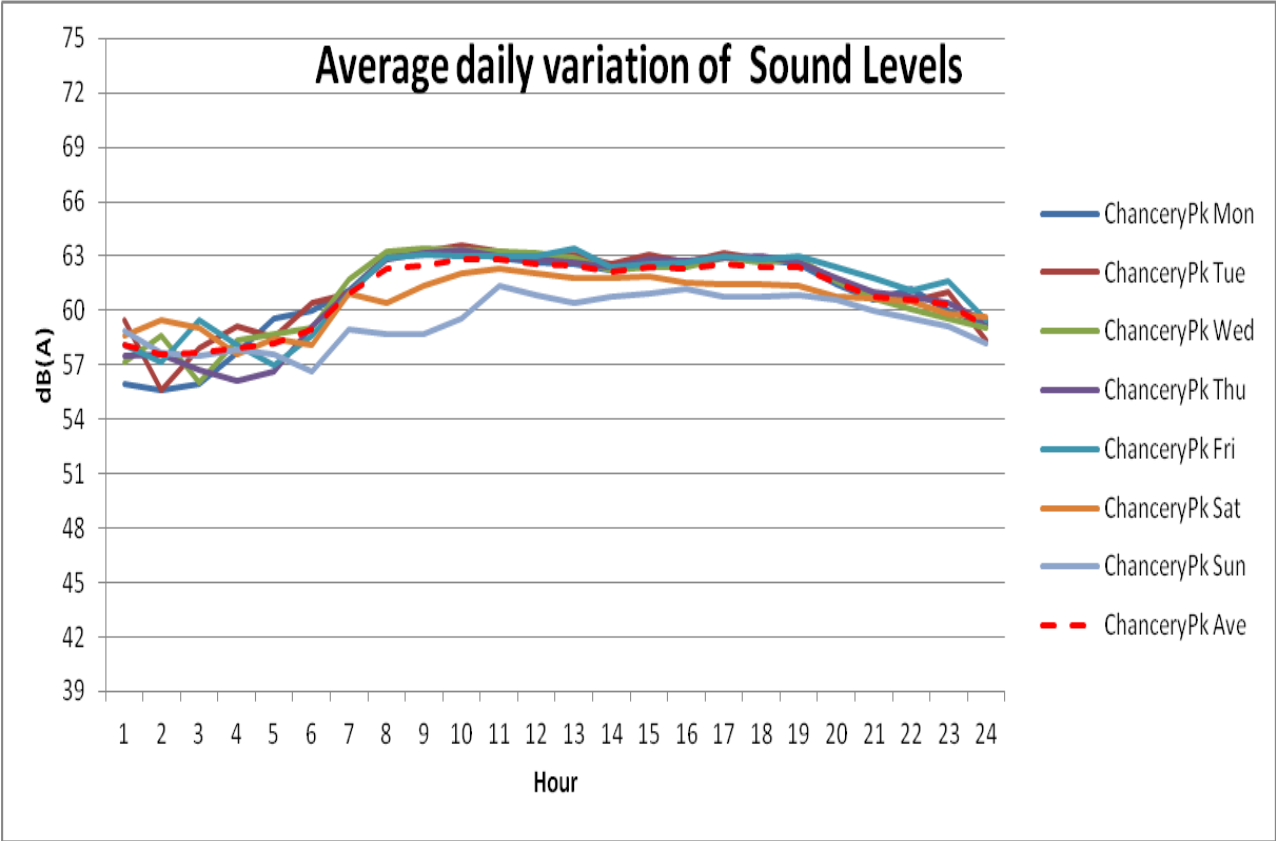


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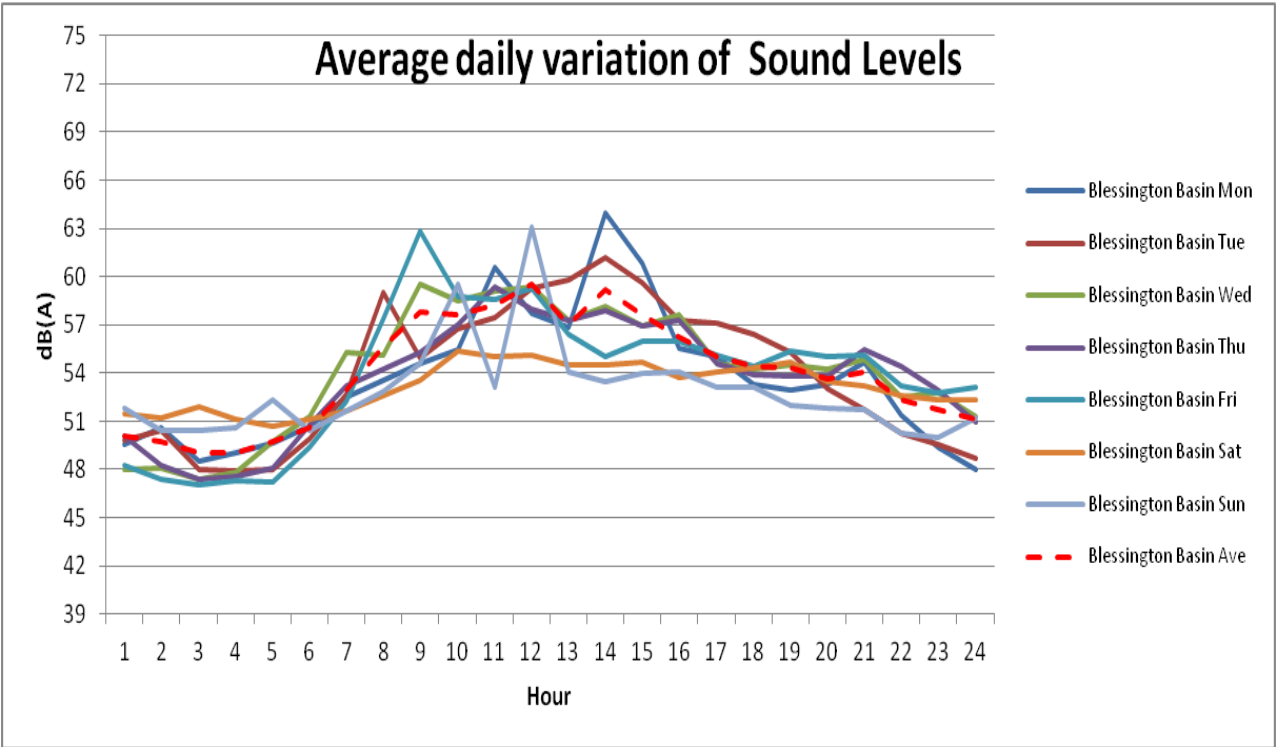




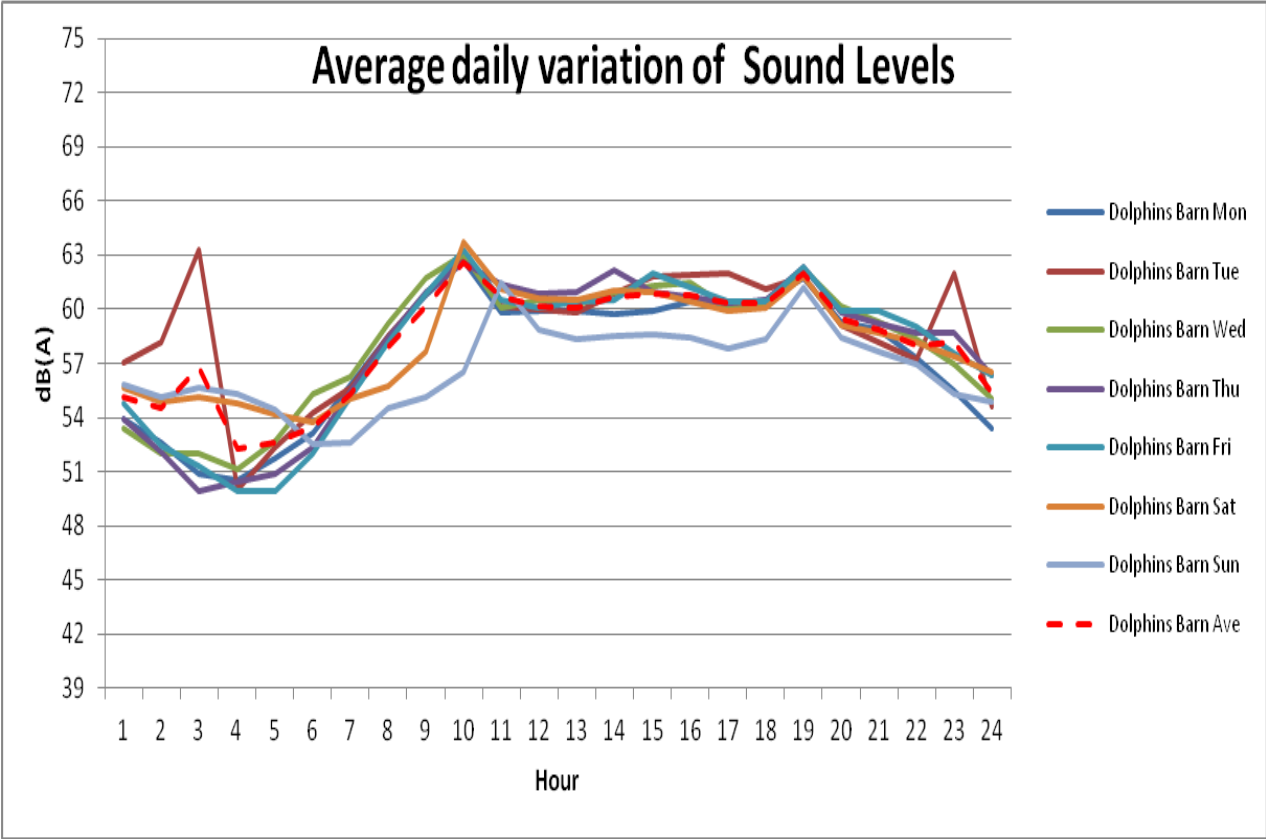
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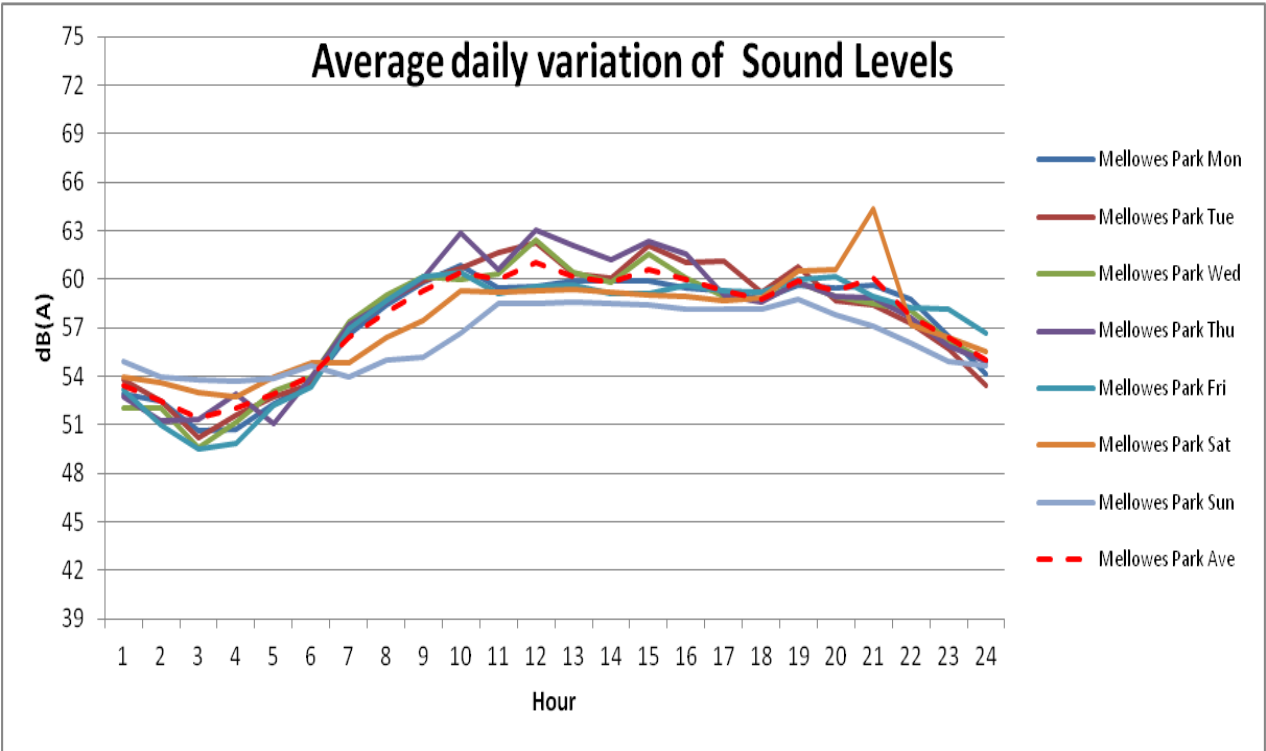
BLESSINGTON BASIN



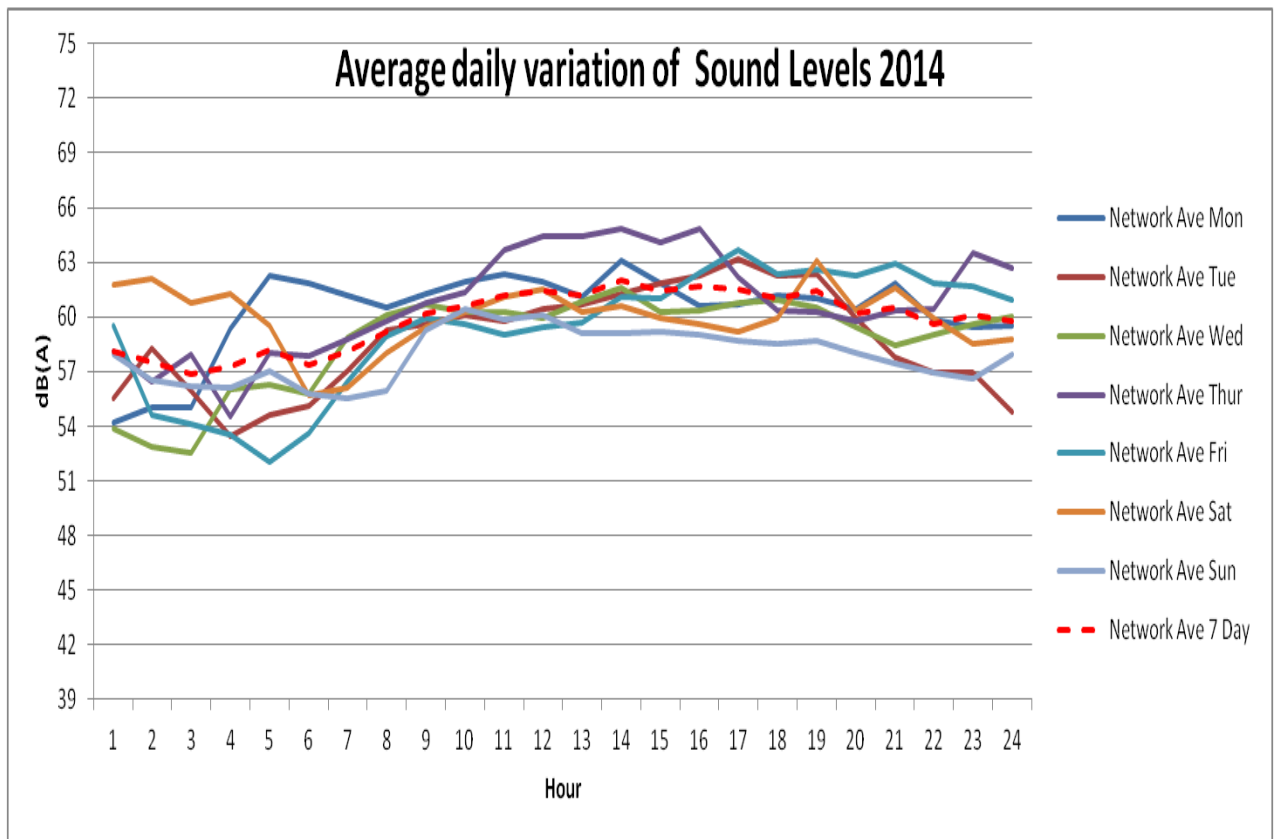
DOLPHIN’S BARN



MELLOW’S PARK



## NETWORK

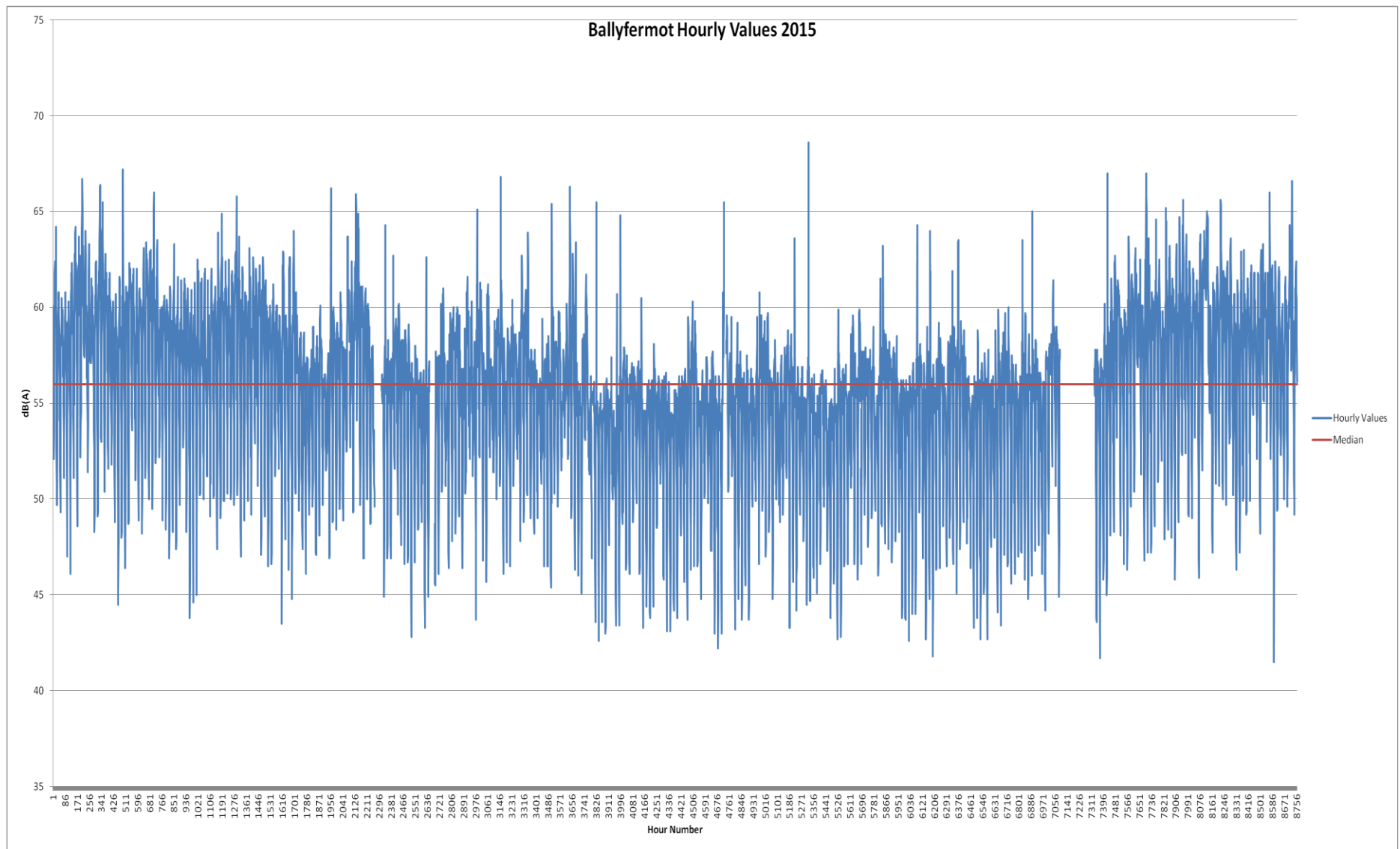


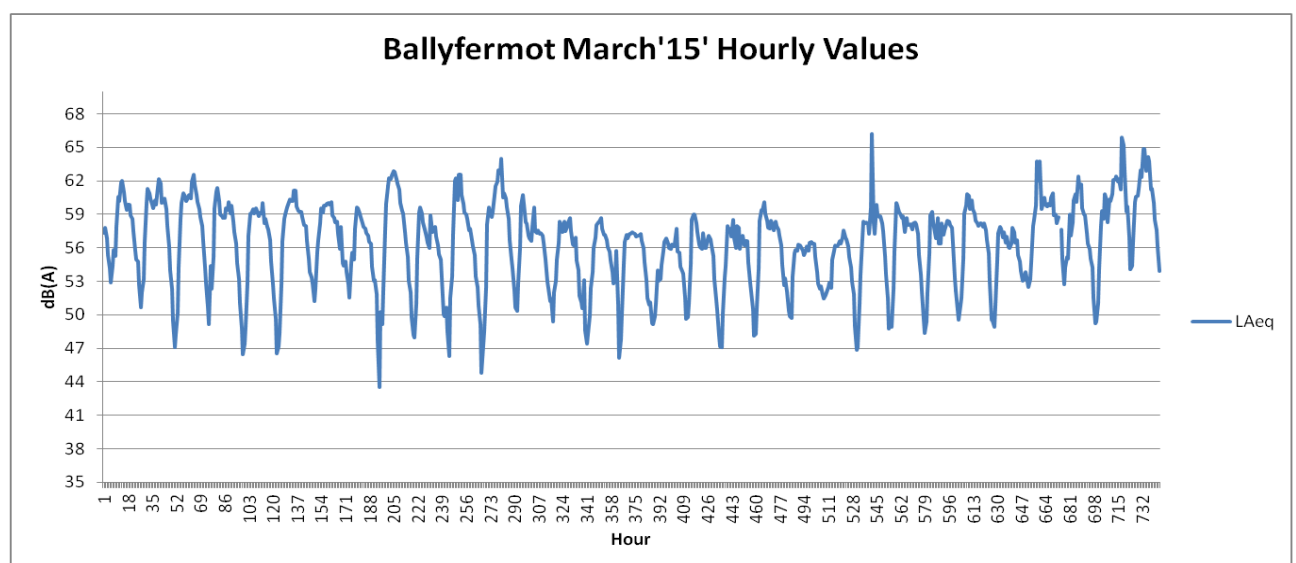
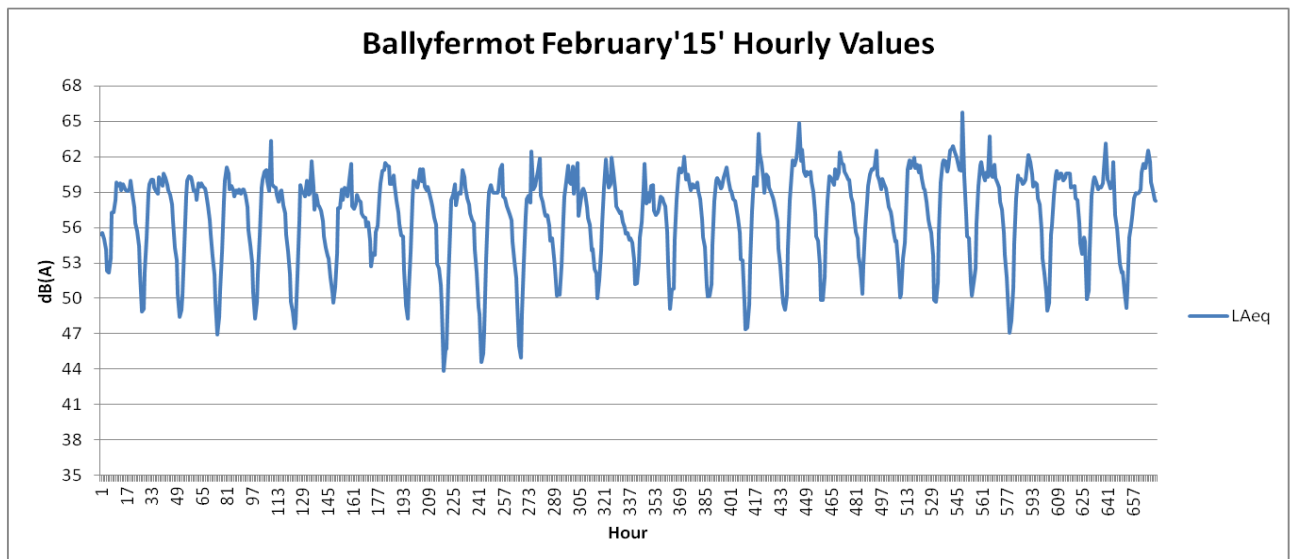
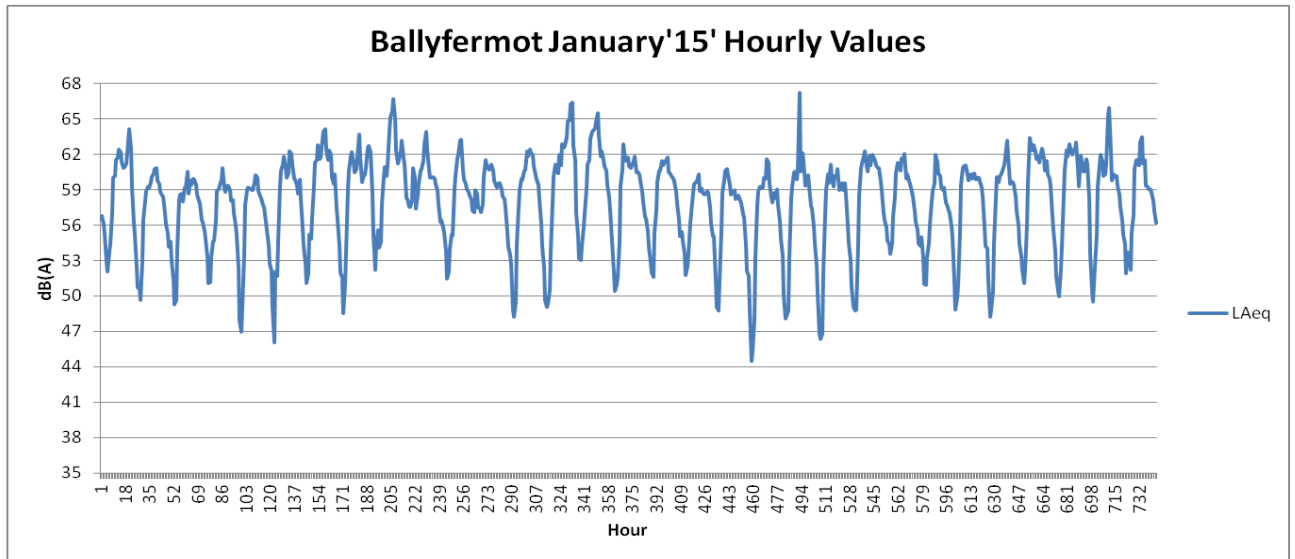


## **Monthly Summary Charts**

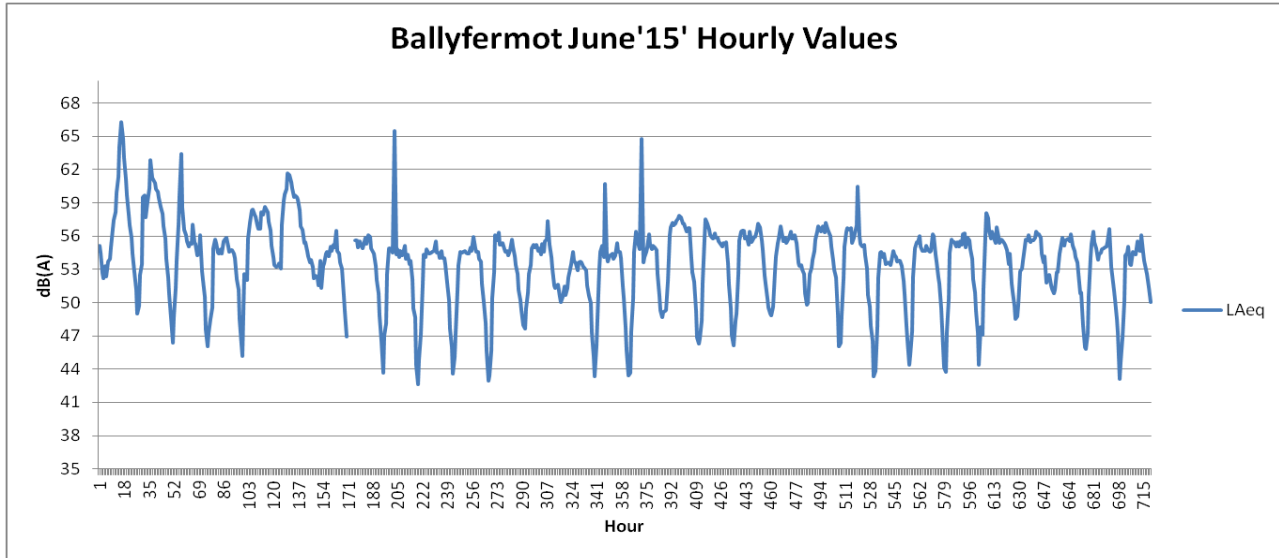
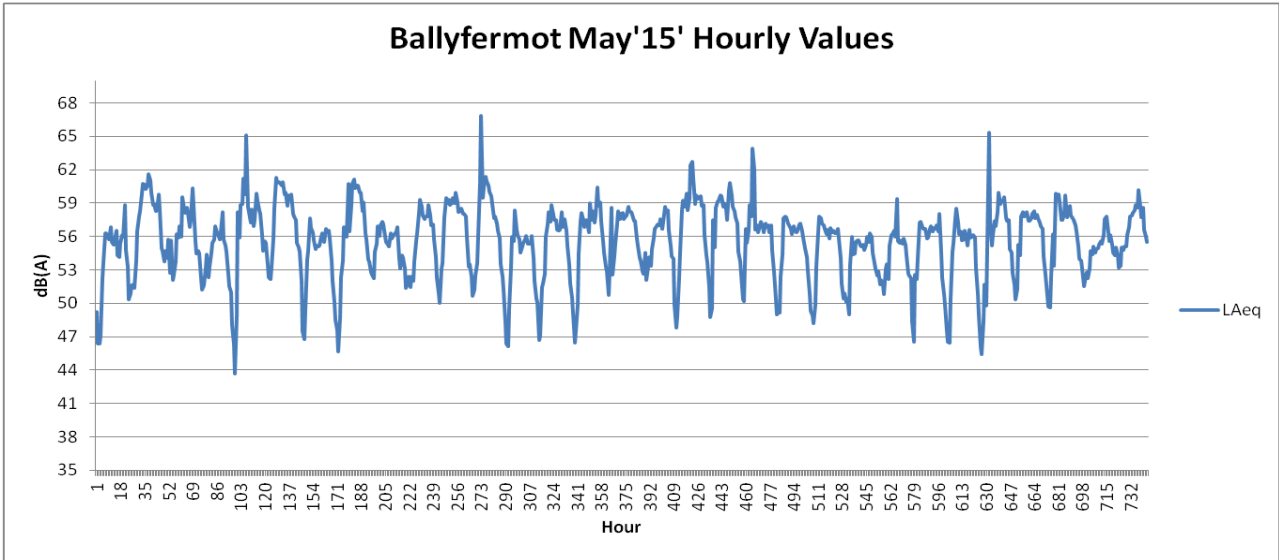
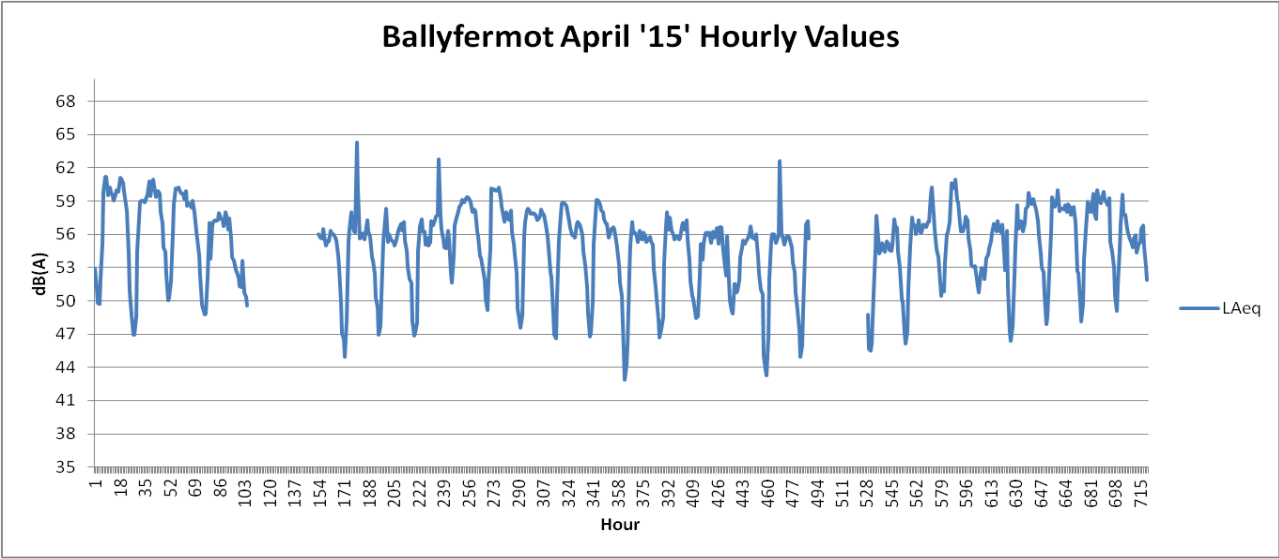
**BALLYFERMOT CIVIC CENTRE**  
**BALLYFERMOT ROAD**  
**DUBLIN 10**

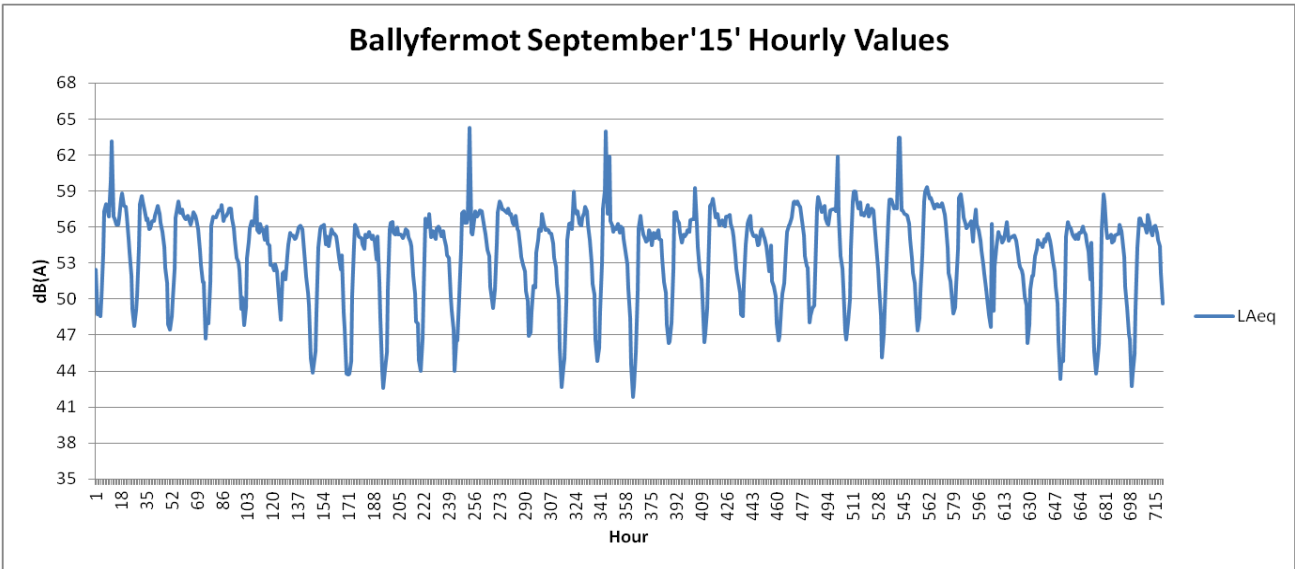
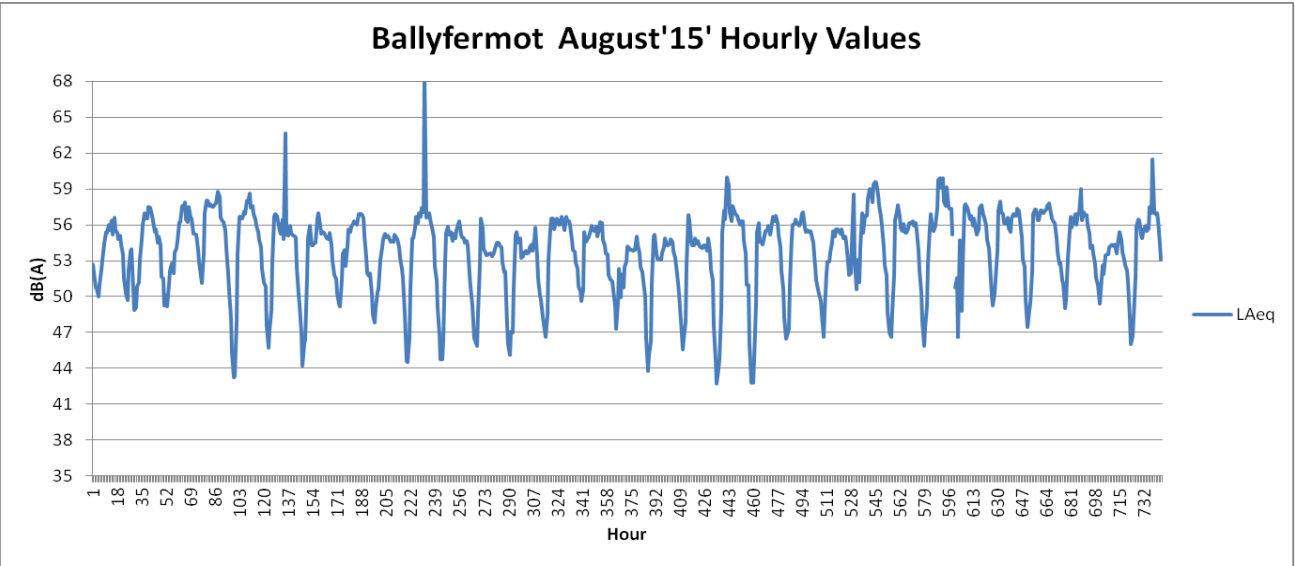
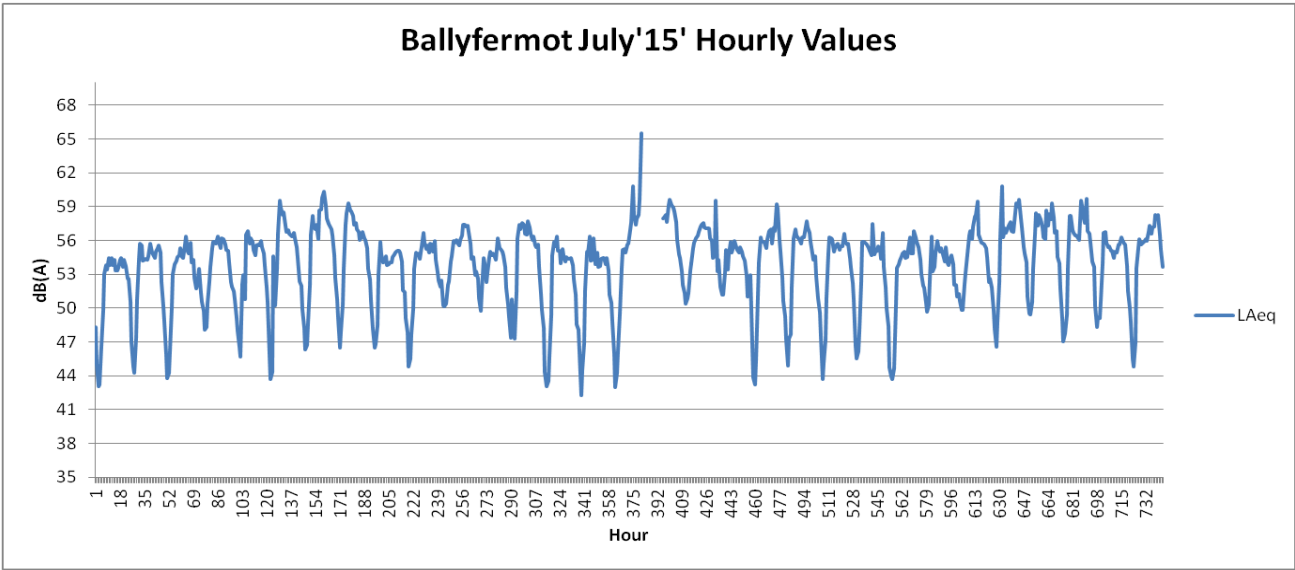


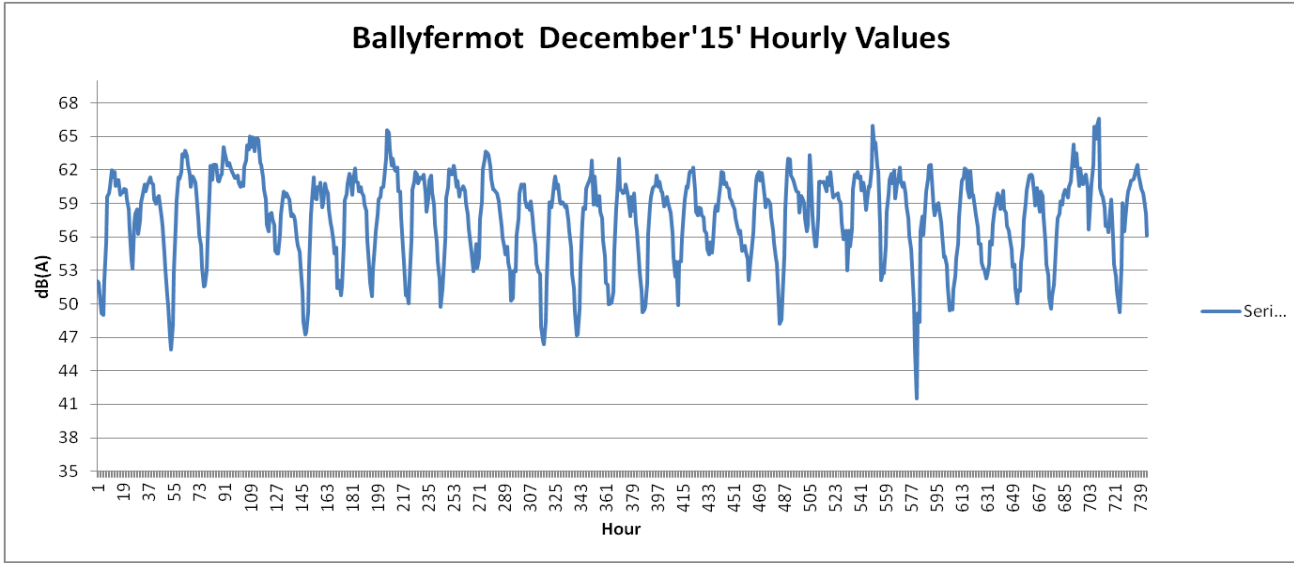
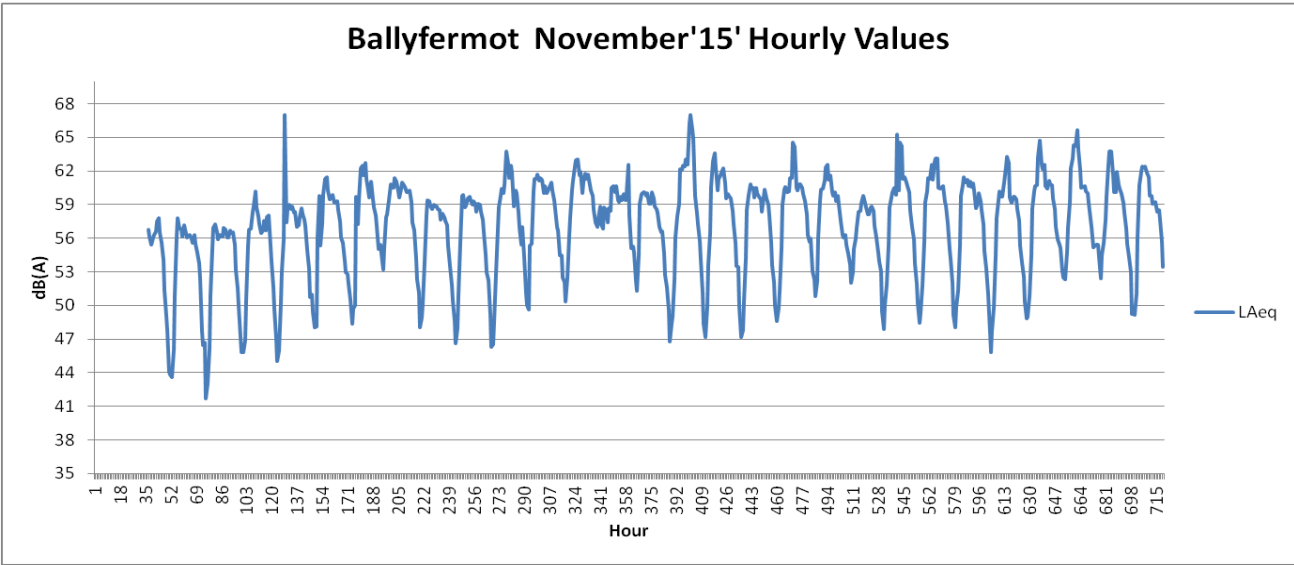
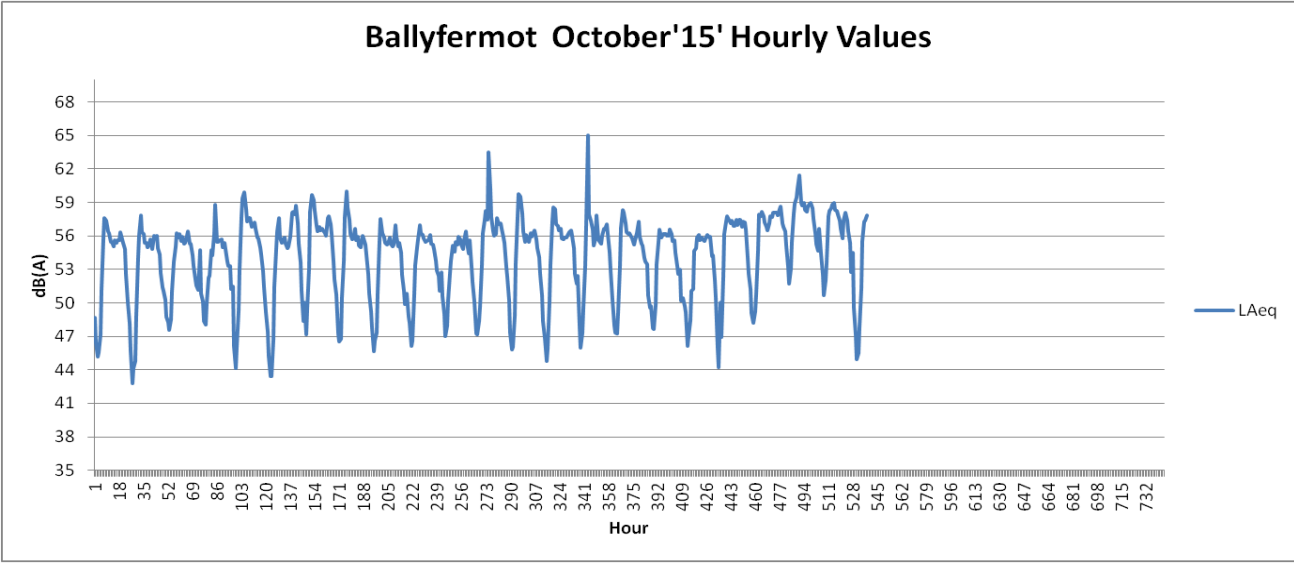






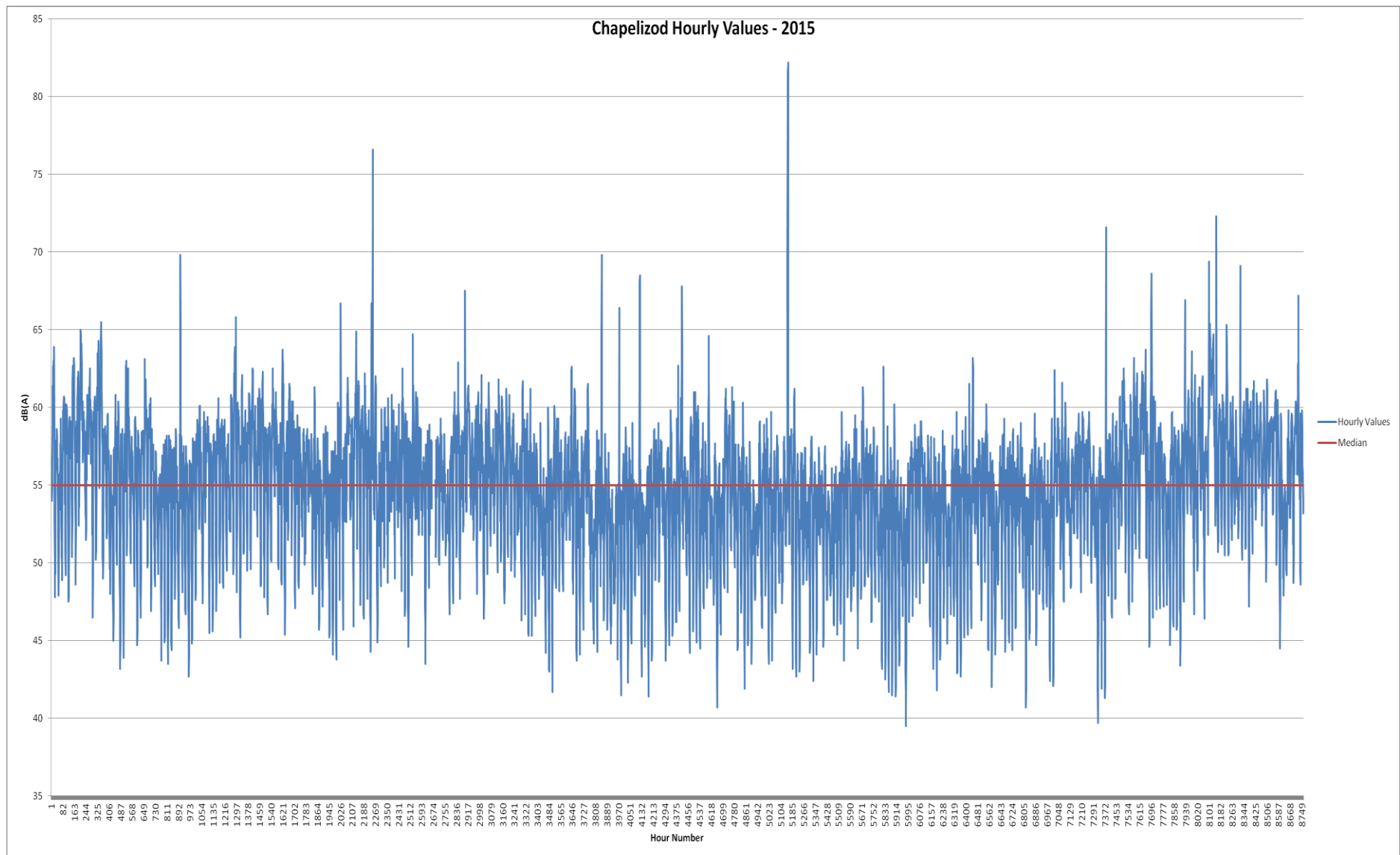




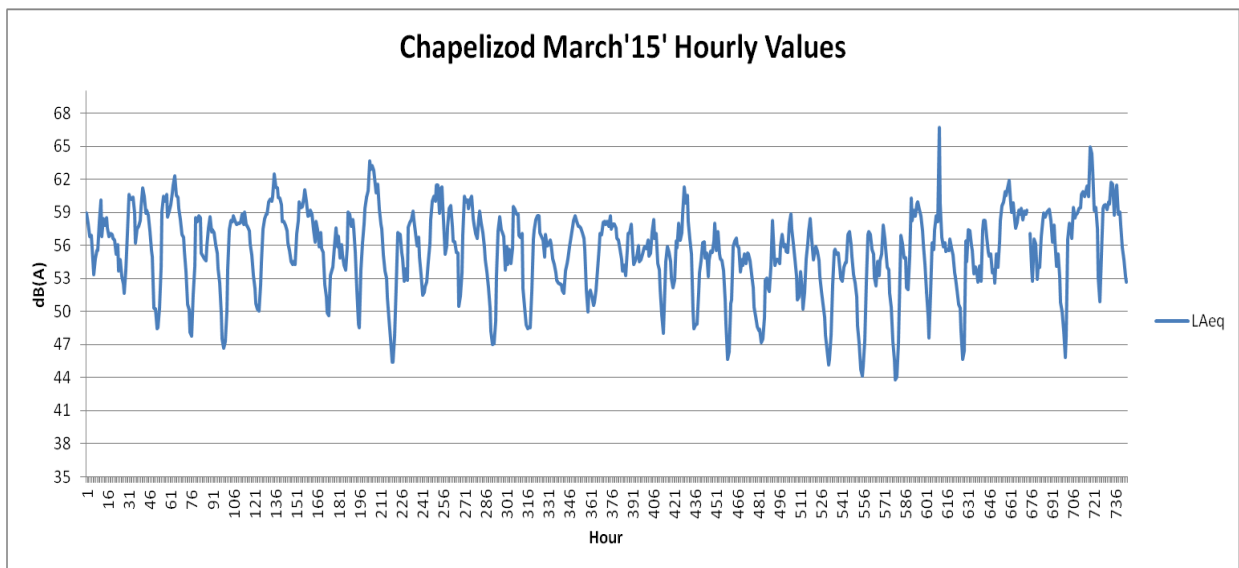
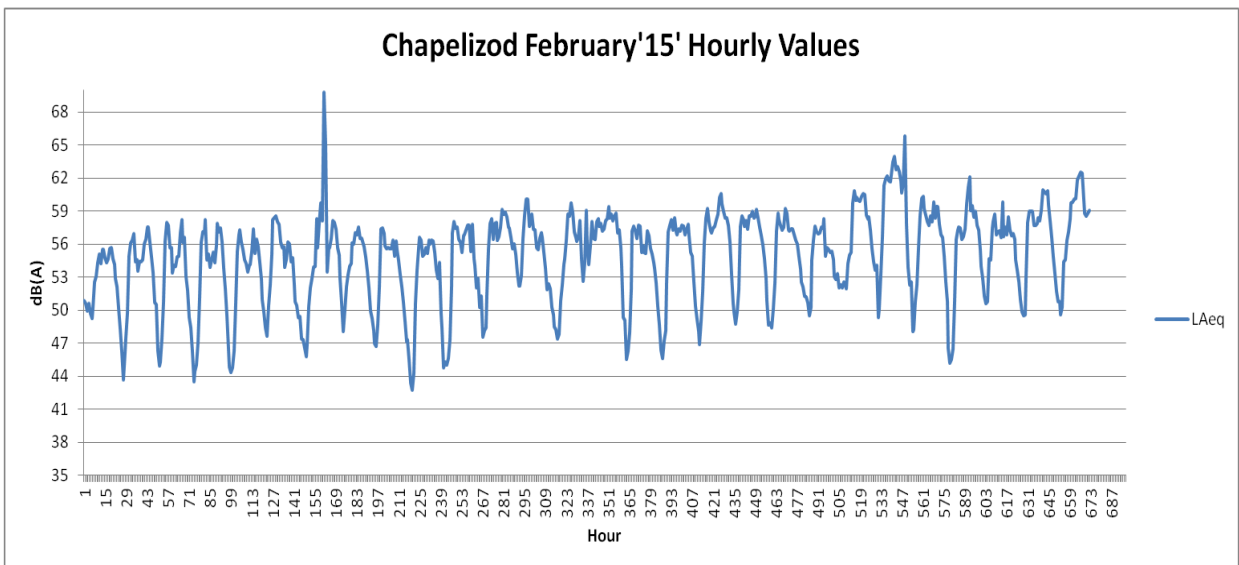
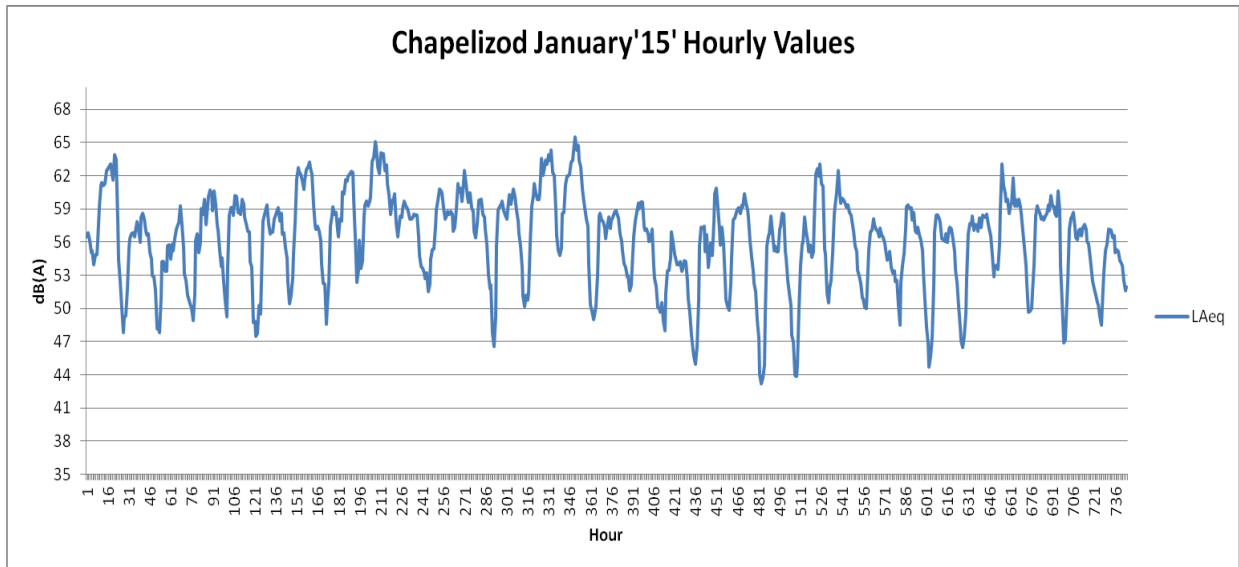


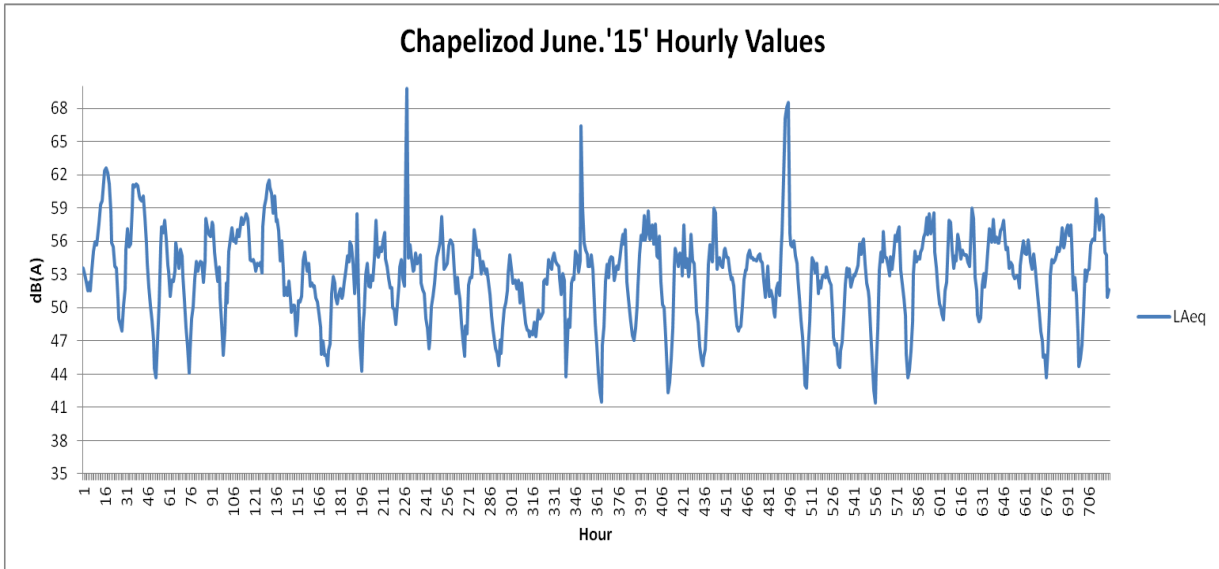
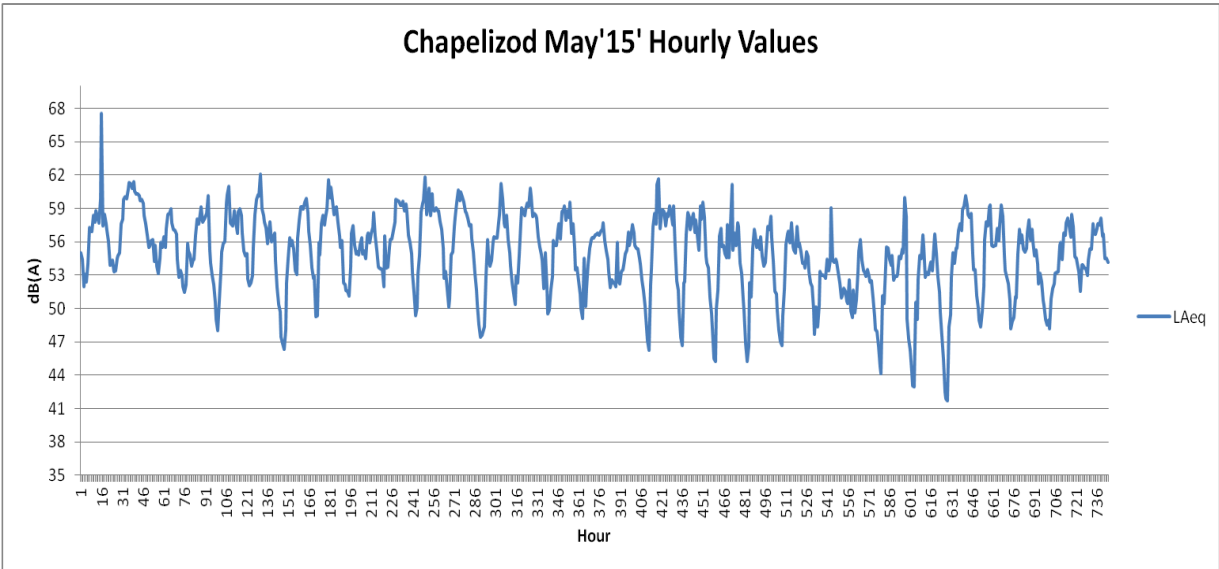
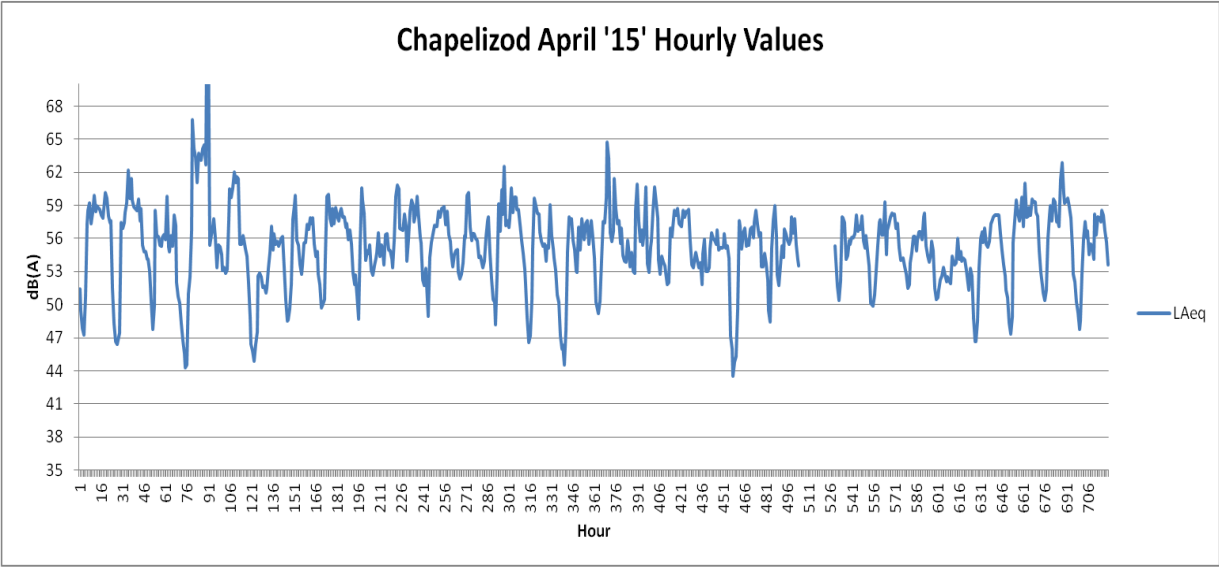
**DUBLIN CITY COUNCIL ROWING CLUB**  
**CHAPELIZOD ROAD**  
**DUBLIN 8**

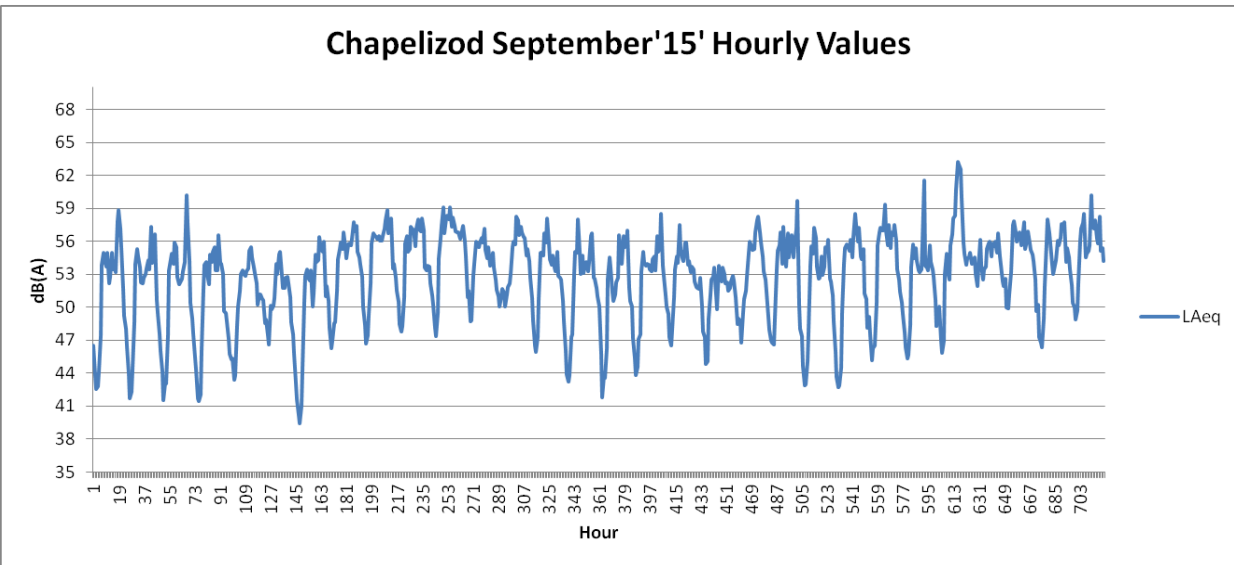
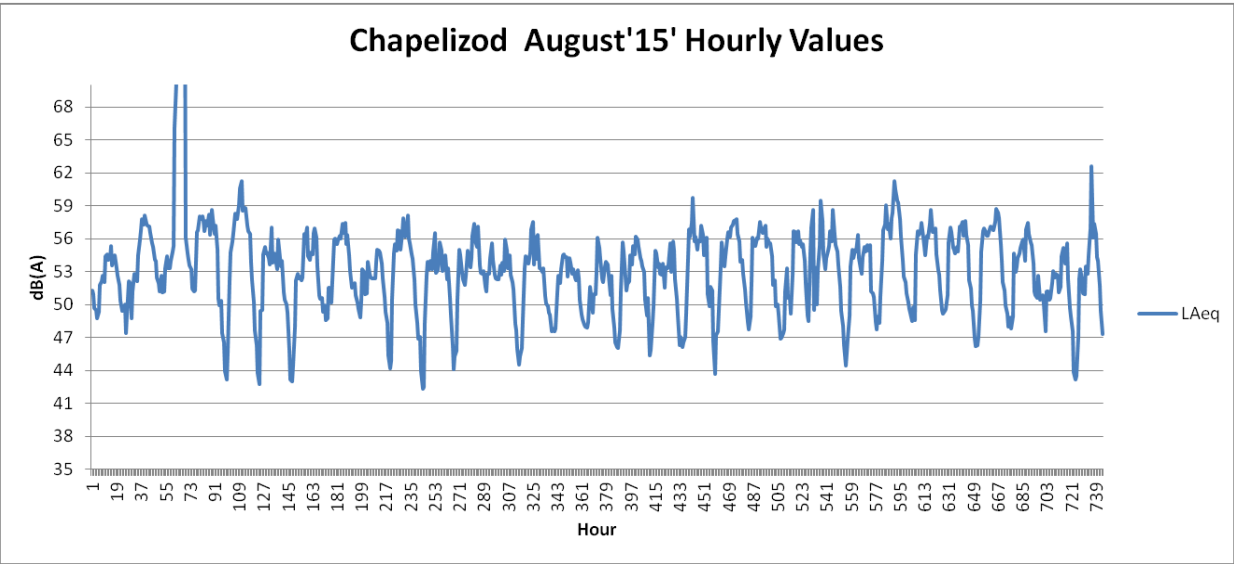
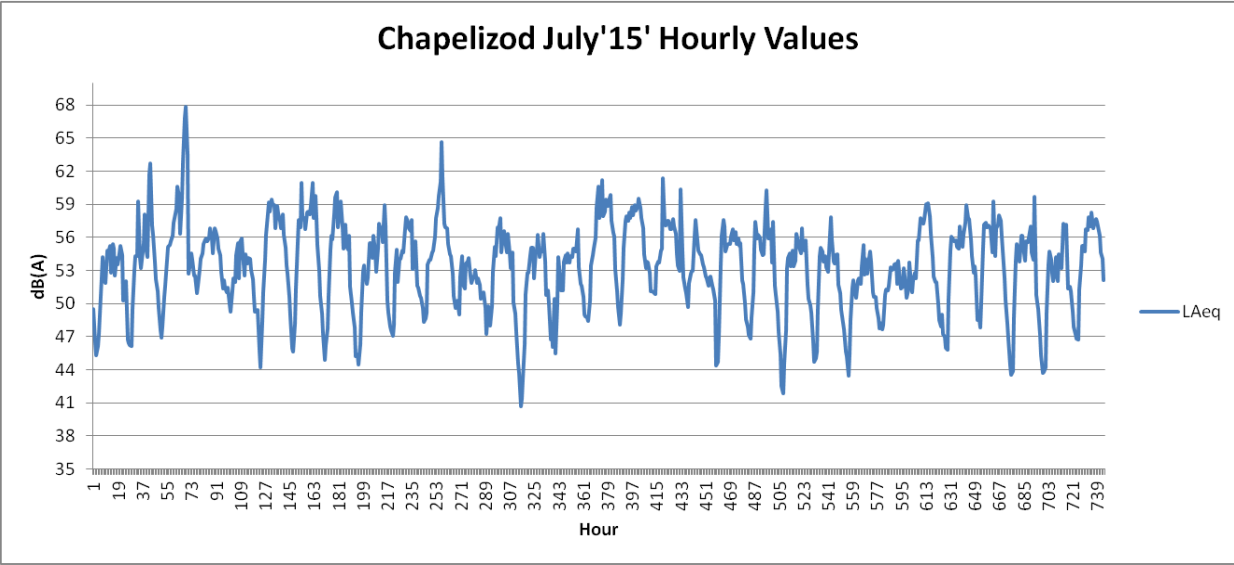




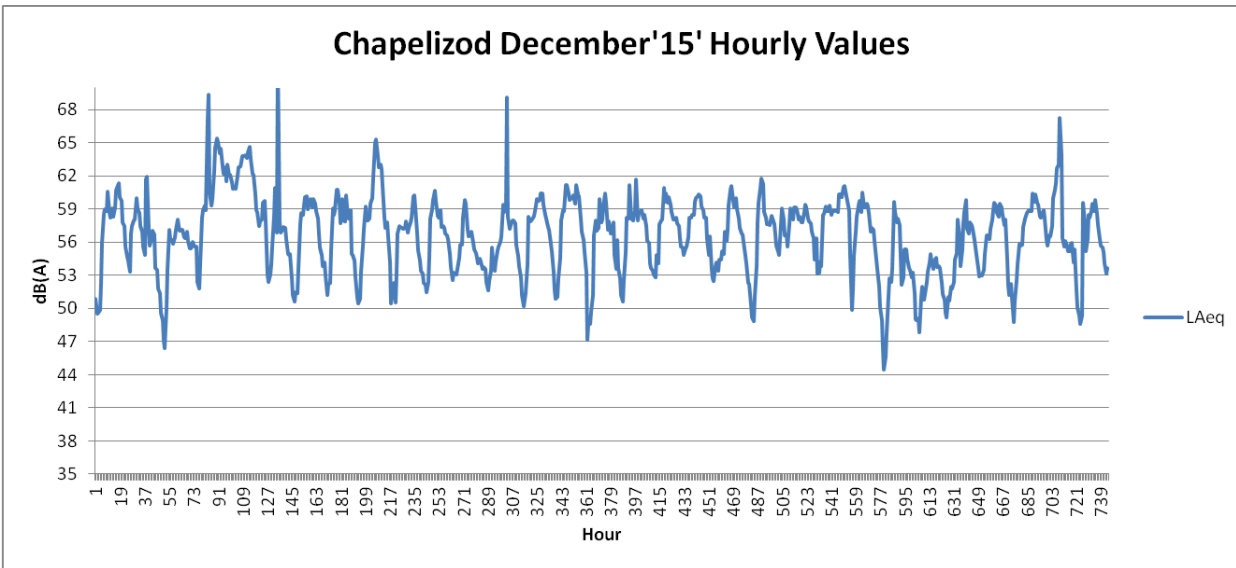
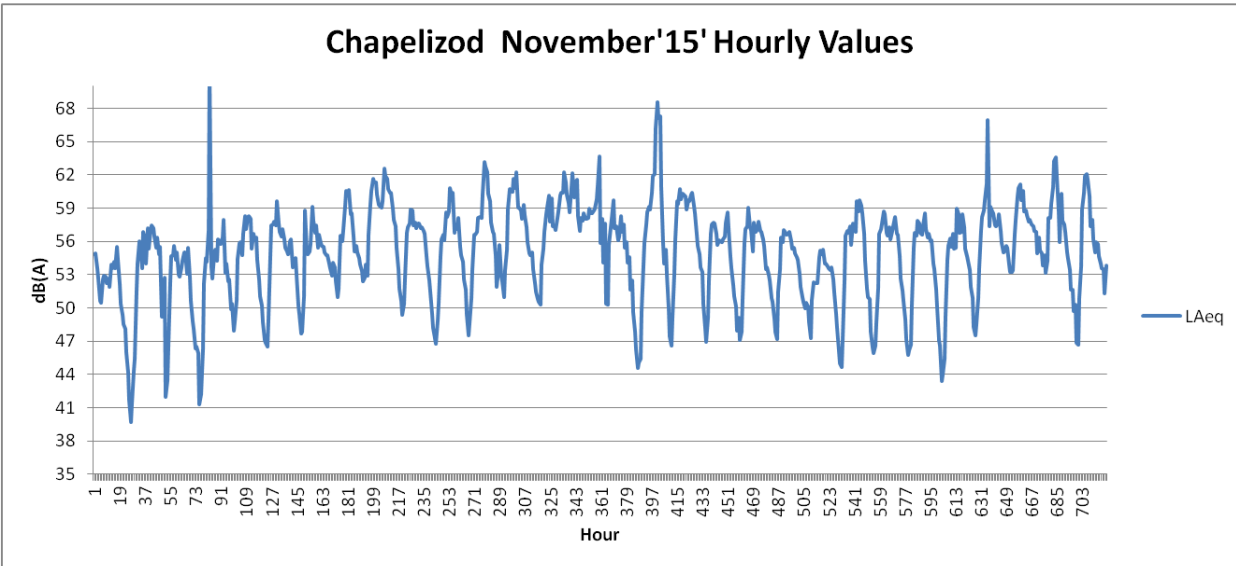
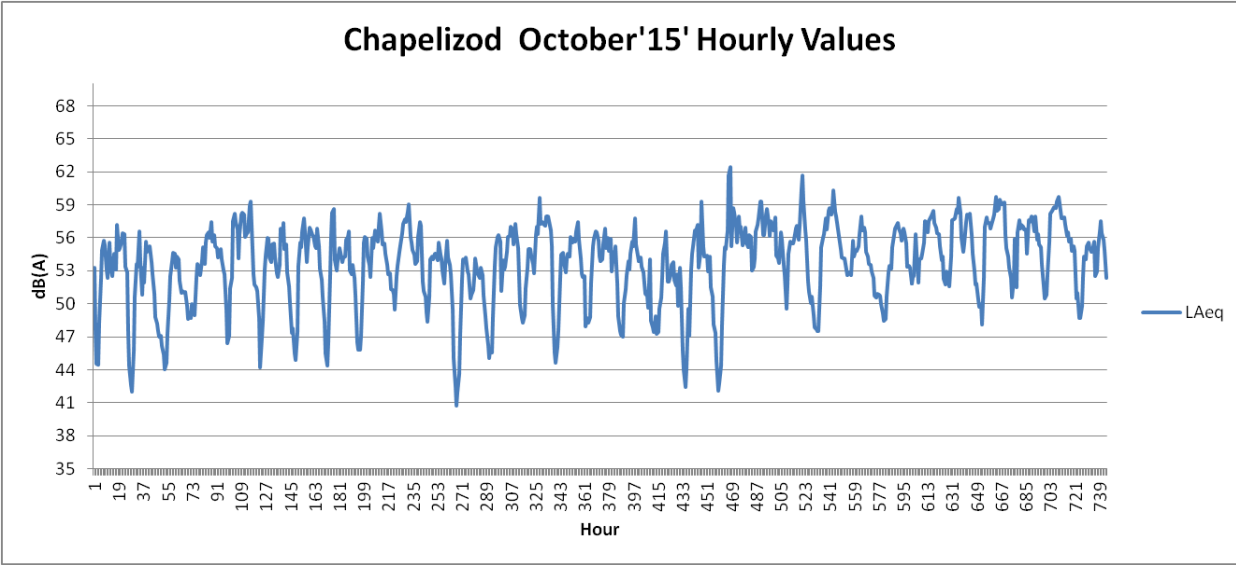






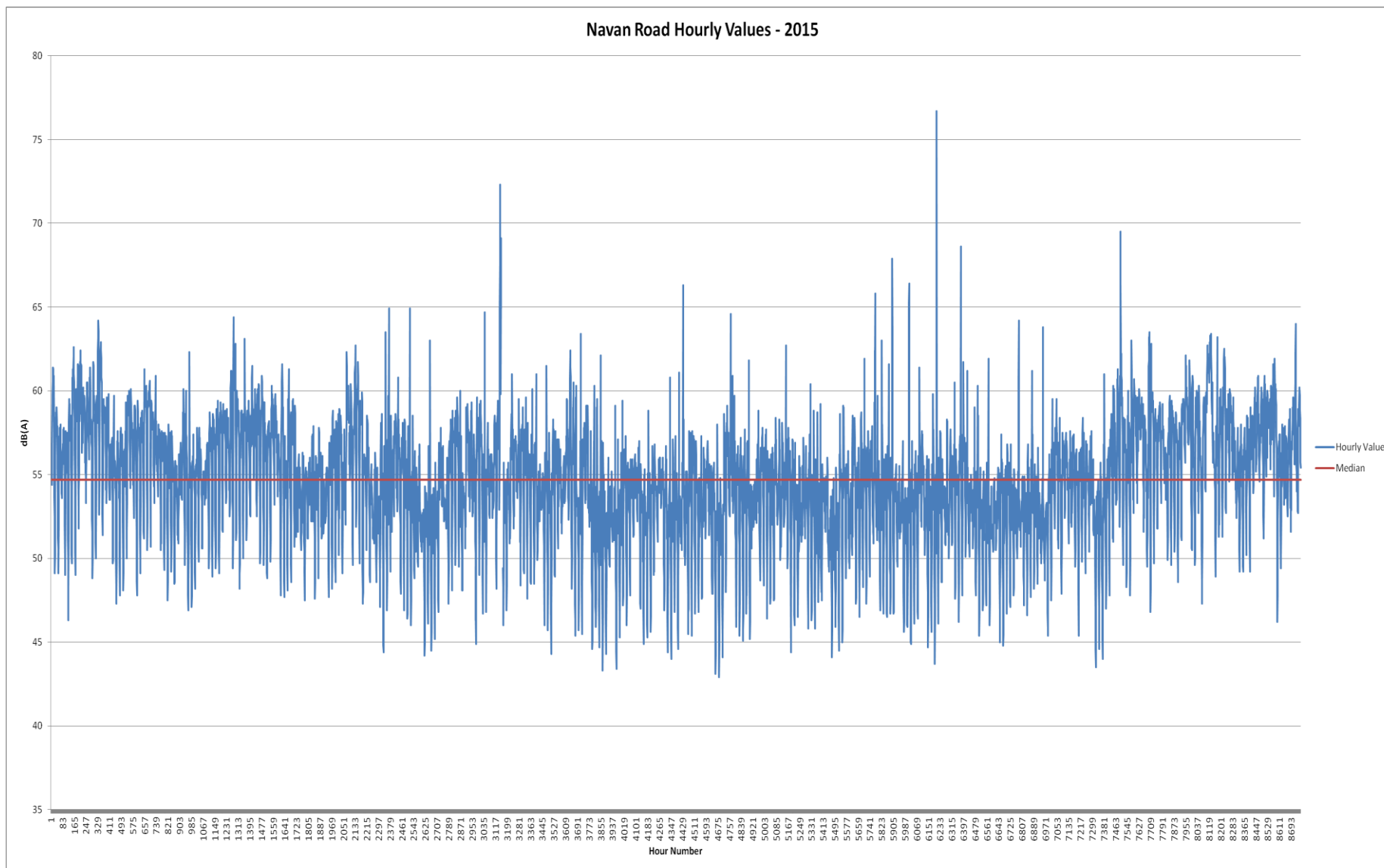


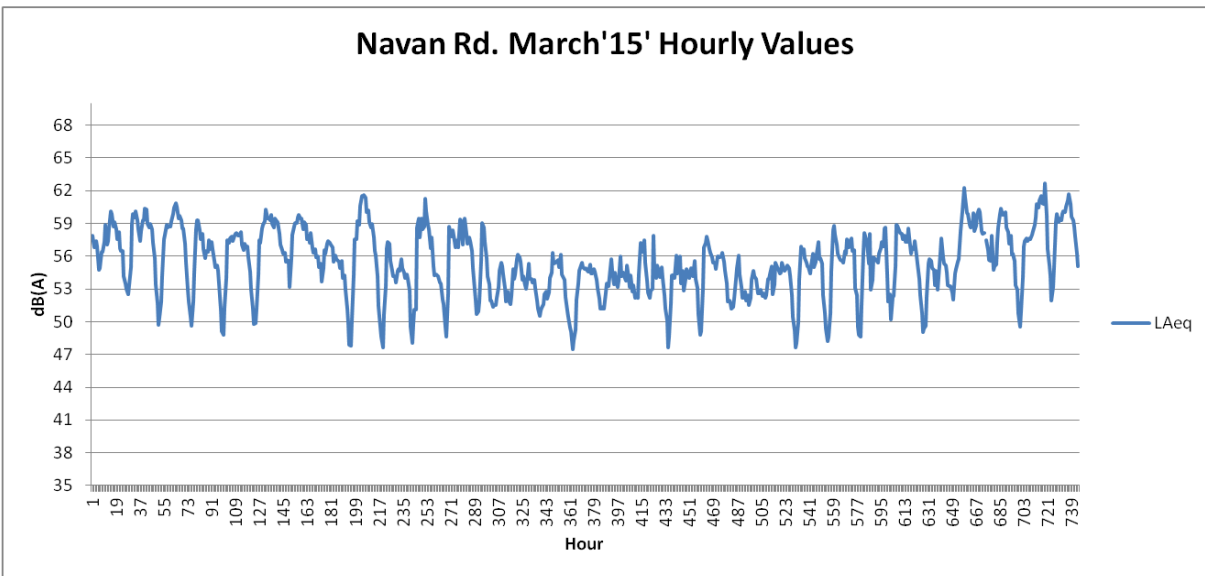
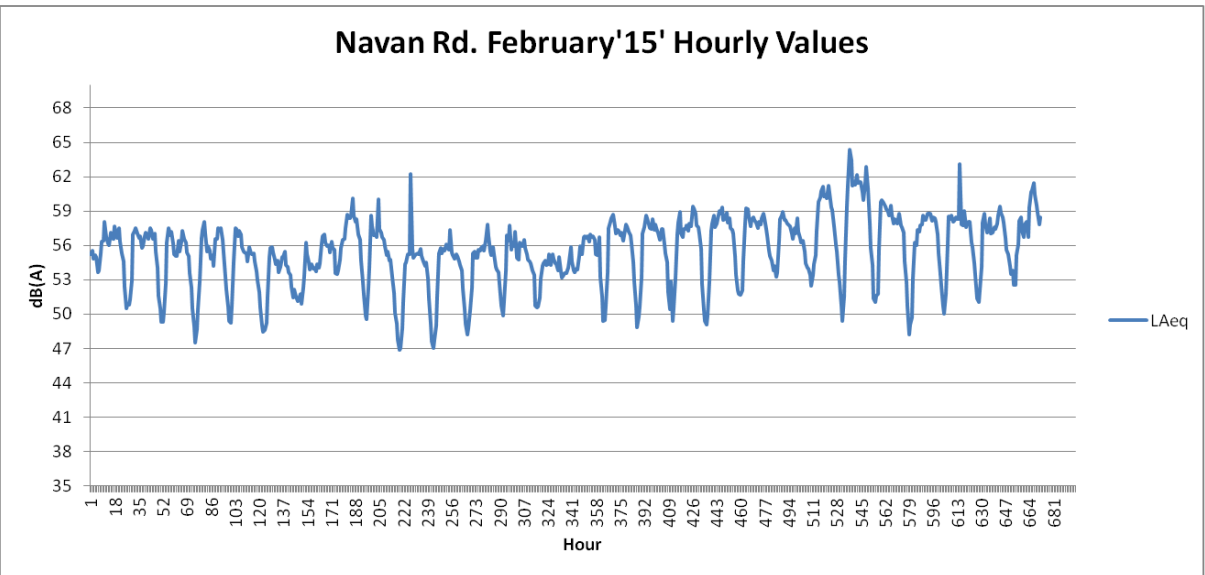
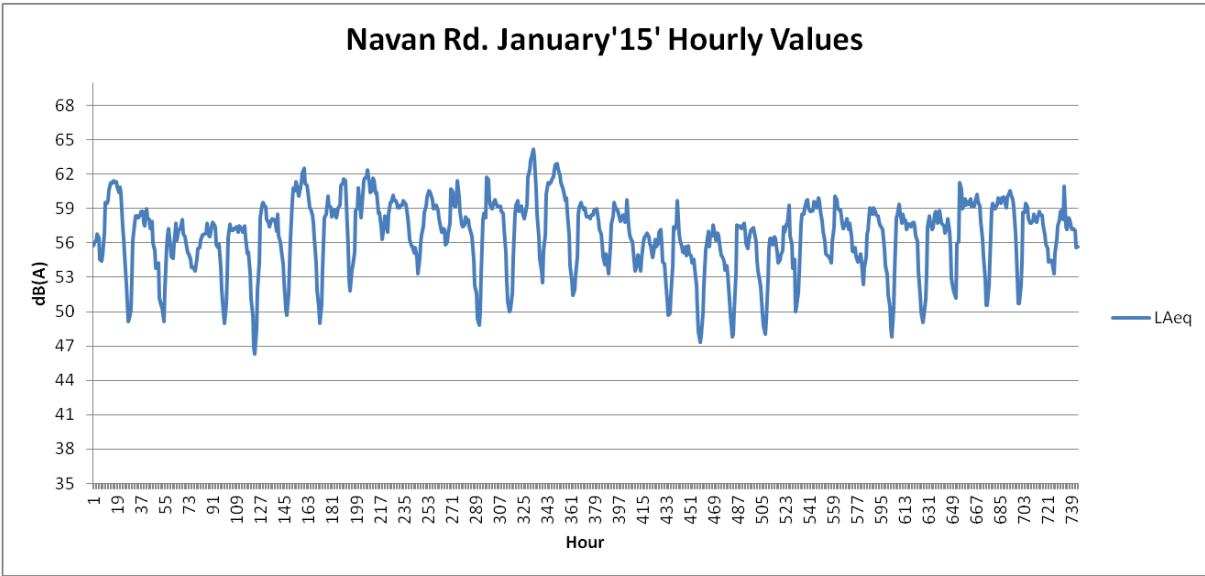


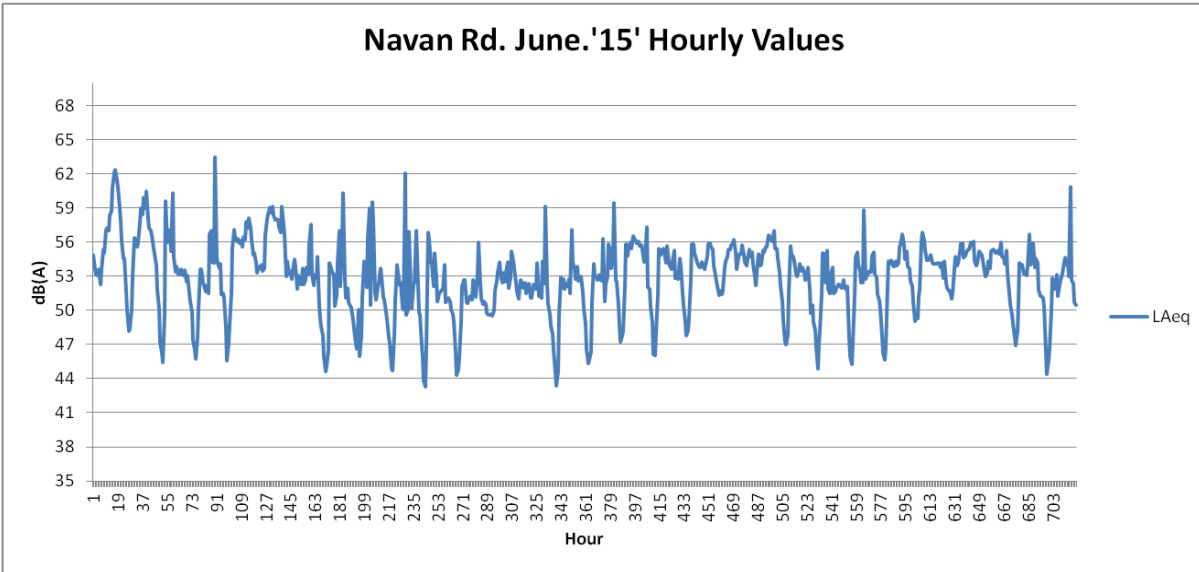
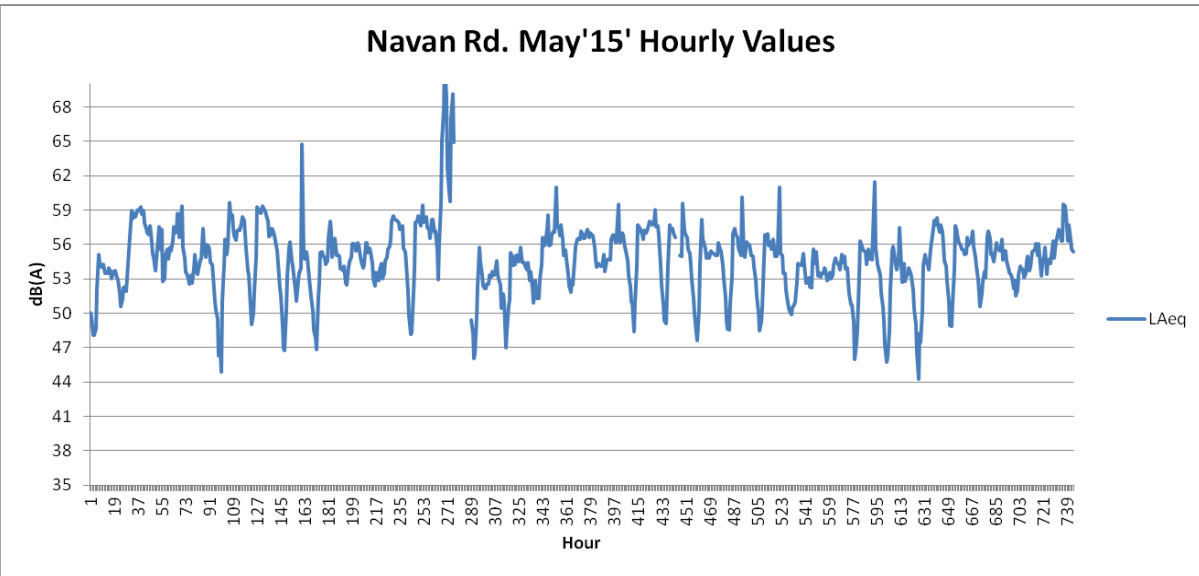
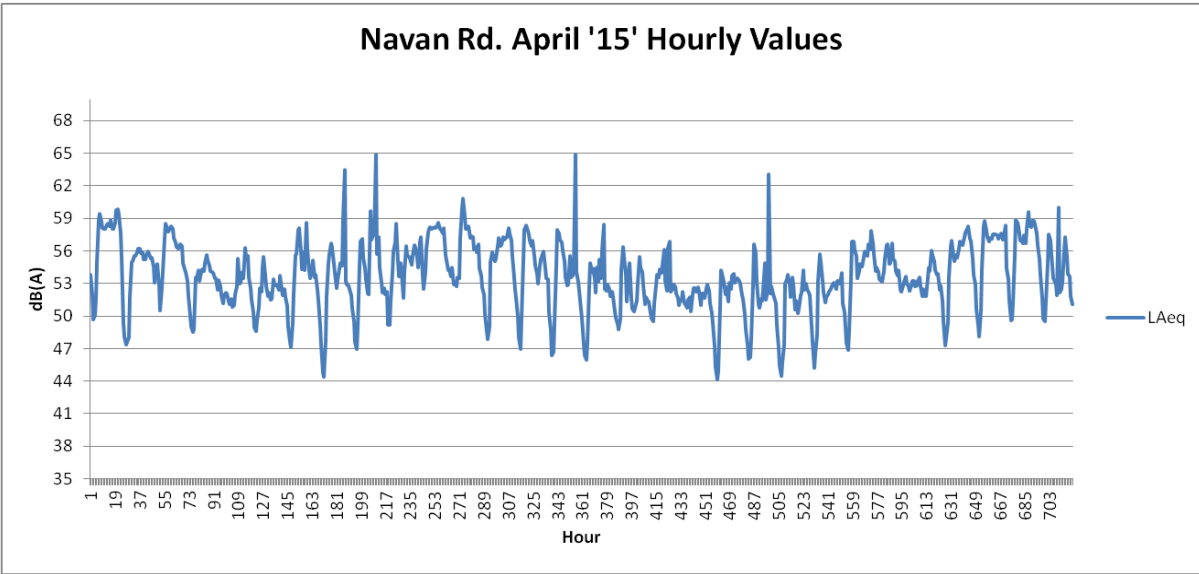


**ASHTOWN GROVE**  
**NAVAN ROAD**  
**DUBLIN 7**

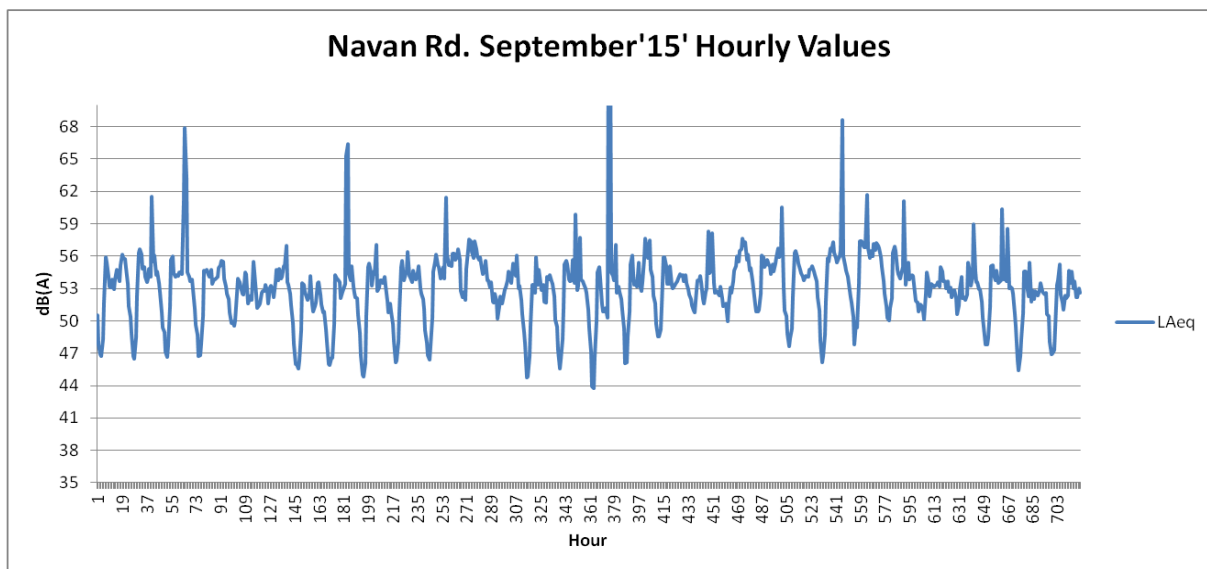
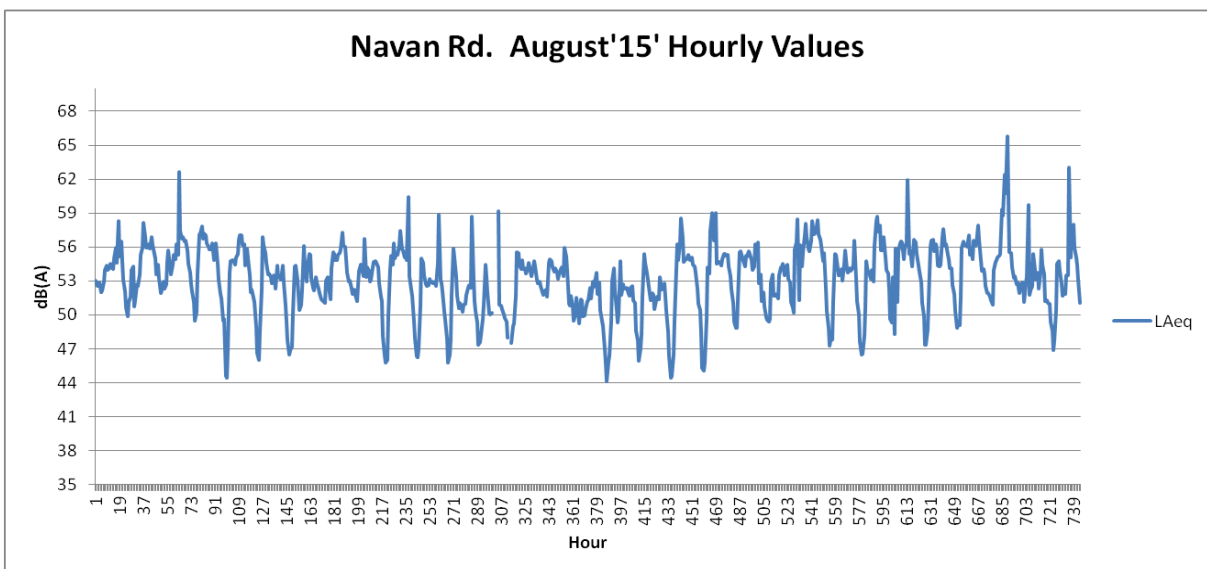
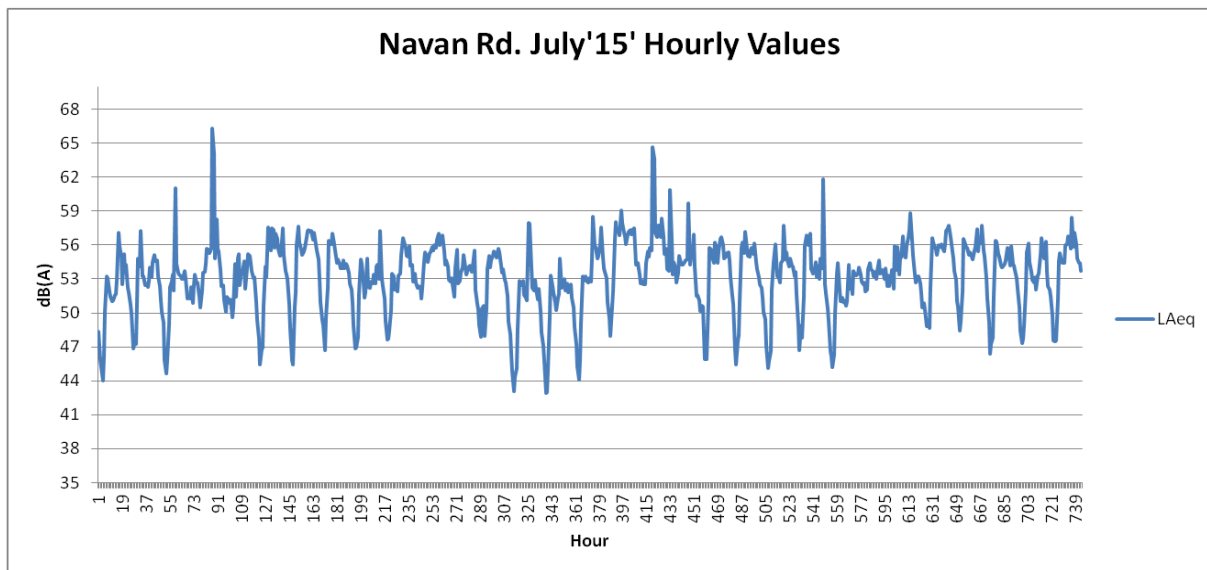


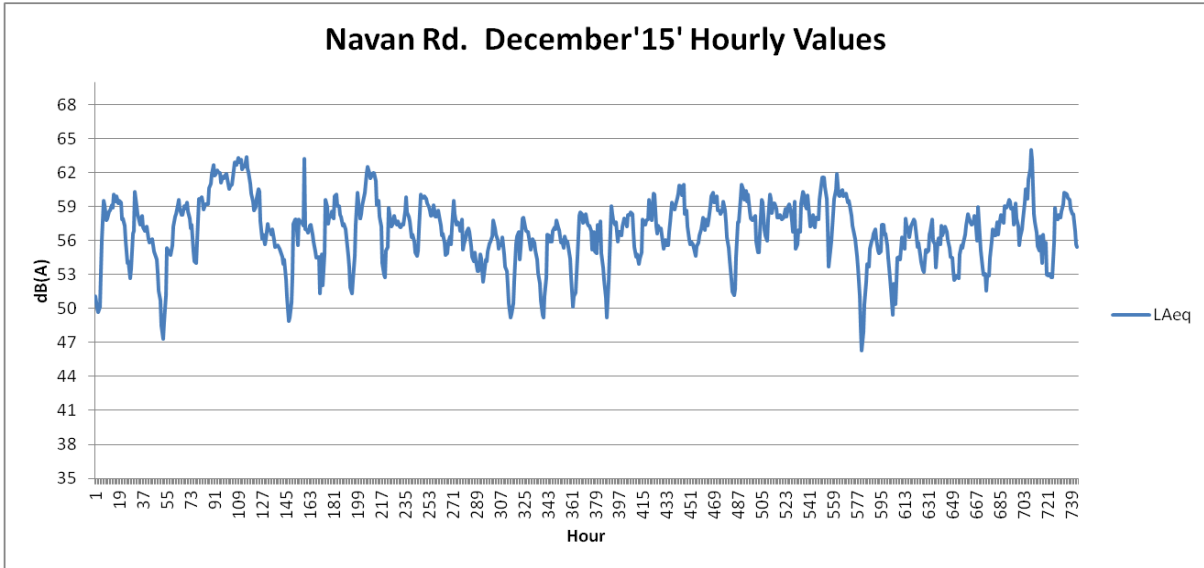
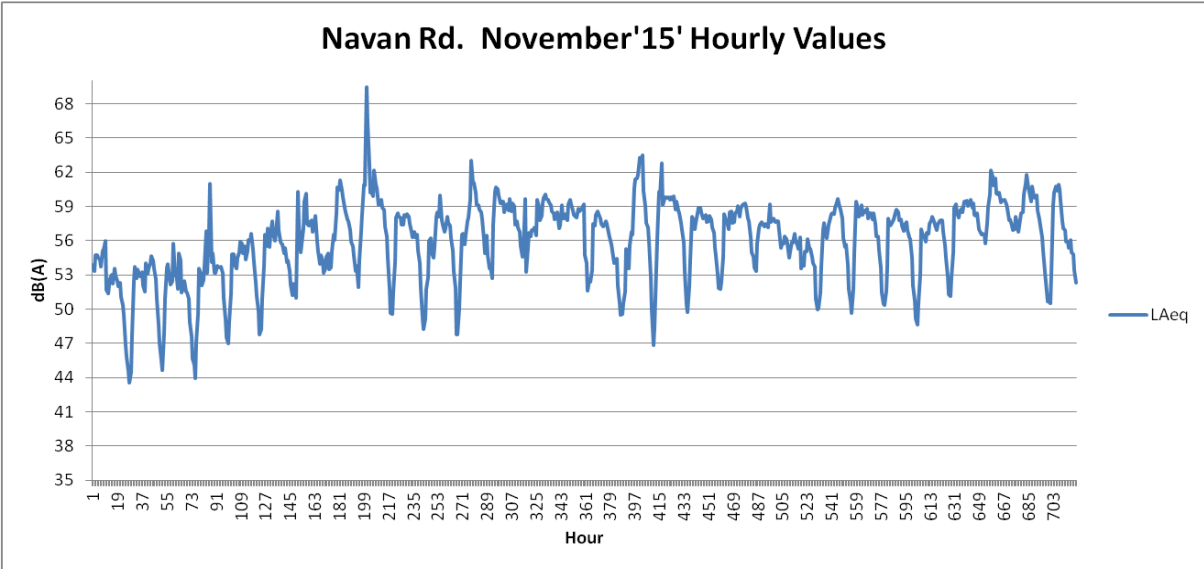
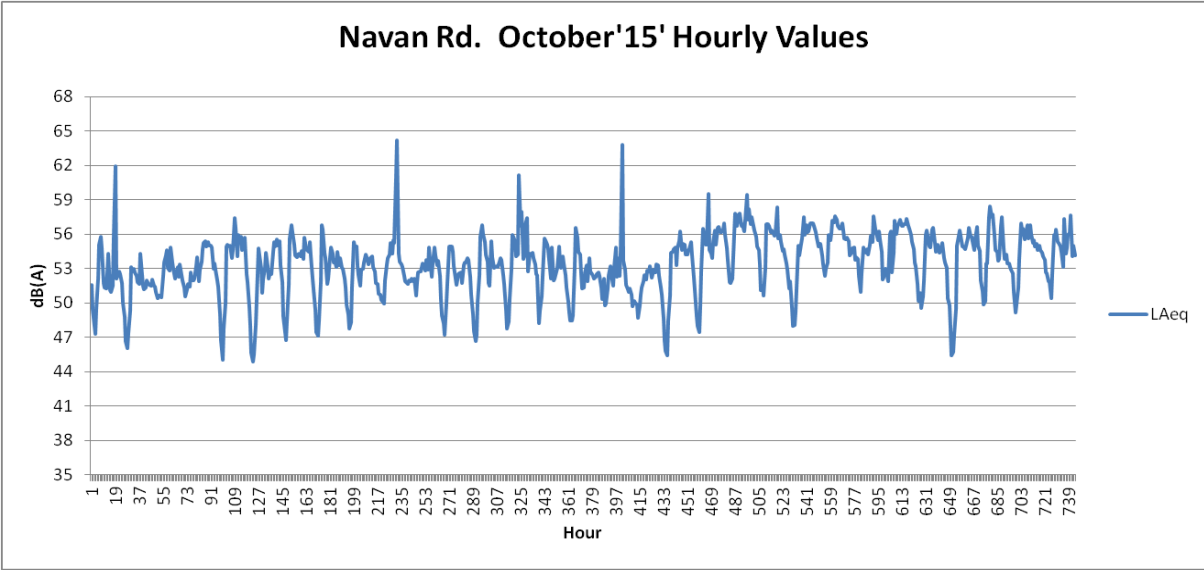




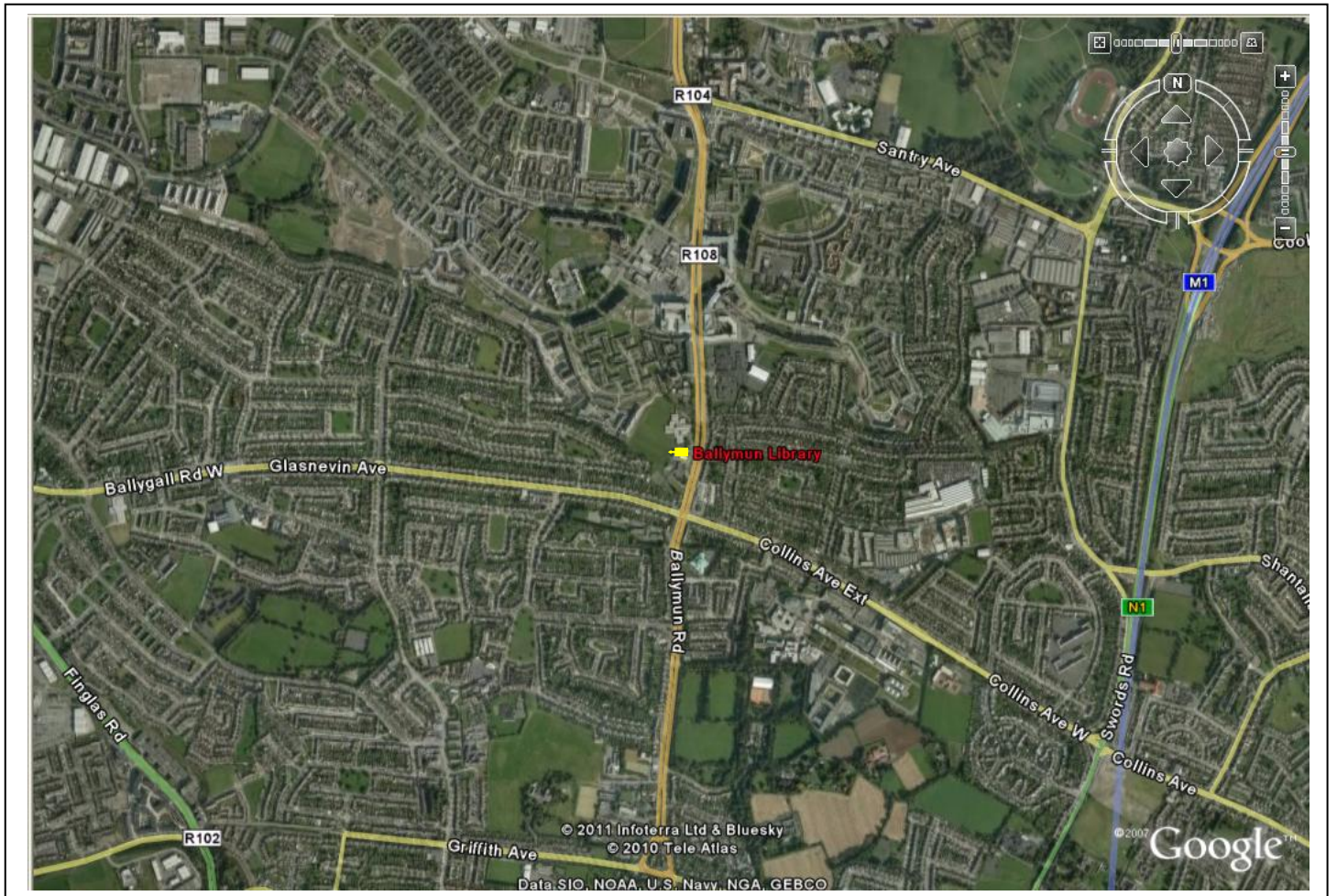




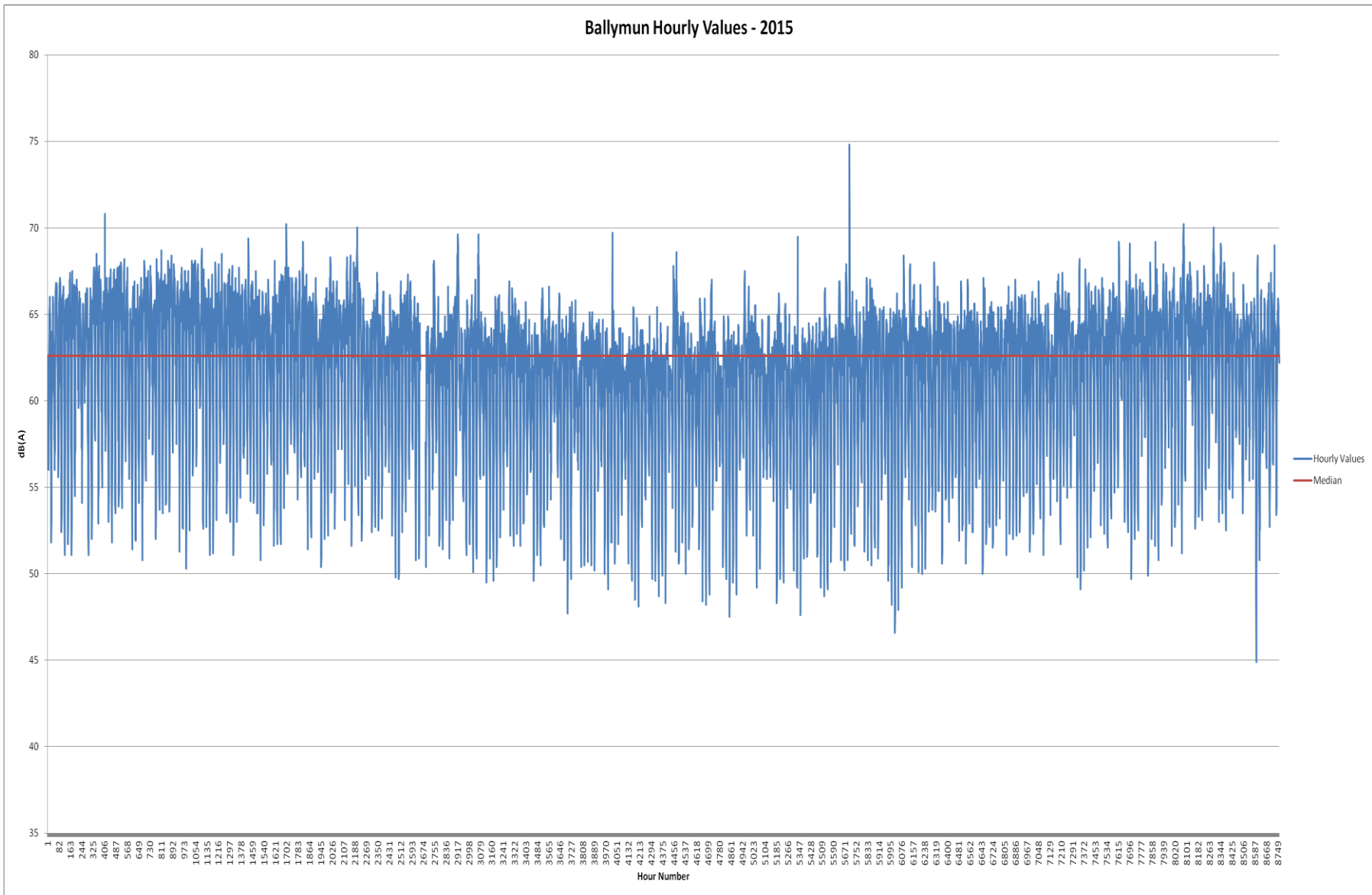


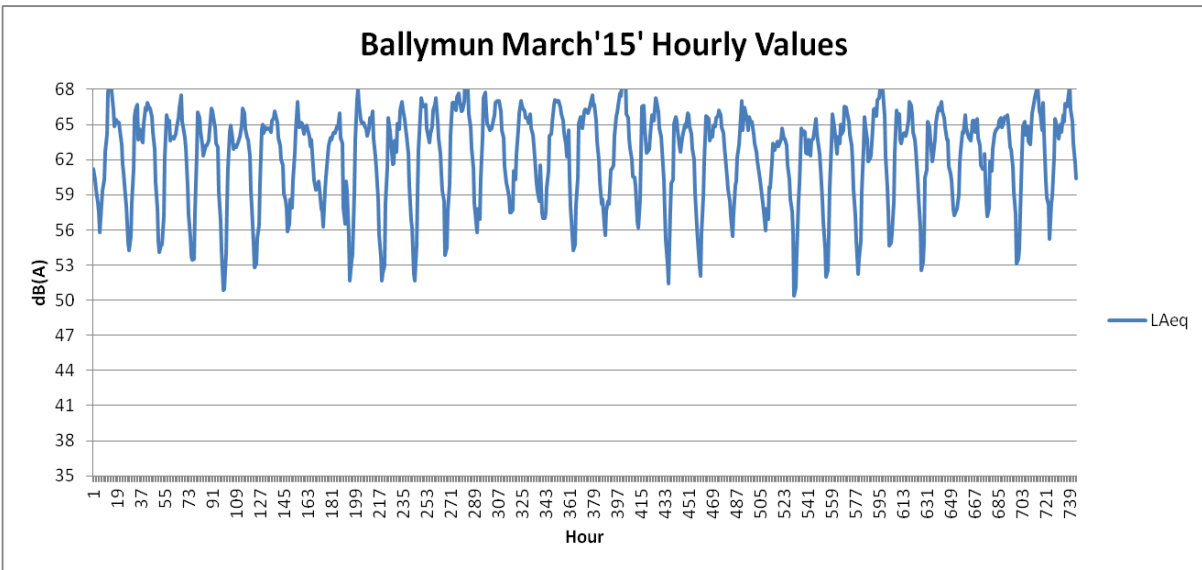
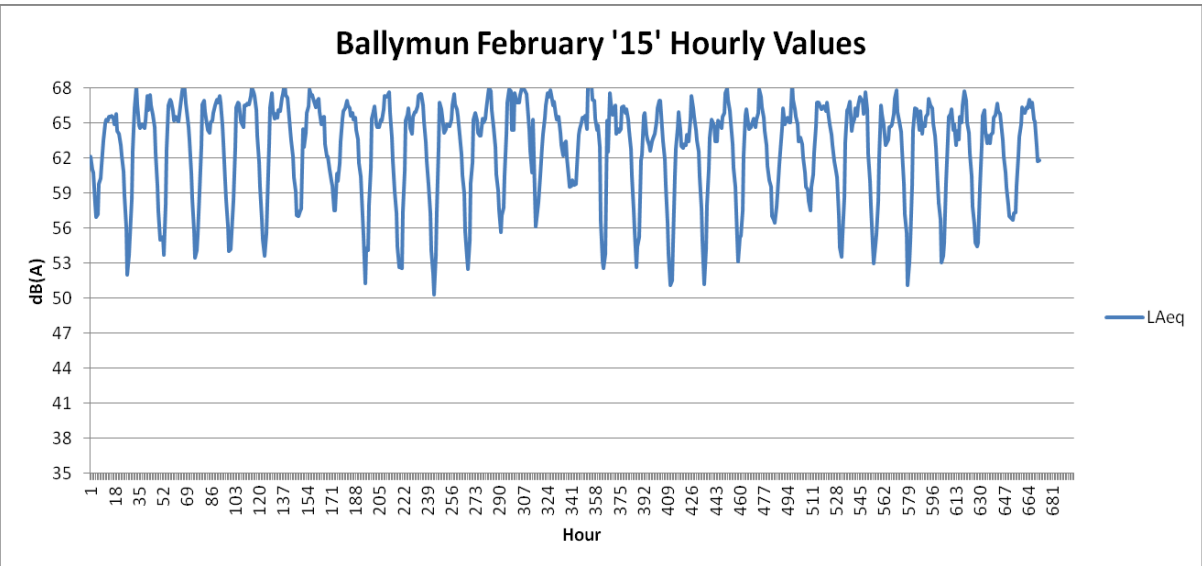
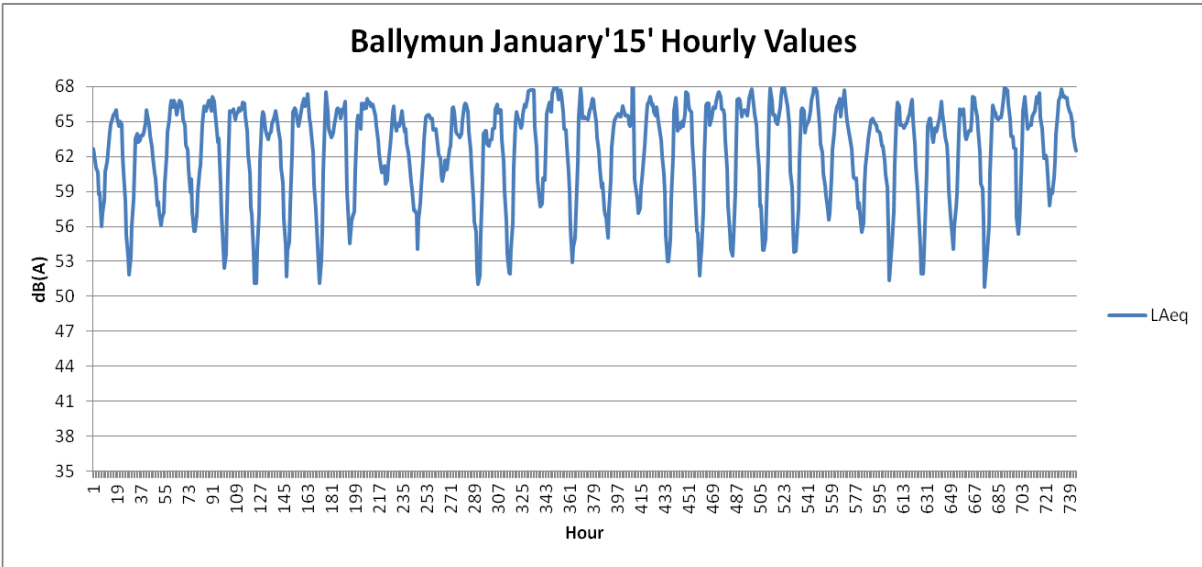


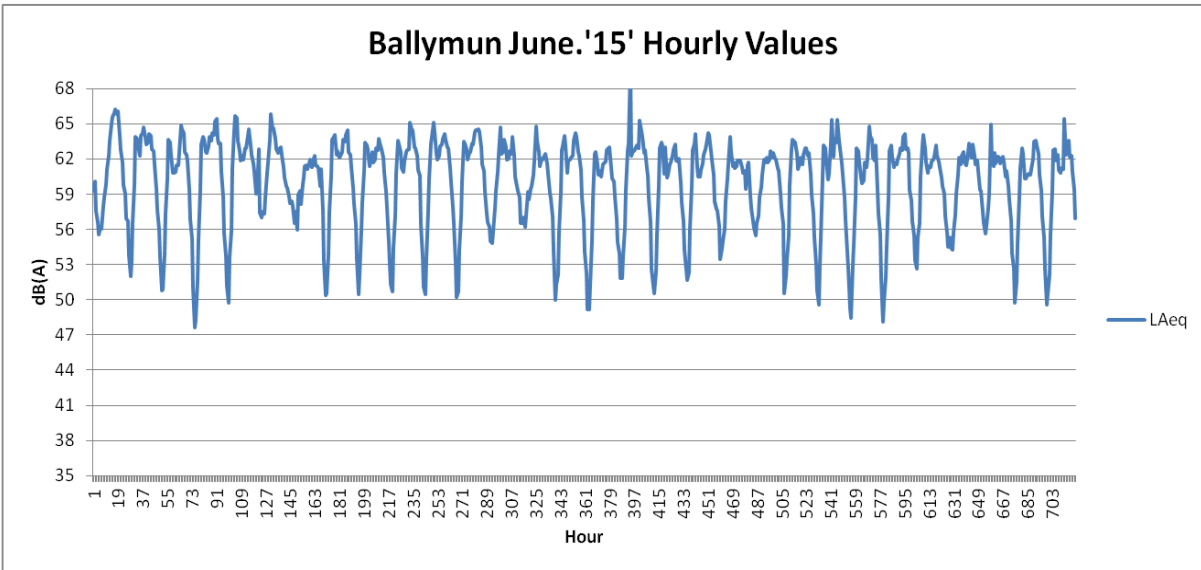
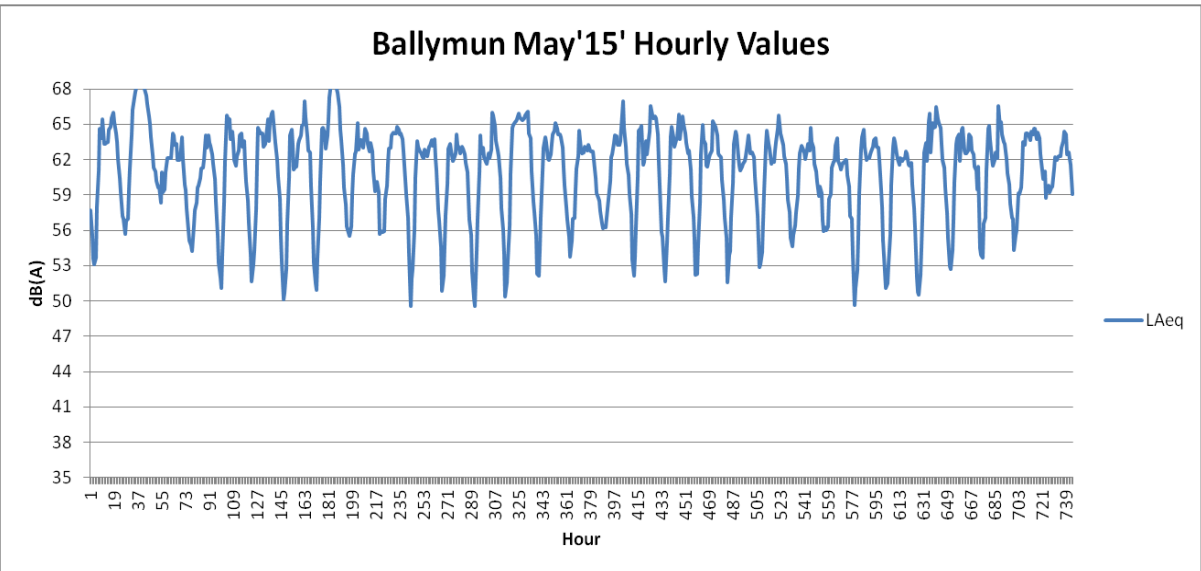
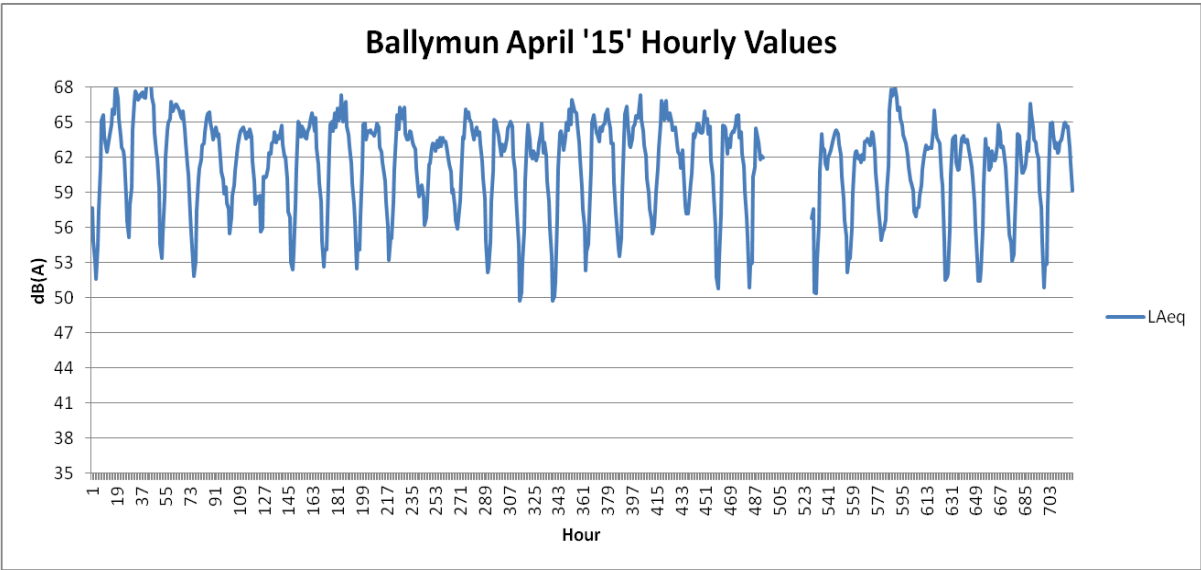
**BALLYMUN LIBRARY**  
**BALLYMUN ROAD**  
**DUBLIN 11**

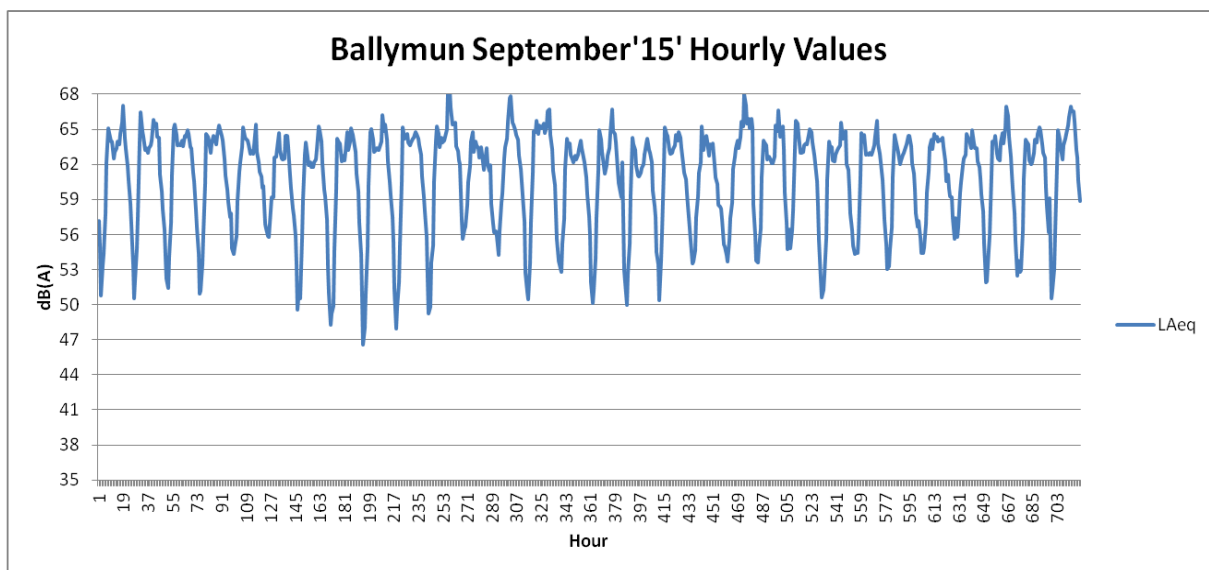
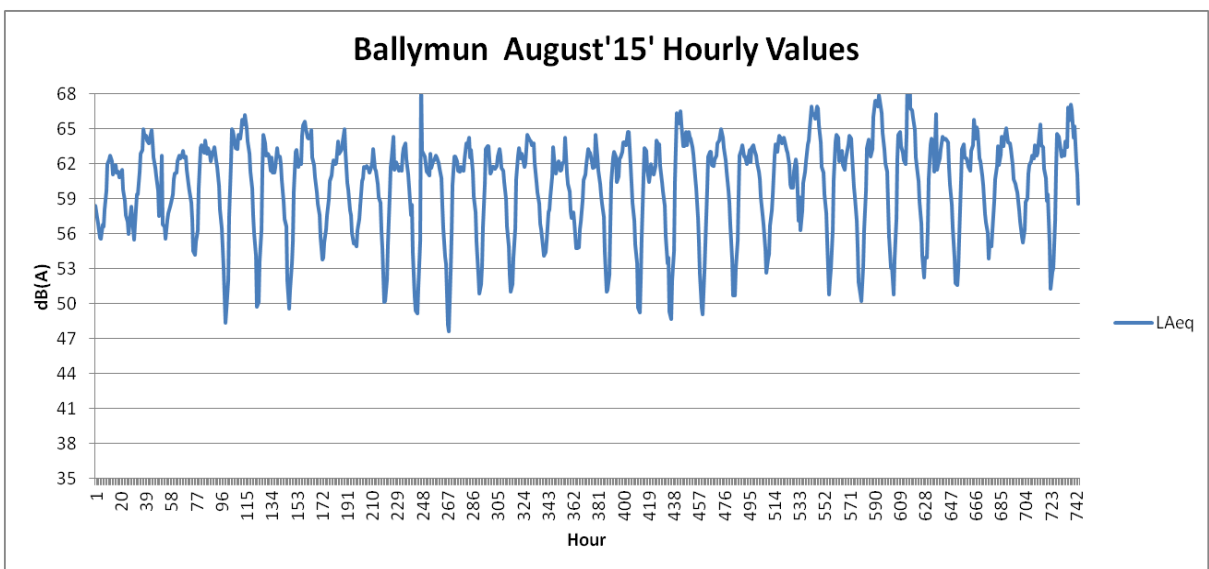
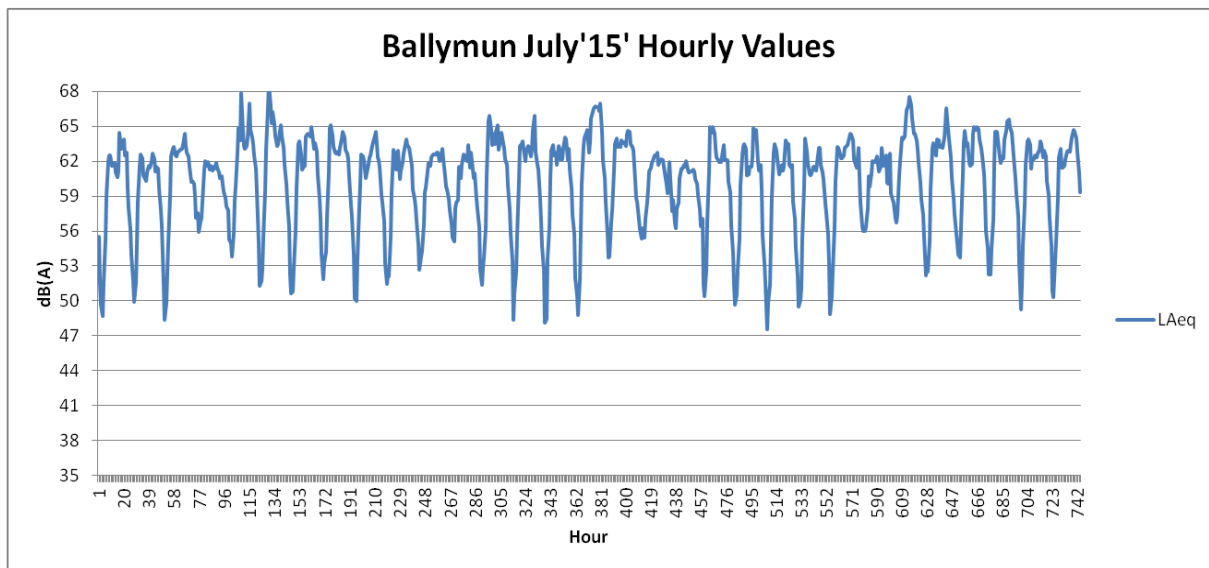


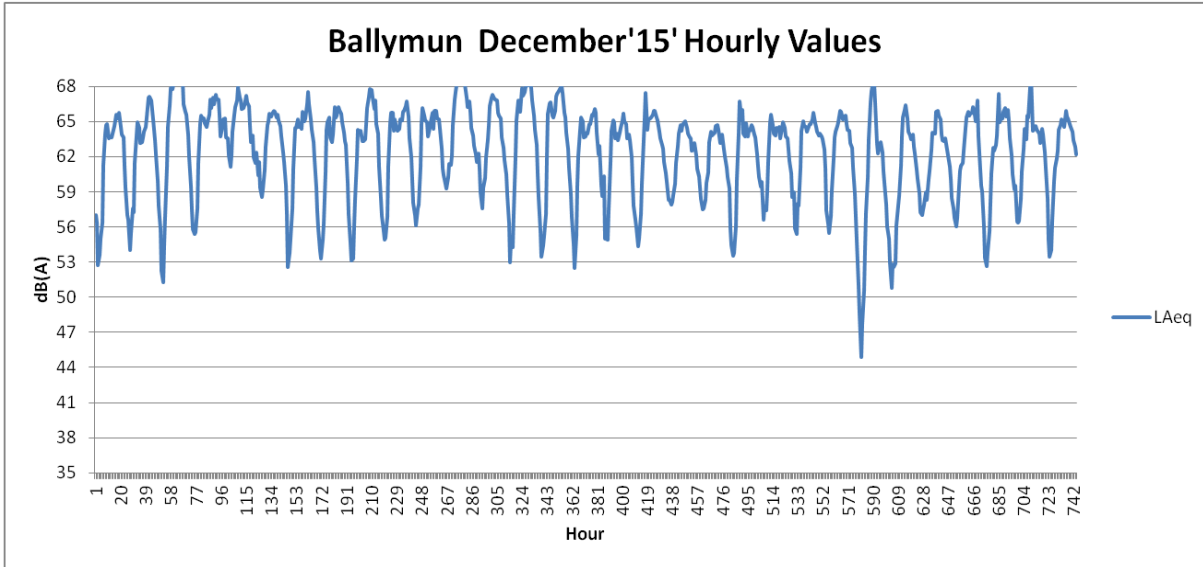
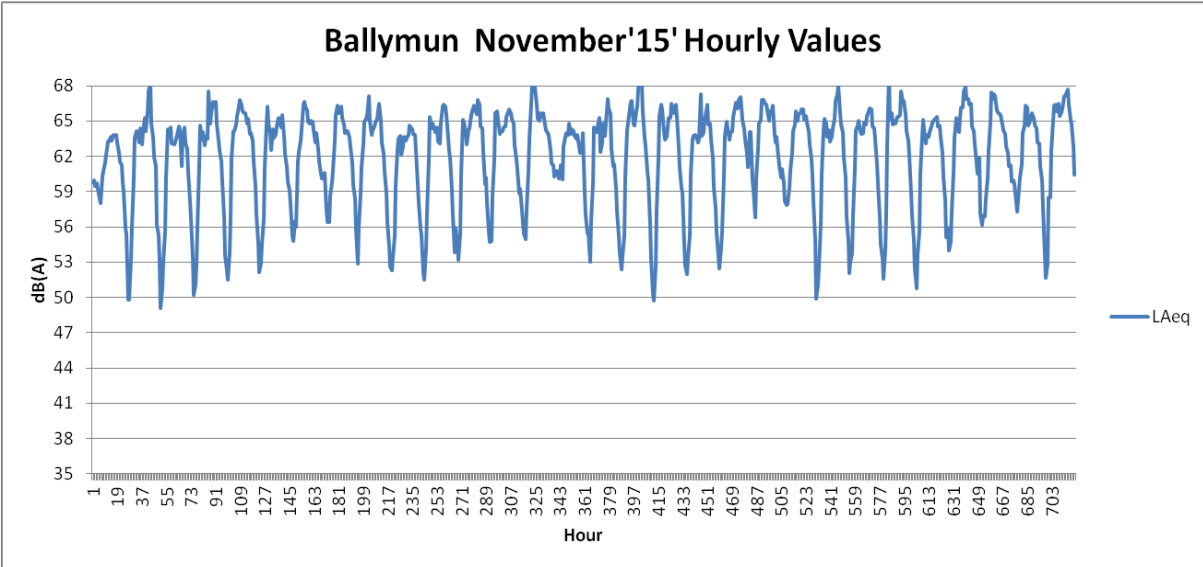
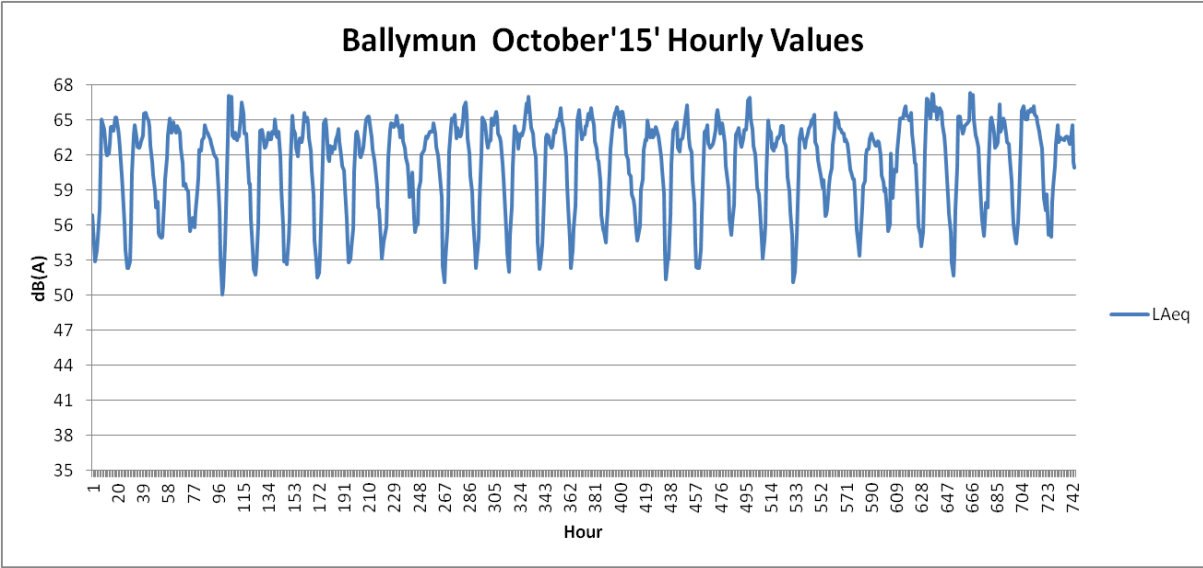








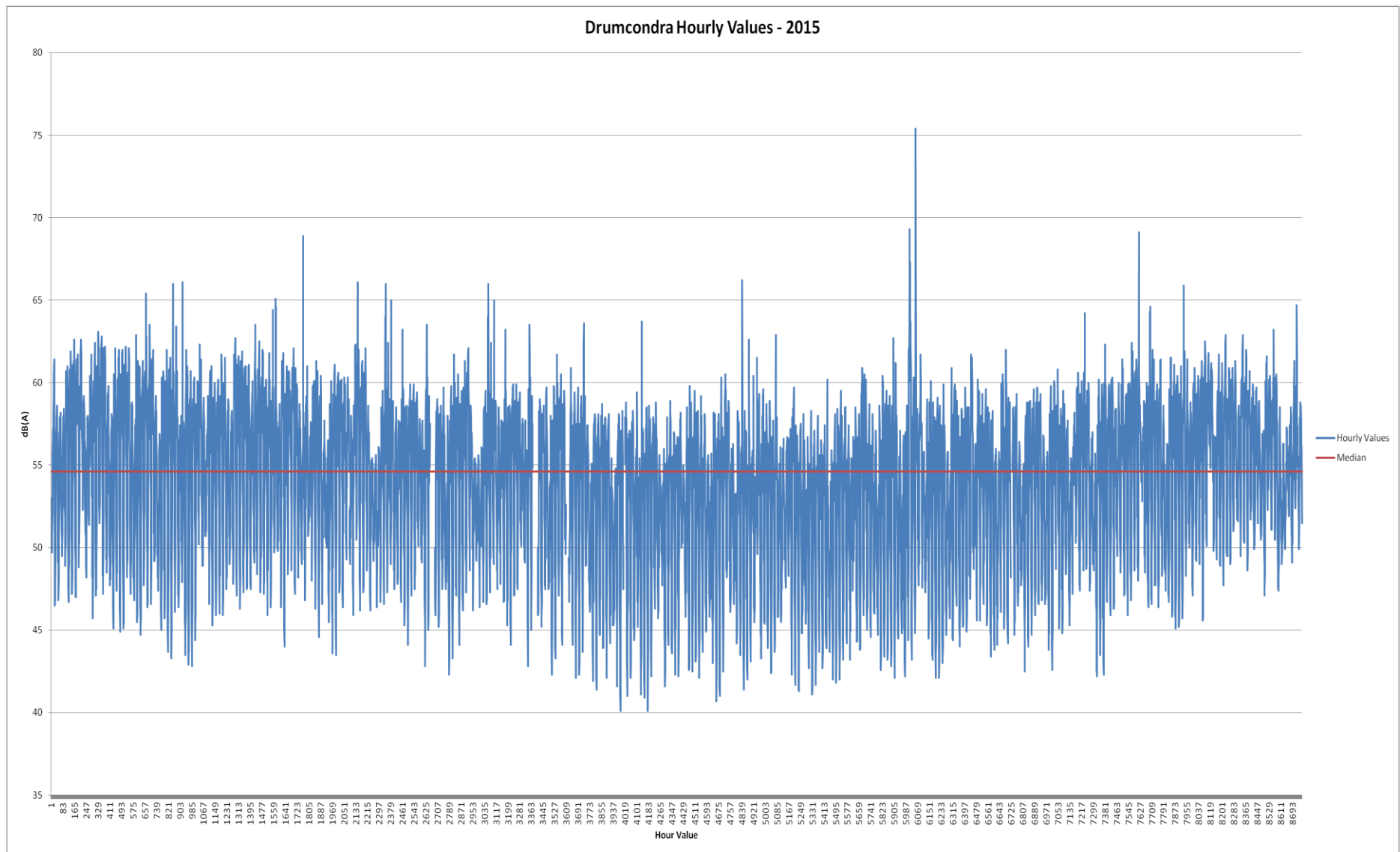


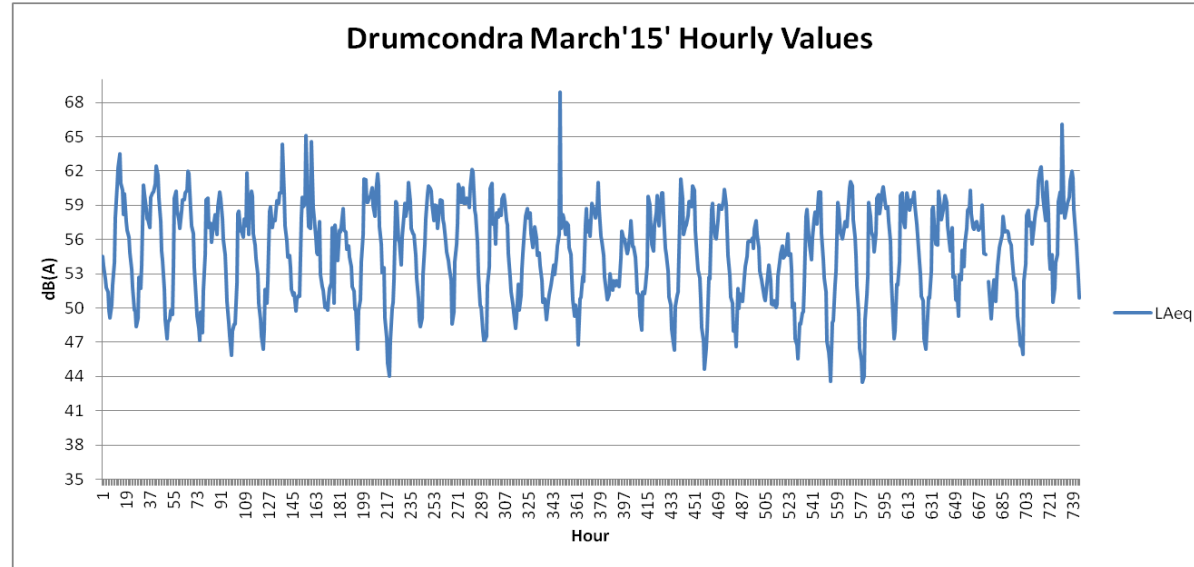
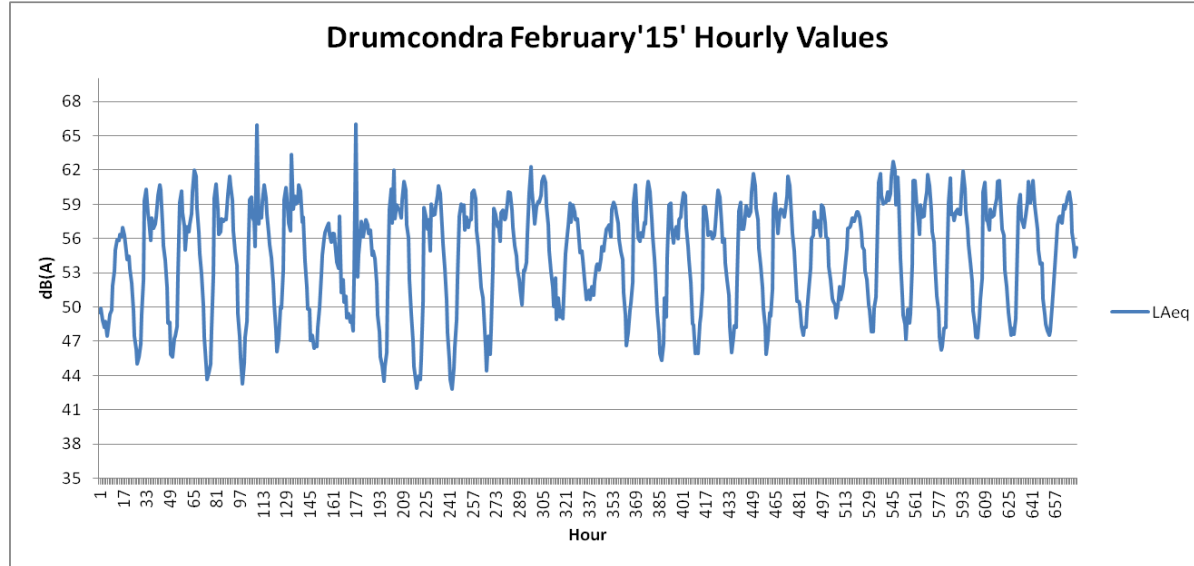
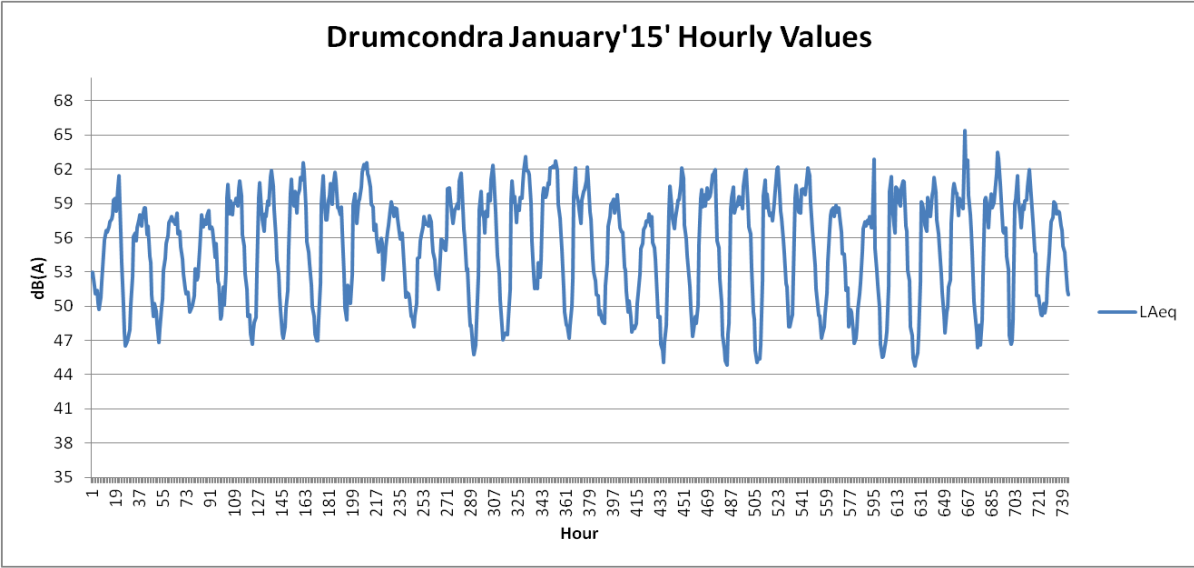




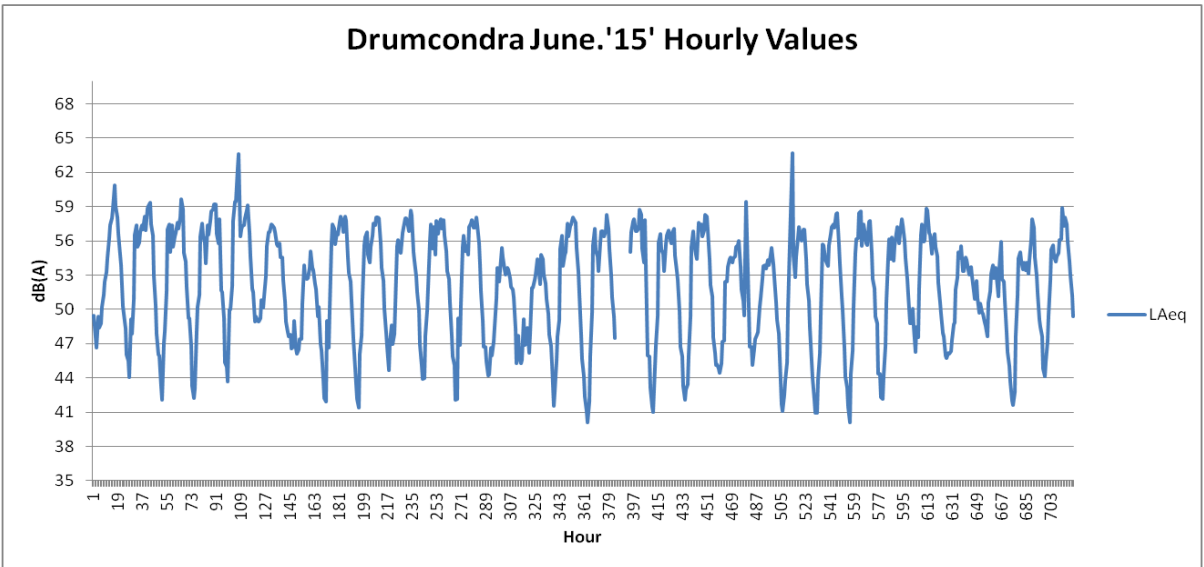
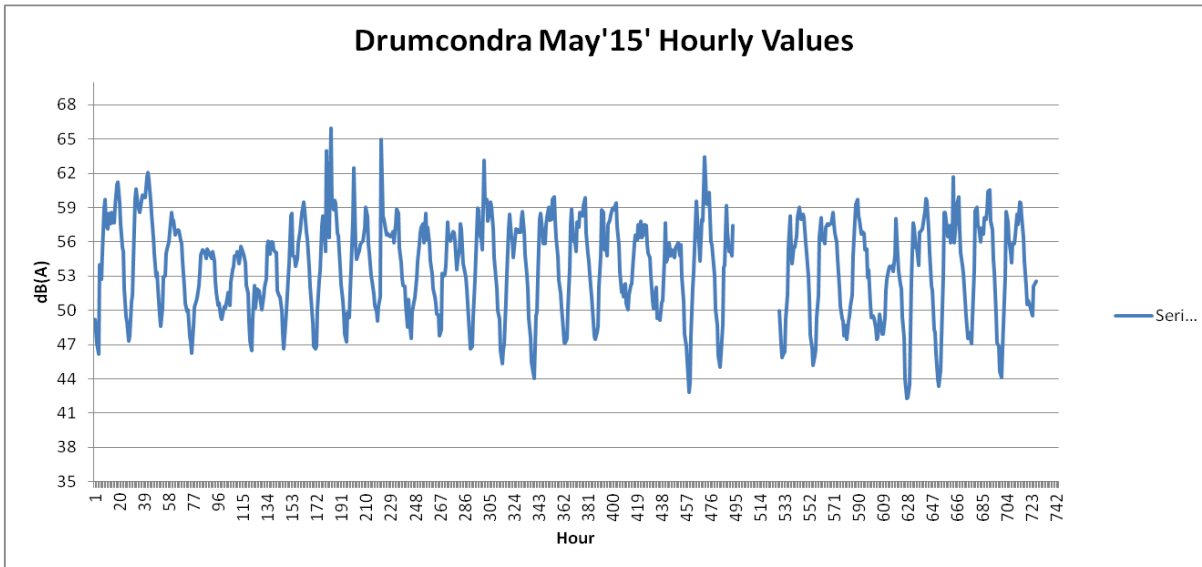
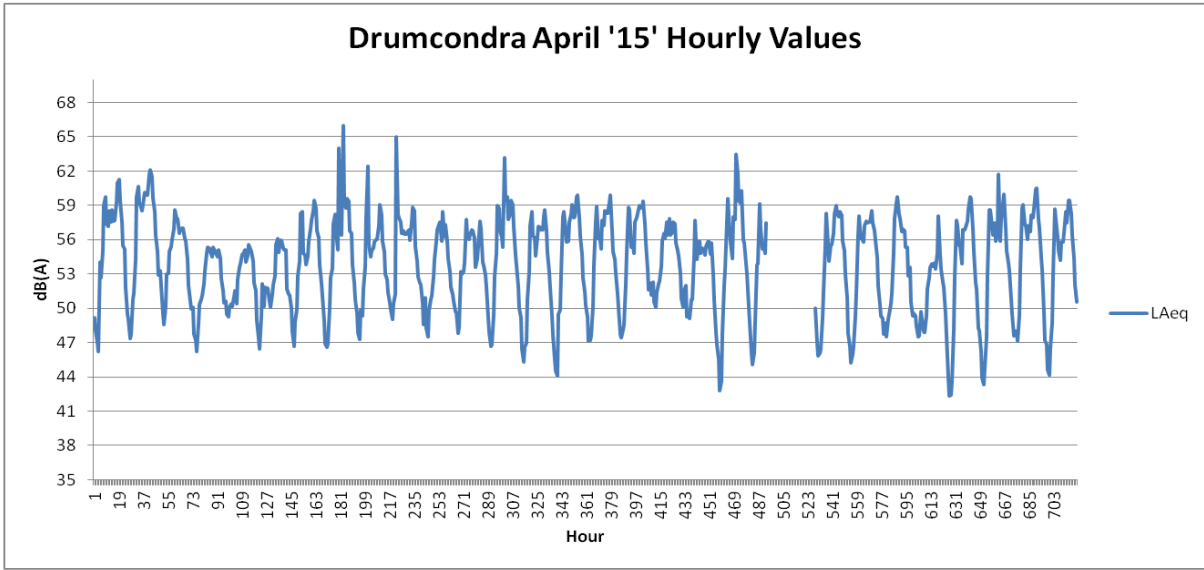
**DRUMCONDRA LIBRARY**  
**MILLMOUNT AVENUE**  
**DUBLIN 9**

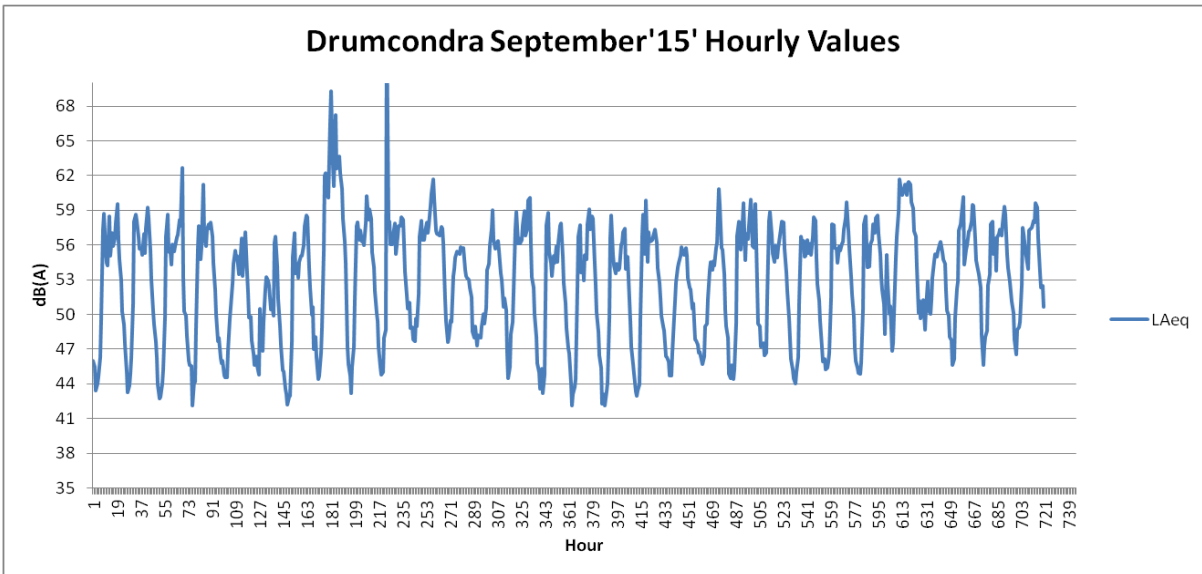
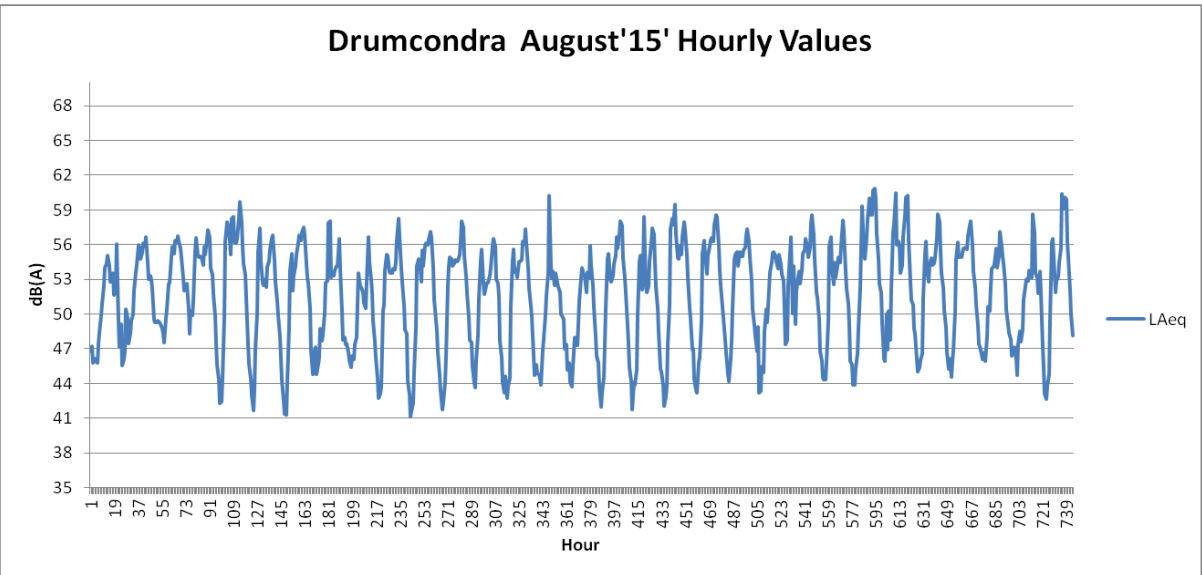
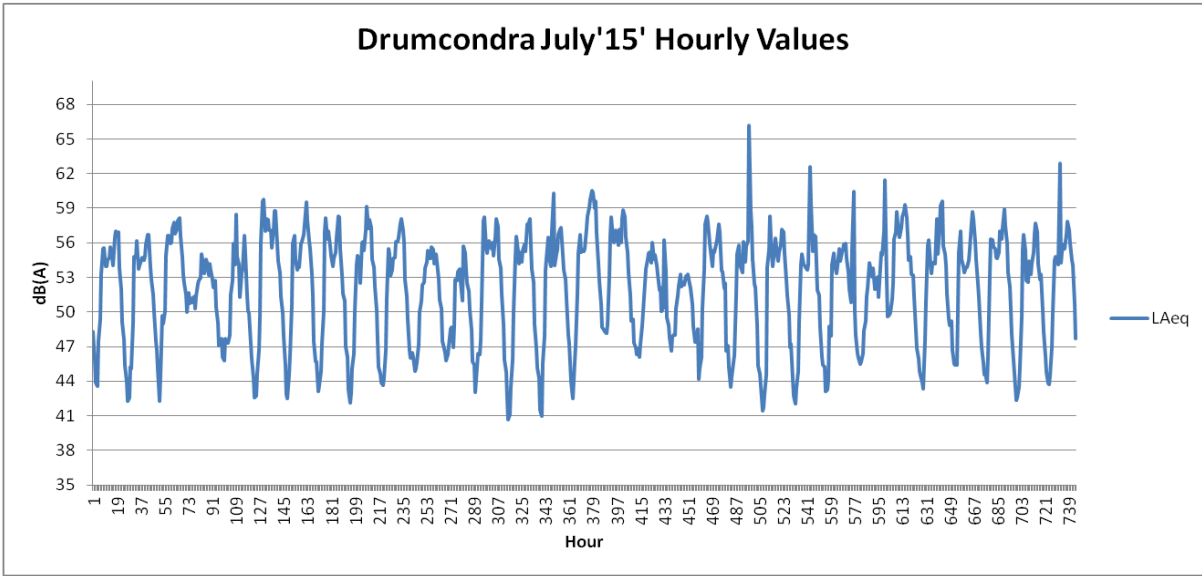


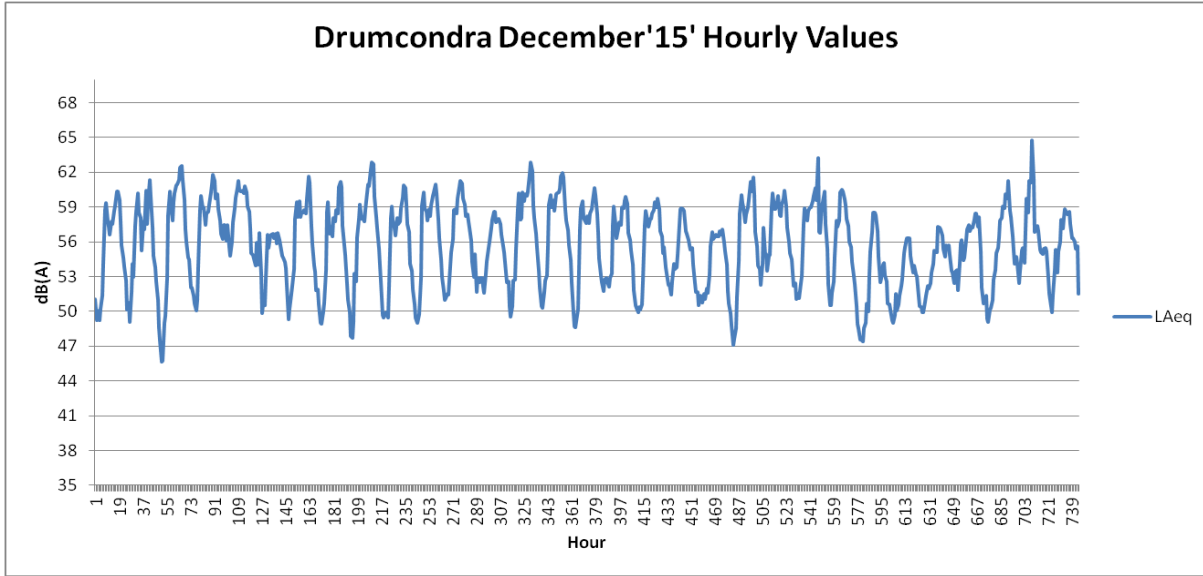
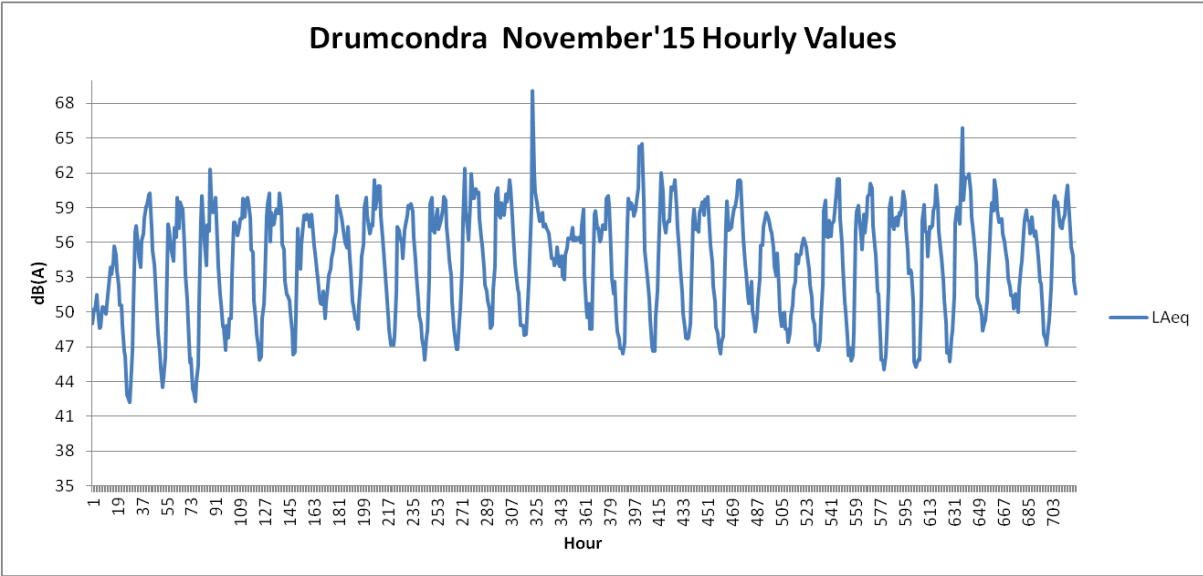
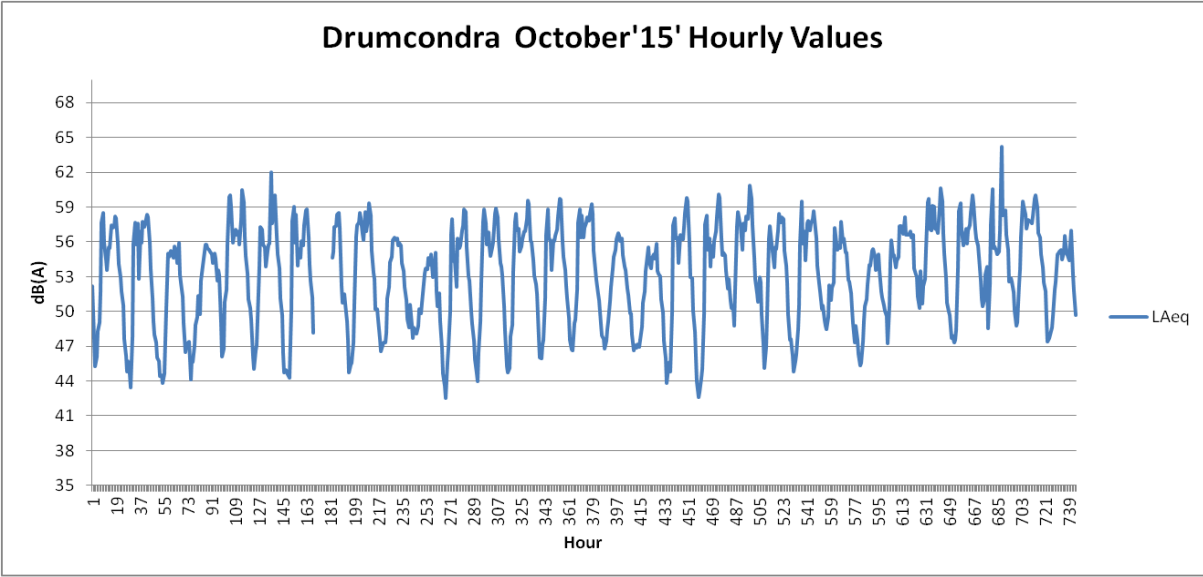






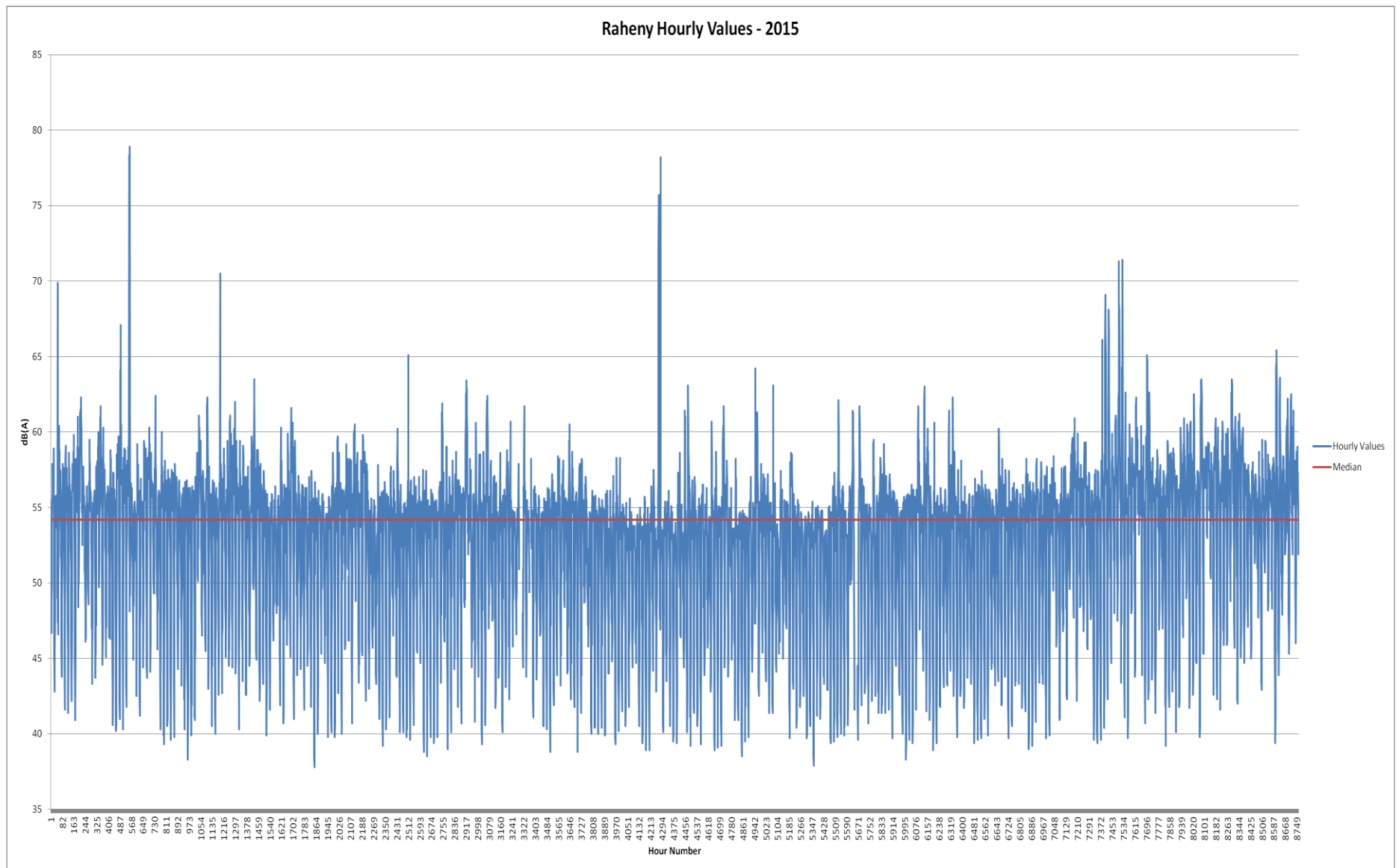




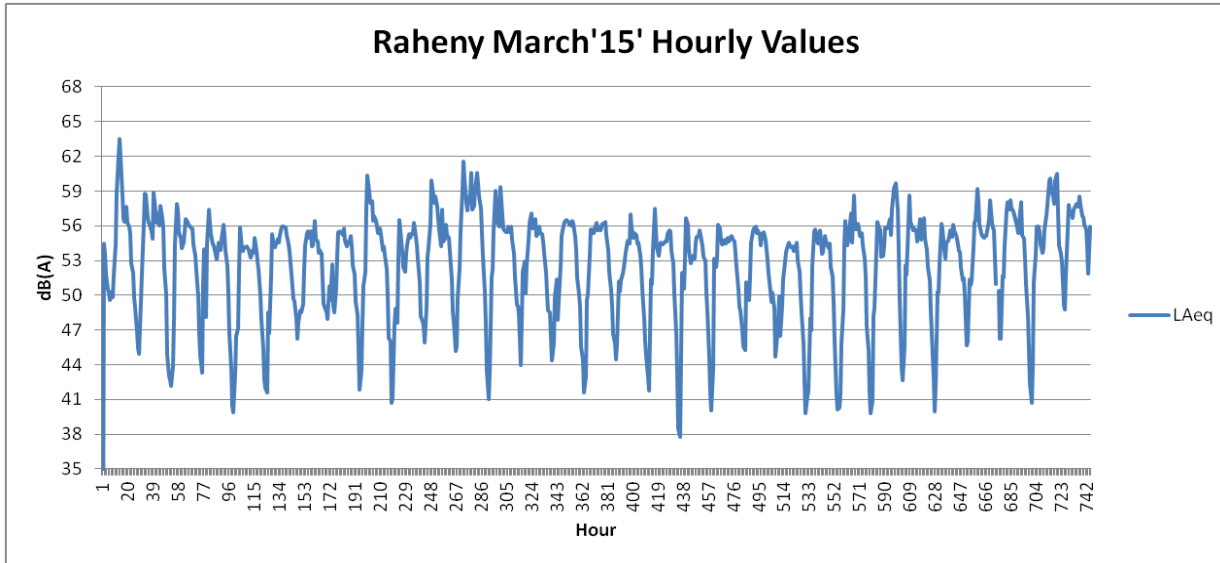
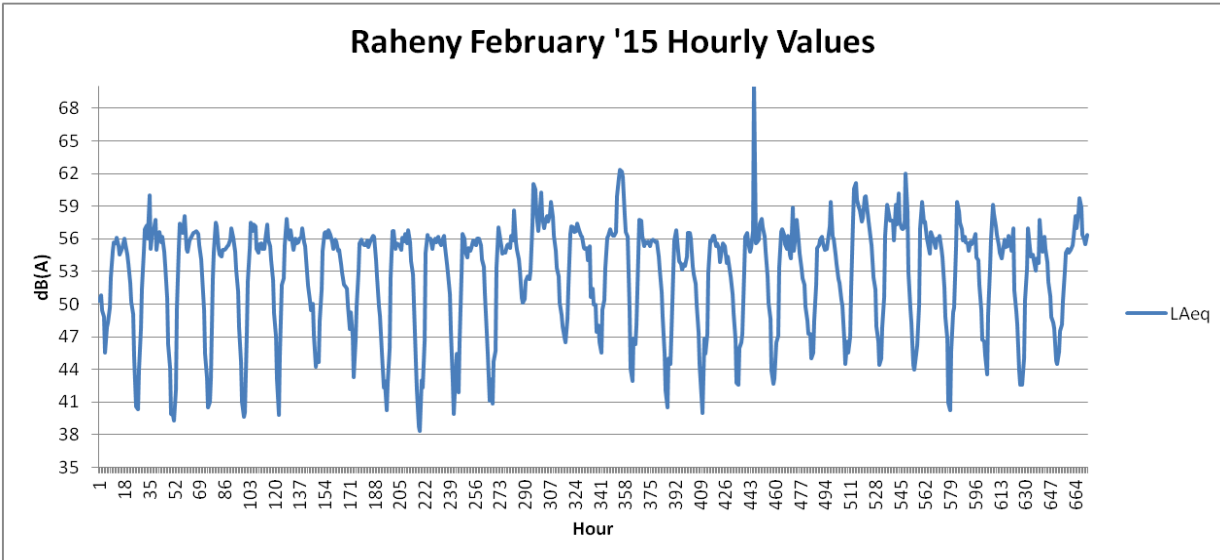
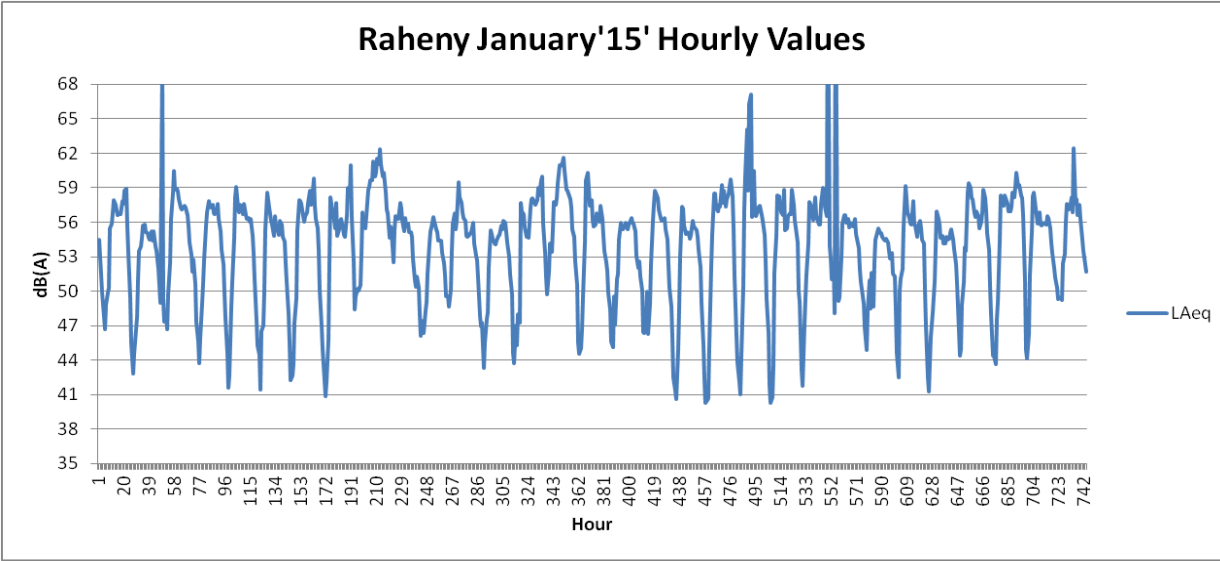


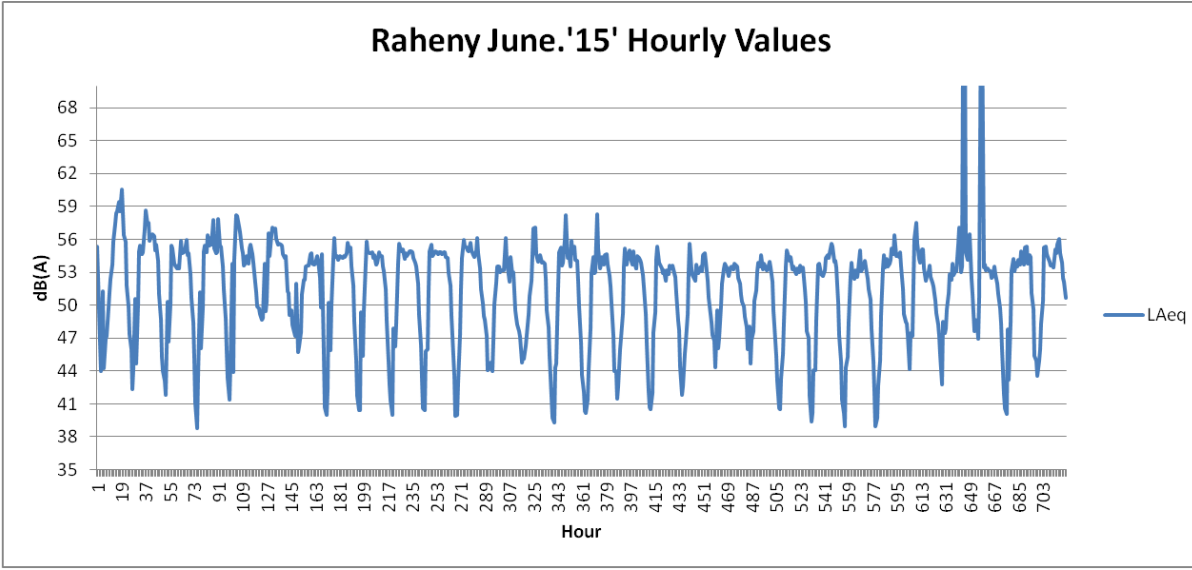
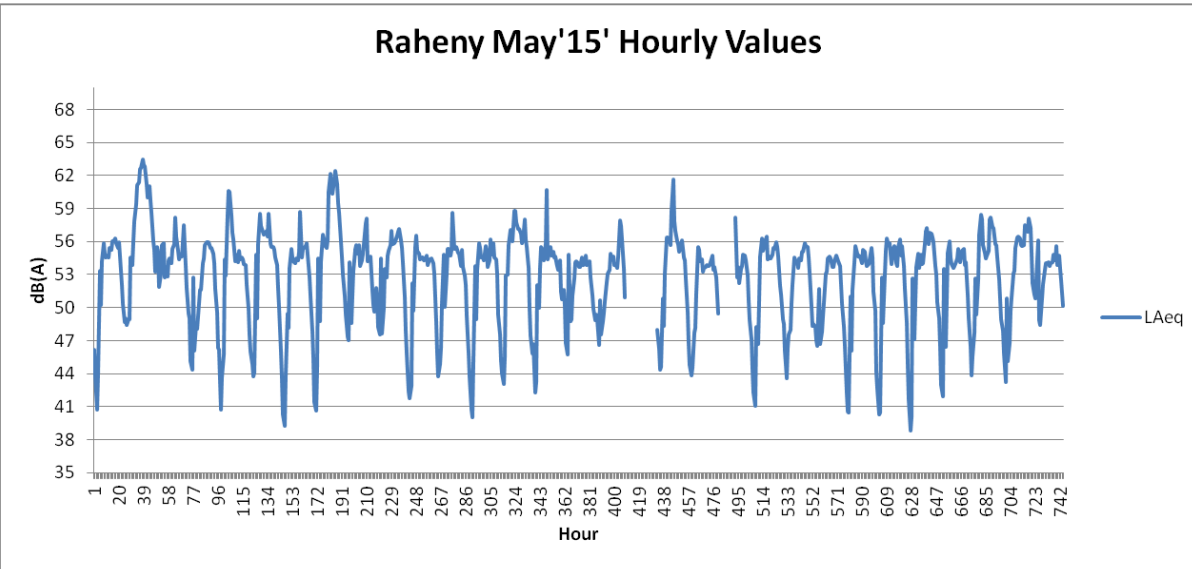
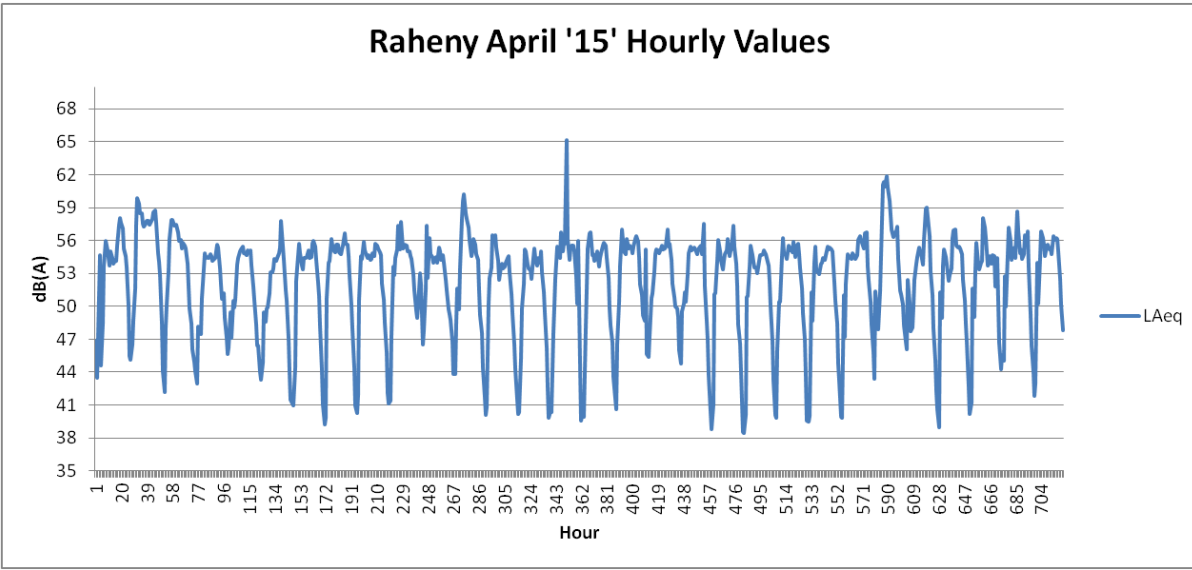
**RAHENY LIBRARY**  
**HOWTH ROAD**  
**DUBLIN 5**

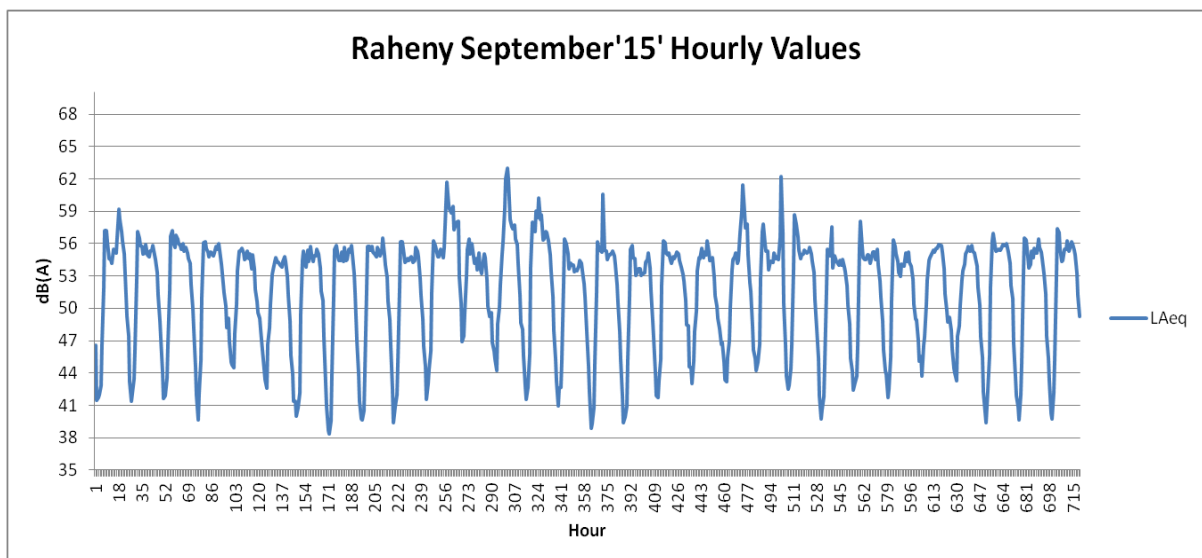
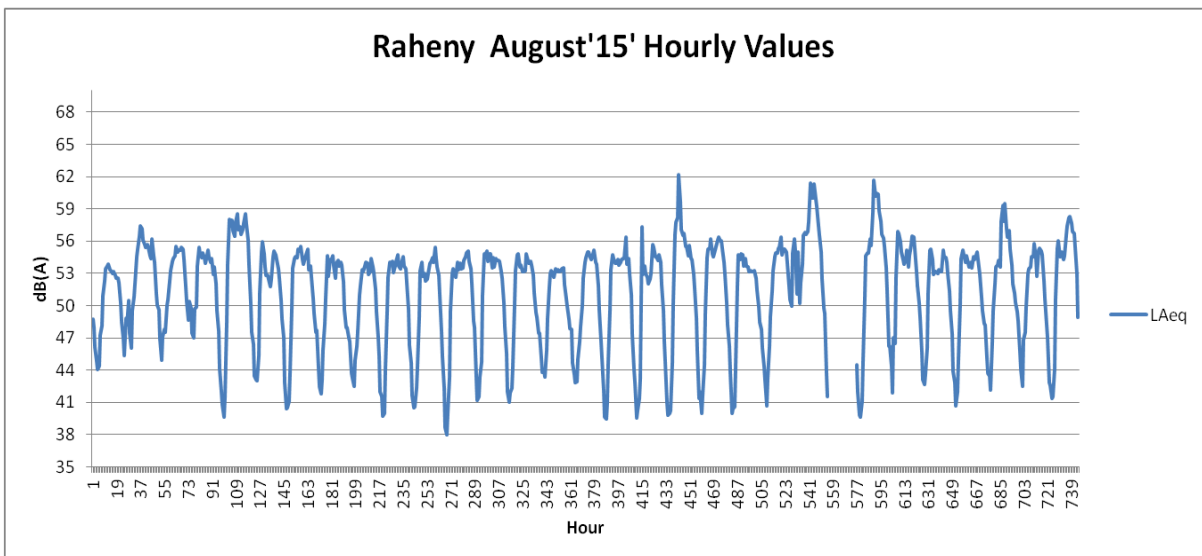
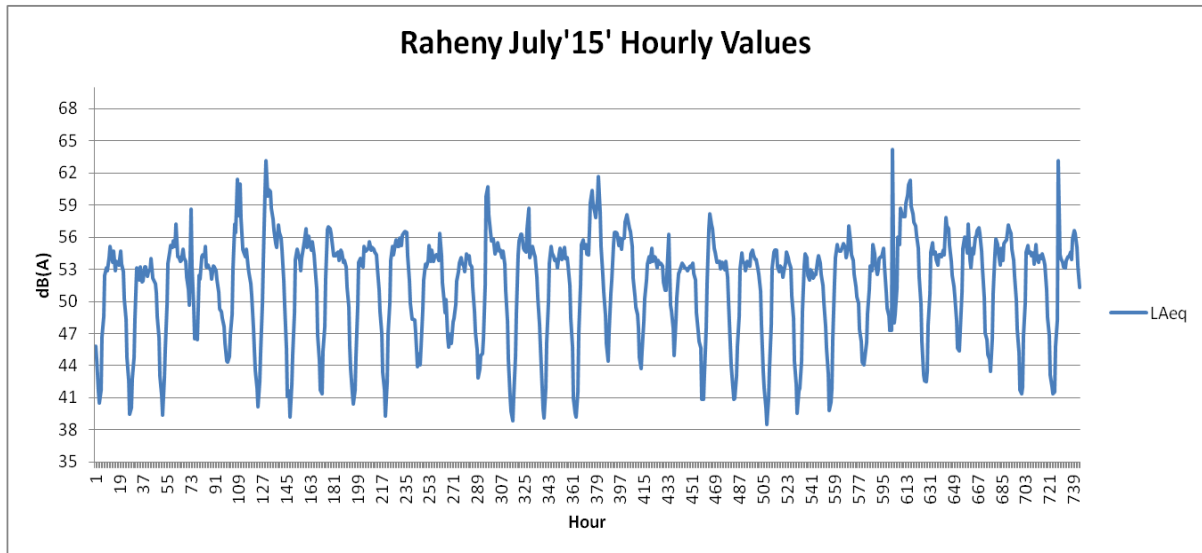






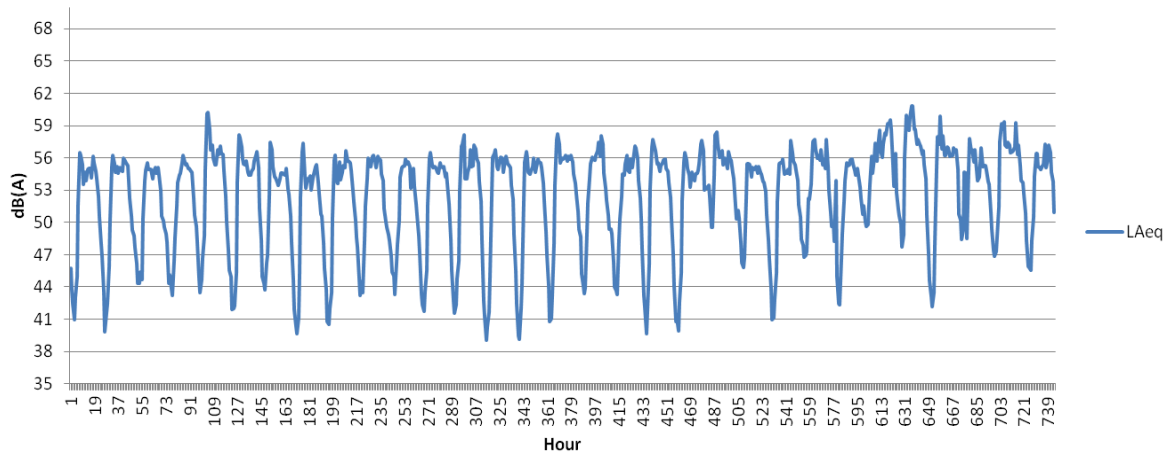




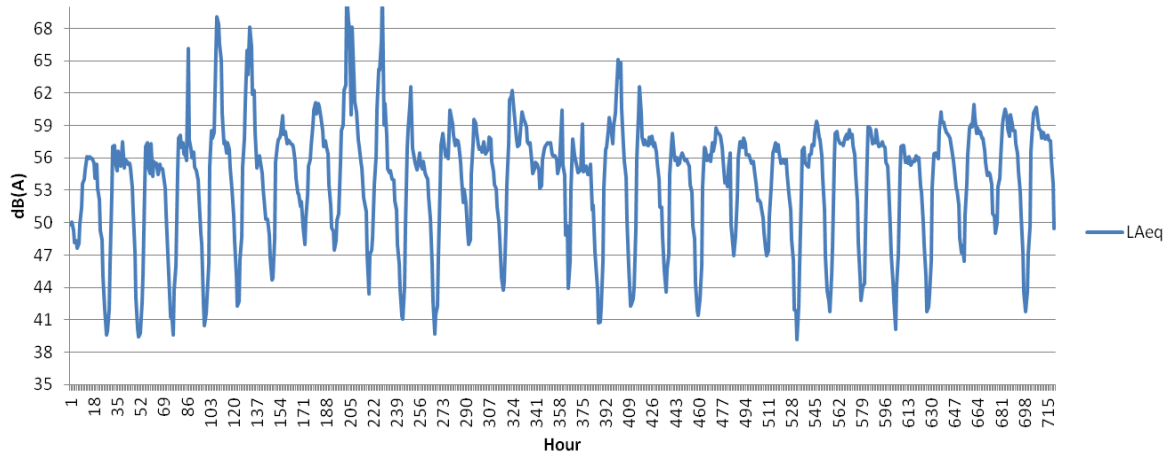




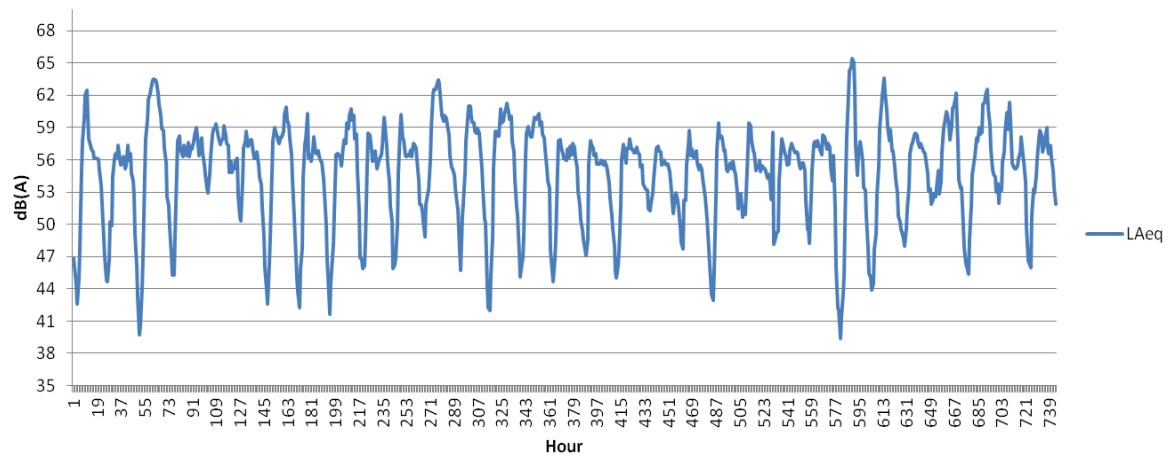
**Raheny October'15' Hourly Values**



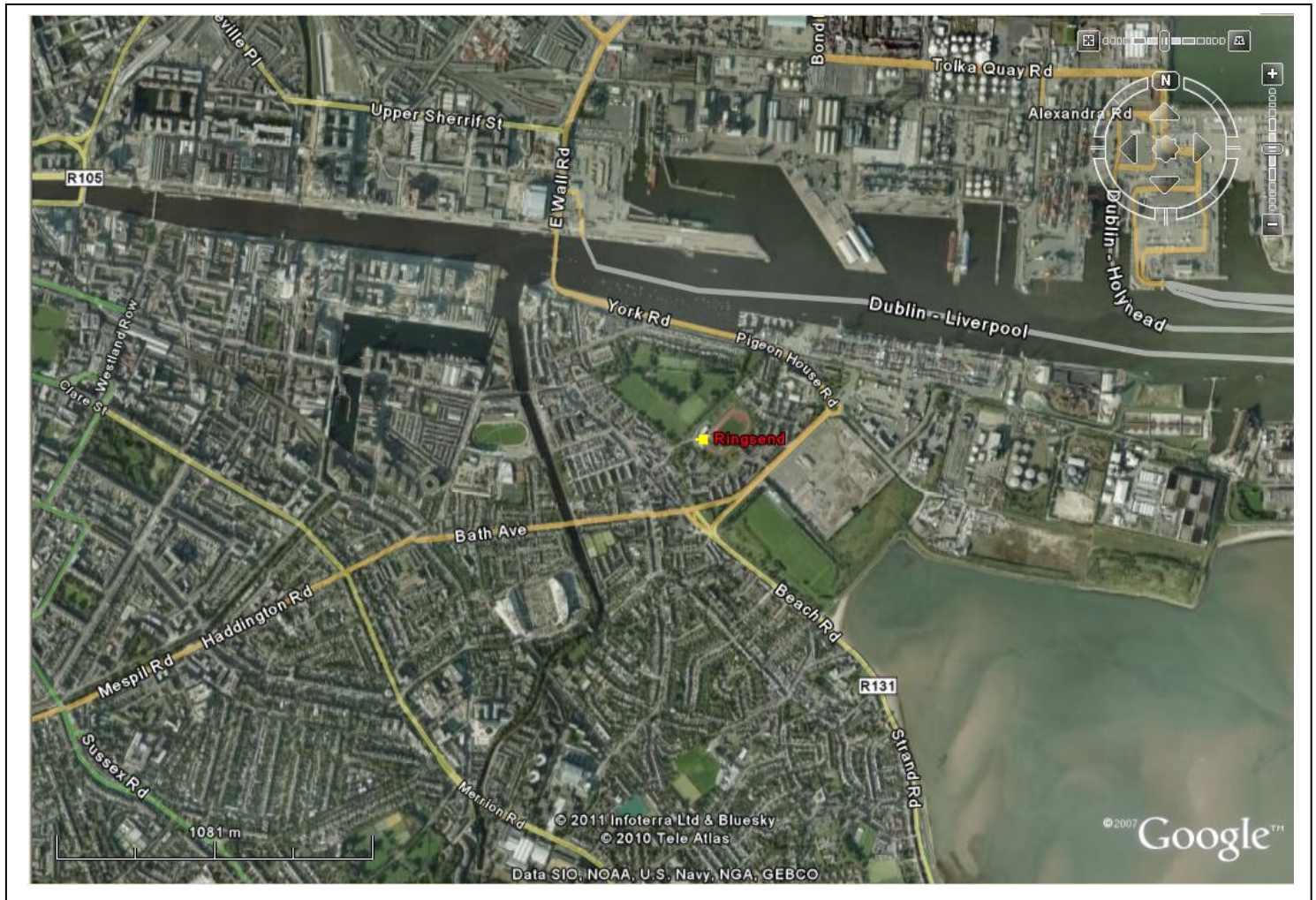
**Raheny November'15' Hourly Values**

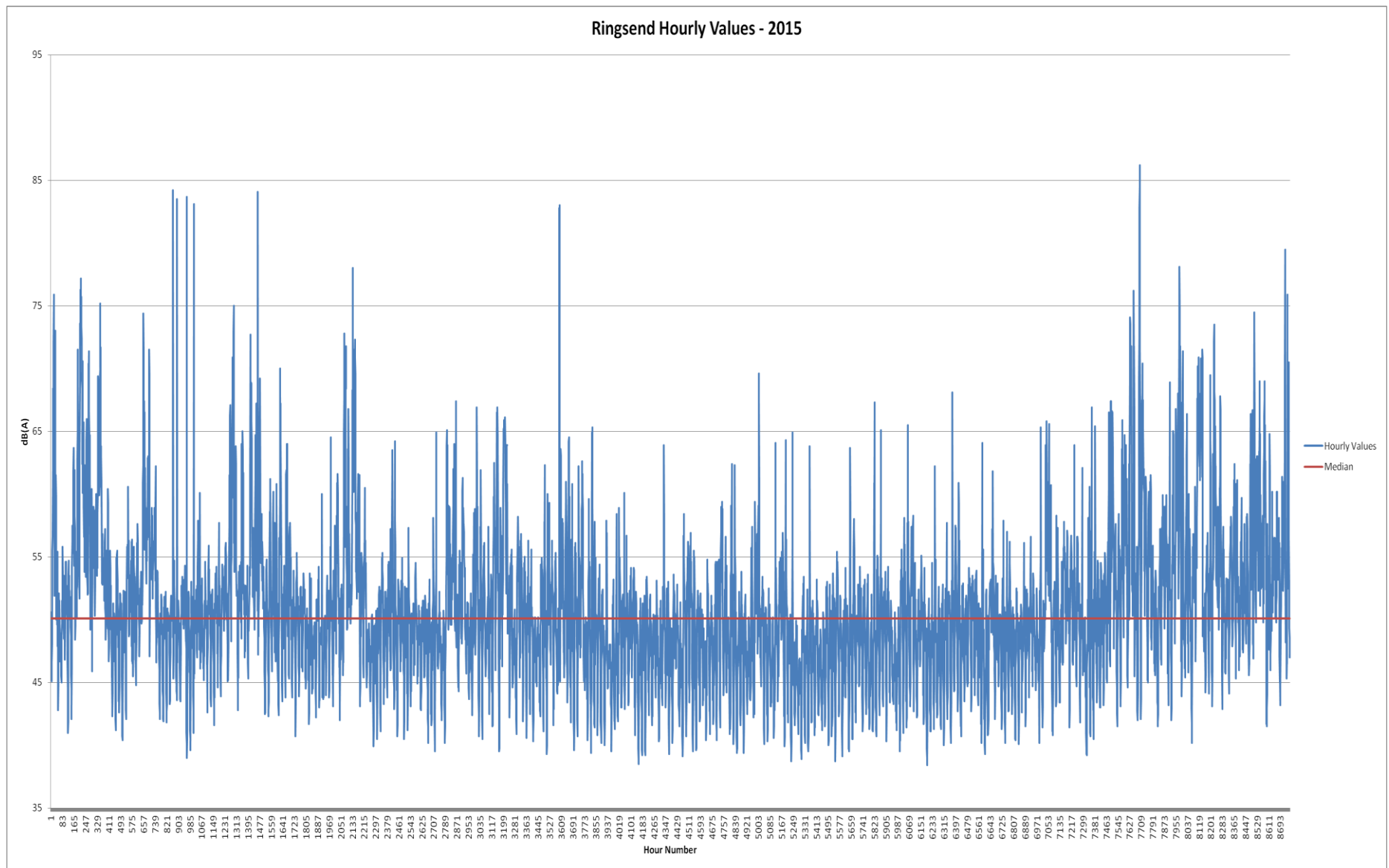


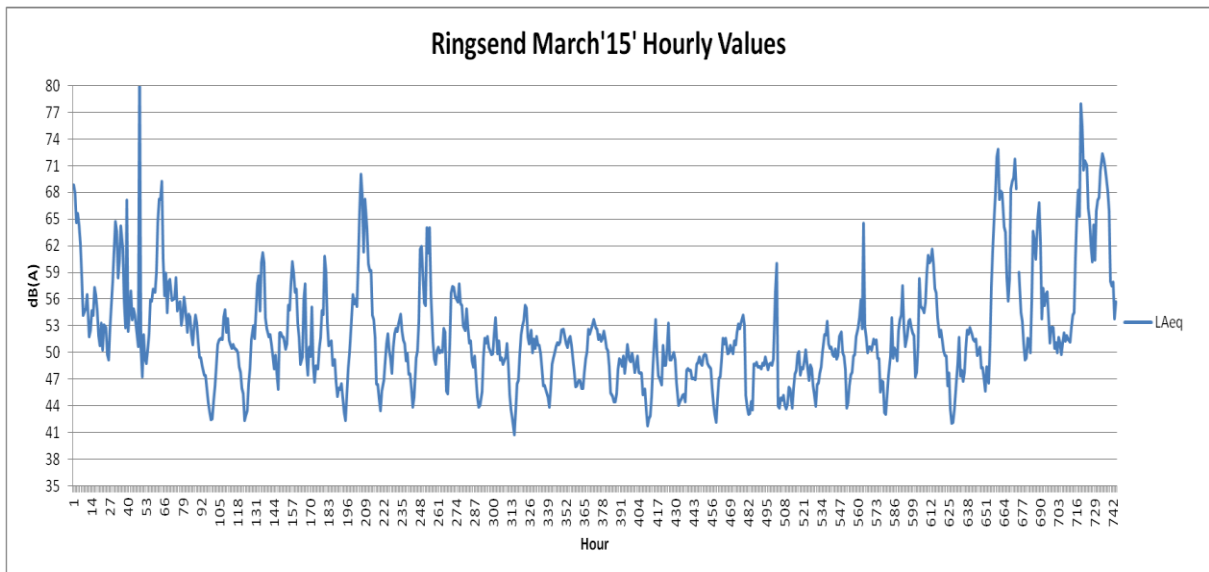
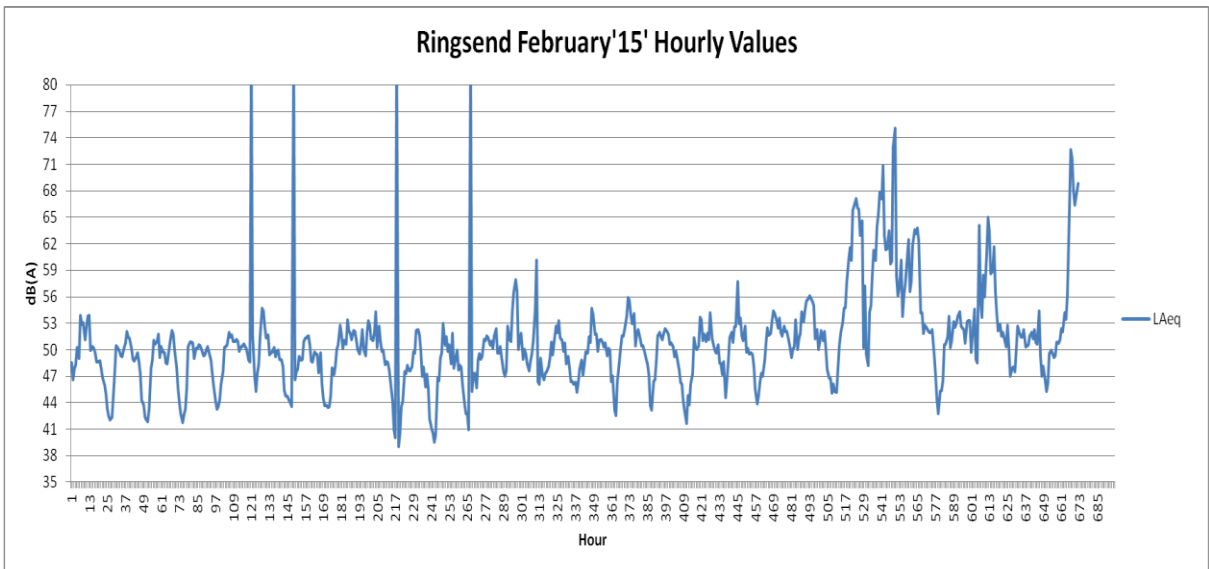
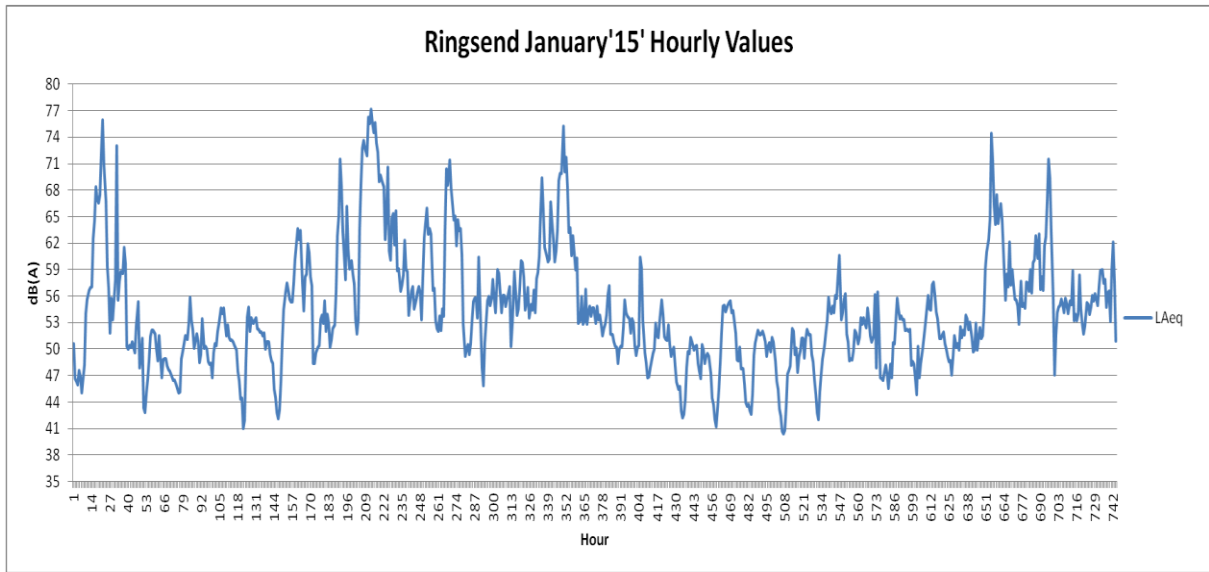
**Raheny December'15' Hourly Values**

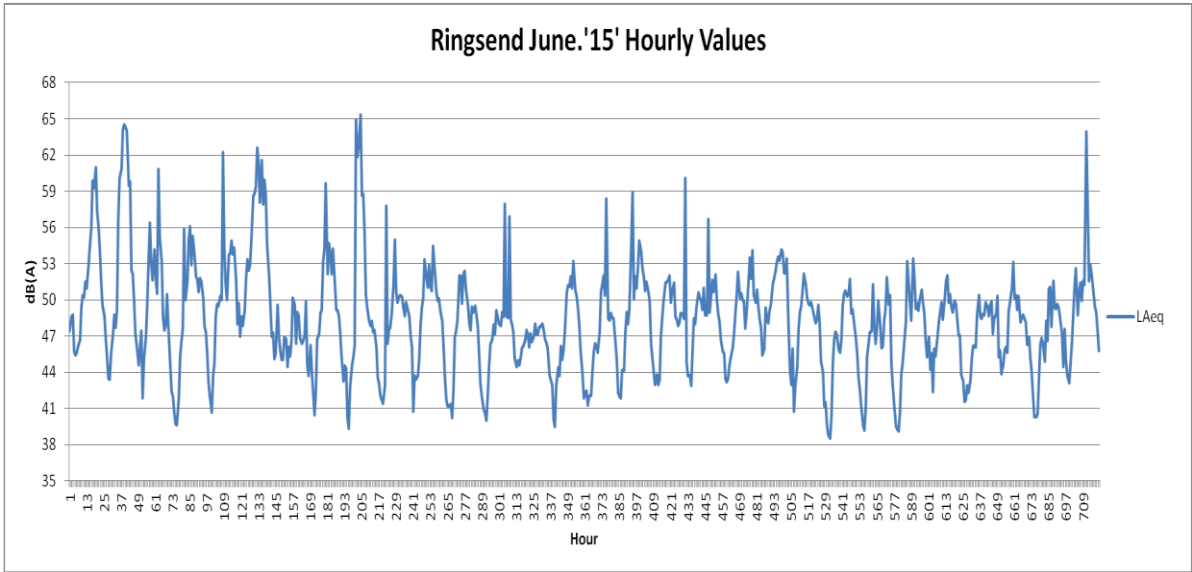
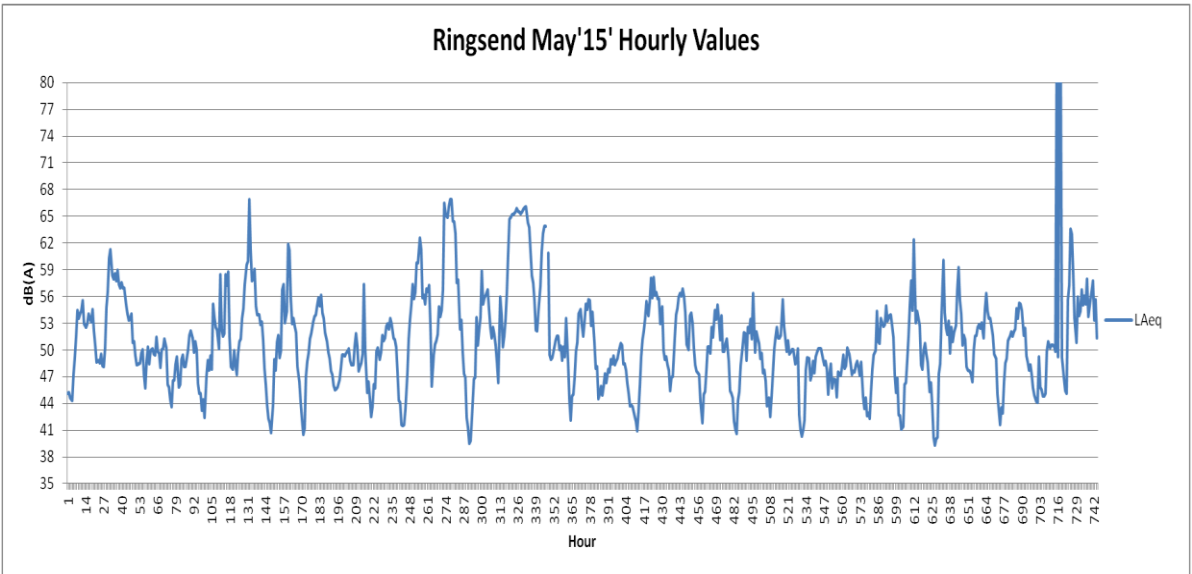
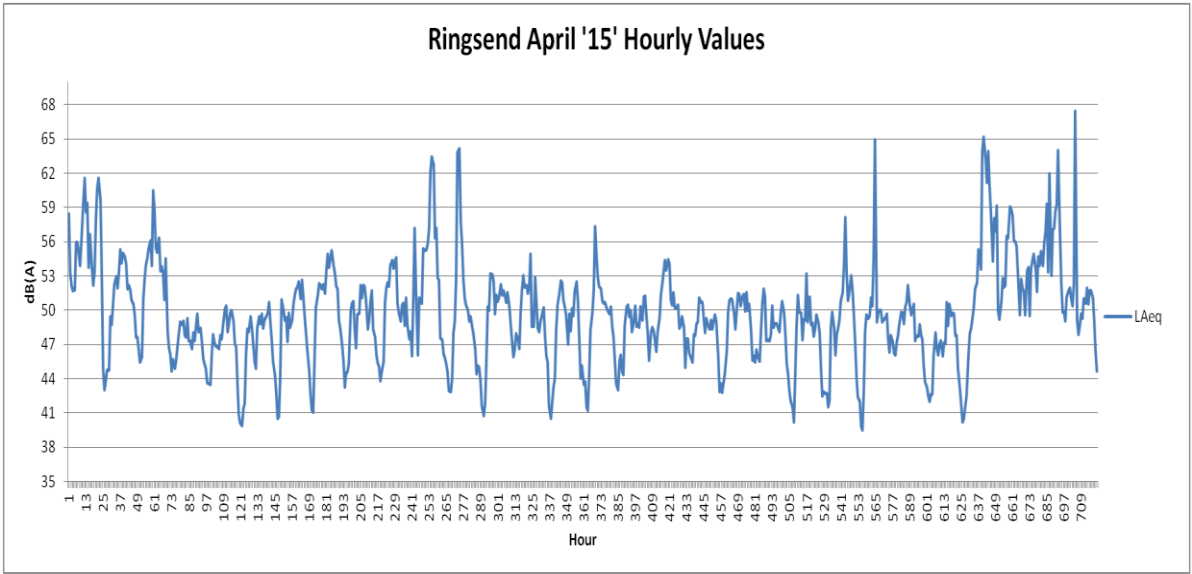


**IRISHTOWN SPORTS CENTRE**  
**RINGSEND**  
**DUBLIN 4**

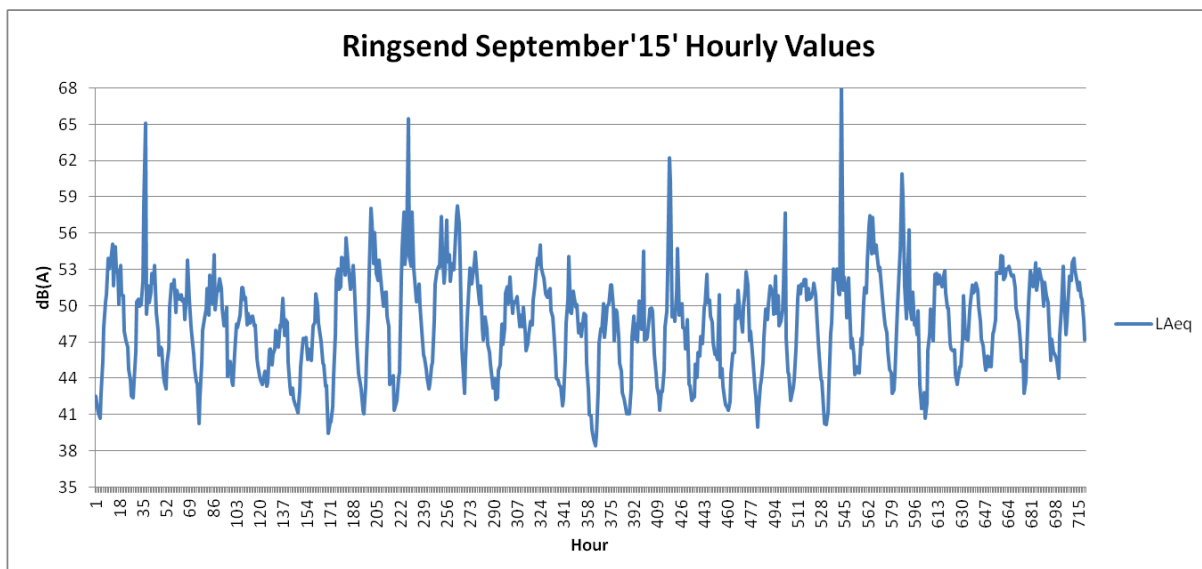
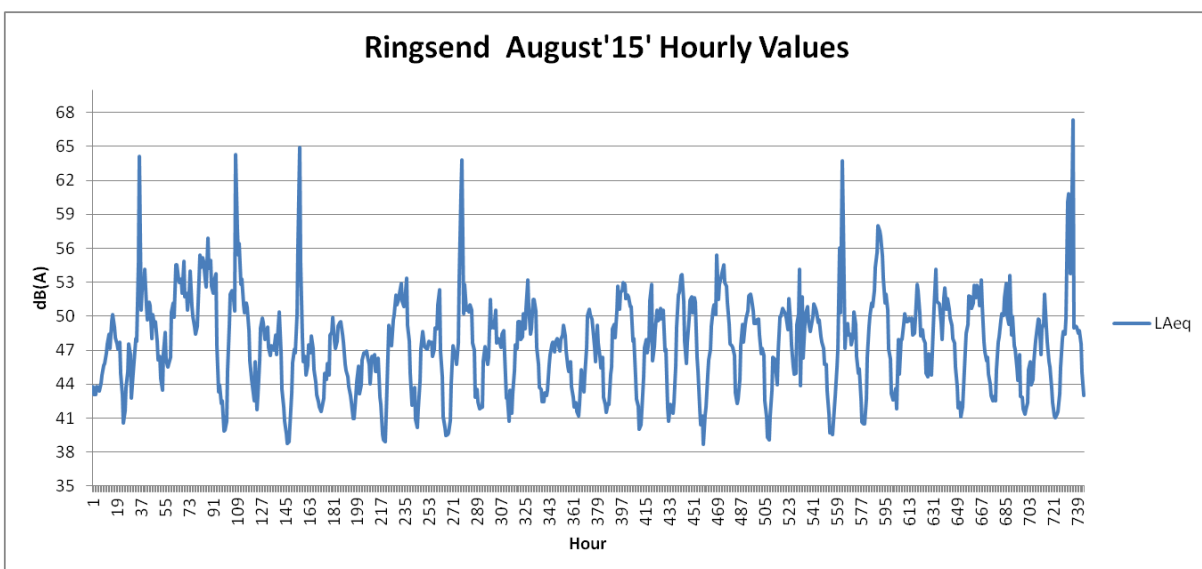
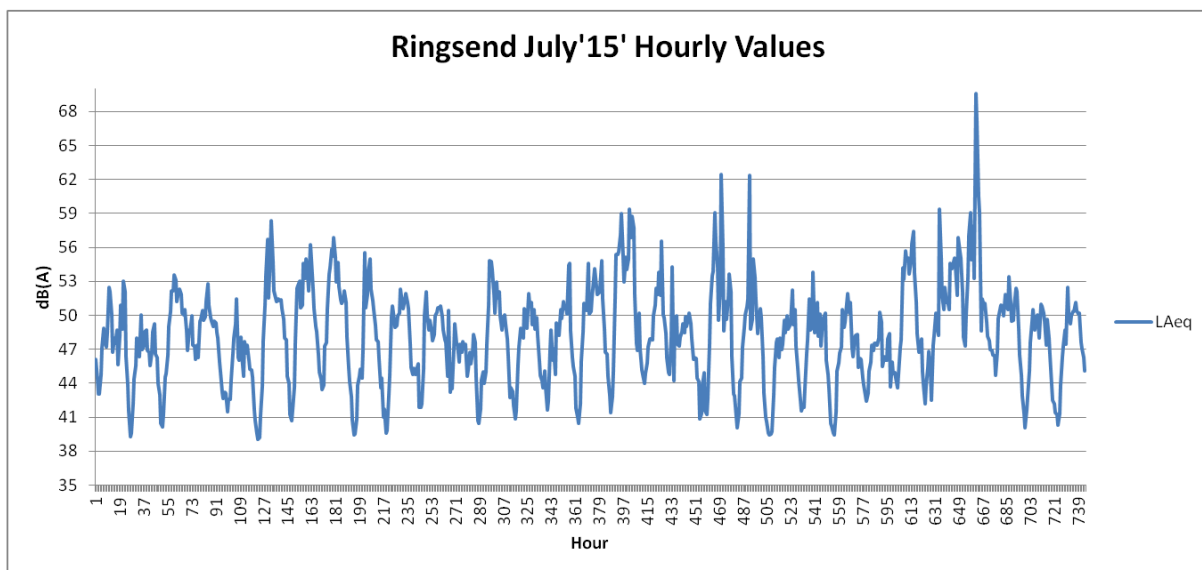


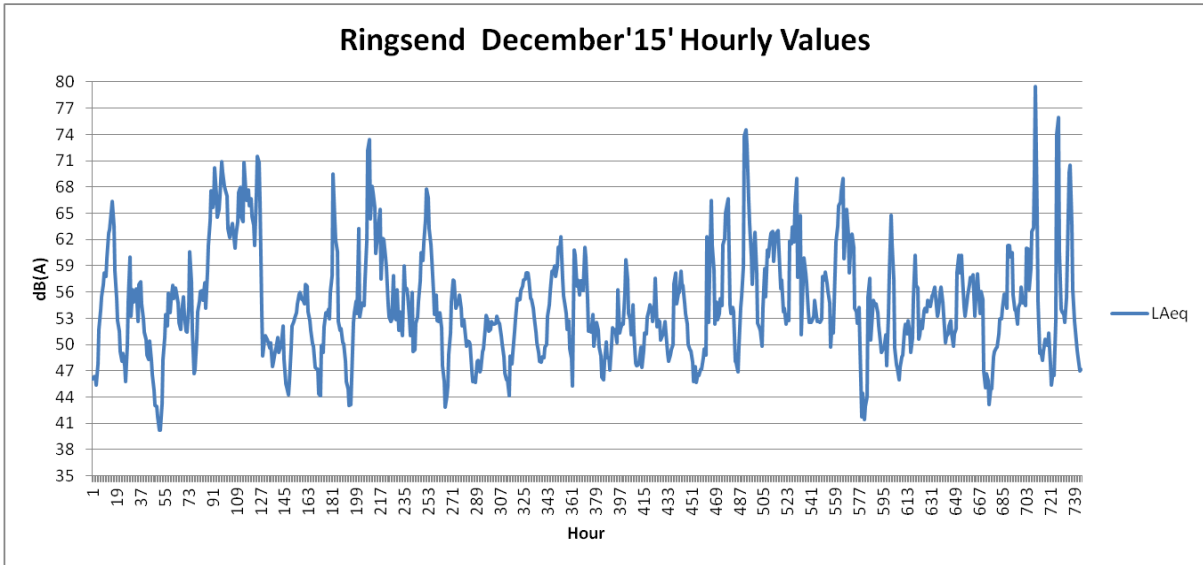
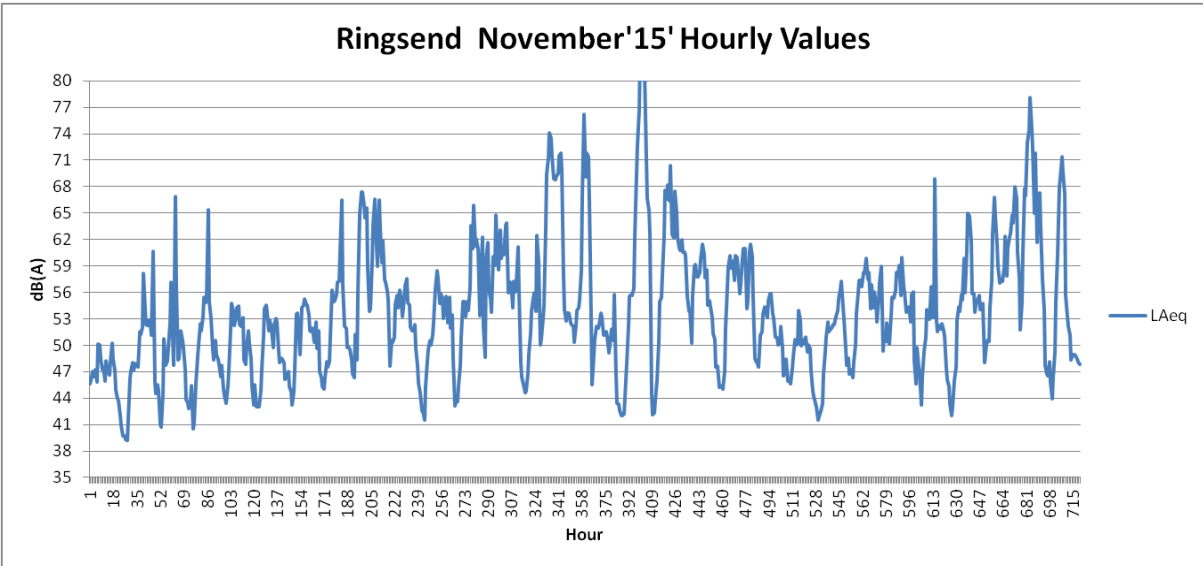
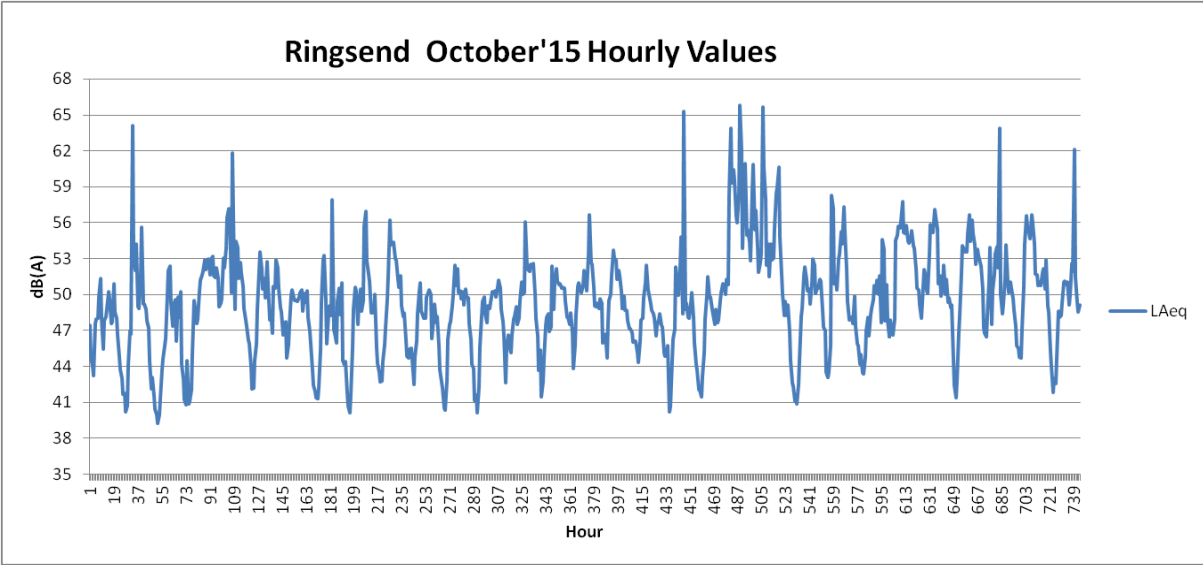








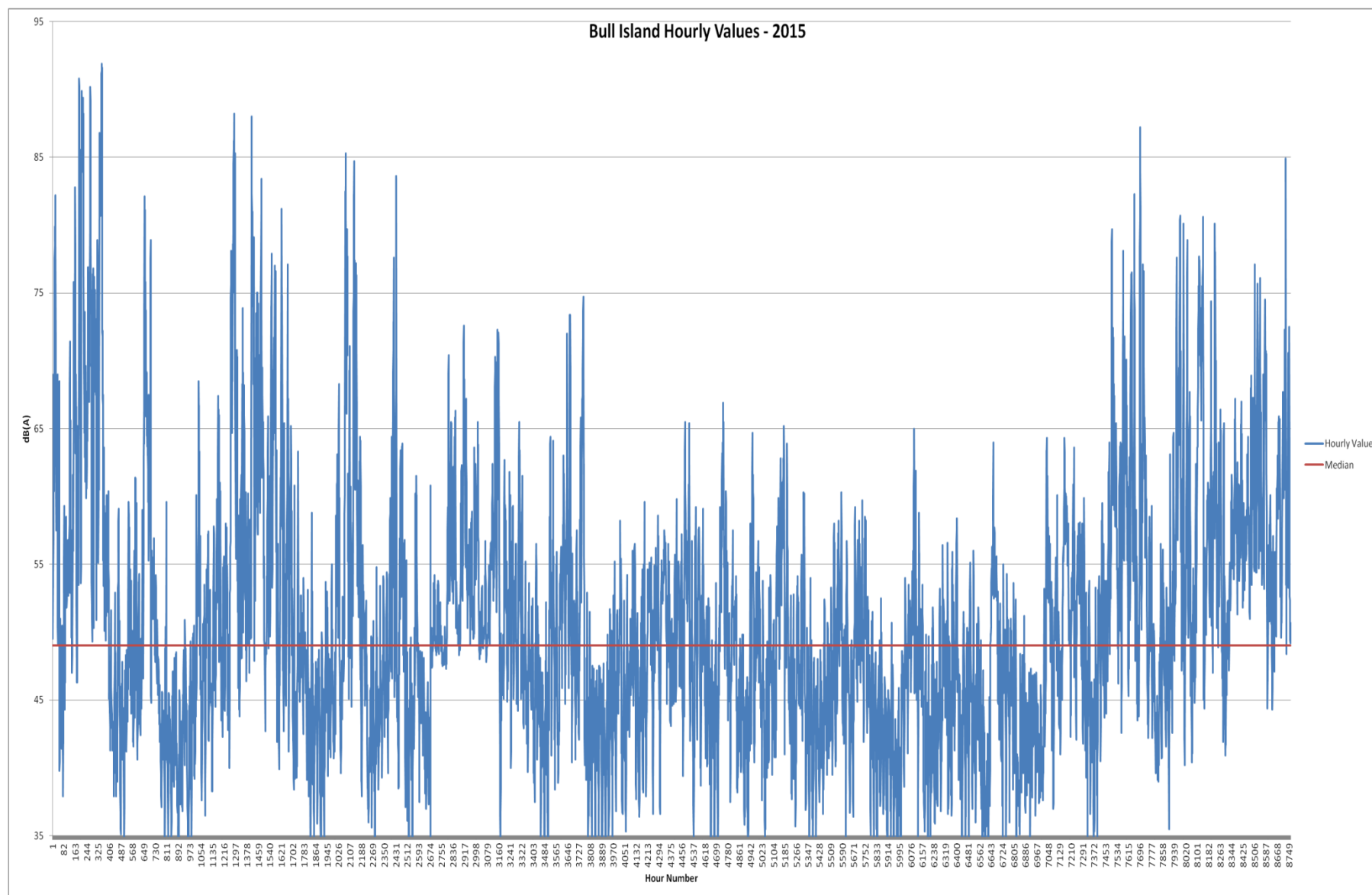


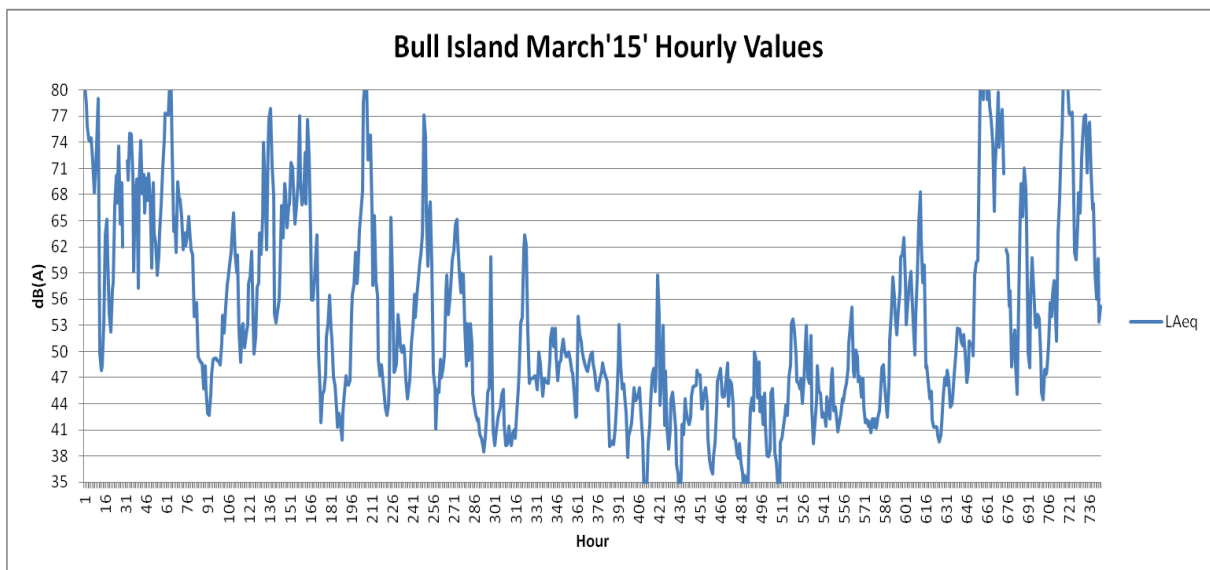
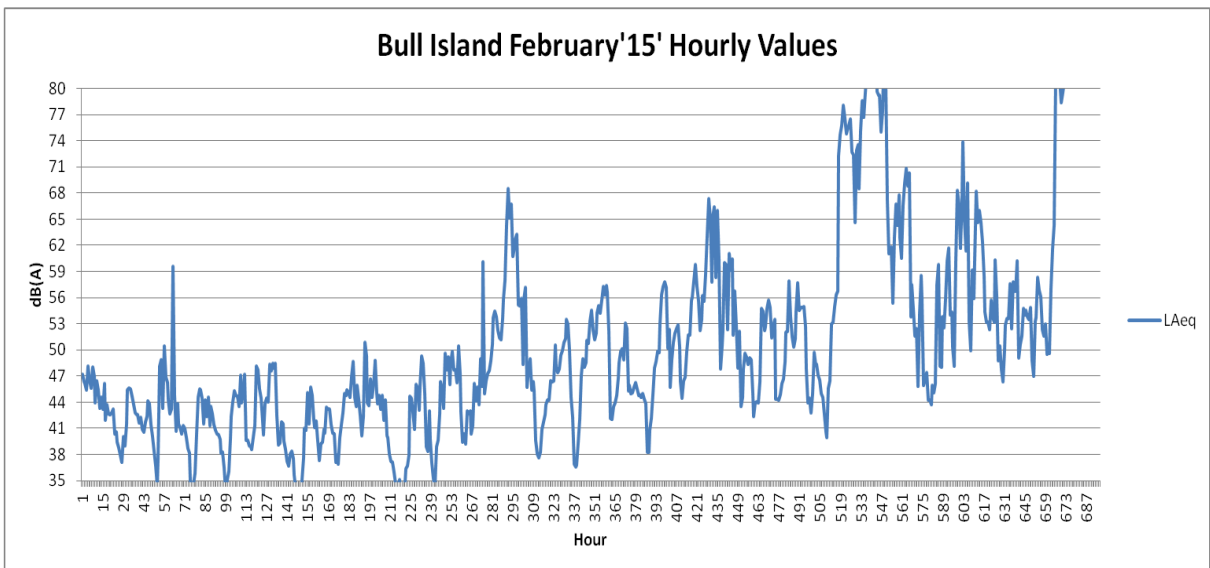
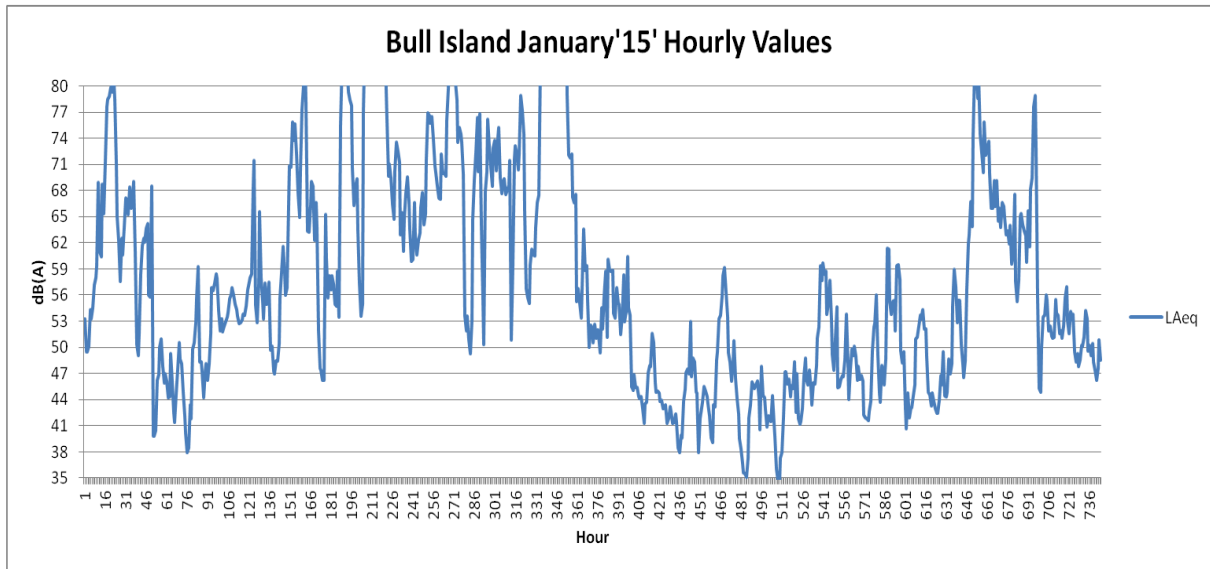


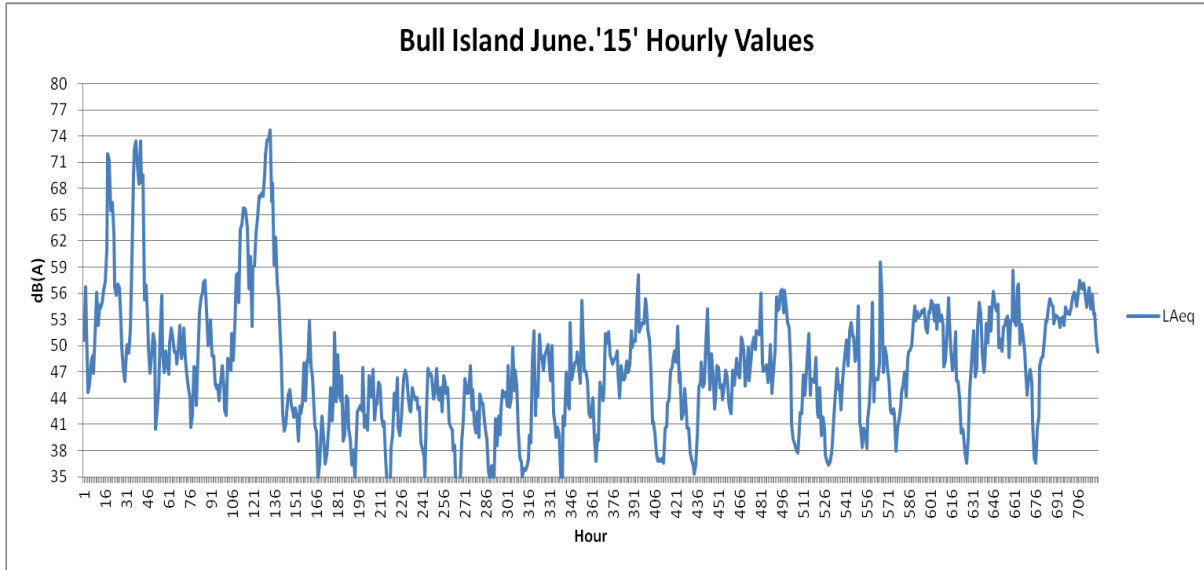
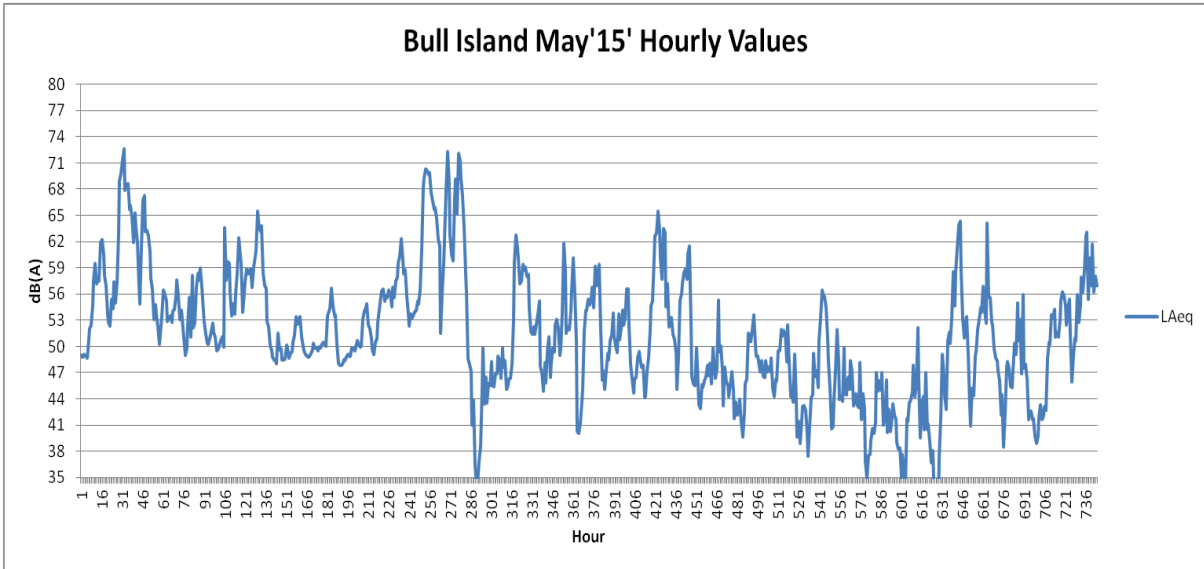
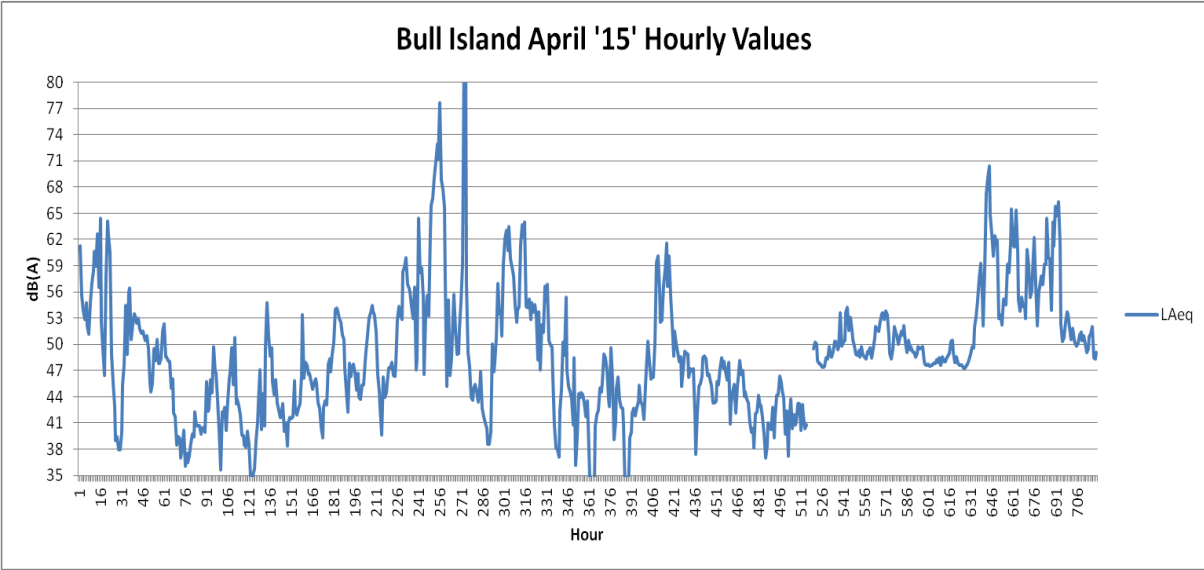
**BULL ISLAND INTERPRETATIVE CENTRE**  
**BULL ISLAND**  
**DUBLIN 3**

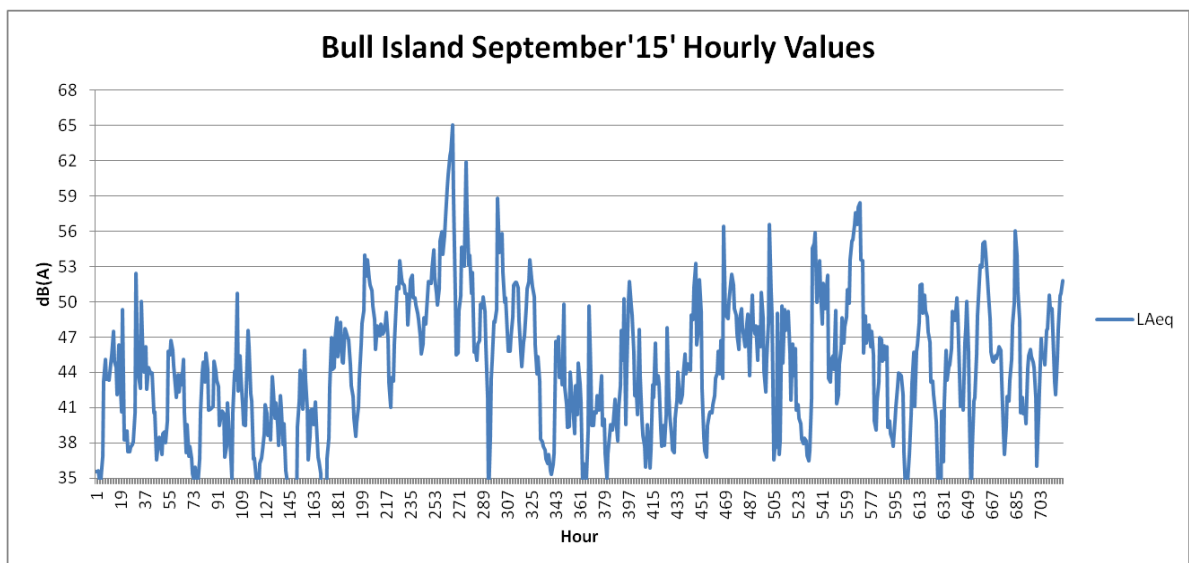
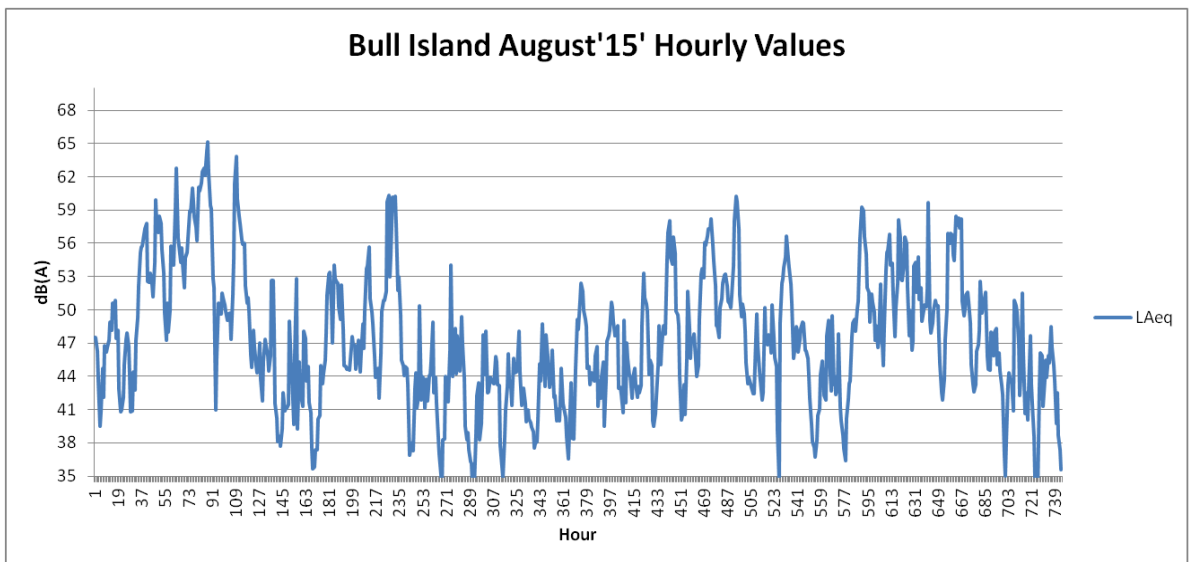
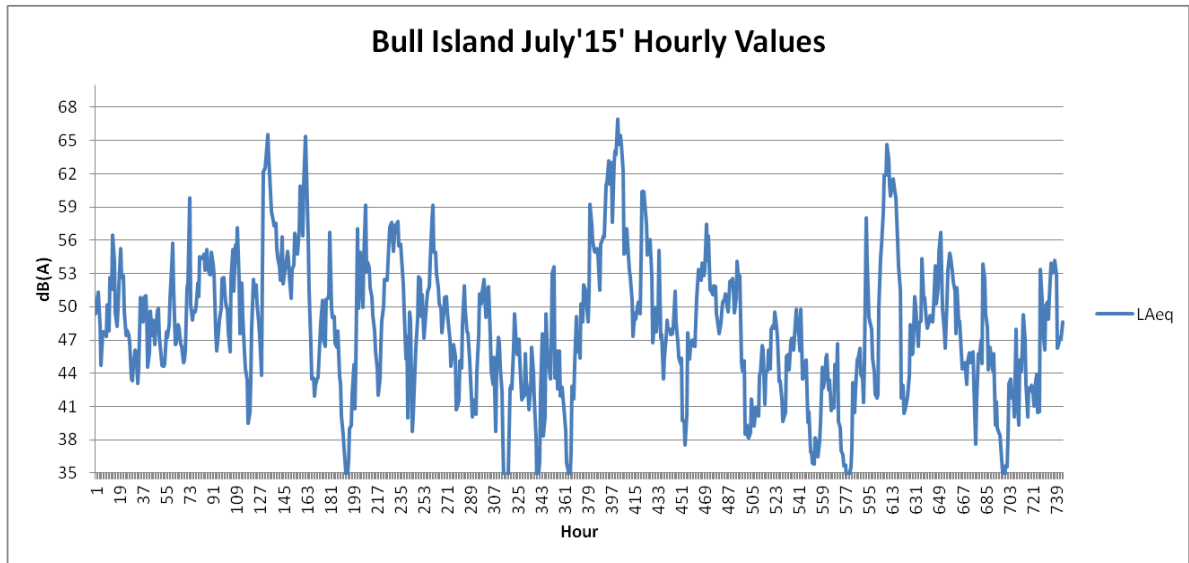


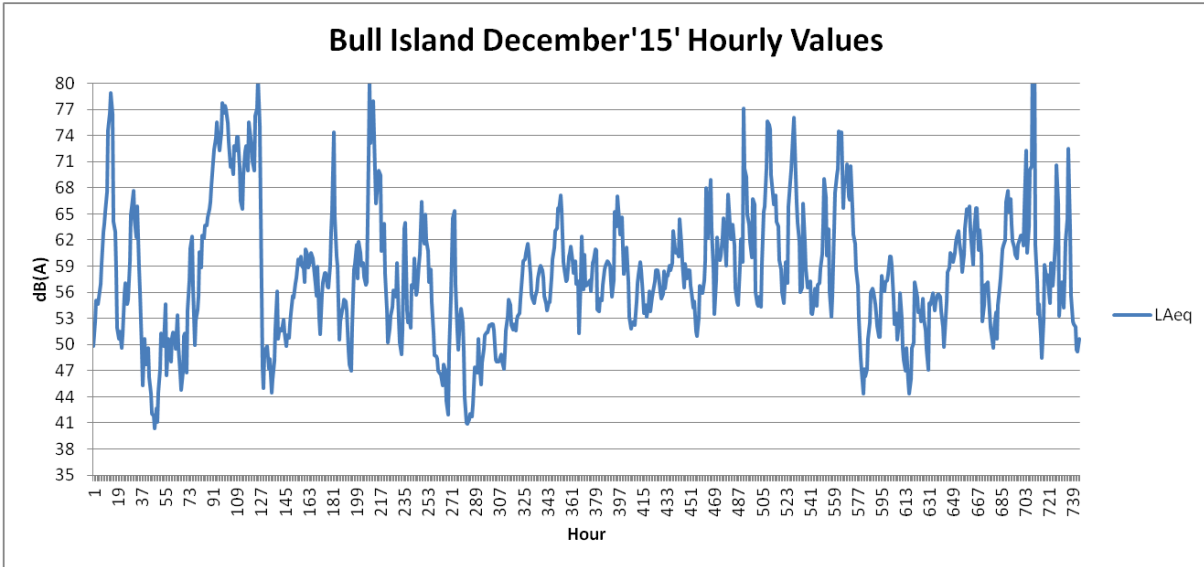
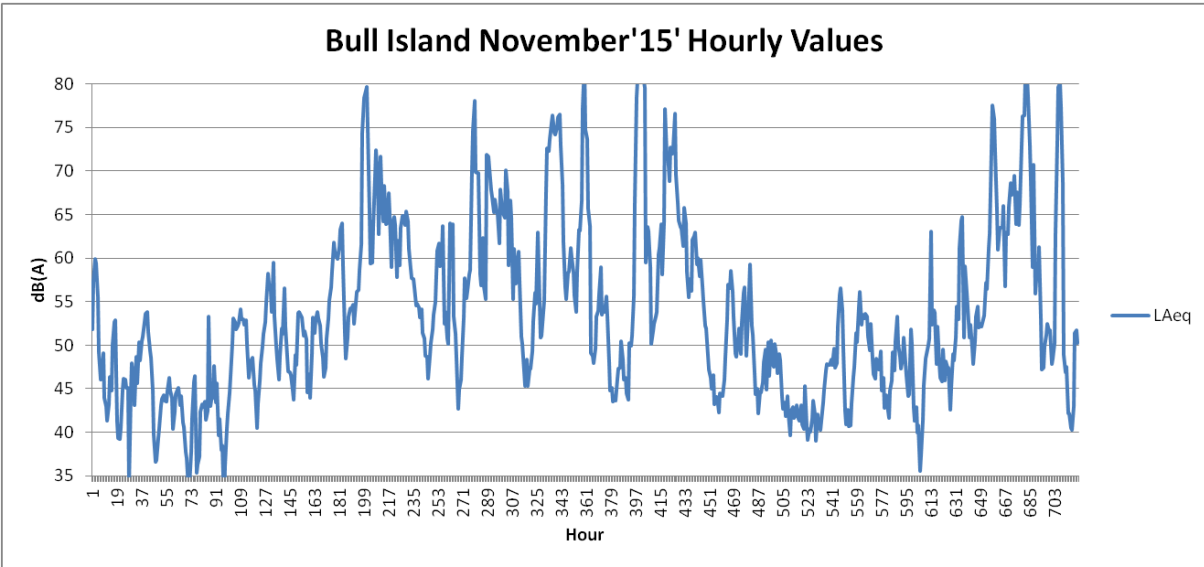
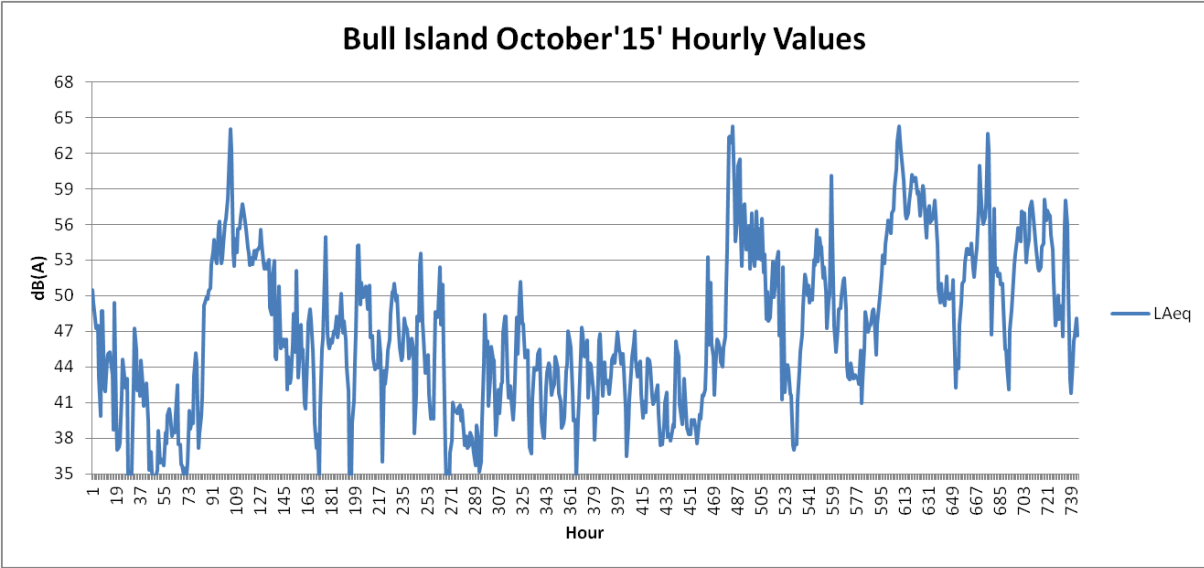








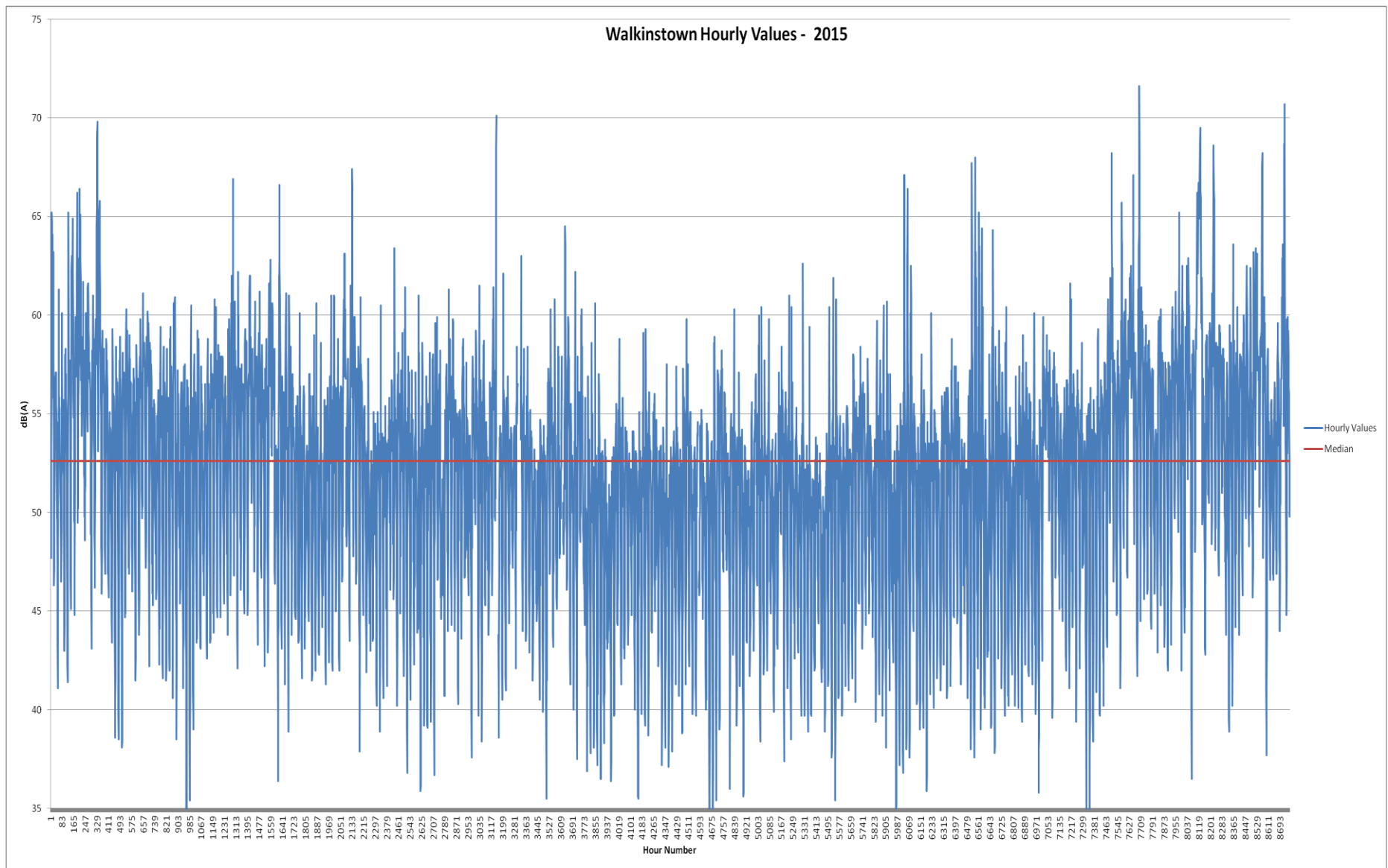




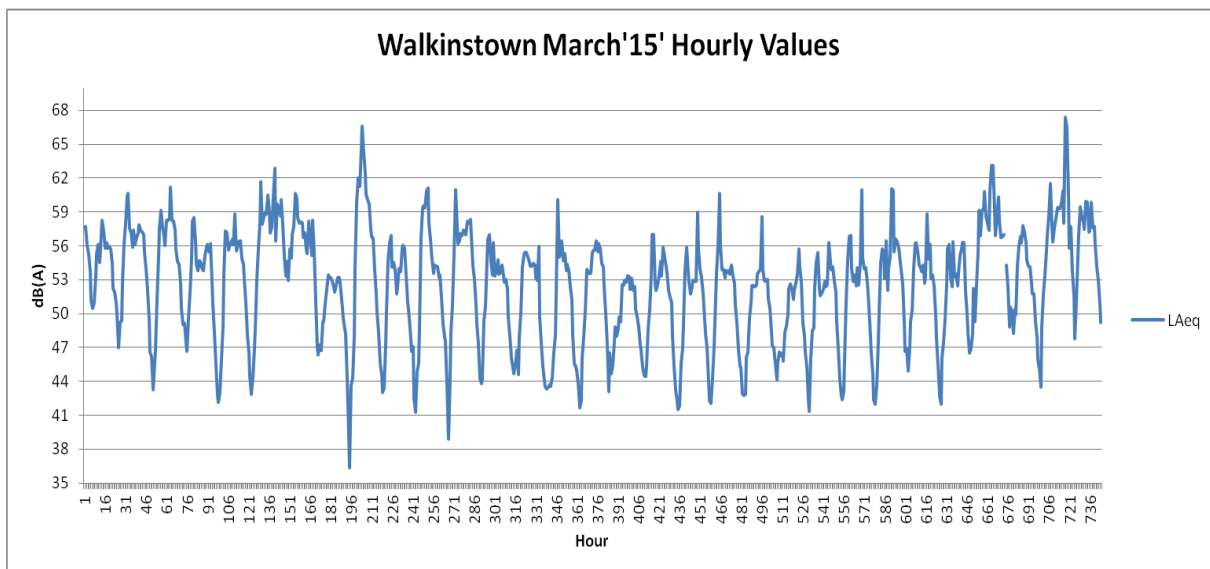
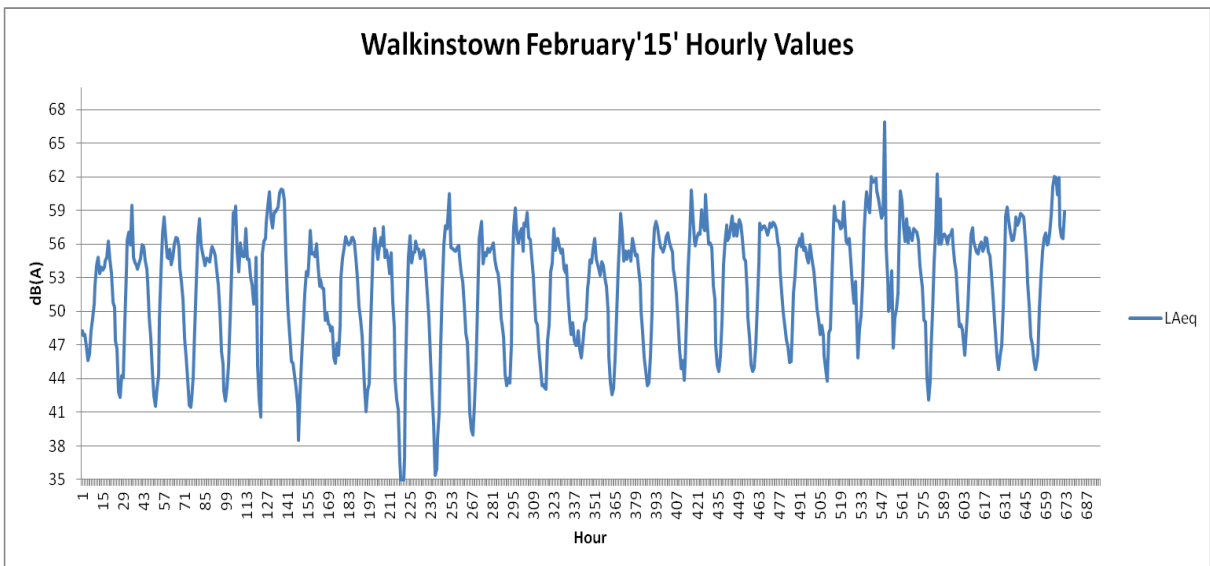
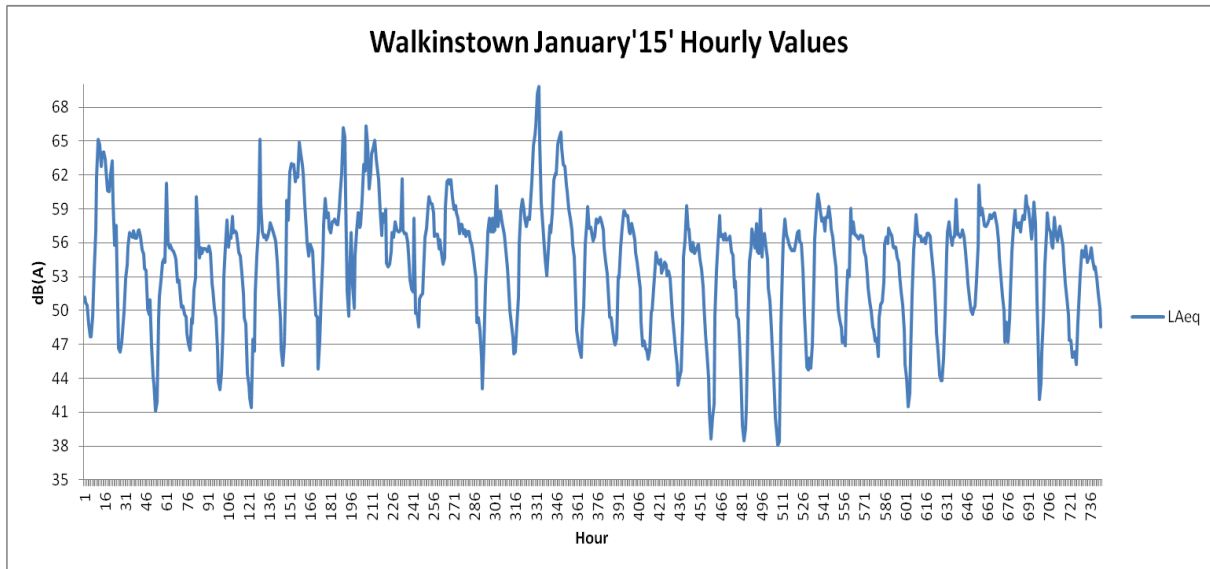


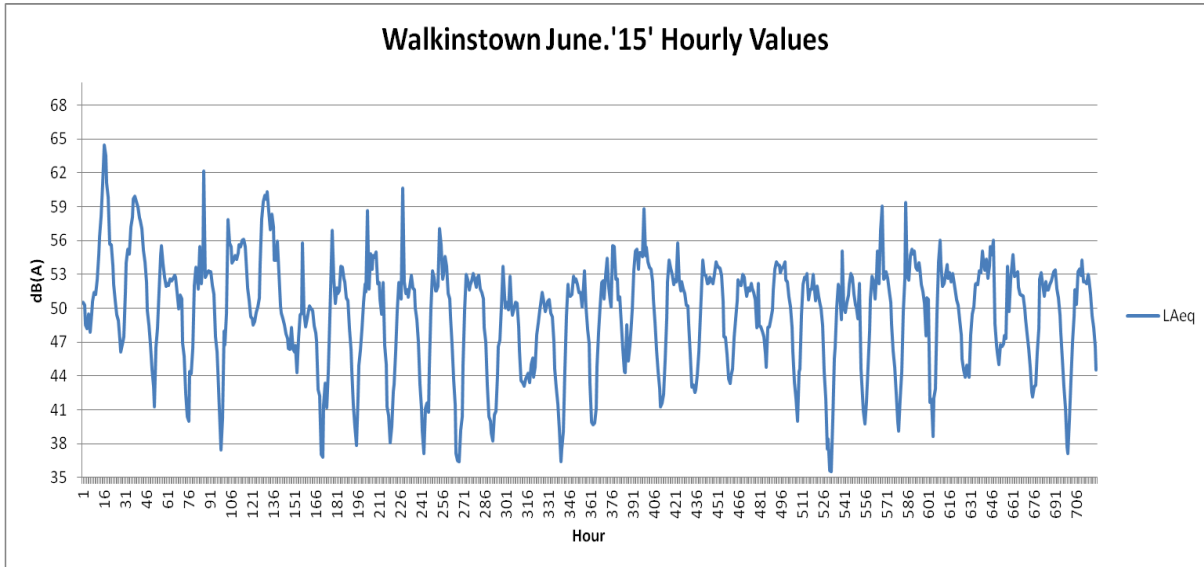
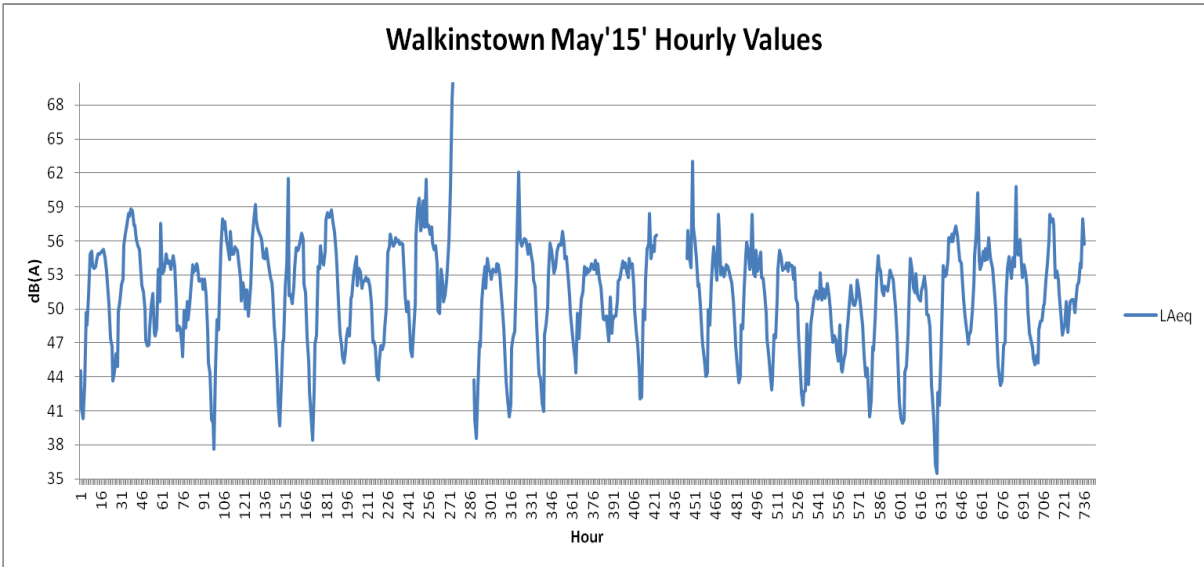
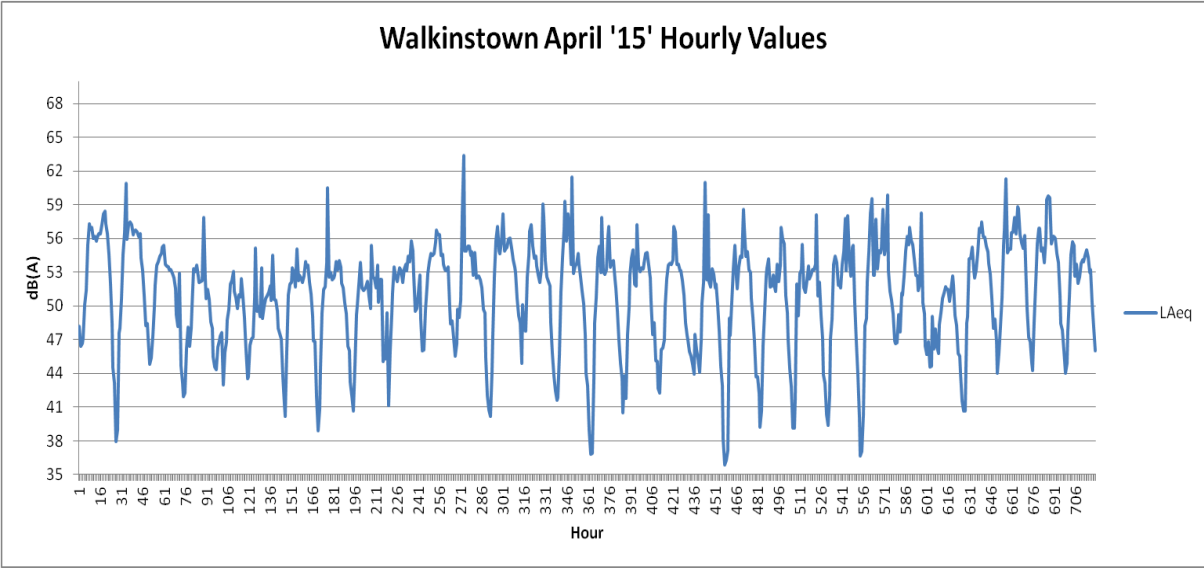
**WALKINSTOWN LIBRARY**  
**PERCY FRENCH ROAD**  
**DUBLIN 12**

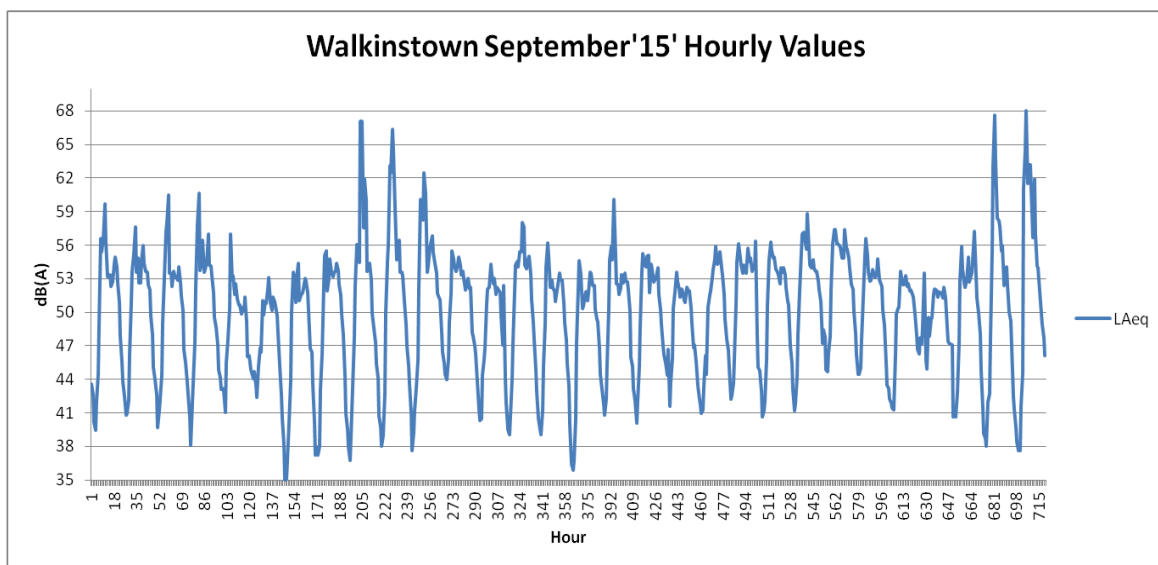
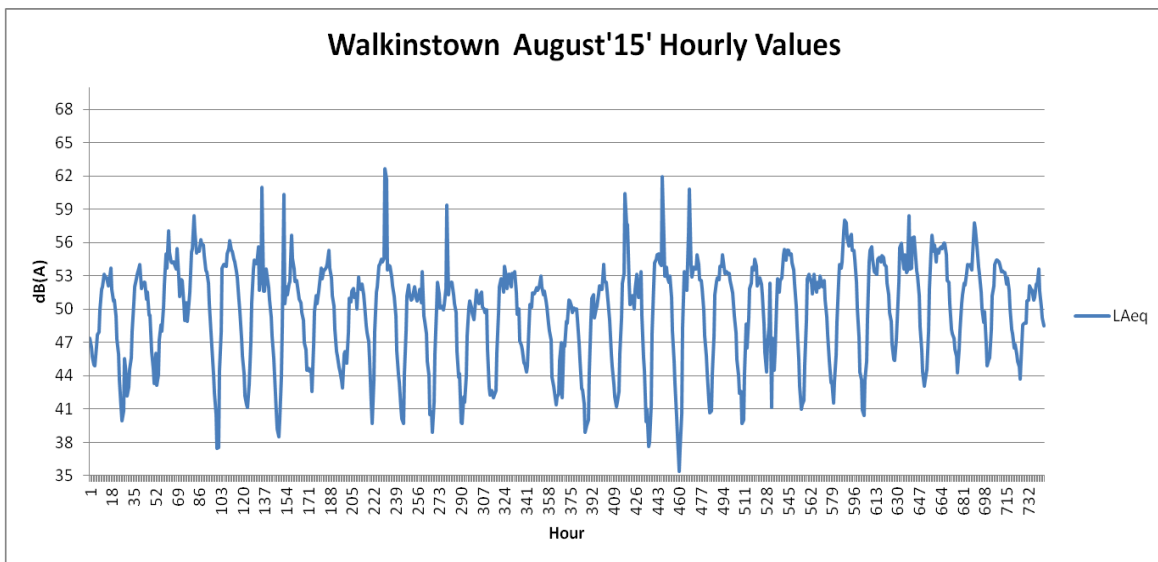
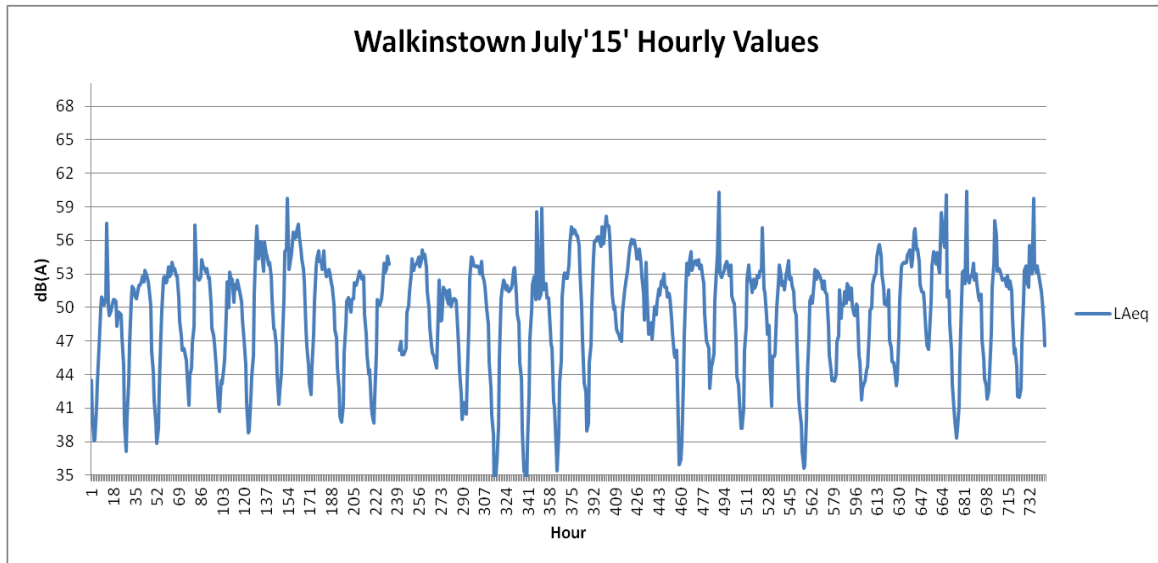


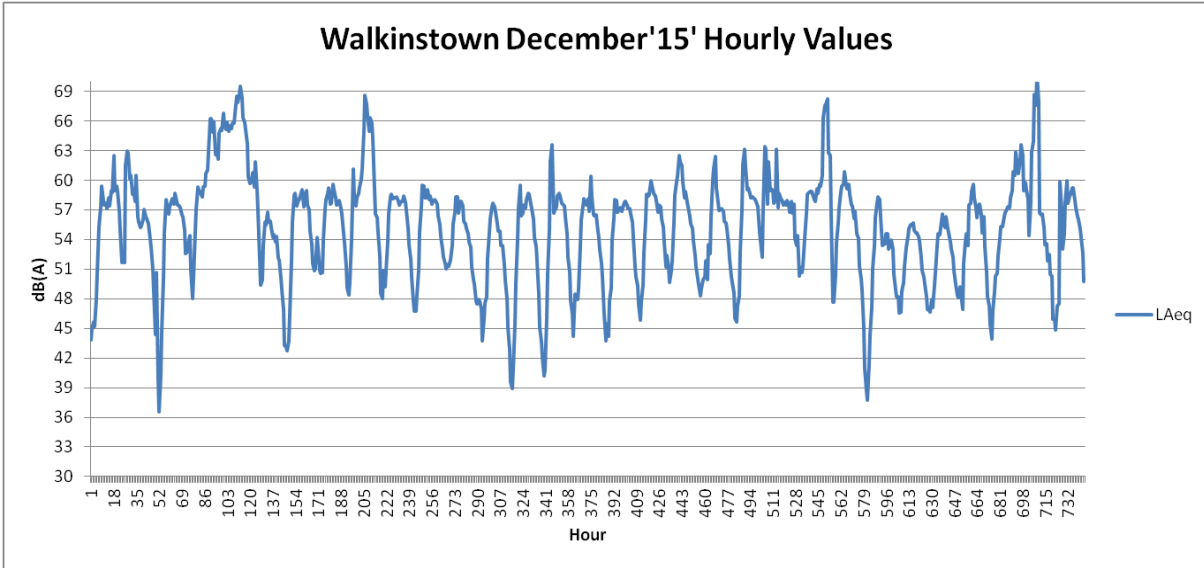
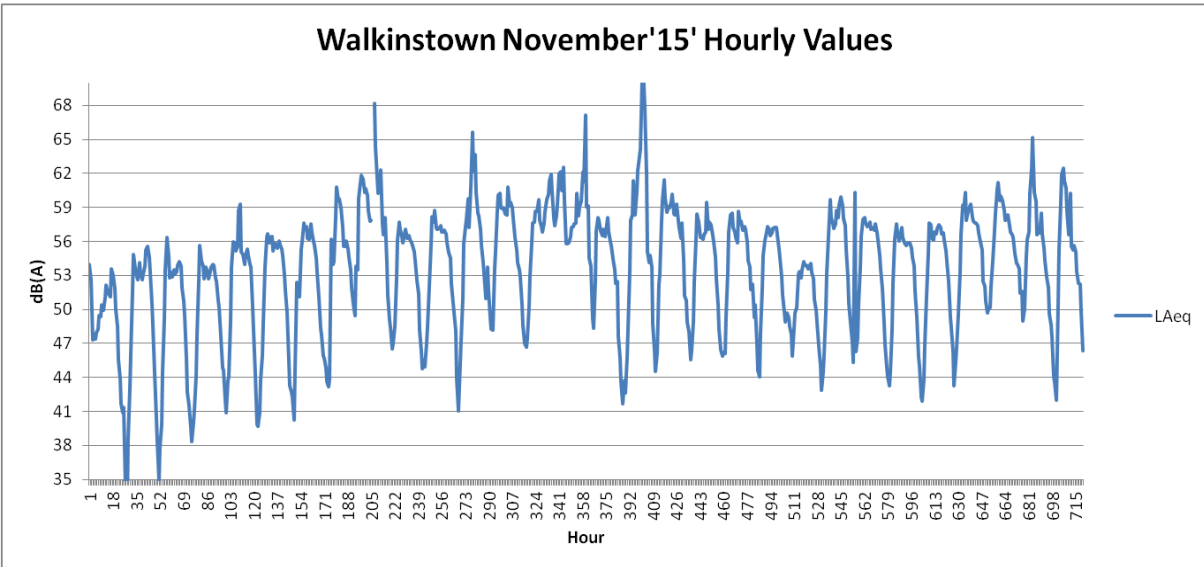
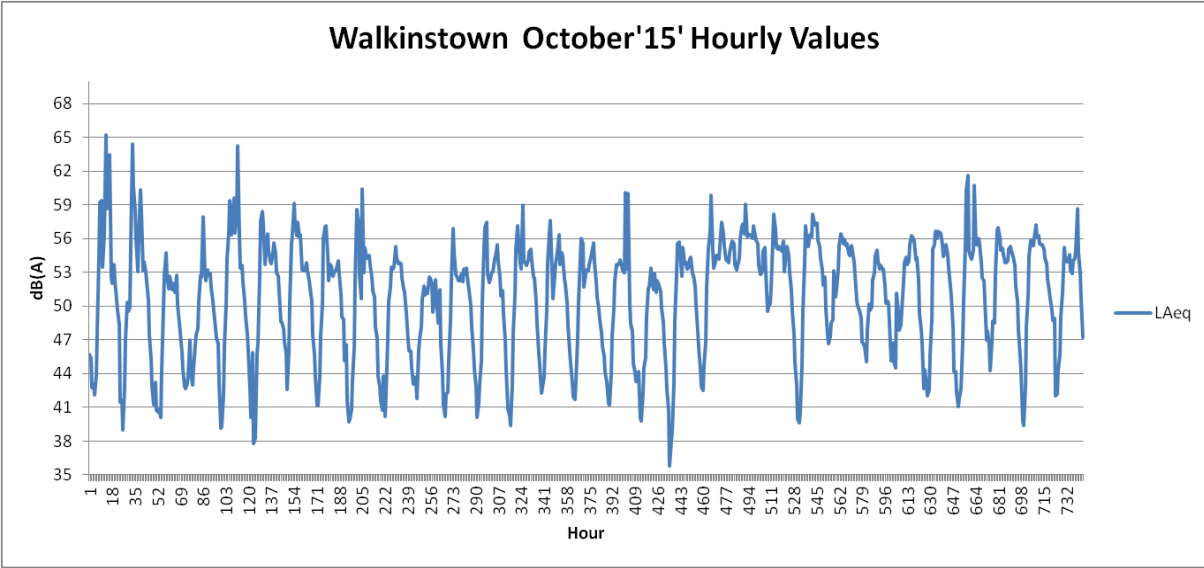








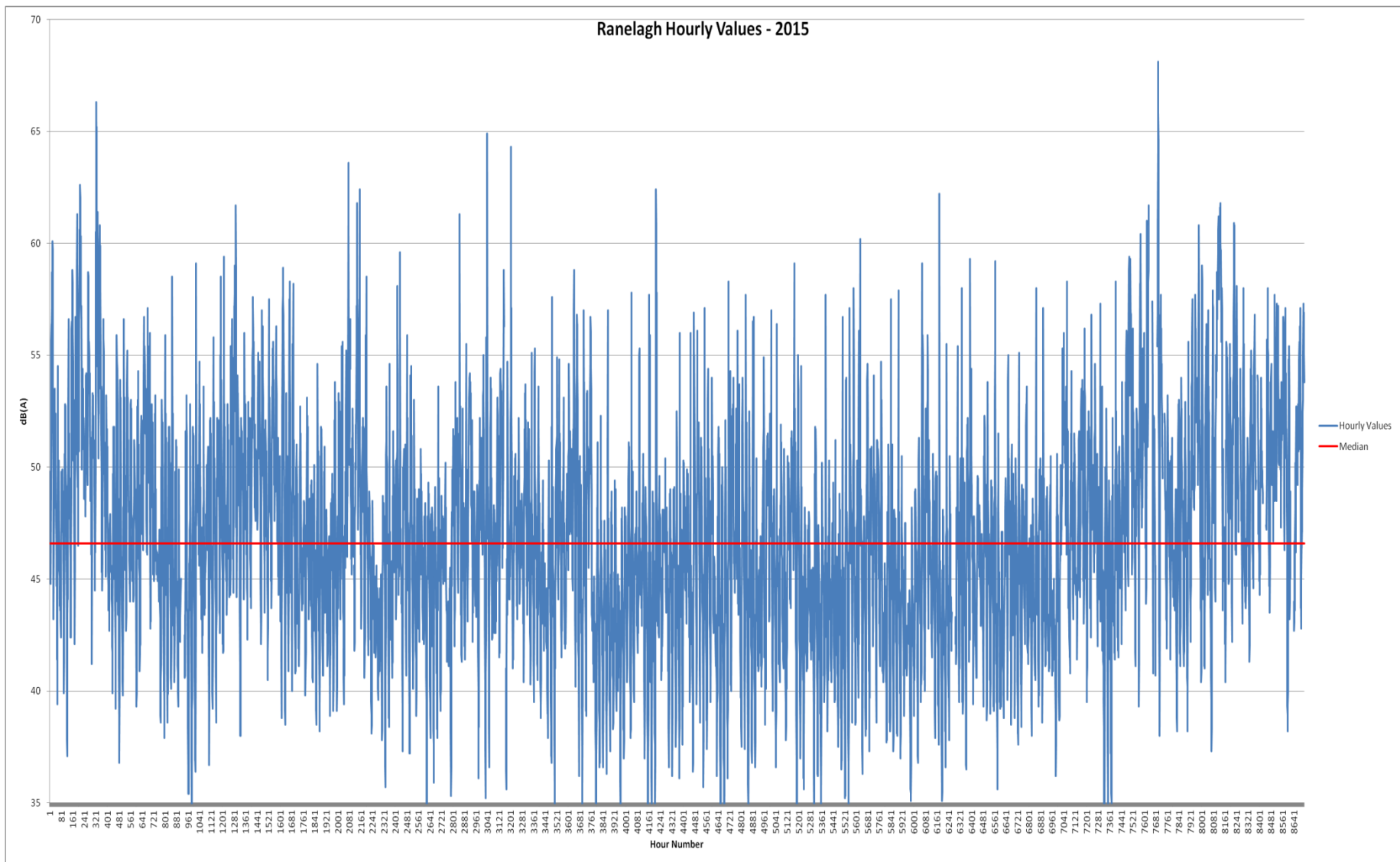


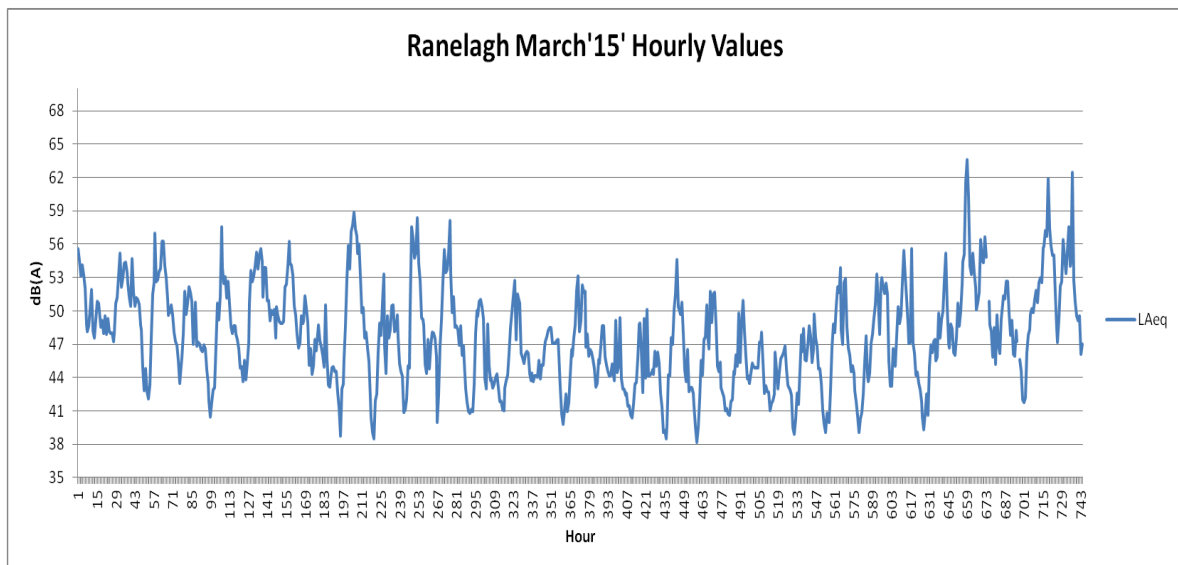
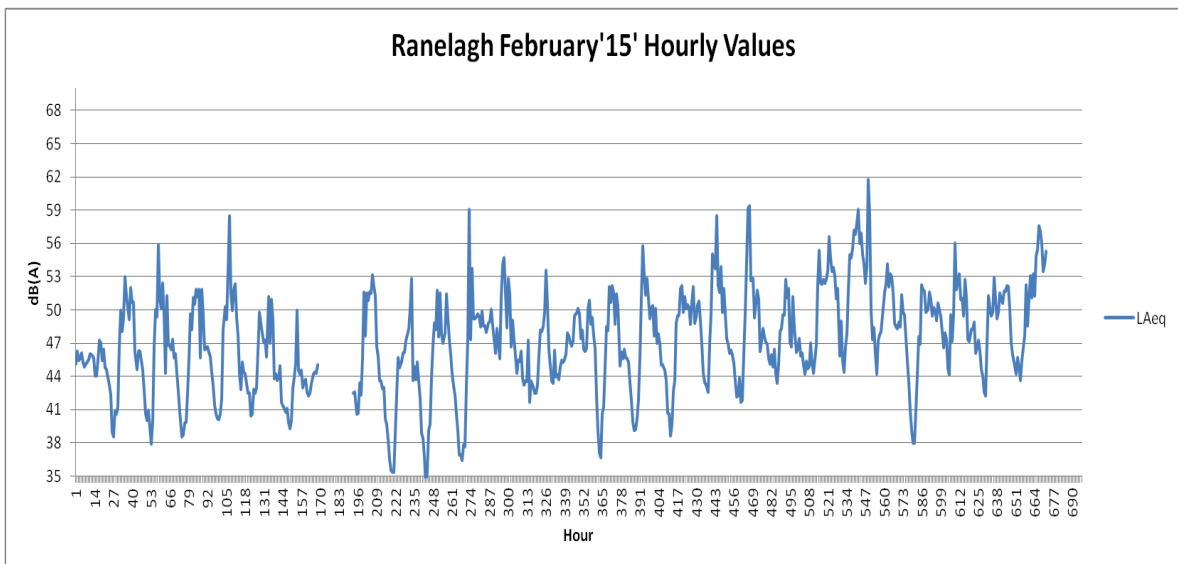
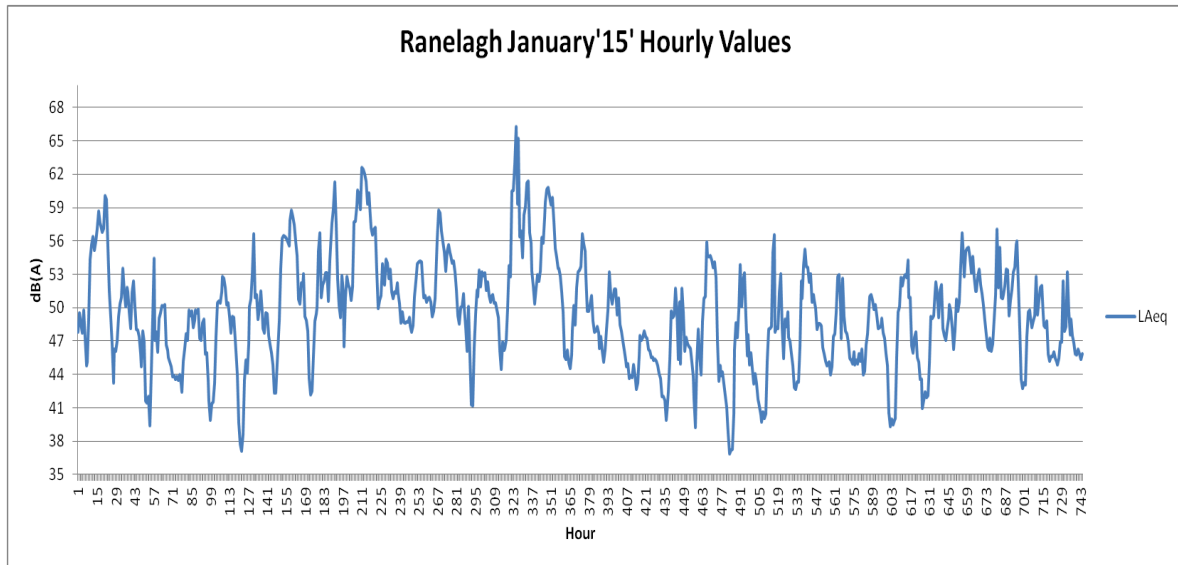




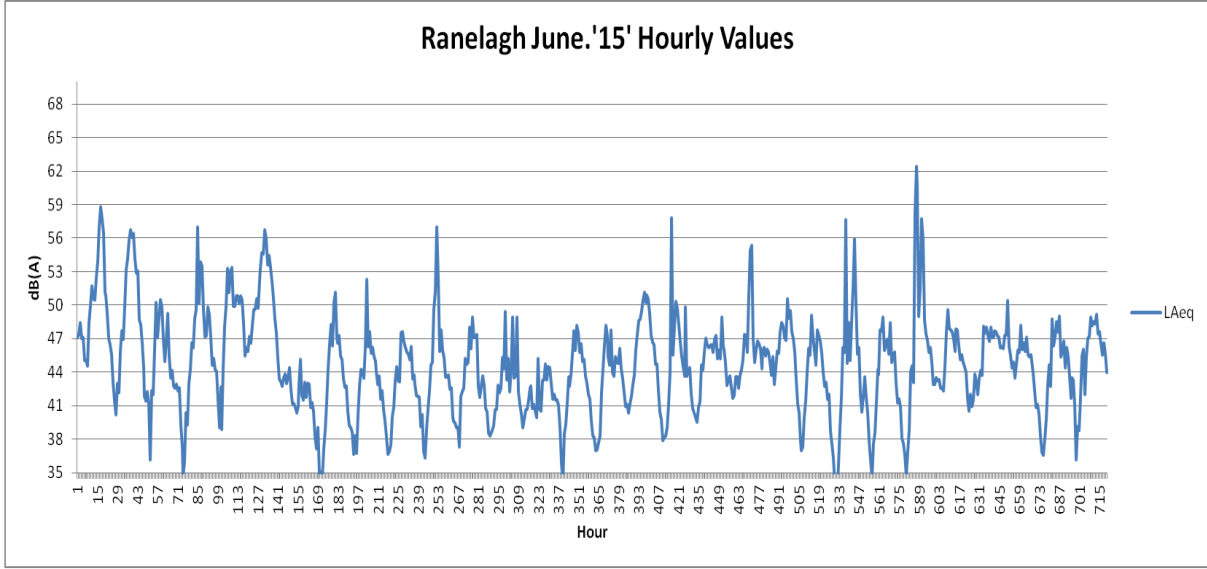
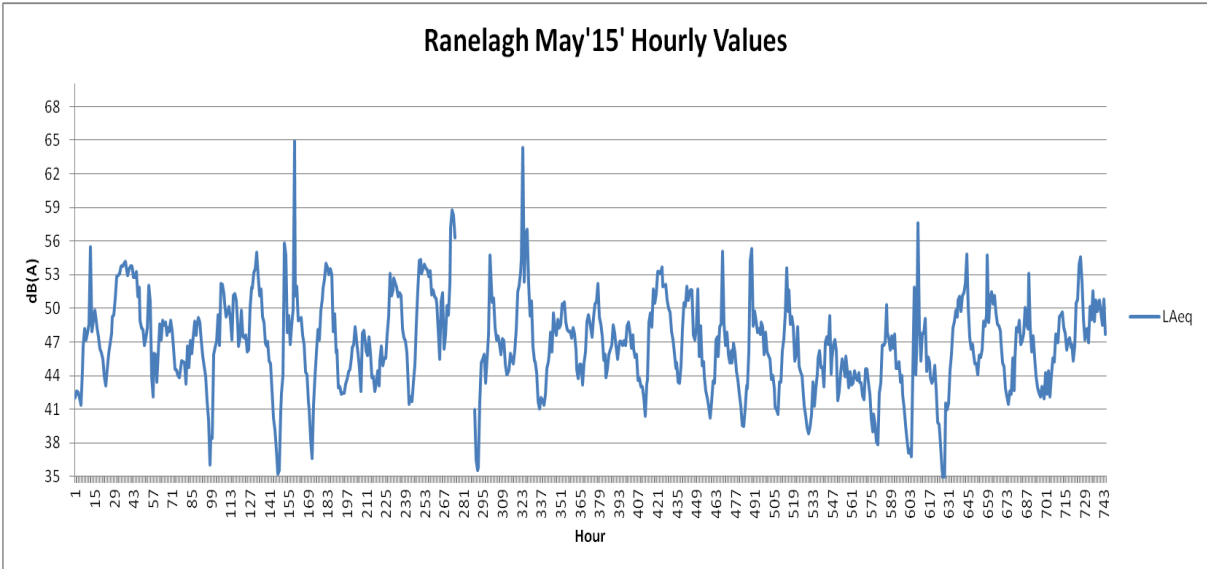
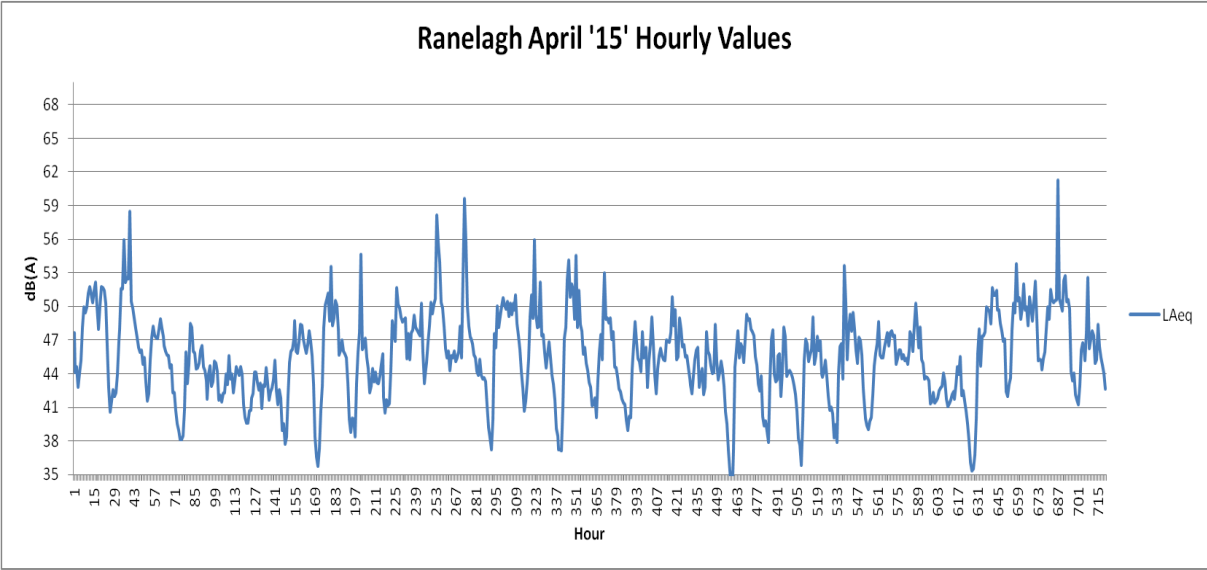
**WOODSTOCK STOCK GARDENS**  
**RANELAGH**  
**DUBLIN 6**

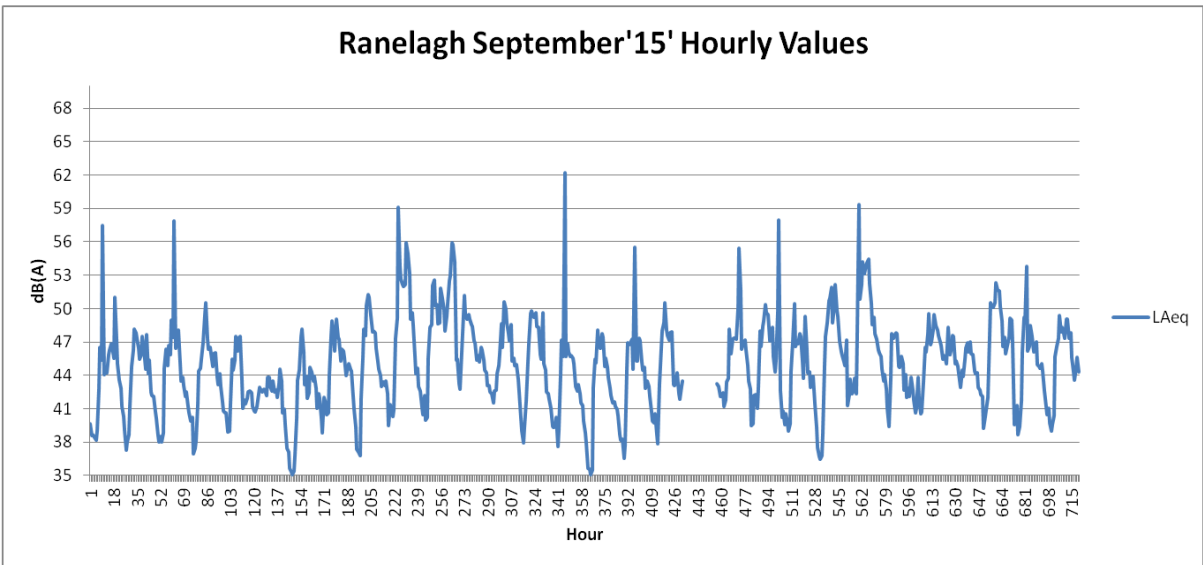
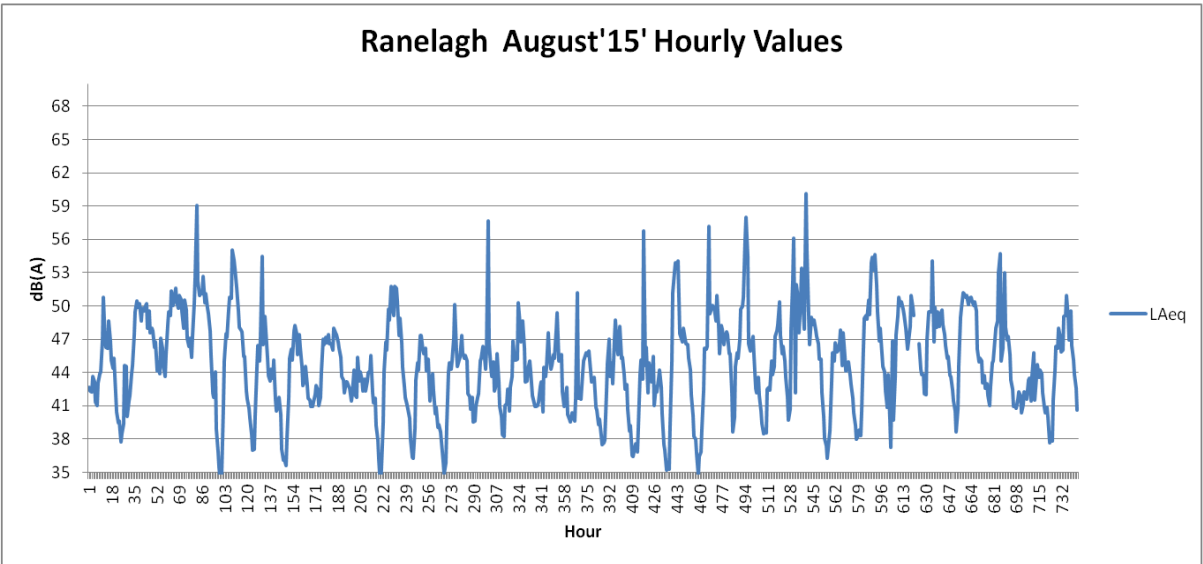
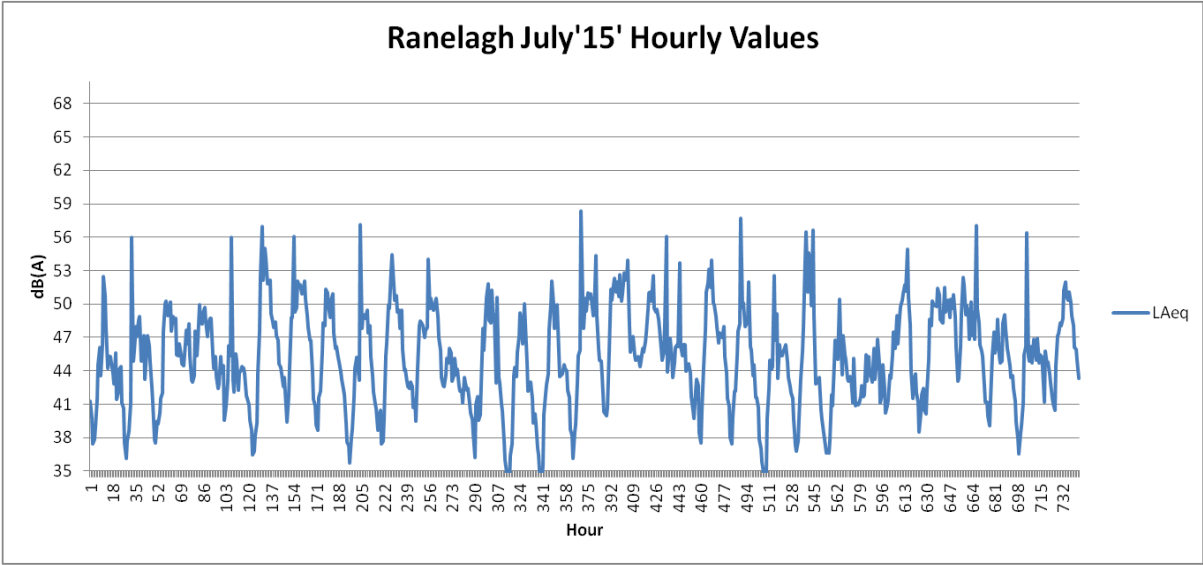


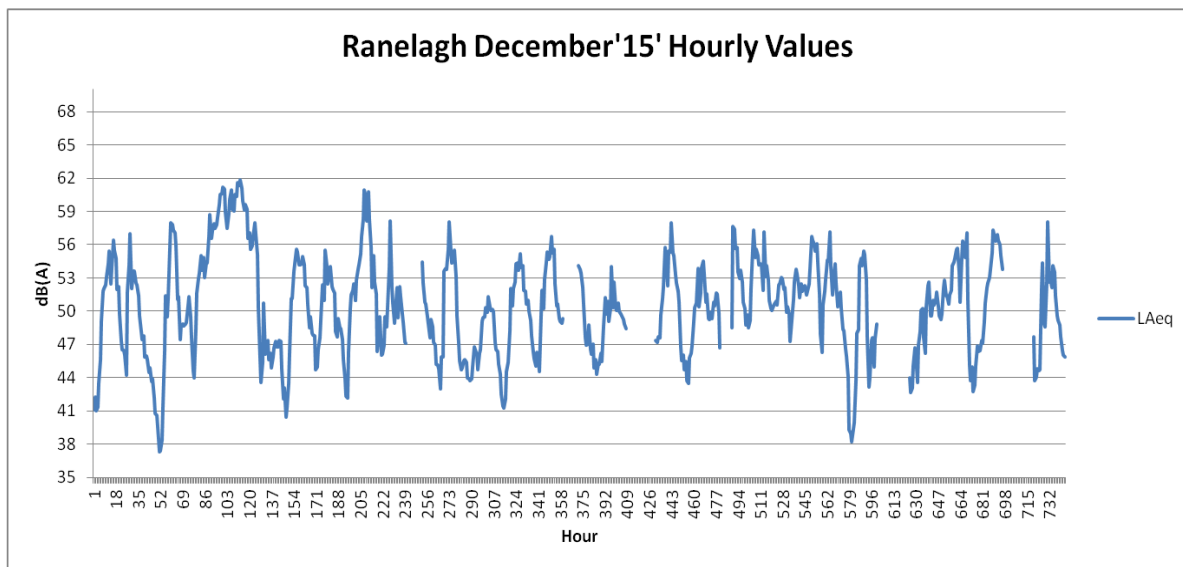
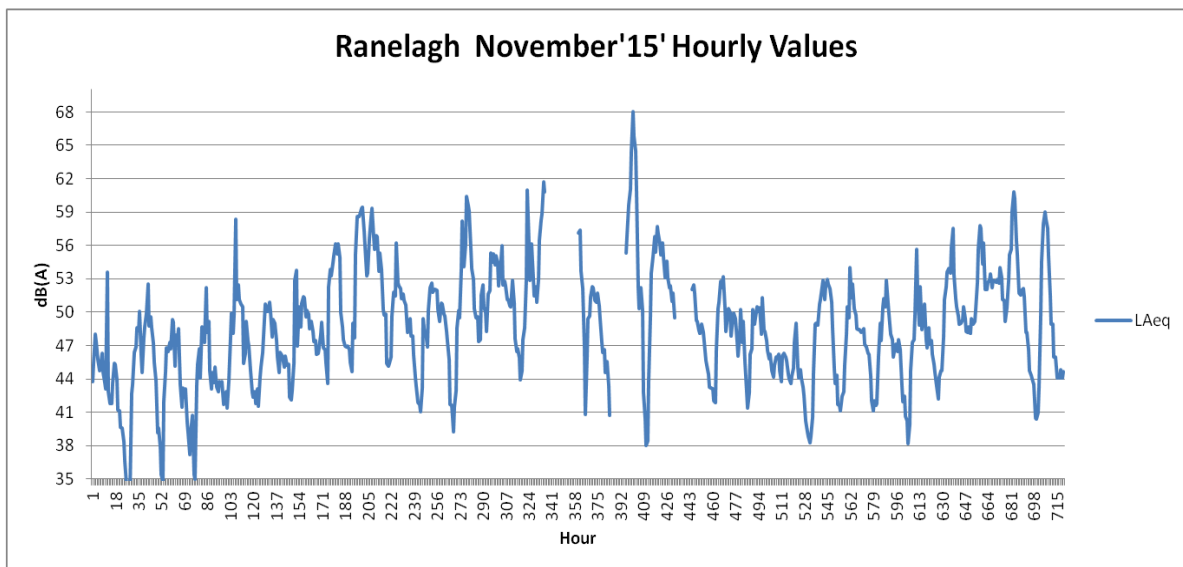
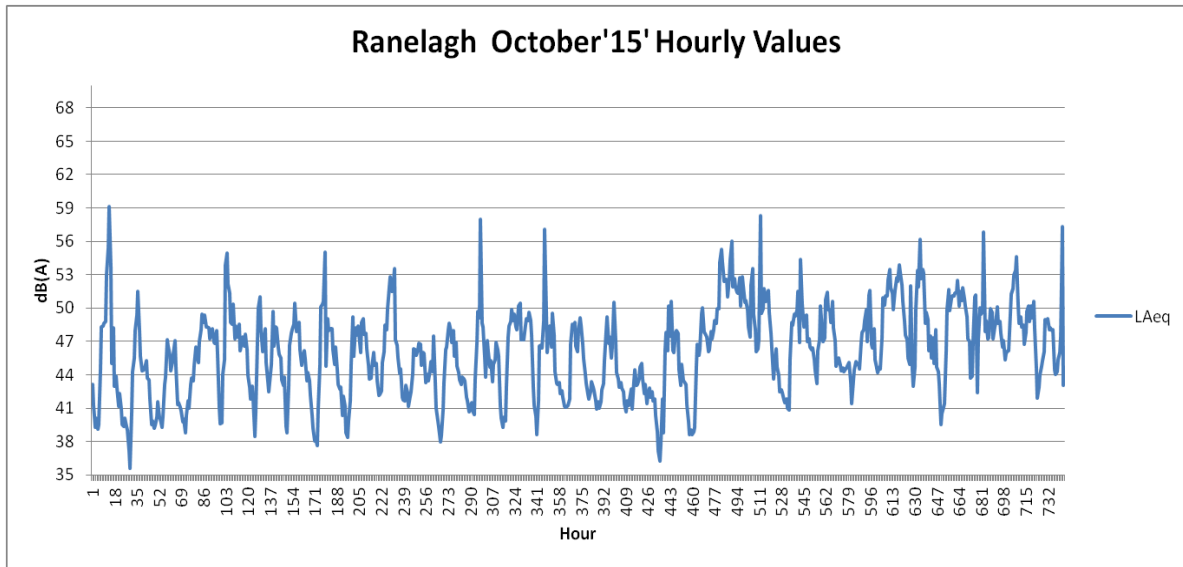




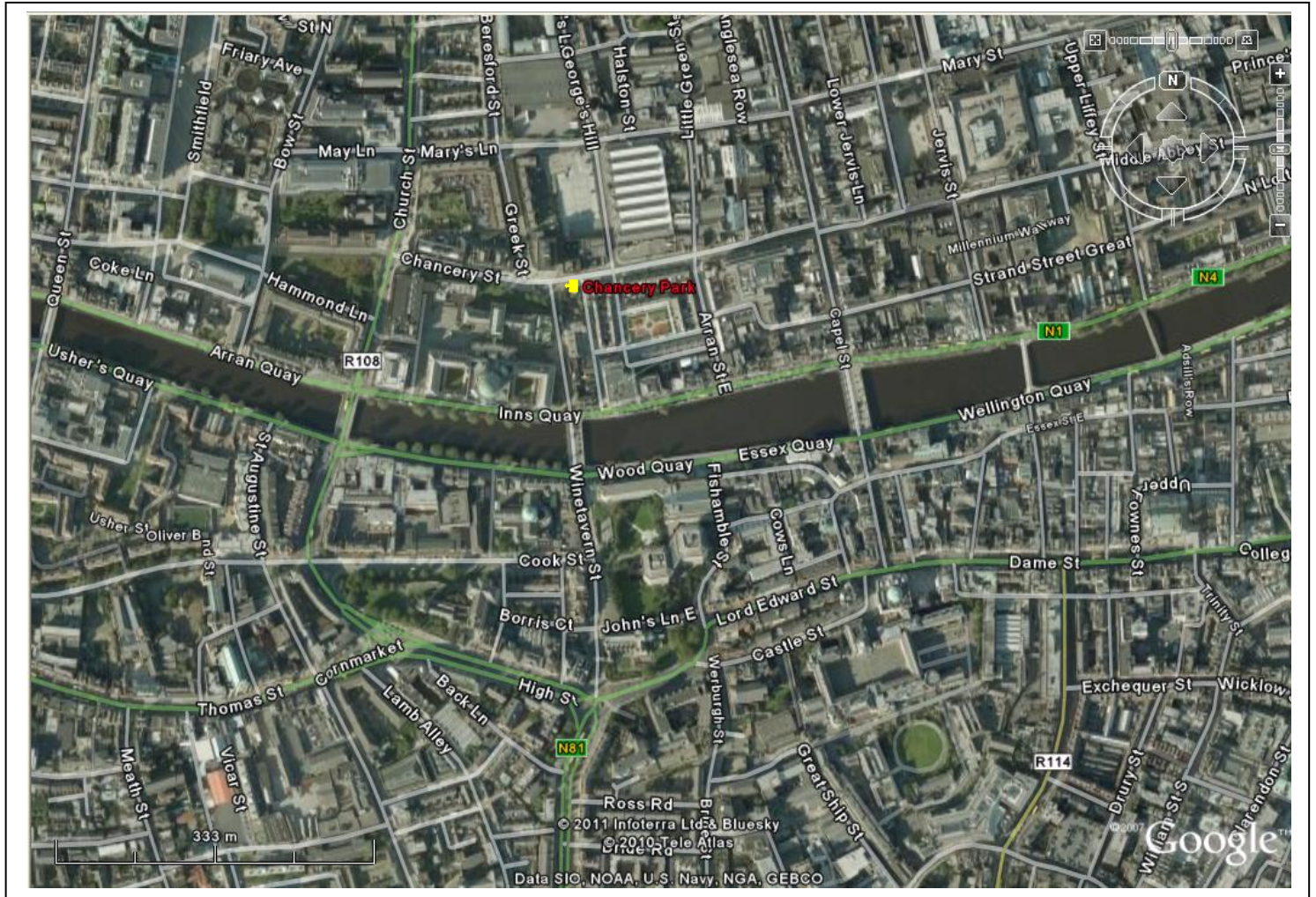


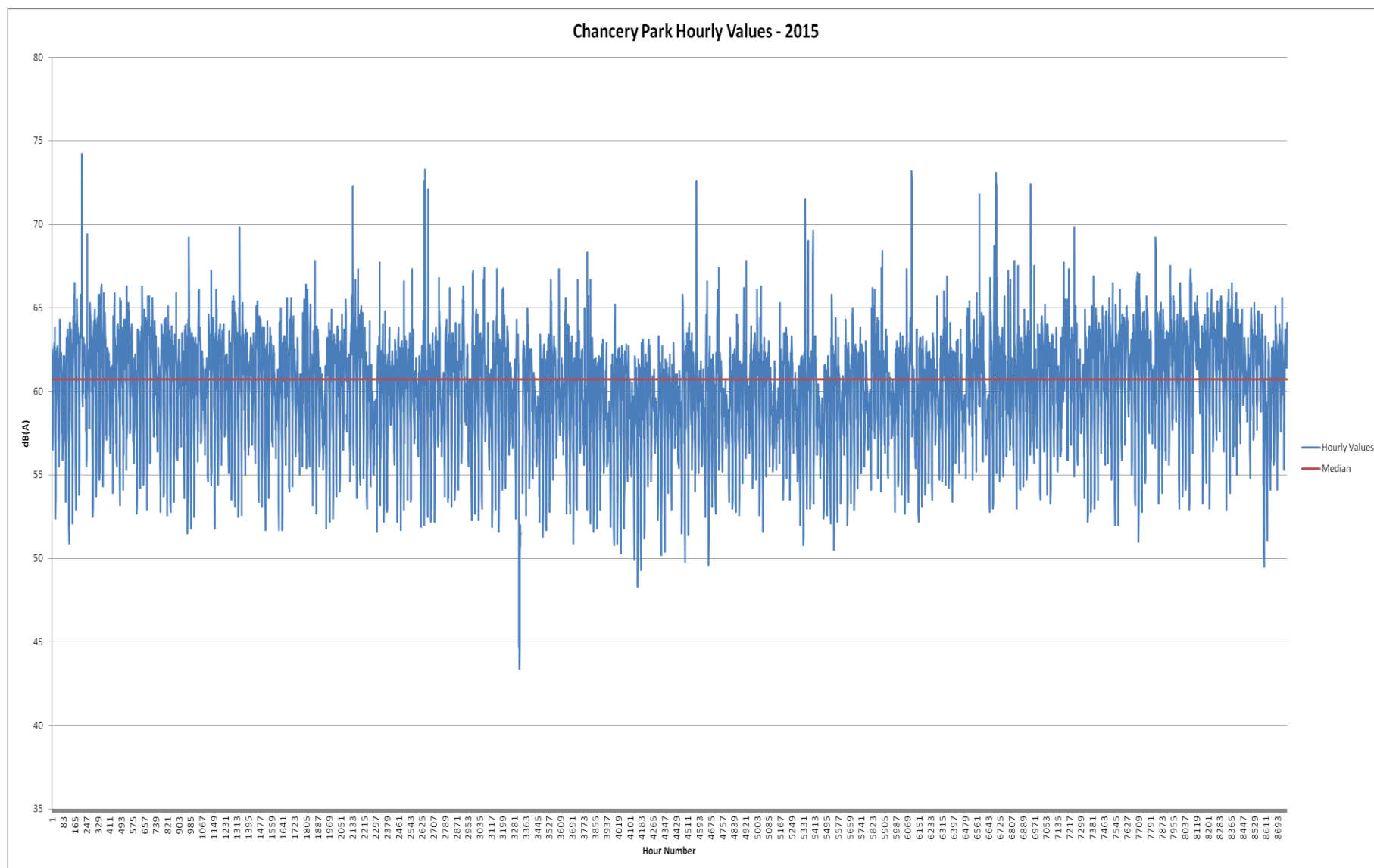




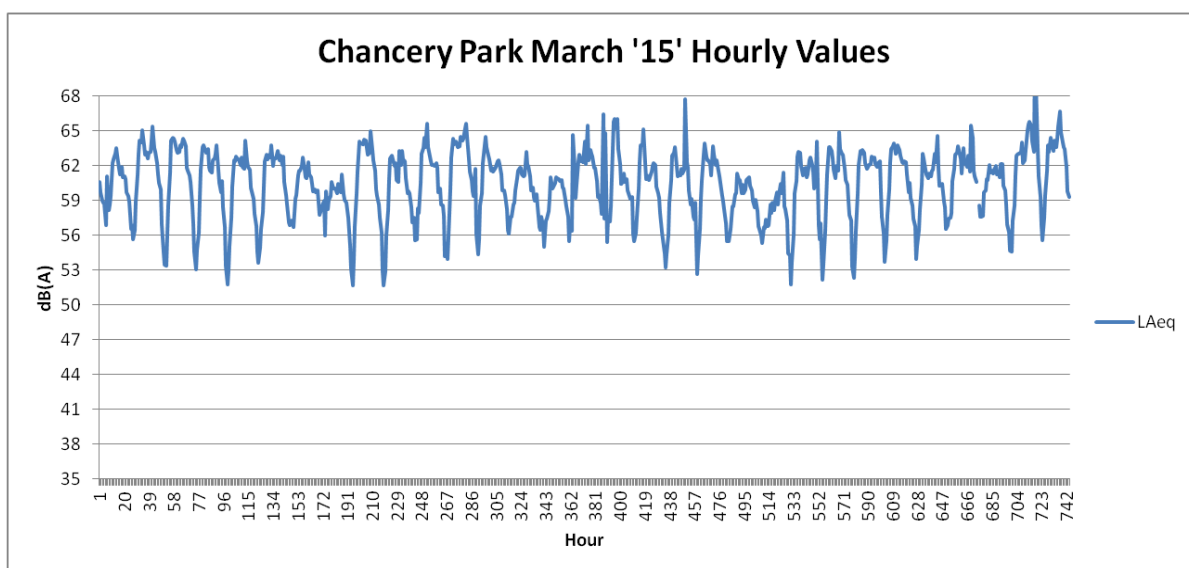
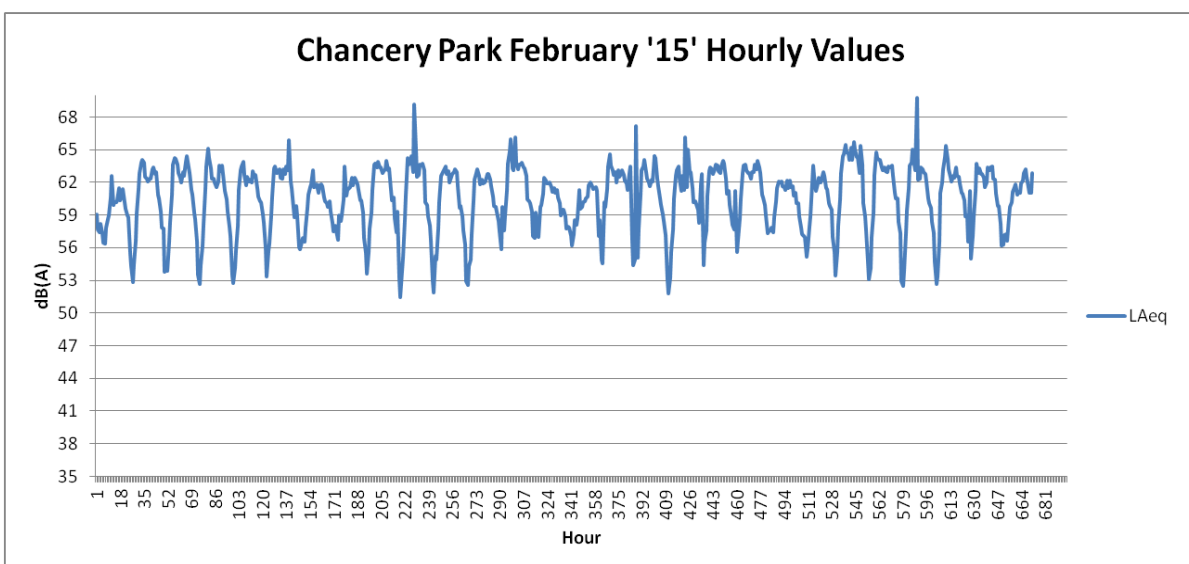
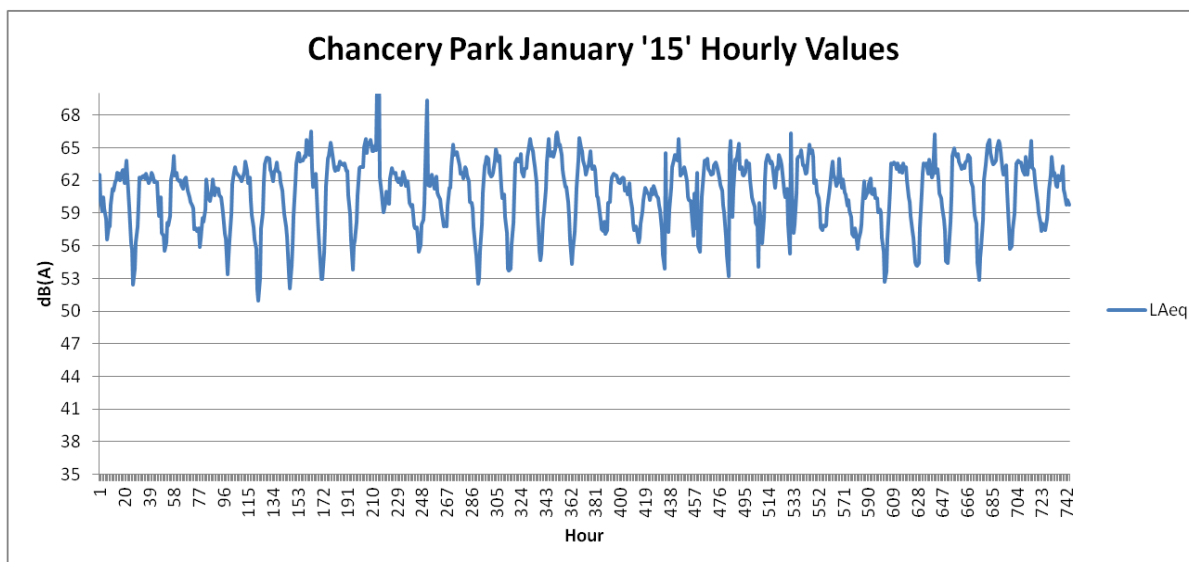


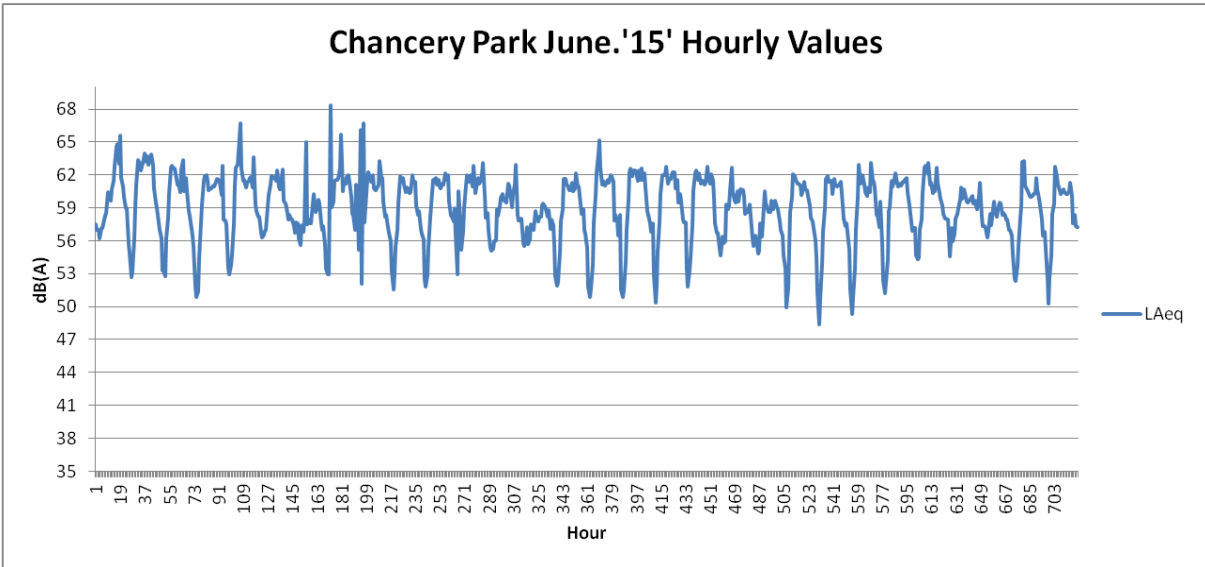
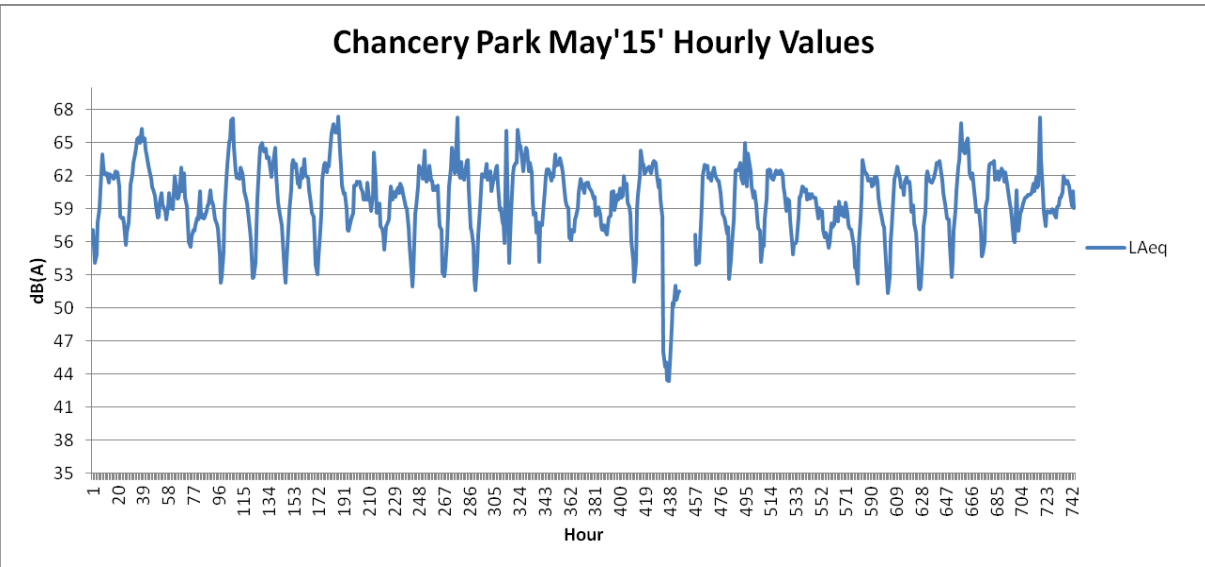
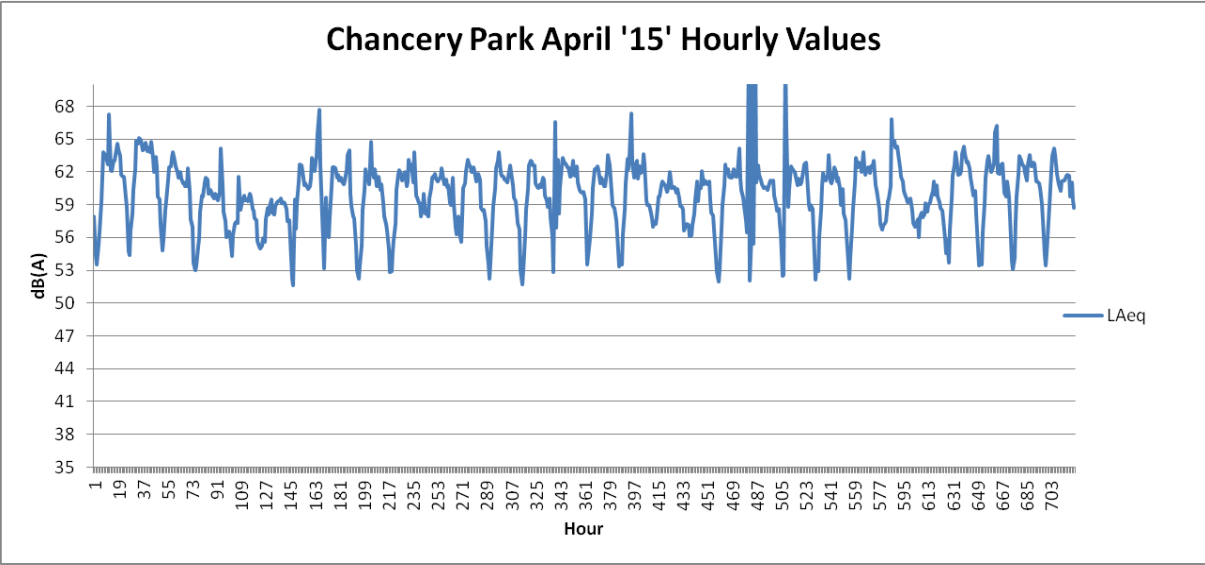
**CHANCERY PARK**  
**CHANCERY ST.**  
**DUBLIN 1**



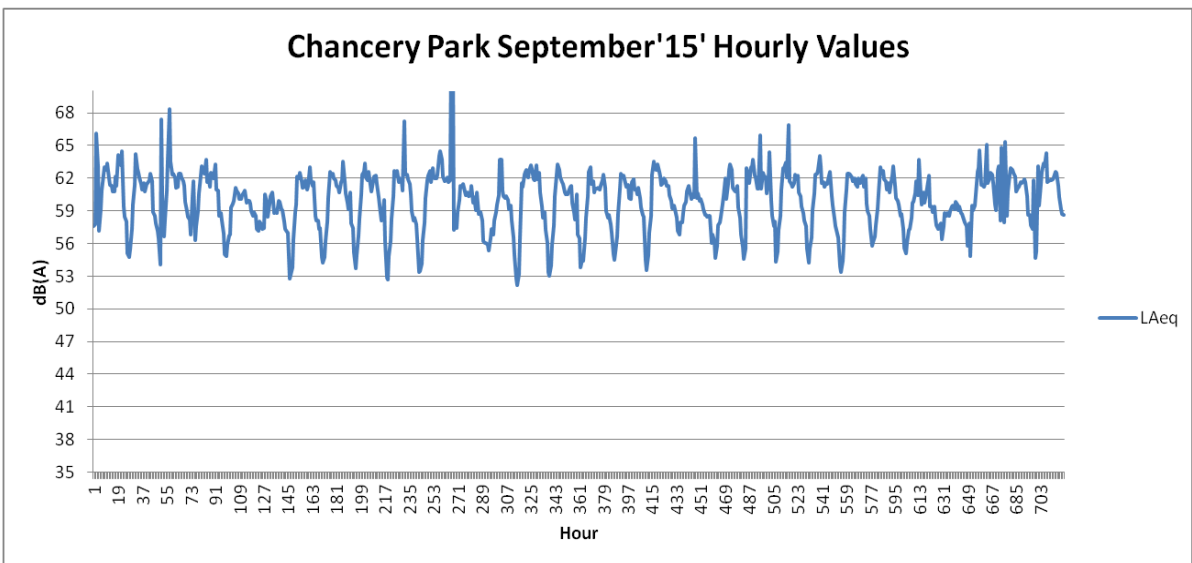
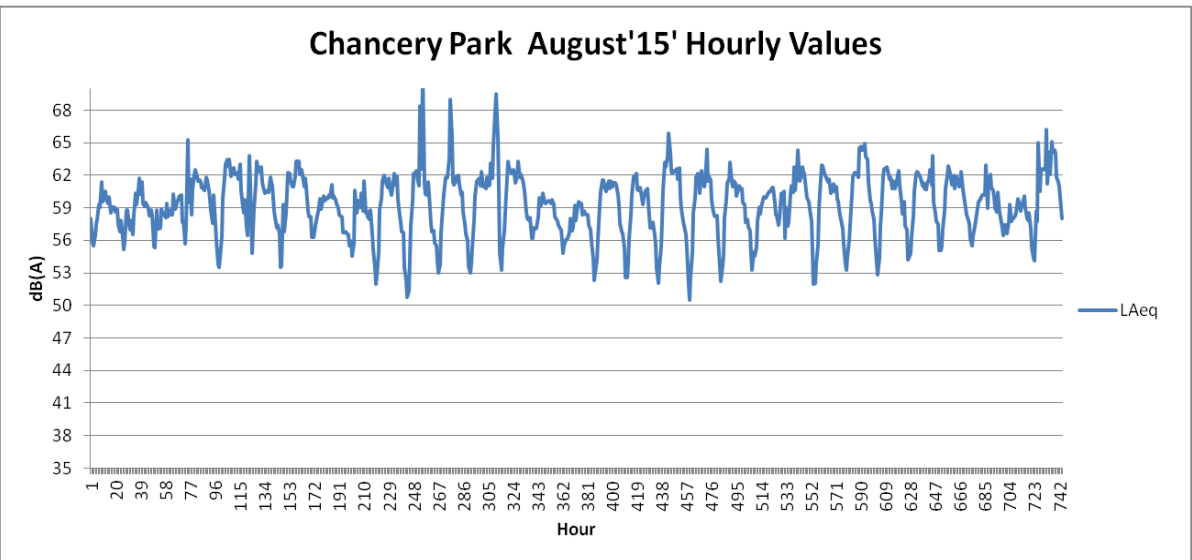
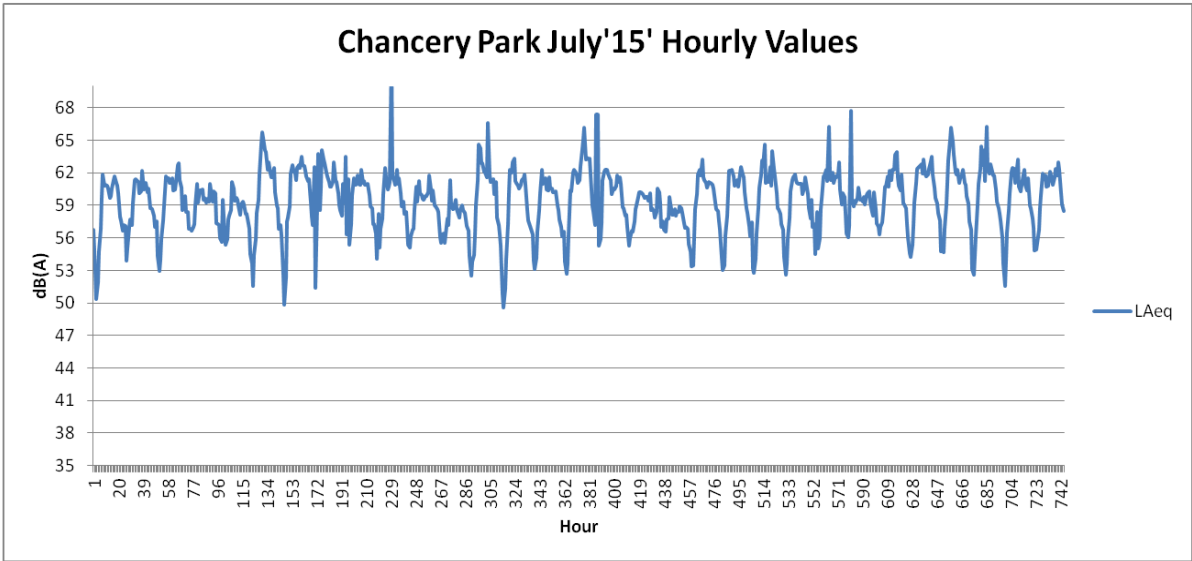


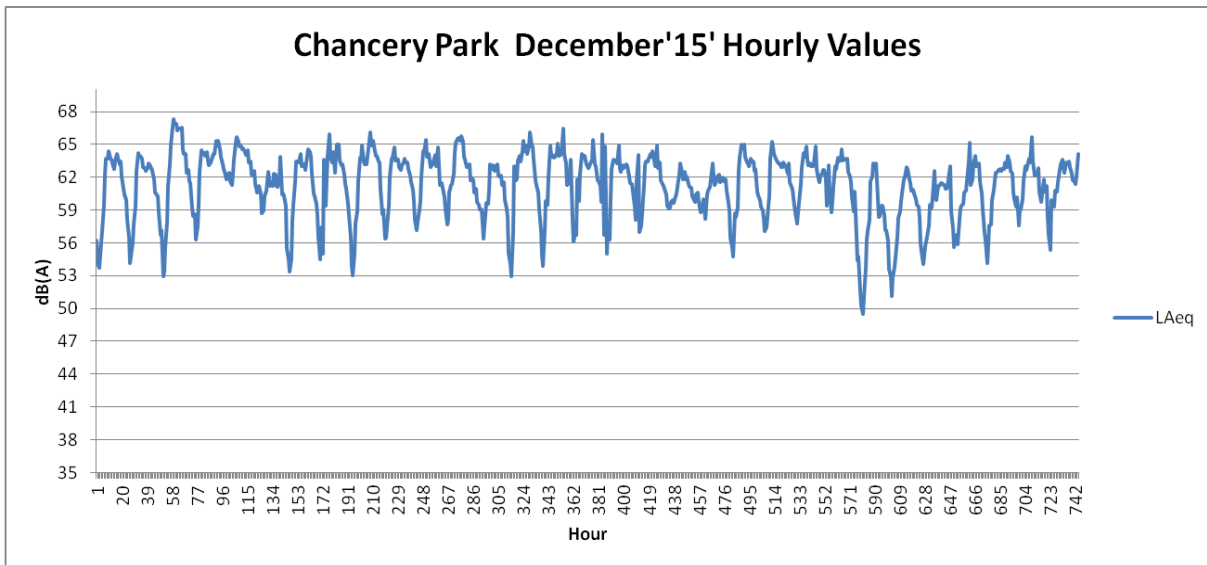
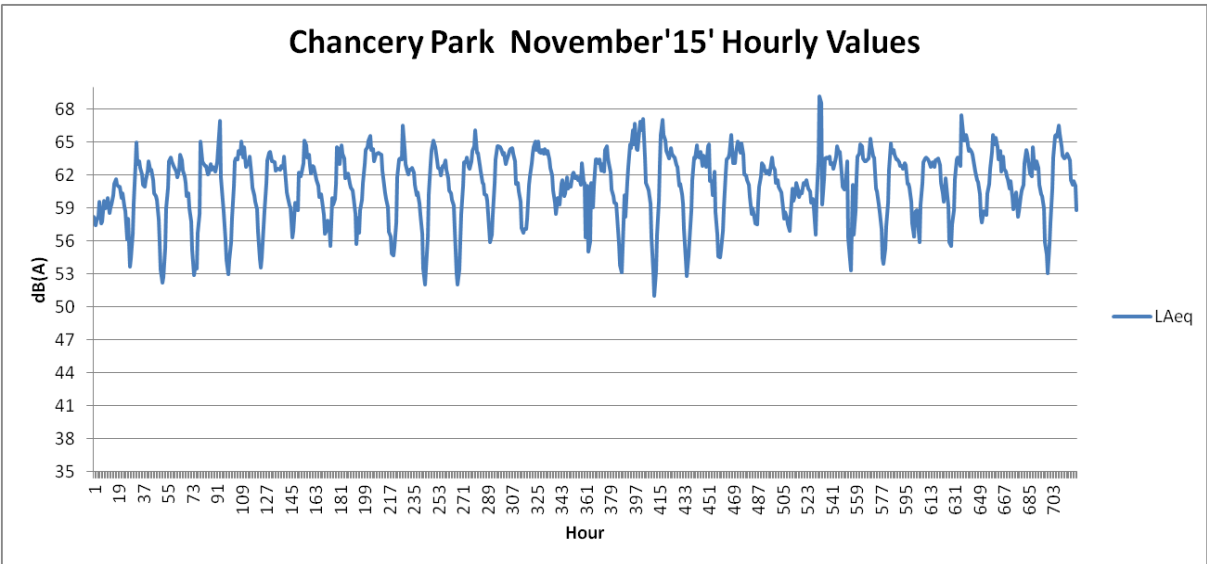
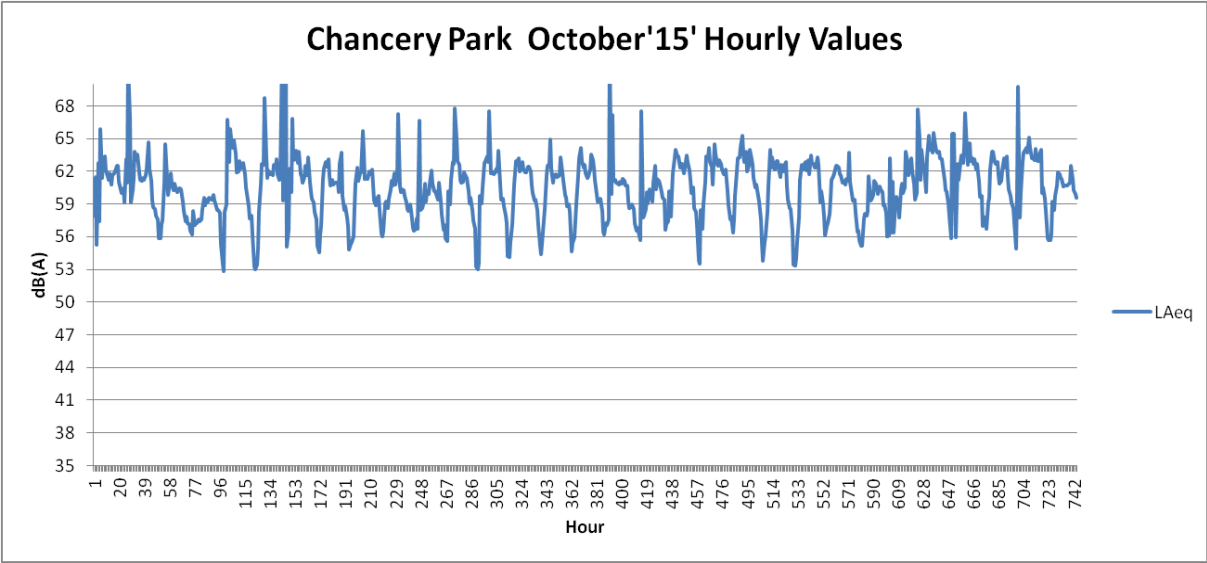






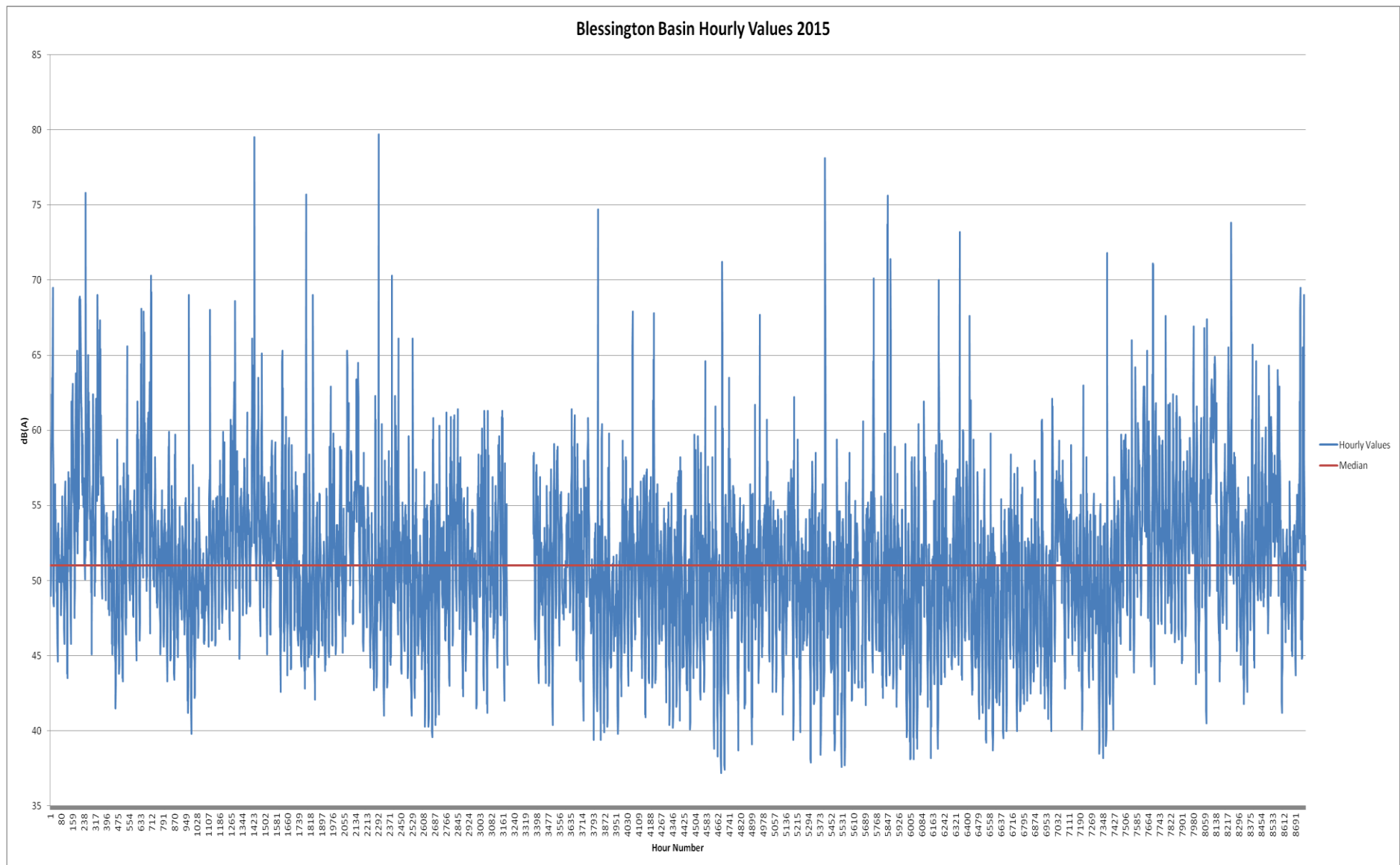




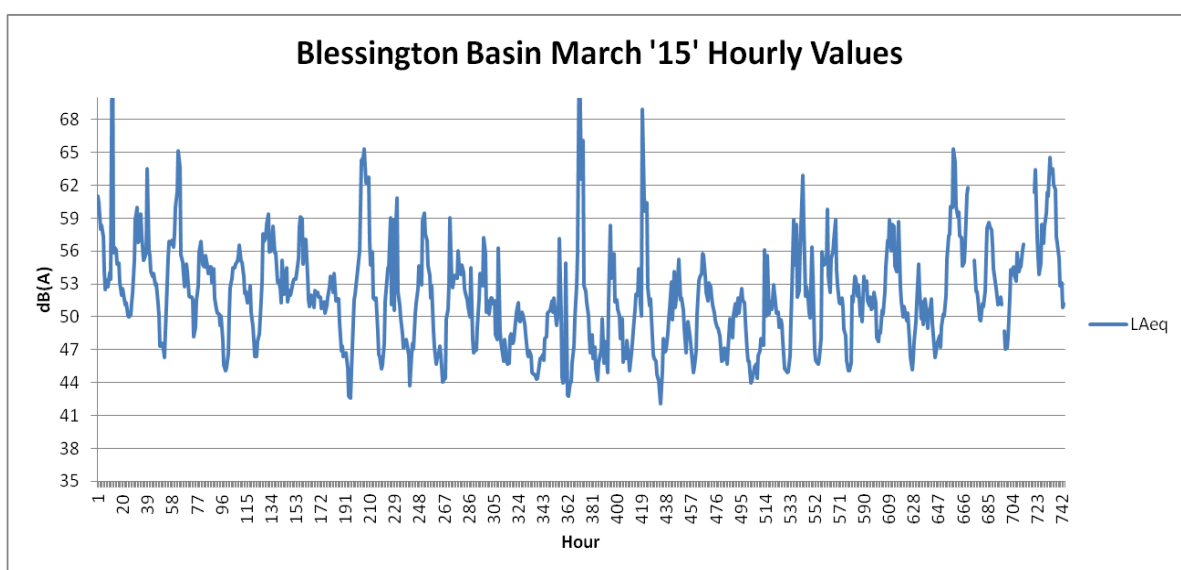
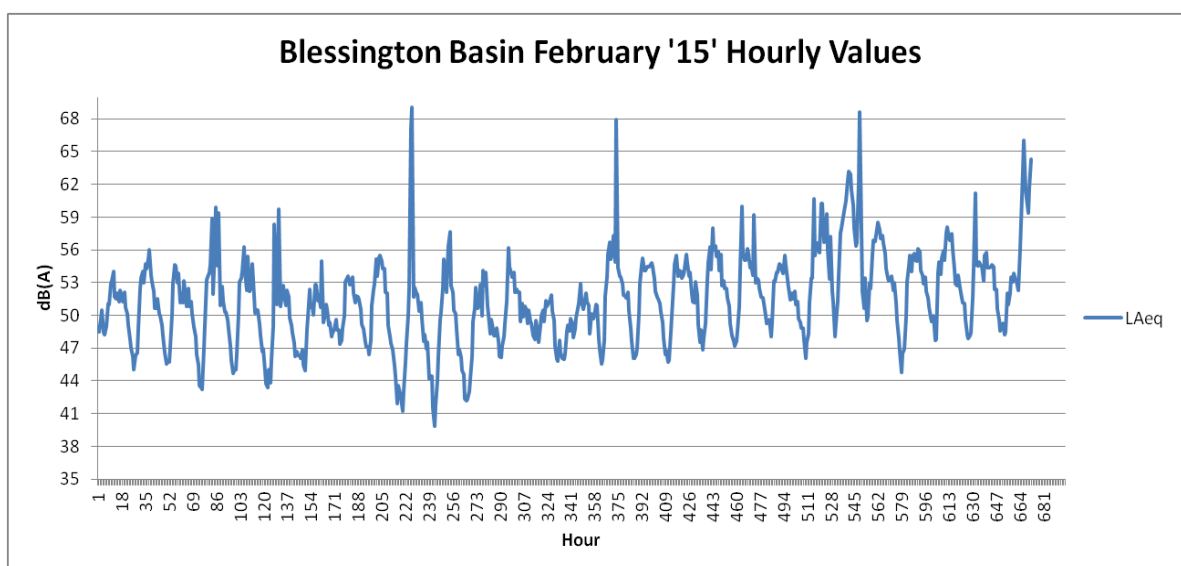
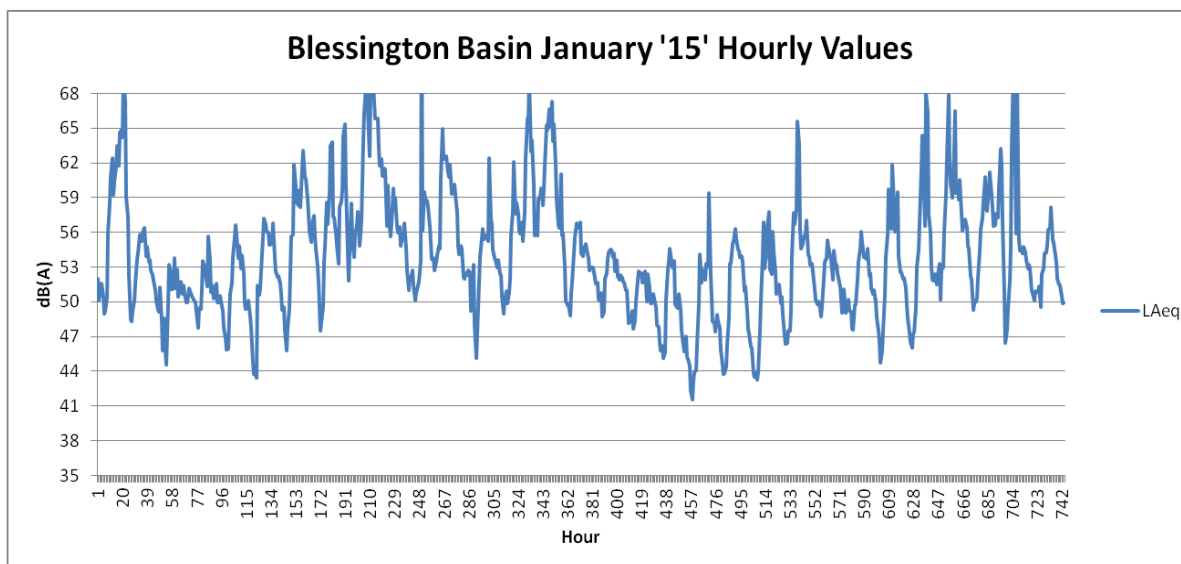


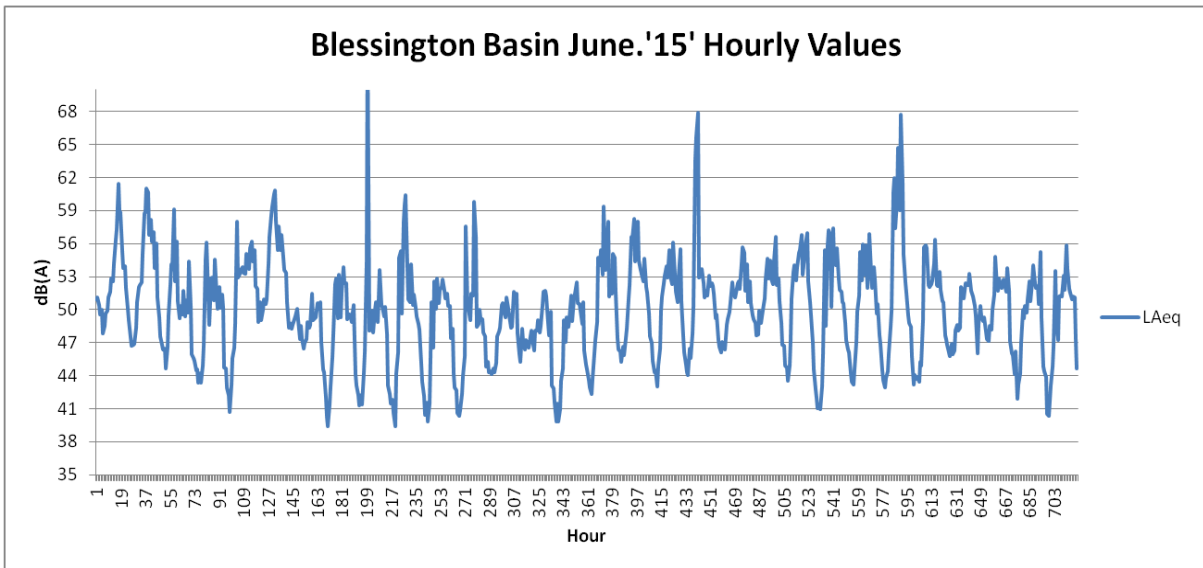
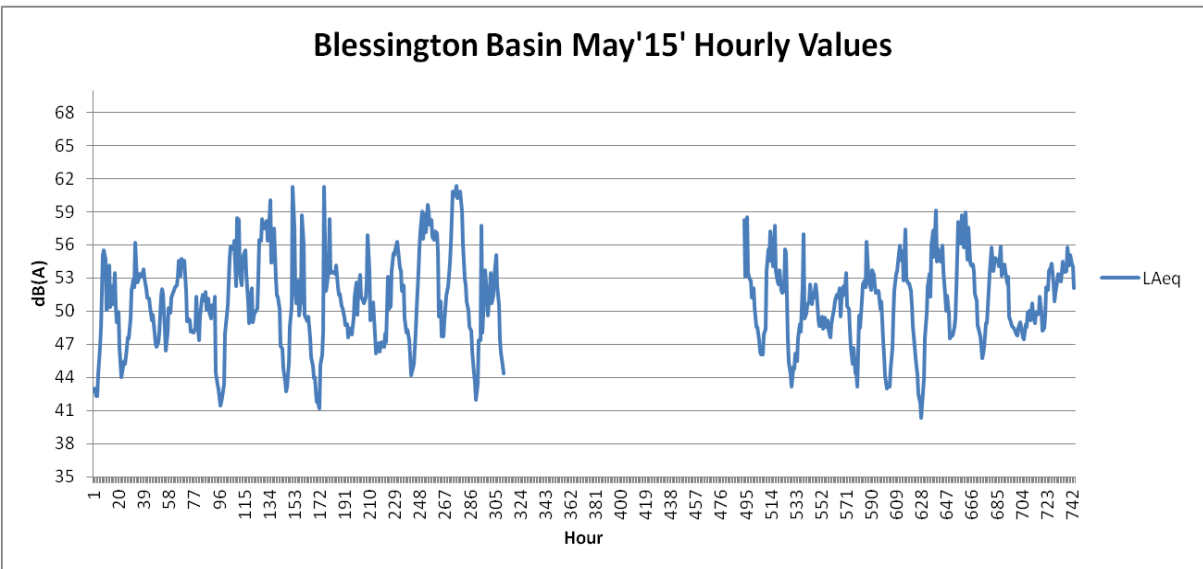
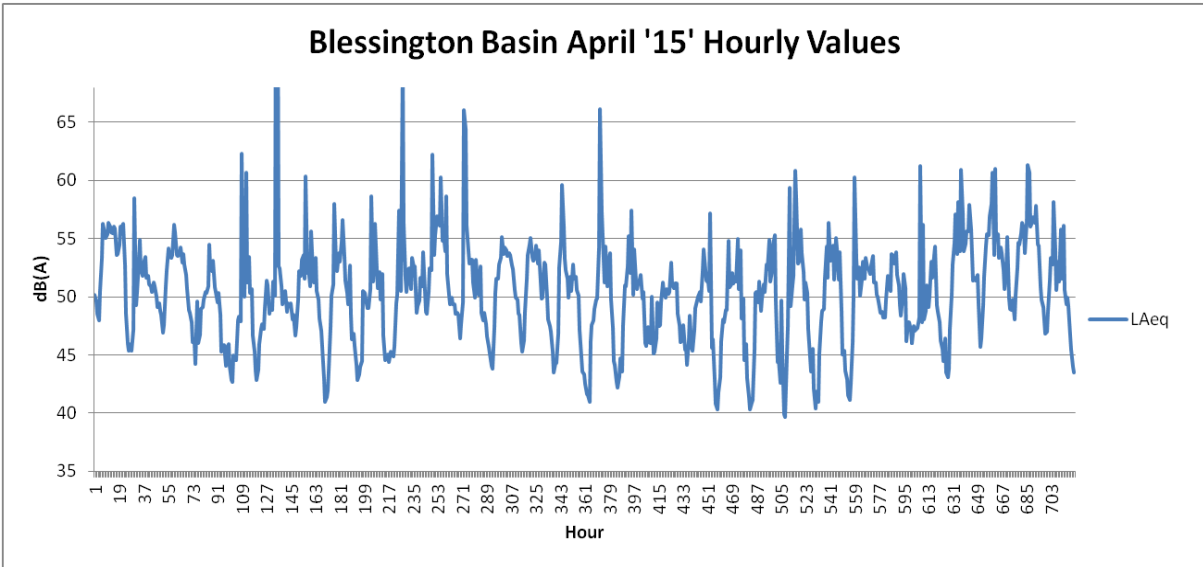
**Blessington Basin**  
**Blessington St.**  
**DUBLIN 1**

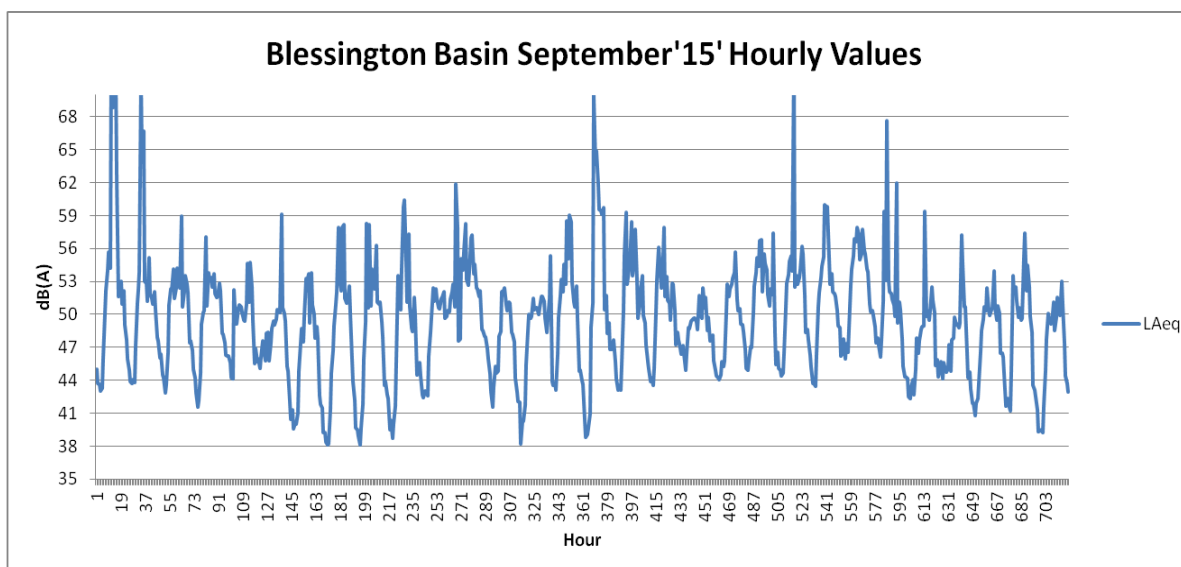
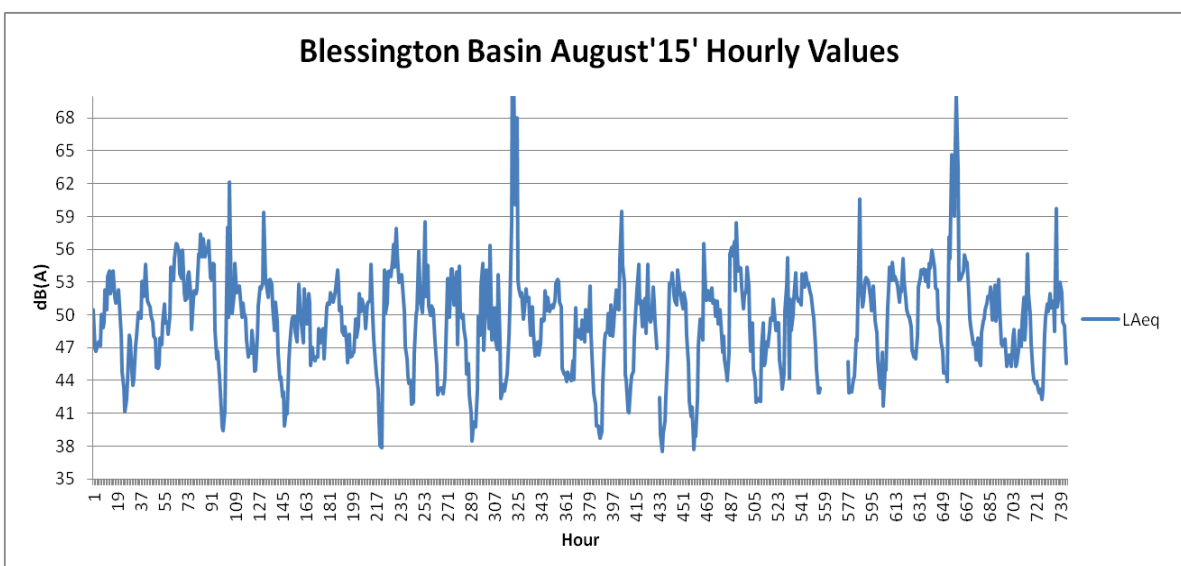
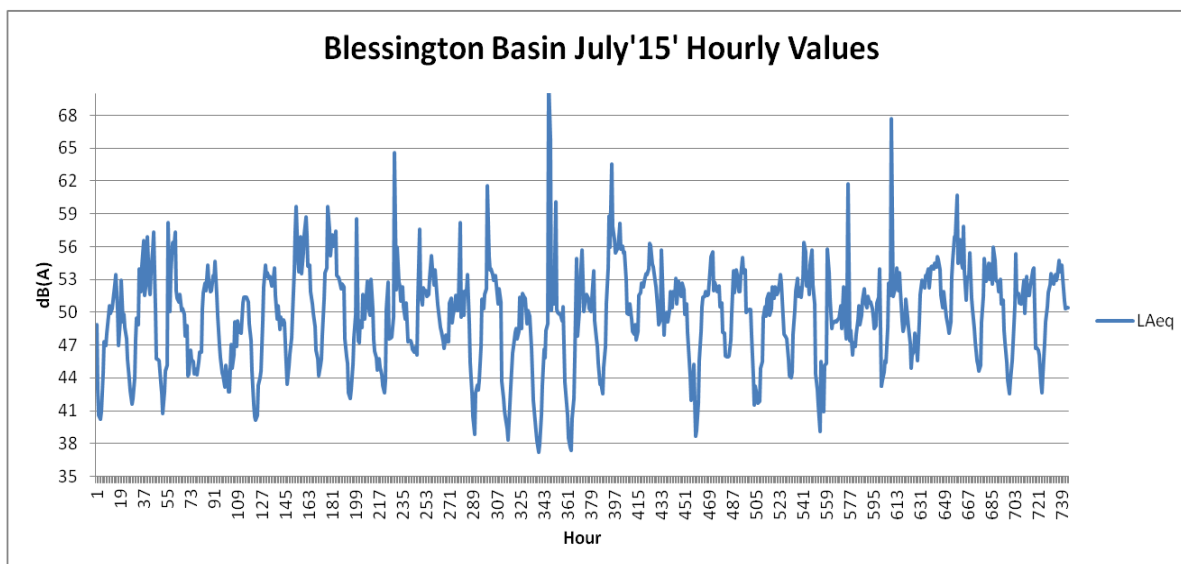




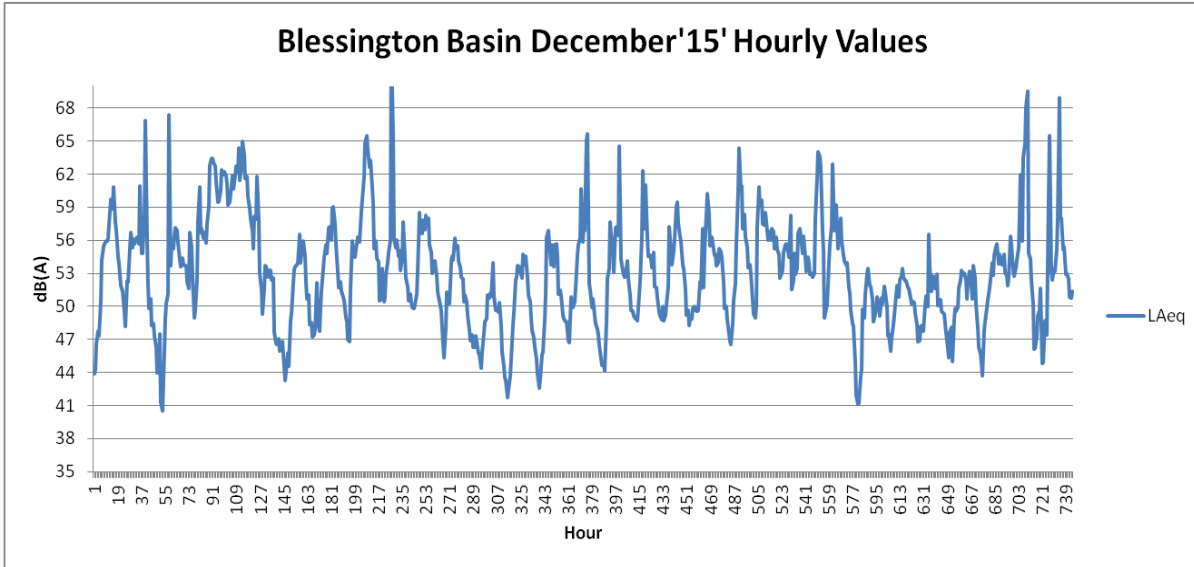
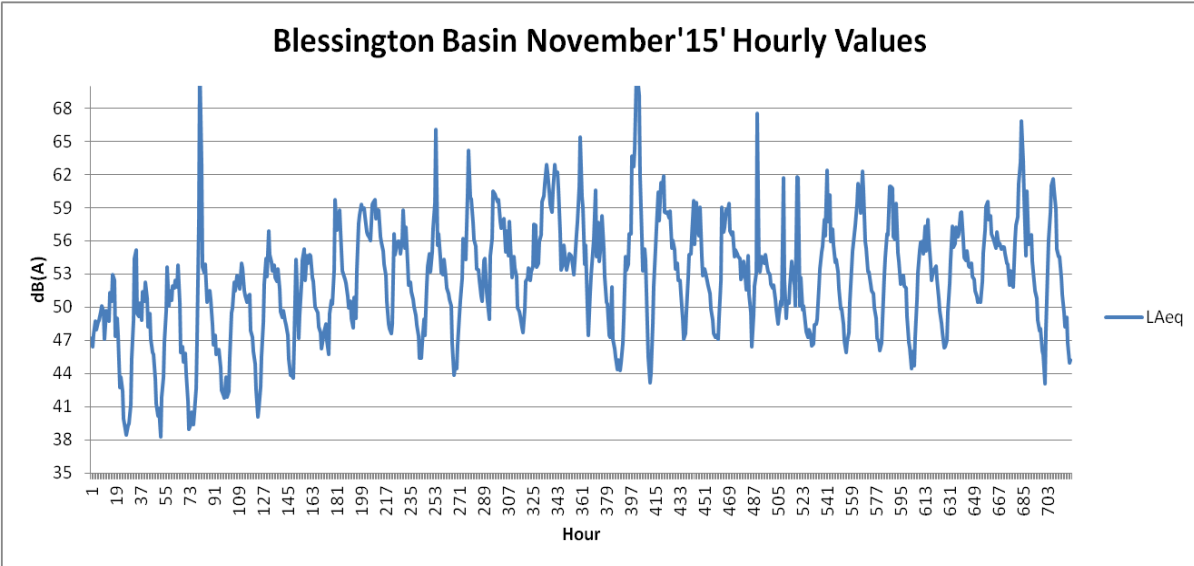
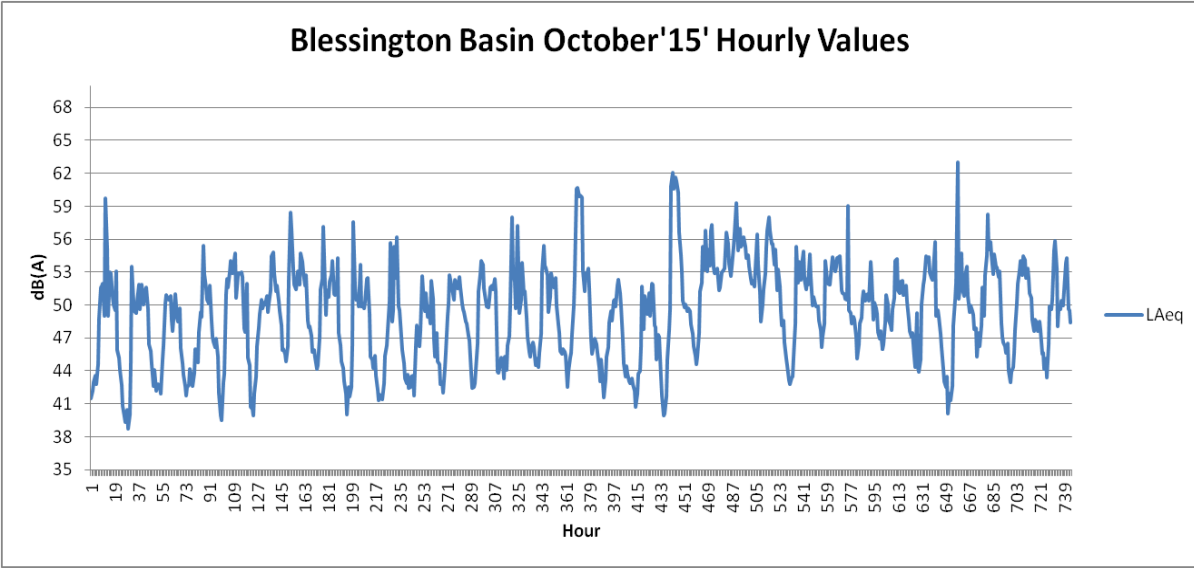




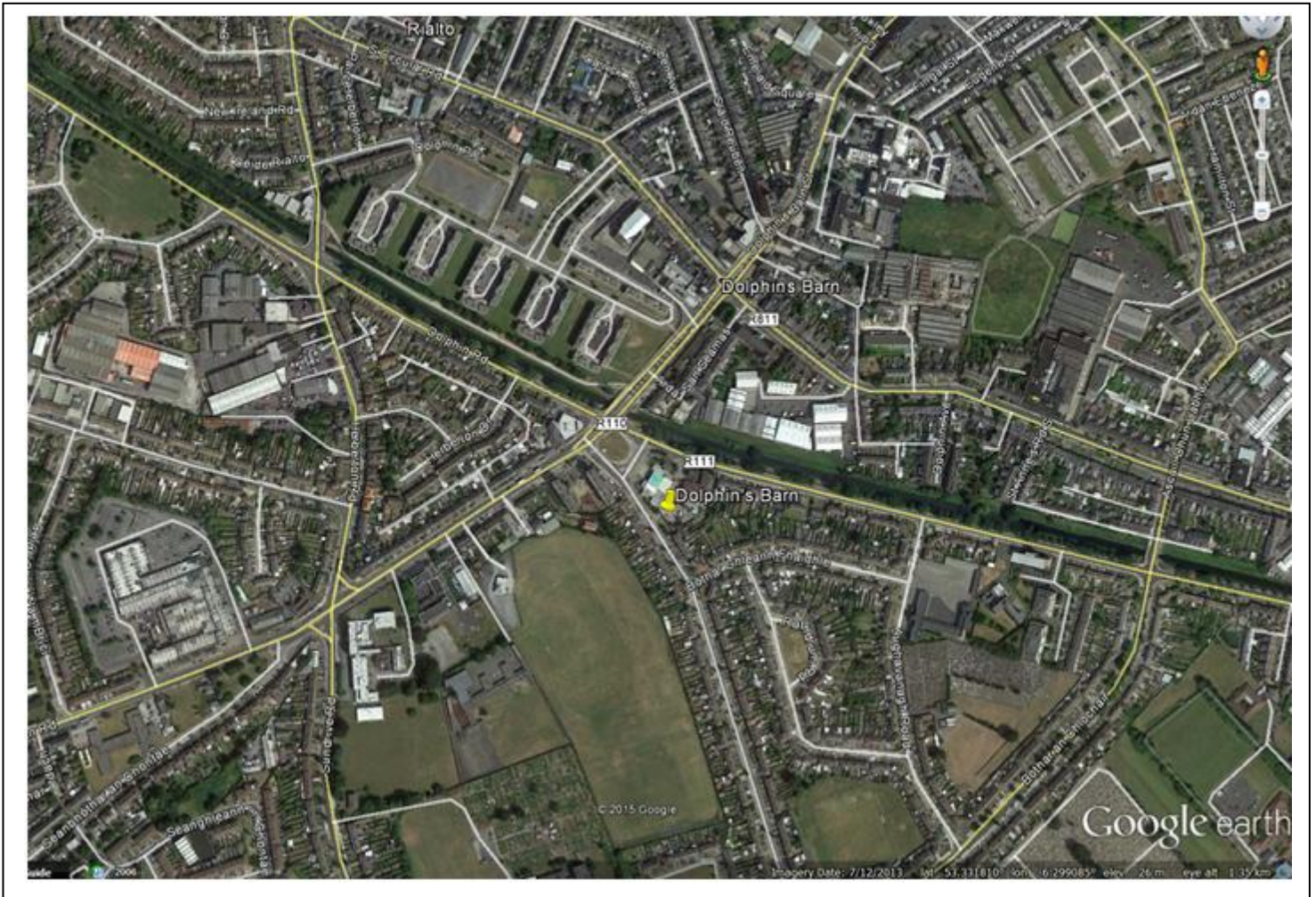


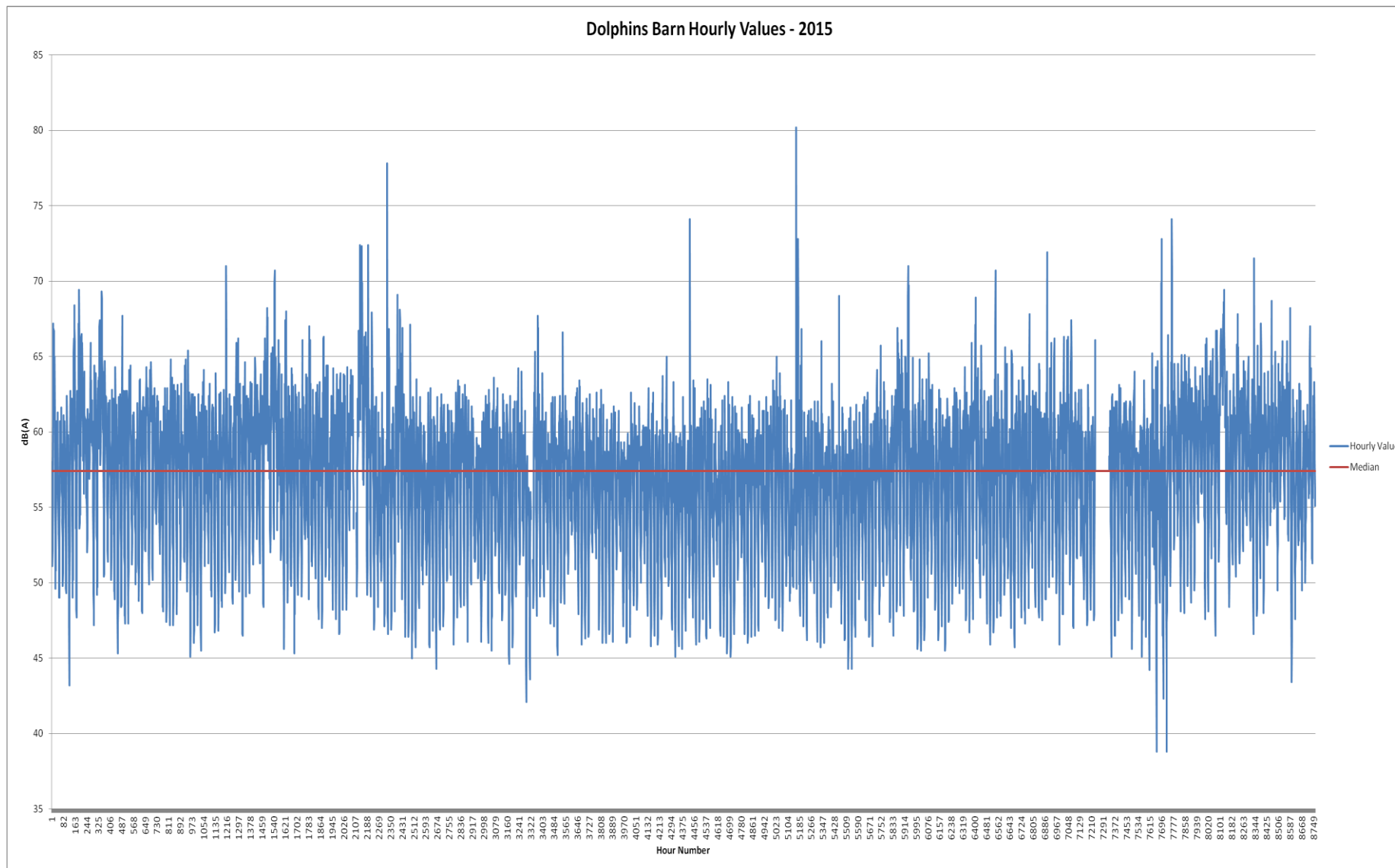


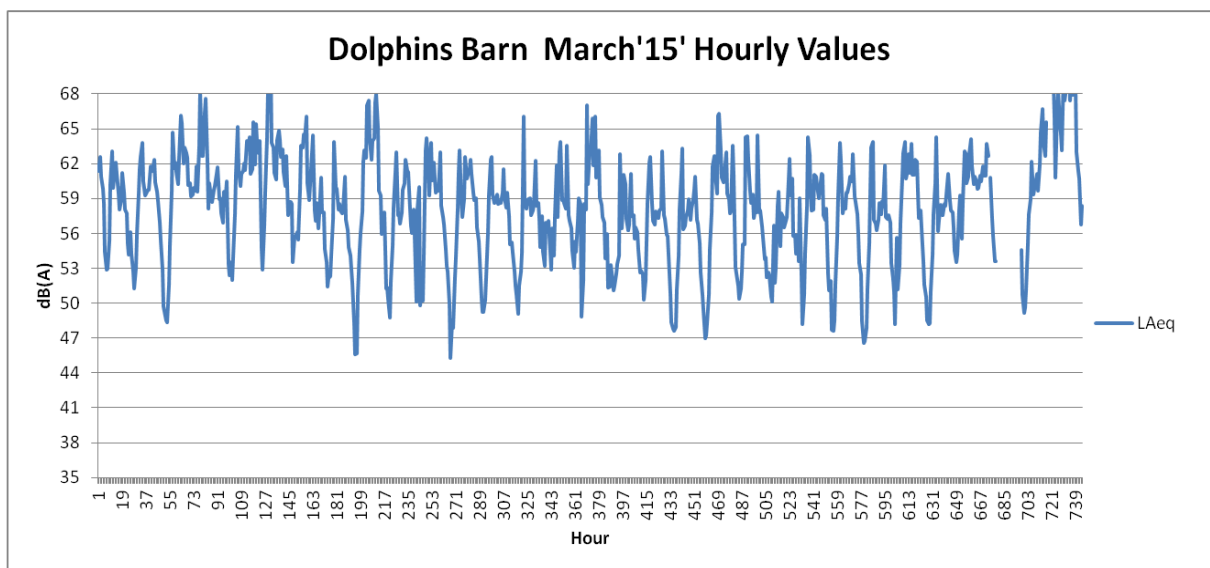
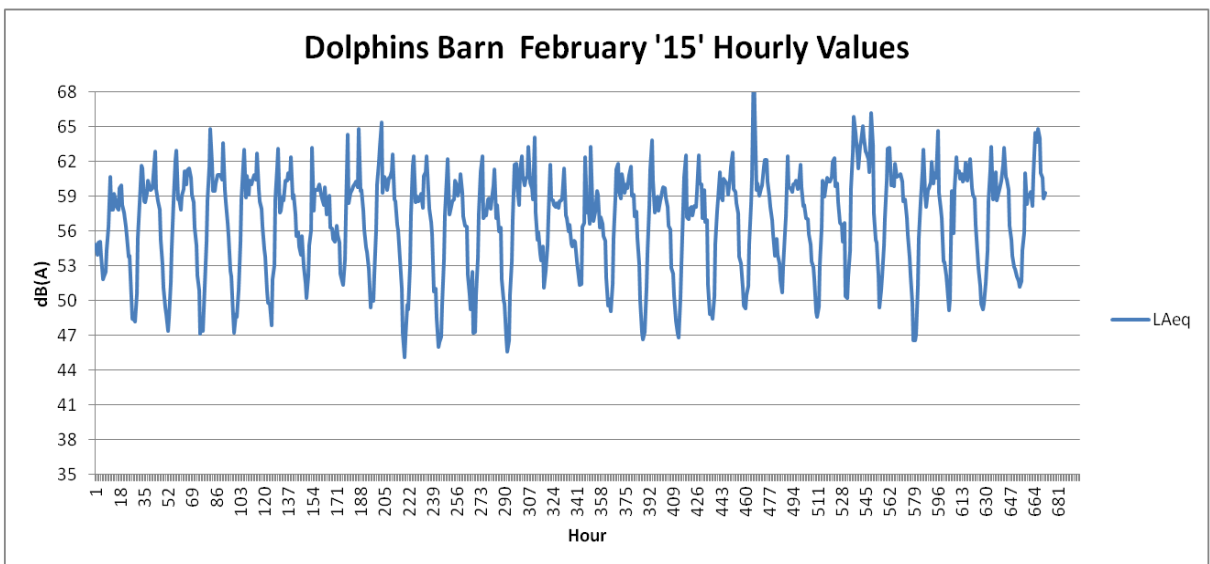
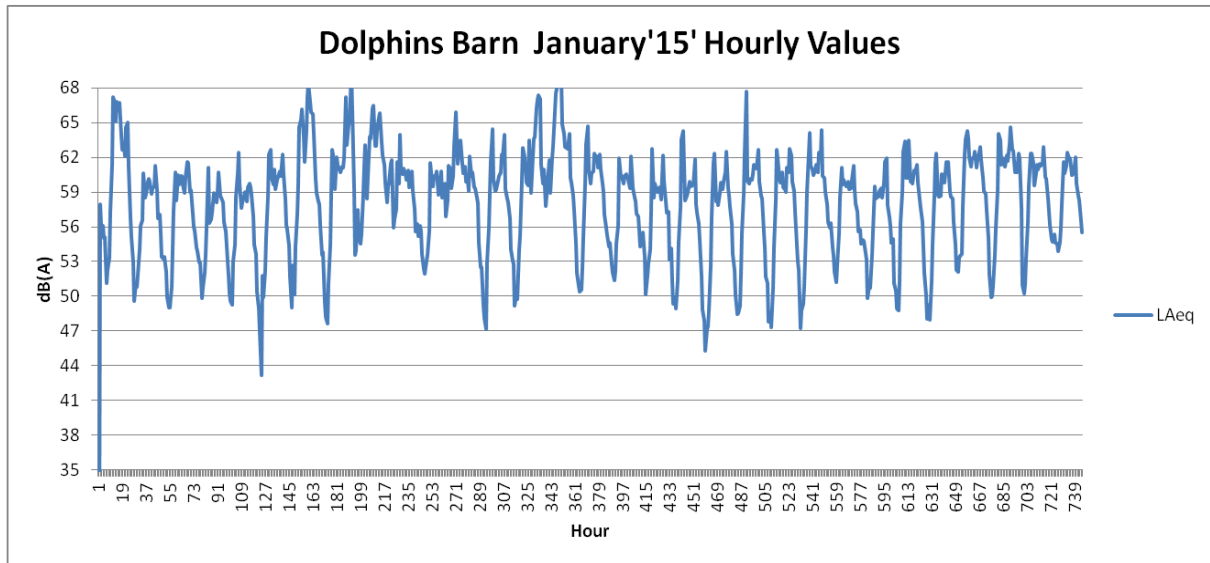


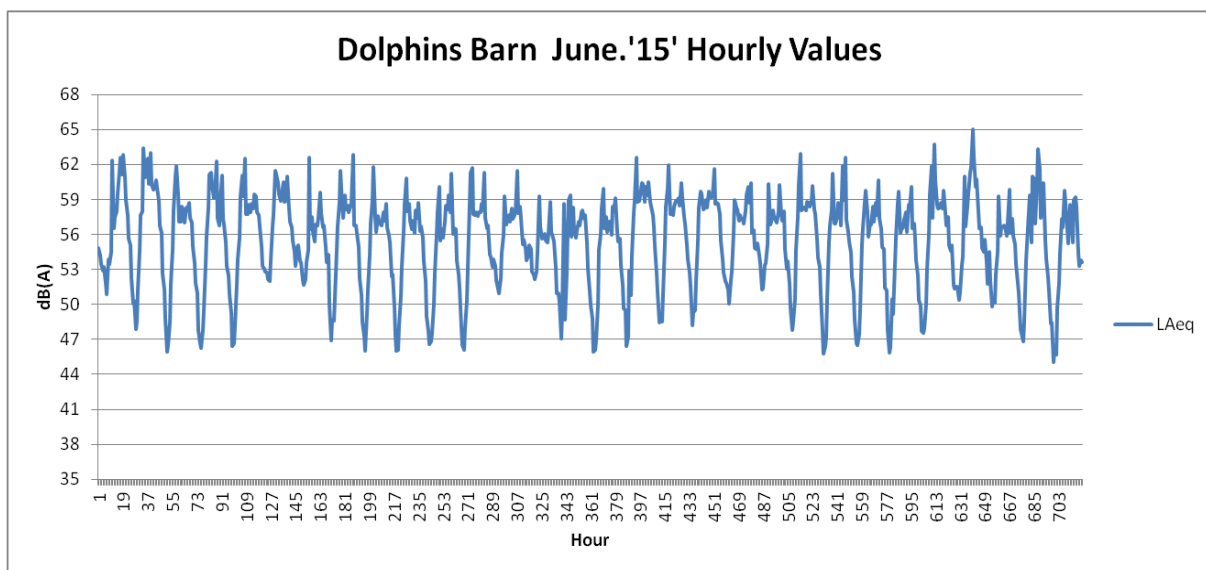
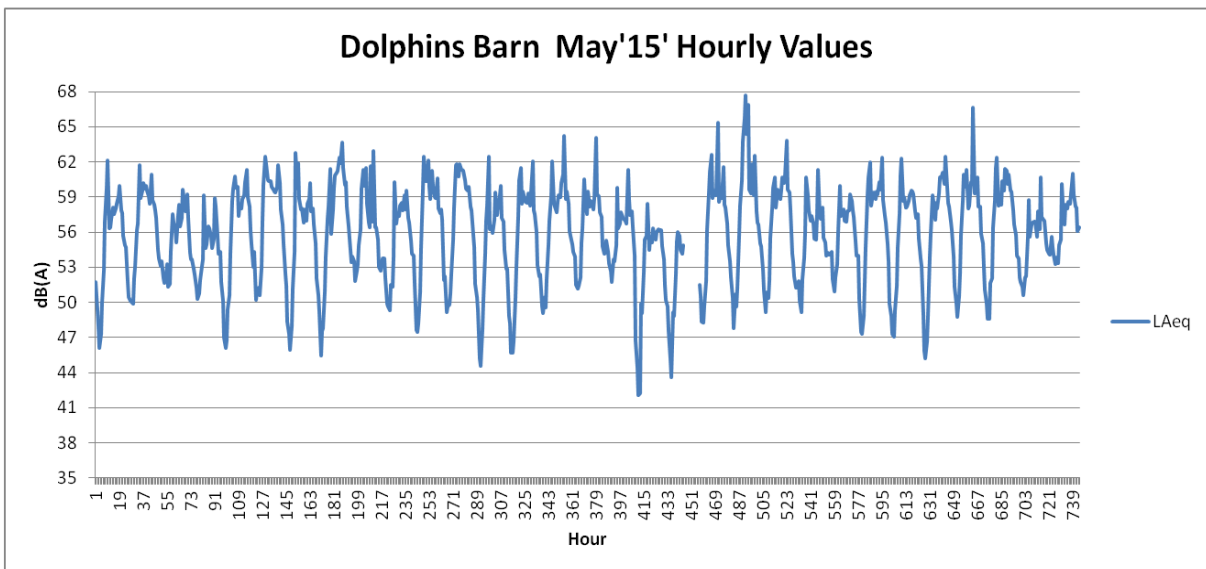
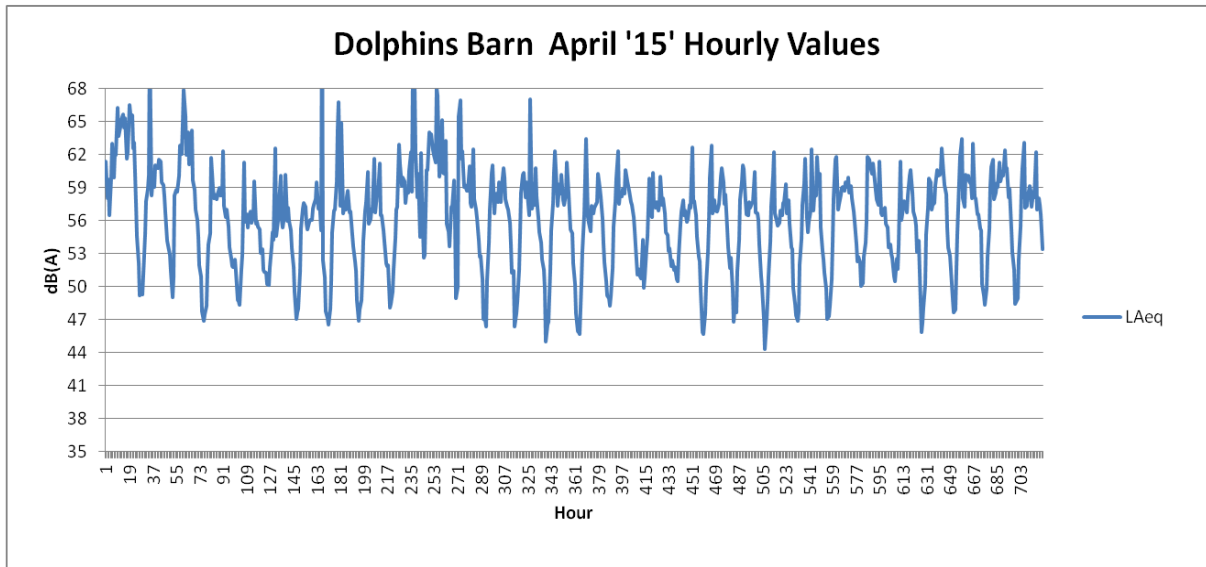


**Dolphin's Barn**  
**Parnell Road.**  
**DUBLIN 8**

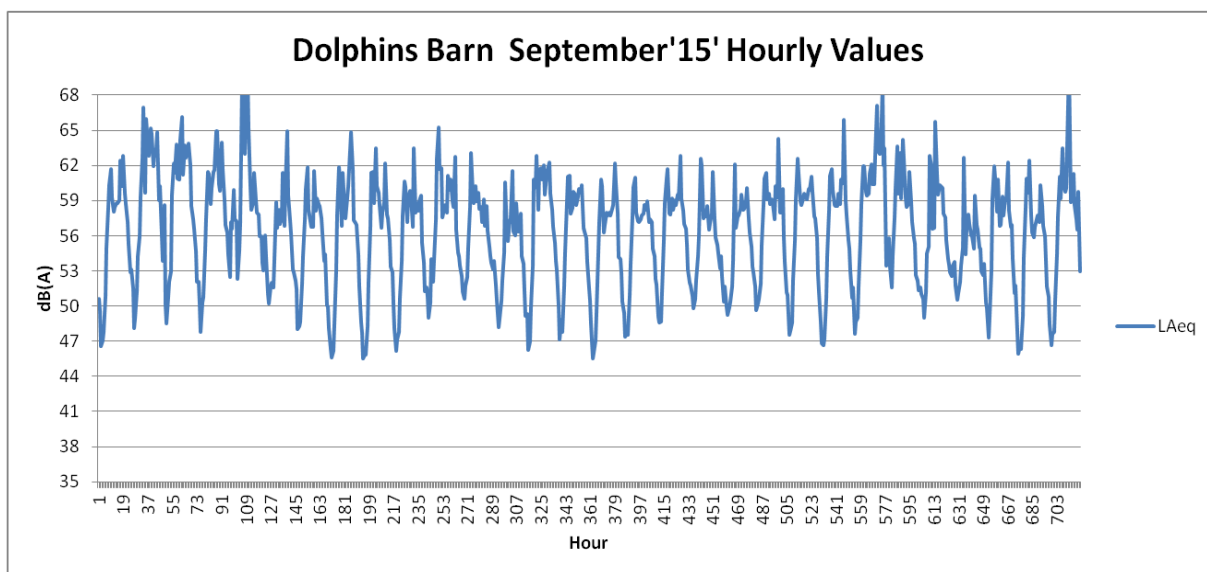
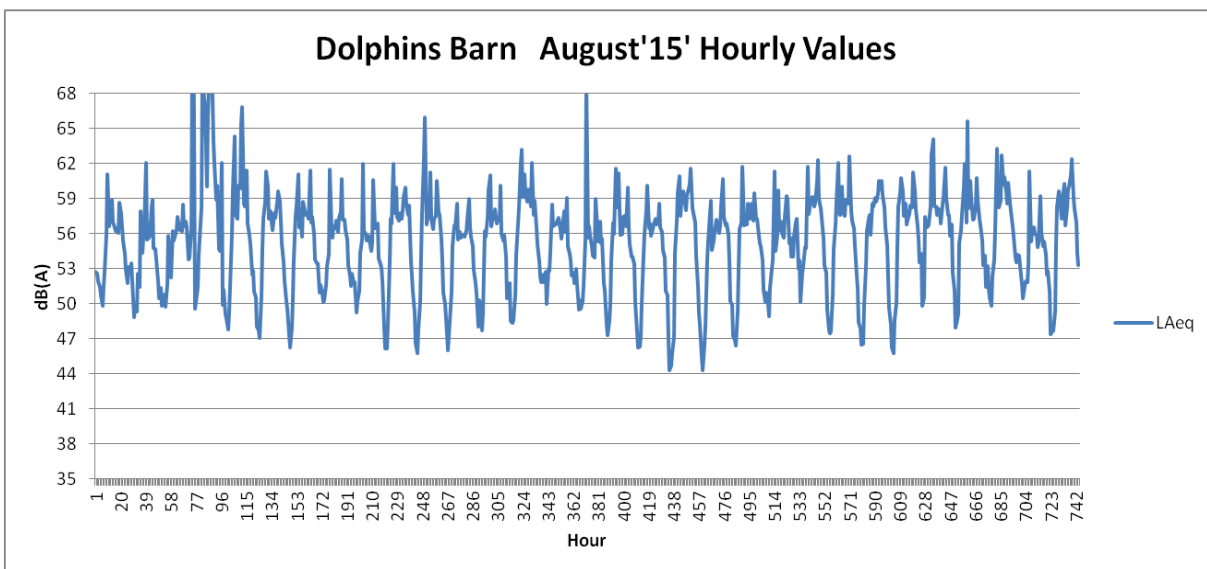
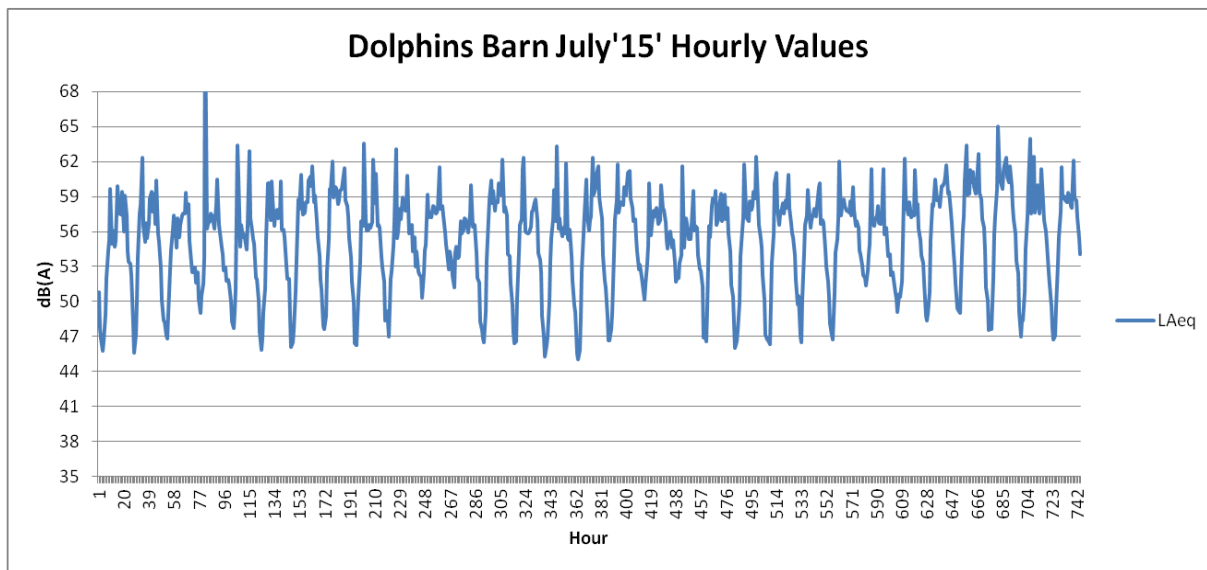




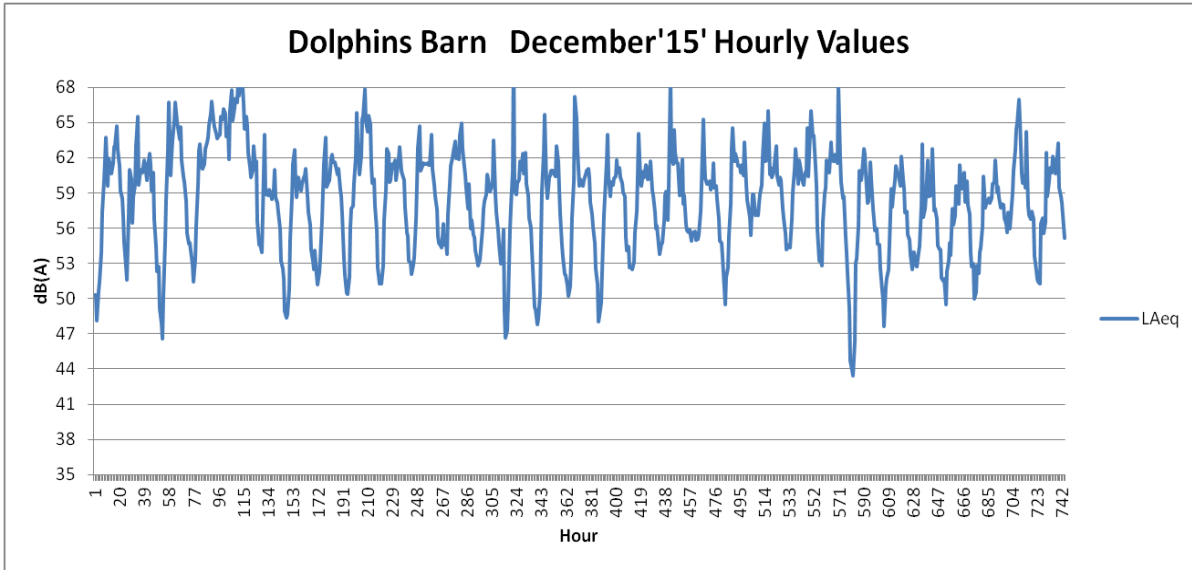
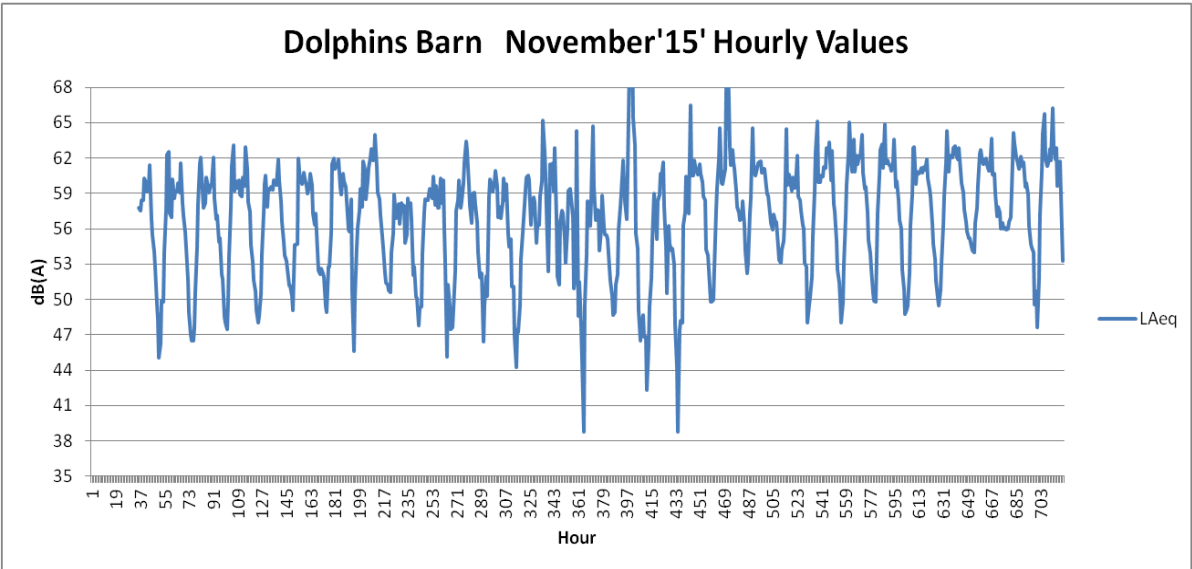
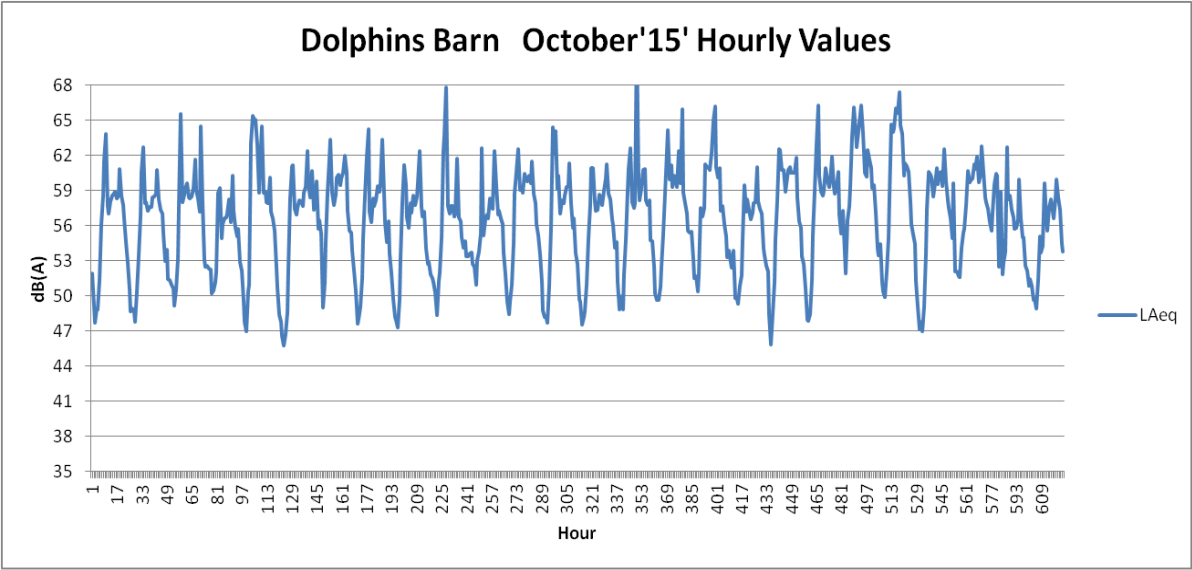




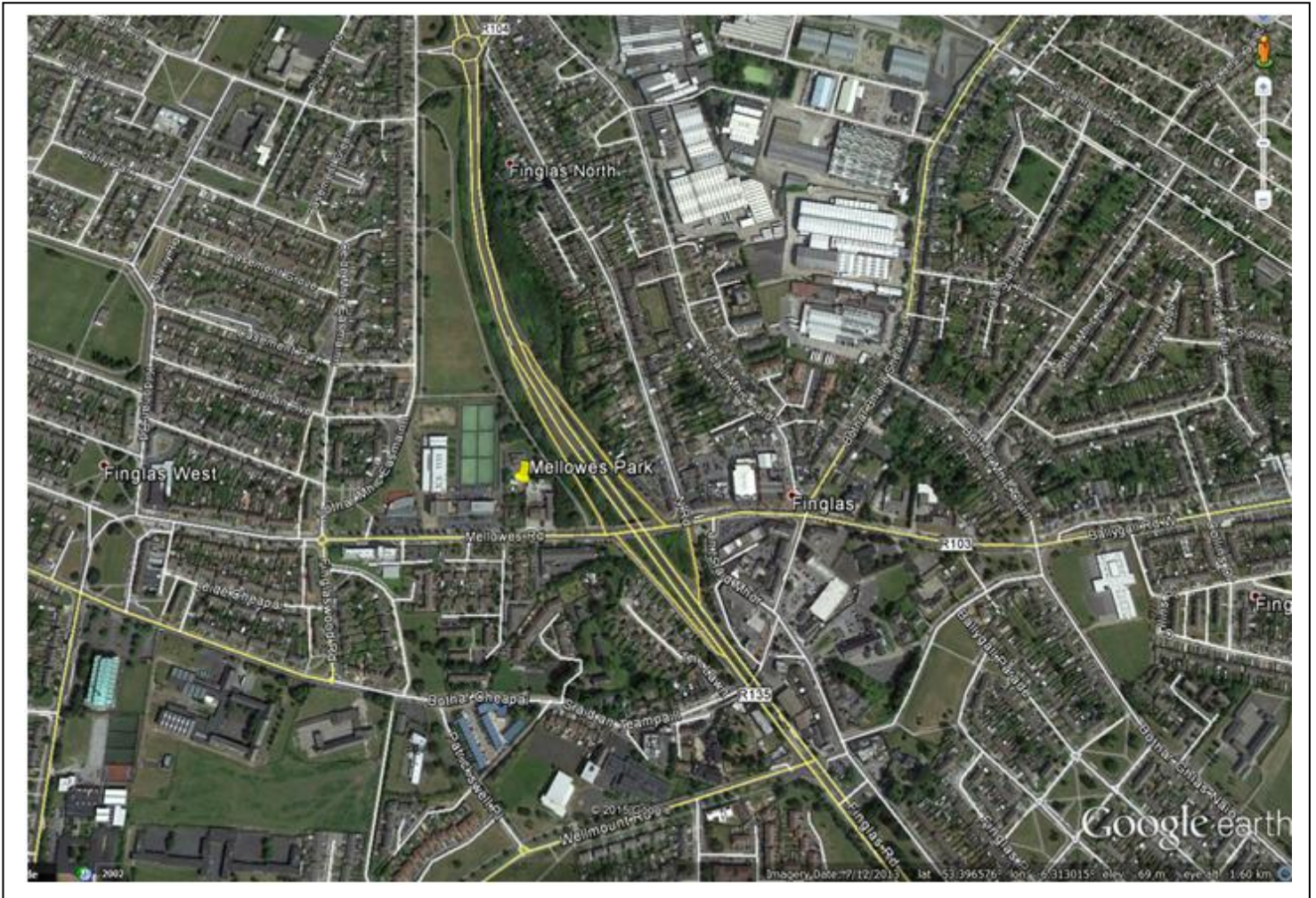


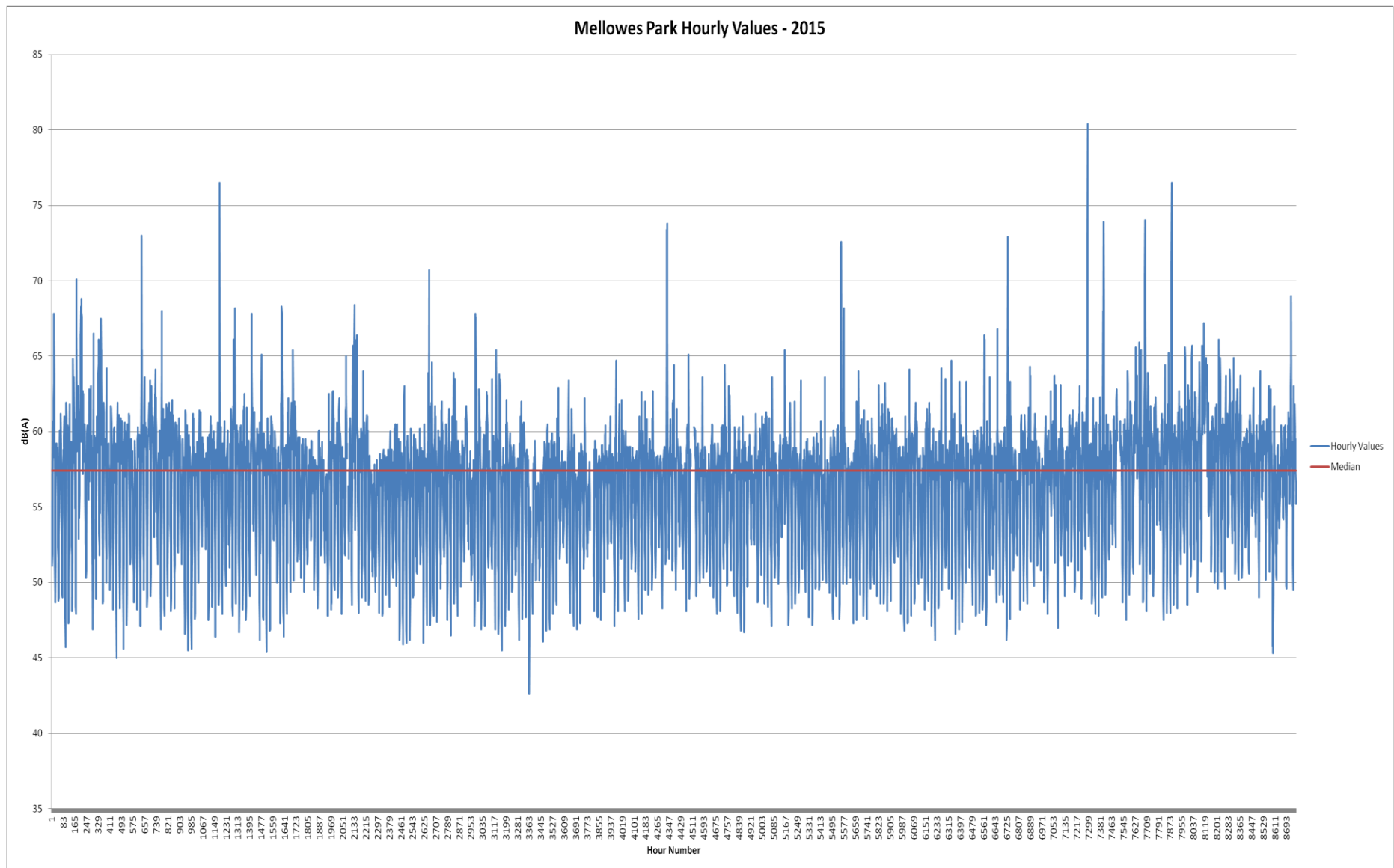


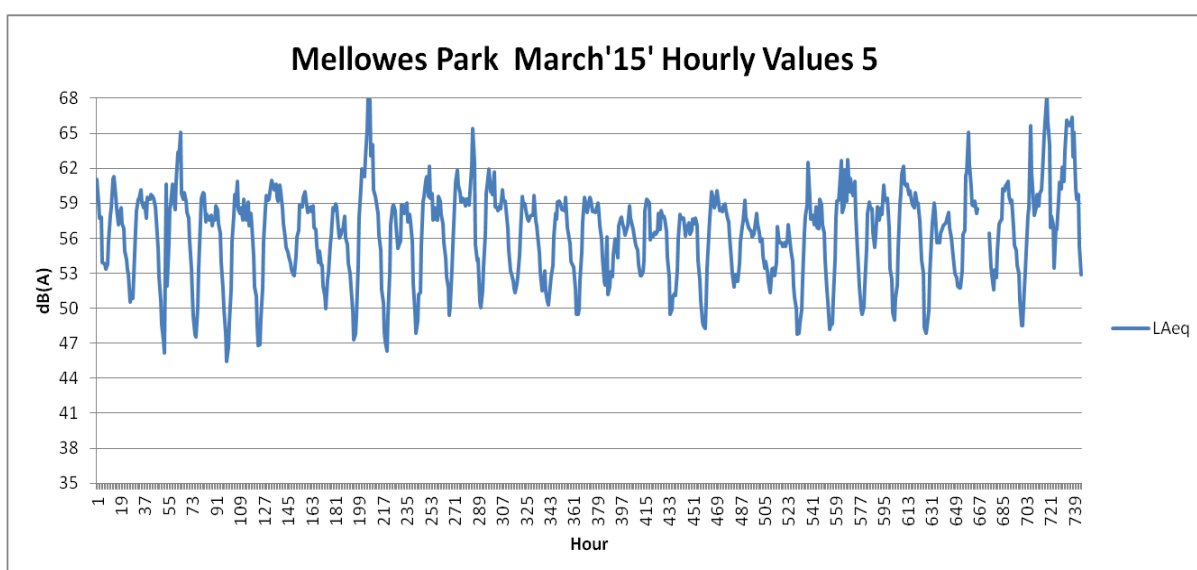
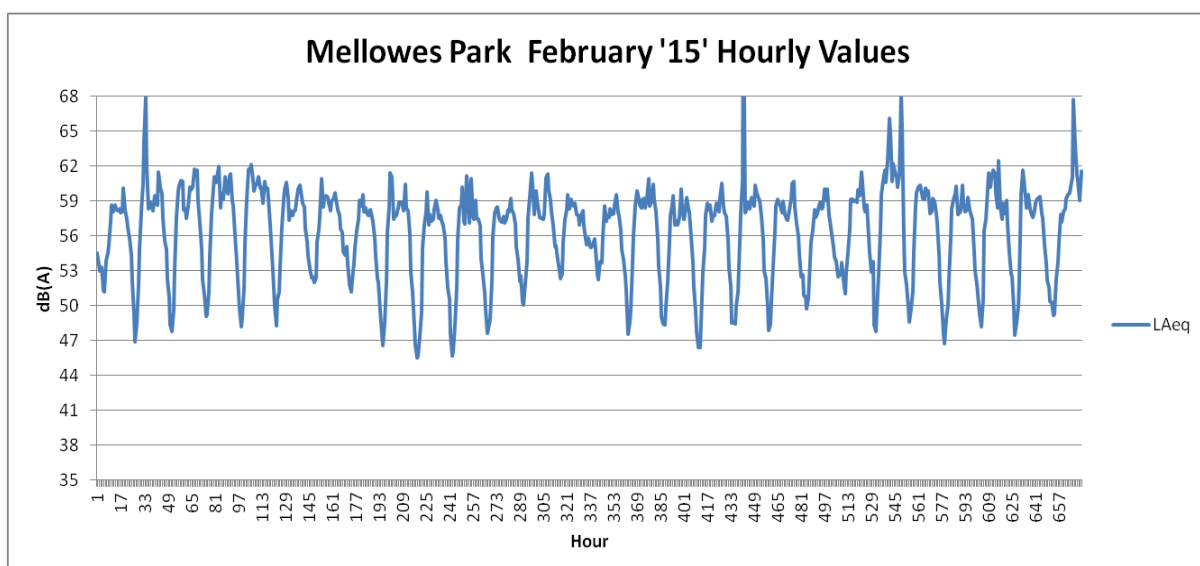
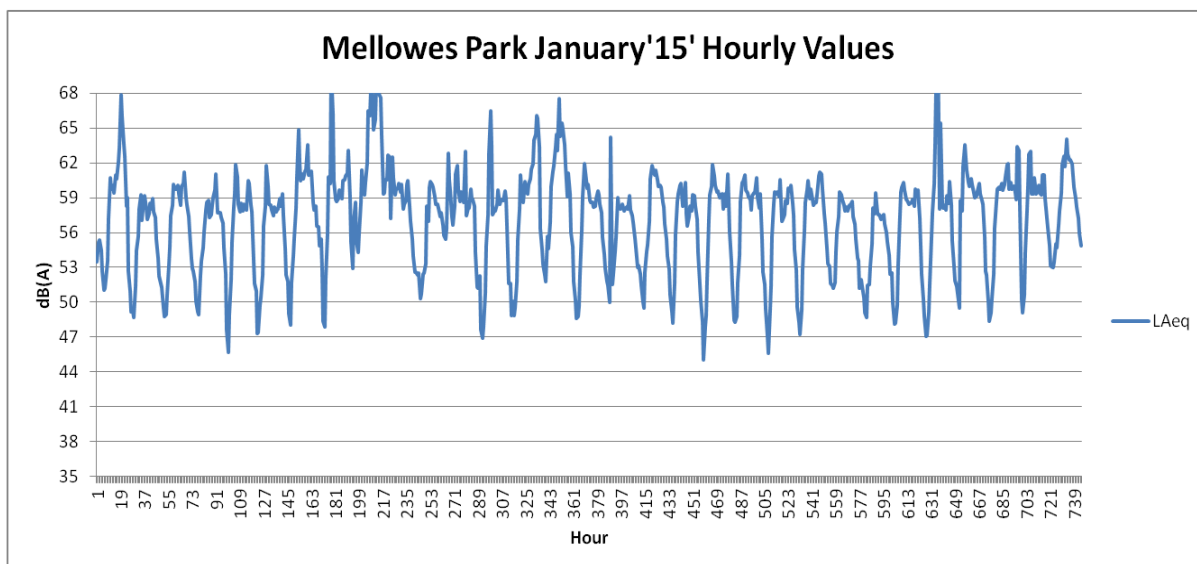


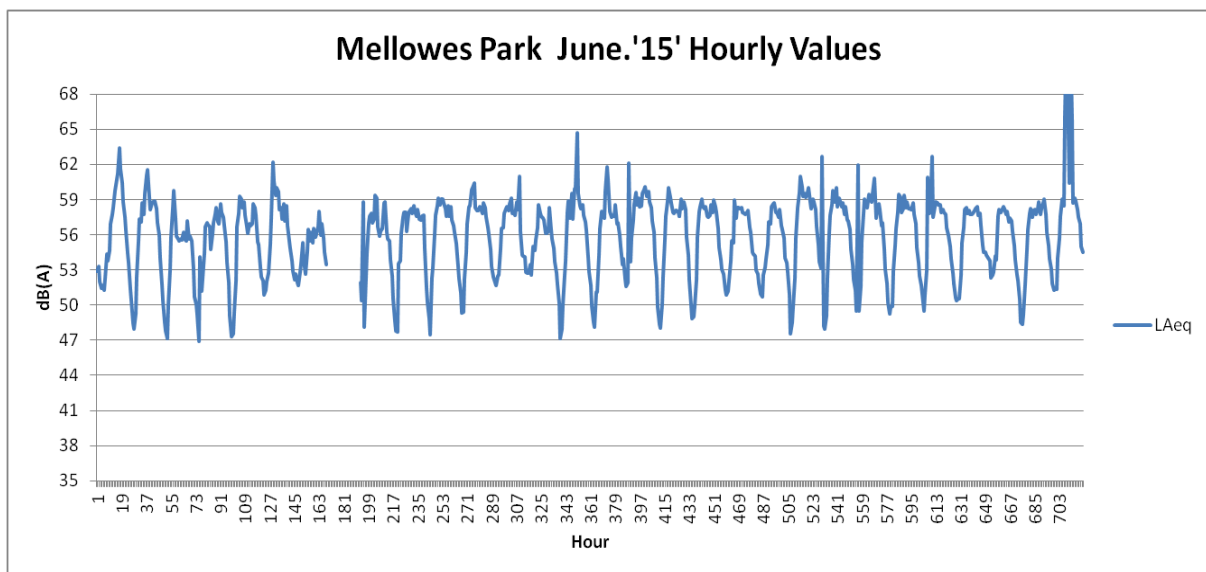
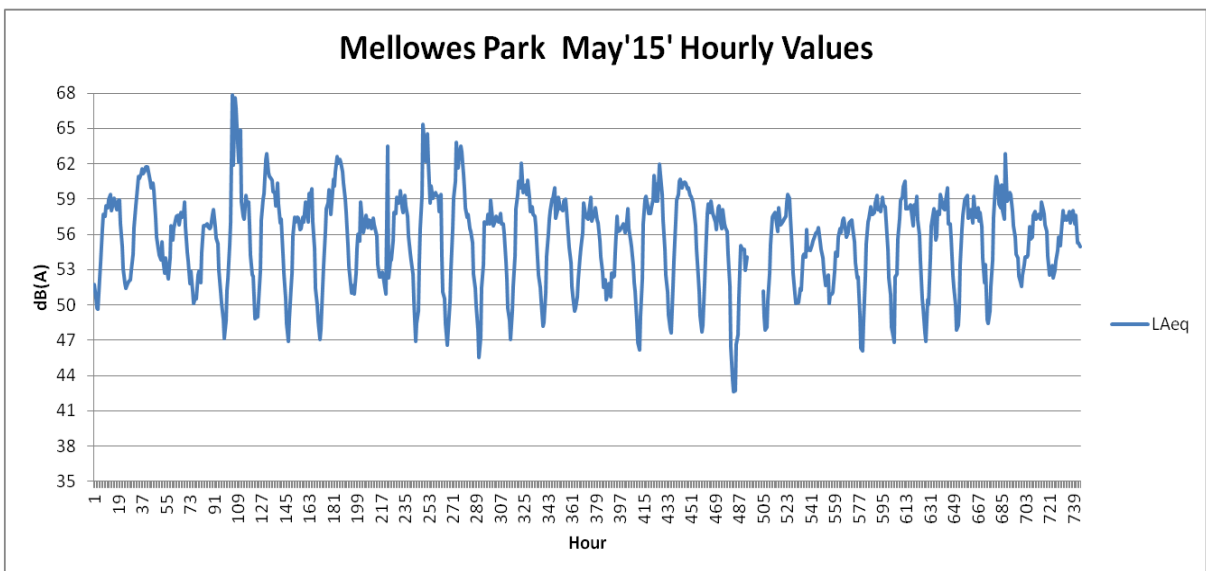
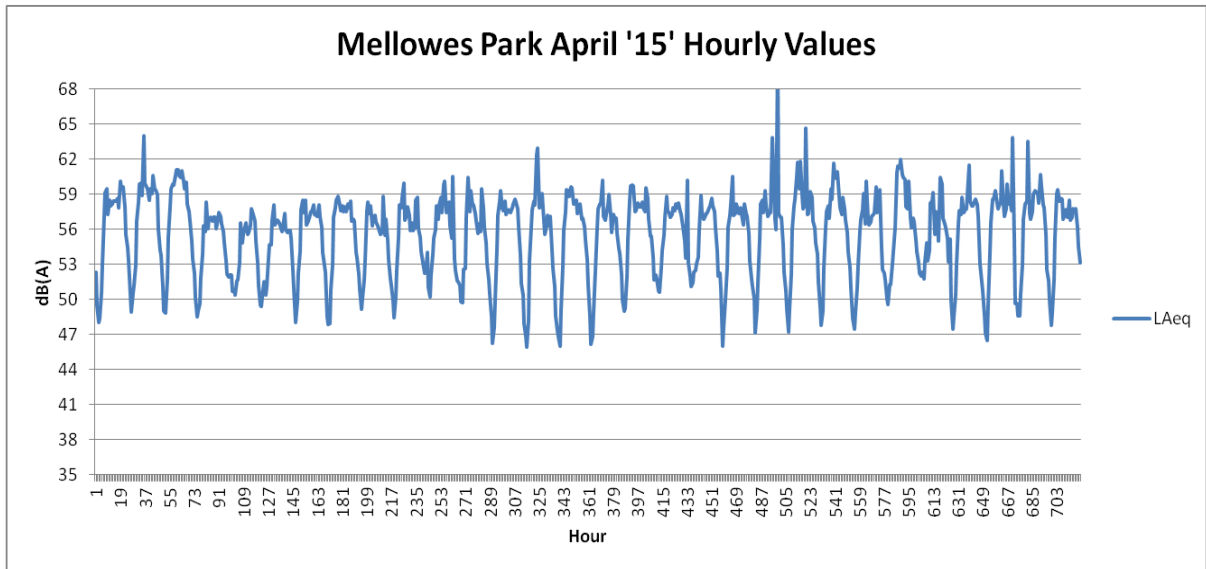


**Mellowes Park**  
**Finglas**  
**DUBLIN 11**

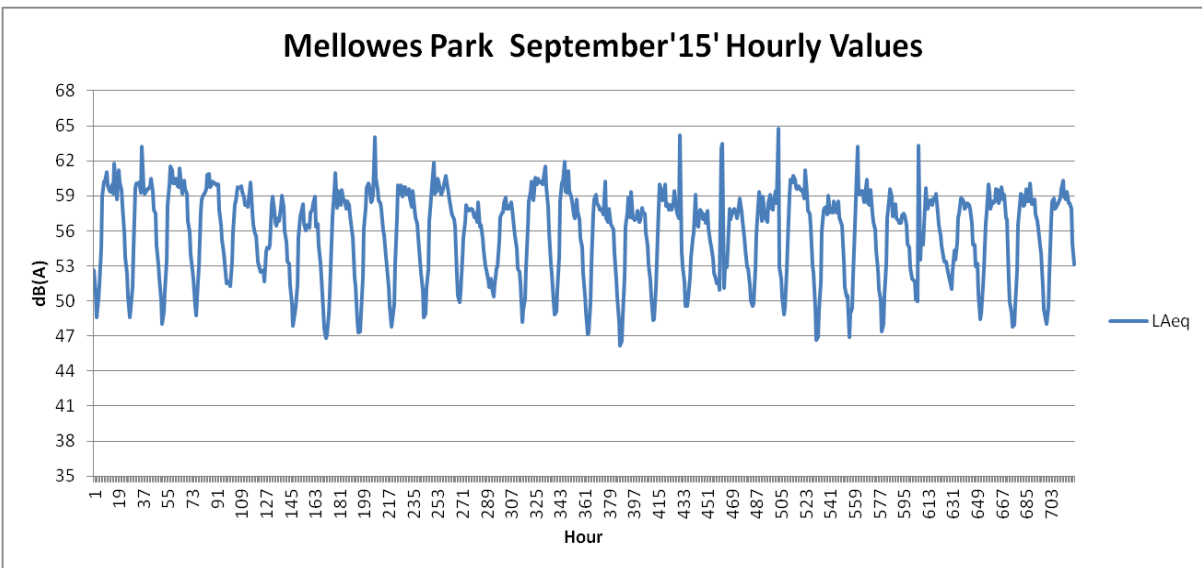
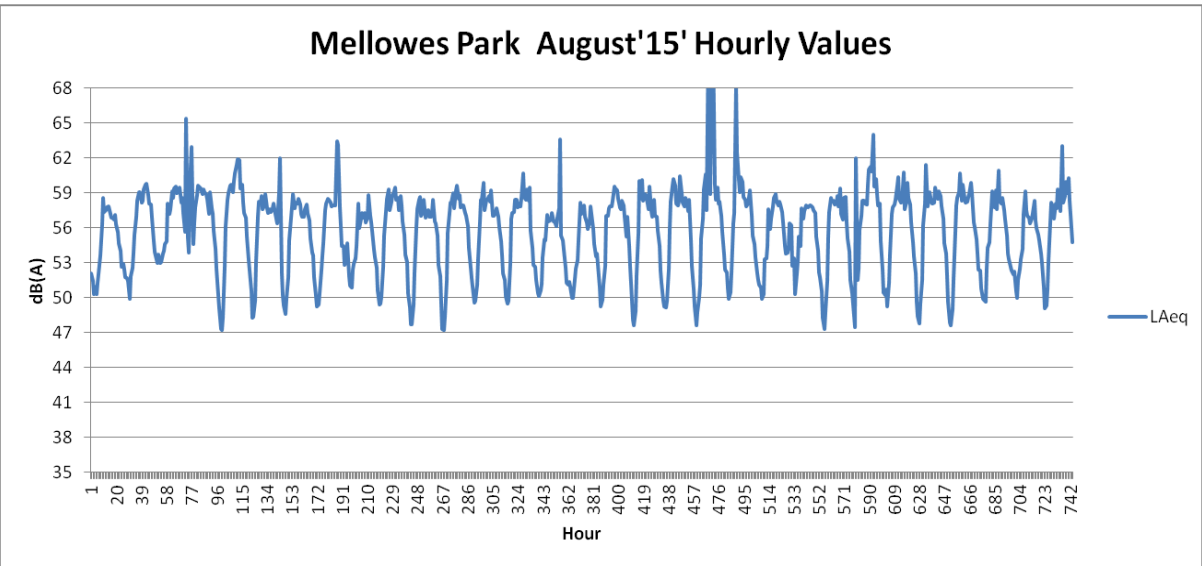
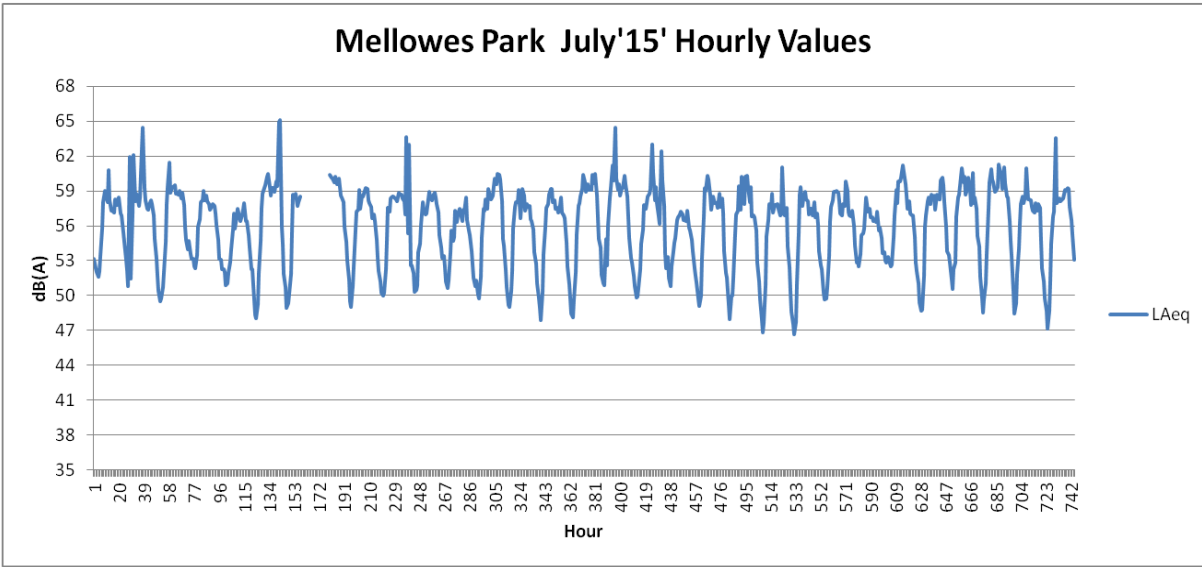




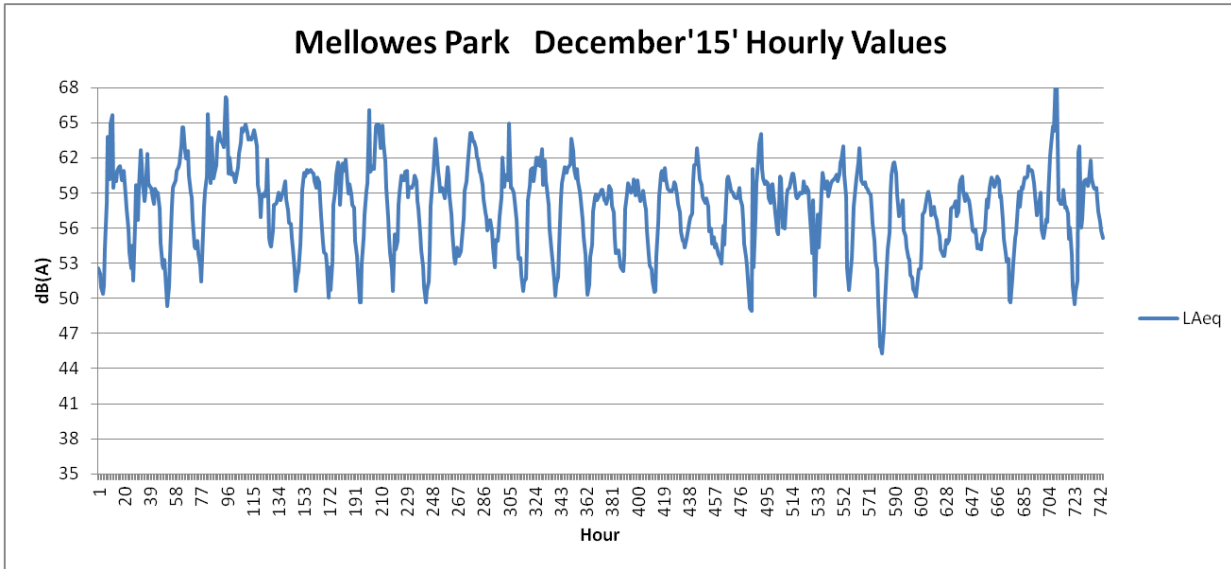
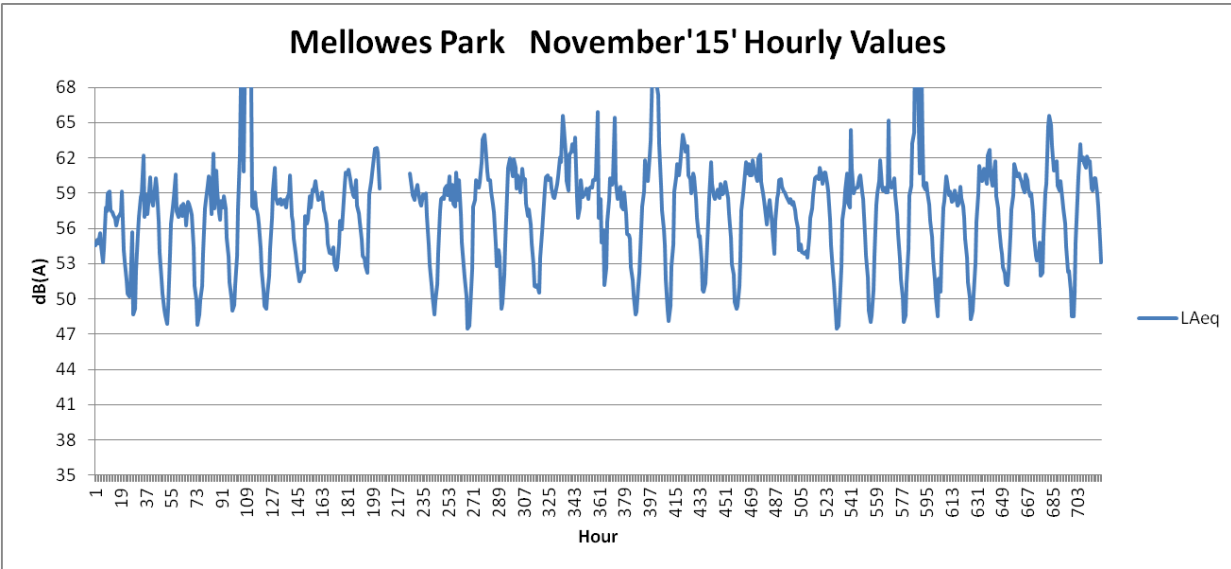
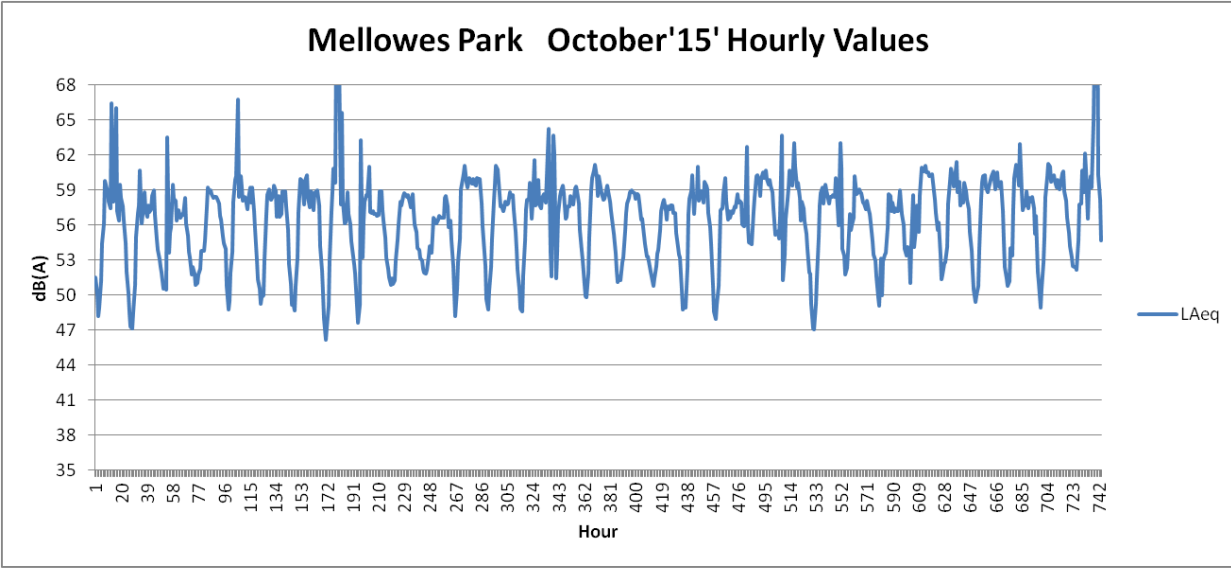














## Notes



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