



Commissioners of
IRISH LIGHTS | *Navigation
and Maritime
Services*

Superintendence and Management of Local Aids to Navigation and Offshore Structures

Annual Report 2017 and Three Year
Review 2015-2017



Contents

01	Executive Summary	4
02	POLICY	6
03	PURPOSE	7
04	Inspection and Auditing Process	8
4.1	Inspections	8
4.2	Results of the 2017 Local AtoN Inspections	9
4.3	Local Lighthouse Authority Audits	9
4.4	Local AtoN Availability	10
4.5	Results of the 2017 Local AtoN Availability Returns	11
4.6	General Overview of the Local AtoN Results	11
4.7	ILV Granuaile	13
05	Notable Developments	14
5.1	Local AtoN Management System and Complementary Technologies	14
5.2	Automatic Identification System (AIS) and GIS	14
5.3	LLA Maintenance Systems Review	17
5.4	Aquaculture	17
5.5	Alternative Energy	20
5.6	Offshore Platform Inspections	21
5.7	Cooperation with Other Bodies	21
06	Conclusion	23
	Table 1: Local Aids to Navigation	24
	Non-Aquaculture IALA Categories:	25
	Table 2: Aquaculture Database	26
	List of Current LLA and LLA Changes	28
	LLA Changes in 2016/2017	29

01

Executive Summary

This report is submitted to the Secretary of State for Transport in the UK and the Minister for Transport, Tourism and Sport in Ireland pursuant to Section 198(4) of the Merchant Shipping Act 1995 and Section 652(4) of the Merchant Shipping Act 1894 respectively. The Report covers the period from 01 January 2017 to 31 December 2017 and reviews the period from 1 January 2015 to the 31 December 2017.

Remit

The Merchant Shipping Acts require Irish Lights to inspect and superintend the management of all lighthouses, buoys and beacons within Local Lighthouse Authority (LLA) areas. Irish Lights has responsibility for the island of Ireland and the adjacent seas and islands.

LLA have authority over Local Aids to Navigation (AtoN) in their area. Typically, LLA are Harbour Authorities or County Councils but can also be Offshore Wind Parks and other similar developments. Local AtoN may be provided by the LLA themselves or by other bodies or individuals such as private marinas or shore-based industry. The provider has responsibility for providing and maintaining the AtoN, whereas the LLA has the responsibility of reporting to Irish Lights on the availability of that AtoN. Through inspection of Local Aids to Navigation (LAtoN), quarterly reporting of AtoN availability, consultation during the Statutory Sanction process and audit of the LLA, Irish Lights helps to ensure consistency in the quality and compliance of LAtoN within the LLA areas.

Duties

There are 3,259 LAtoN around the island of Ireland, and these are inspected on a biennial basis. Of the 60 LLA that are responsible for the provision of LAtoN, half are audited each year. Due to the merger of Local Authorities in Northern Ireland, the implementation of the National Ports Policy and the amalgamation of some AtoN under Irish Water, the number of LLA has been reducing on a gradual basis. In 2017 a special project to assess and audit all LLA maintenance management systems was undertaken.

Interaction

Irish Lights provide LLA with tools and services to support them in carrying out their duties. As an aid to the management of their LAtoN, LLA have access to the LAtoN Portal. This is a web-based system, giving the LLA access to their own AtoN for reporting of failures and as an online tool for accessing the Statutory Sanction application process. Irish Lights encourages the LLA to use this tool as part of their asset management and records keeping system.

LLA management of their AtoN was central to a High Court action in 2016. As part of its response to this judgement, Irish Lights has provided a temporary additional resource to focus on assessment of LLA Maintenance Management Systems and to support LLA to improve their systems where required.

Technology

The standard of AtoN continues to improve and there is a growing focus on the use of new technology.

- Self-contained lanterns provide a reliable and cost-effective solution to lighting AtoN.
- Plastic buoys integrating the daymark and AtoN top mark profile as part of the buoy structure improve conspicuity and reliability.
- The Automatic Identification System (AIS) has been implemented as an AtoN by several LLA and continue to be an option considered in applications for statutory sanction.



- In 2017 there has been increased interest in Virtual AIS as AtoN. This introduces specific challenges for the systems and users. The increased use of AIS capable navigation systems will help in some cases but not all. Virtual AIS is a solution that is only accessible to AIS equipped vessels and this must be considered when designing navigation solutions.
- LED linear leading lights and LED projector sector lights have been installed in several locations replacing less reliable incandescent lanterns to give an improved AtoN service.
- GSM enabled Units with automatic monitoring of AtoN position and performance have been employed by some LLA with others expressing interest.

Growth

As the marine sector continues to grow Irish Lights has supported the LLA and connected organisations in the provision of AtoN in local areas. The expansion of key industries such as aquaculture and offshore renewables has provided LLA with the challenge of ensuring that safe navigation continues to be provided for all users. Irish Lights responds to this challenge by providing support, information and advice on the provision and maintenance of AtoN. There has been an increase in investment in maritime leisure infrastructure, and LLA must bear in mind the capability and competence of users when introducing new features and attractions when developing facilities.

Cooperation

To best serve the LLA in their provision of LAtoN, Irish Lights has been working closely with marine organisations to enhance cooperation and the sharing of knowledge. Organisations such as the Loughs Agency, the RNLI, BIM, the Marine Institute and the MSO have all engaged with the LAtoN Inspector to improve the provision of LAtoN.

02

Policy

The Merchant Shipping Acts require the General Lighthouse Authorities (GLA) to inspect and superintend the management of all lighthouses, buoys and beacons within Local Lighthouse Authority (LLA) areas.

Within the Irish Lights policy, emphasis is placed on a combination of inspecting Local Aids to Navigation (AtoN) and auditing Local Lighthouse Authority Maintenance Management systems in a two-yearly cycle. The audit and inspection programme is backed up by ongoing review of Availability Statistics against IALA requirements through LLA quarterly reporting.

Local Lighthouse Authorities are responsible for ensuring that any third-party Aids to Navigation, within their area of responsibility, are correctly established and maintained. It is the responsibility of the third party to establish and maintain these AtoN. For example, a private marina is required to act under the direction of the LLA with respect to any AtoN for which they are responsible.

The SOLAS convention requires administrations to take account of IALA Recommendations and Guidelines when providing Aids to Navigation.

Within Northern Ireland the UK Port Marine Safety Code¹ requires all Aids to Navigation maintained by Harbour Authorities and other Local Lighthouse Authorities to be maintained in accordance with the availability criteria laid down by the General Lighthouse Authorities and provides detailed guidance on requirements.

The Port Marine Safety Code does not apply within the Republic of Ireland, but Irish Lights recommends the implementation of the Code by analogy in that area. The characteristics of all aids to navigation must comply with Standards Guidelines and Recommendations as laid down by the International Association of Marine Aids to Navigation and Lighthouse Authorities² (IALA).

The General Lighthouse Authorities also require those responsible for Local Aids to Navigation, which lie outside Statutory Harbour and Local Authority areas, e.g., offshore wind-parks, to establish and maintain their AtoN to IALA standards. Irish Lights treats these bodies in the same way as LLA and requires the same records of availability statistics and outage response reports.

In addition, each Authority is required to establish procedures for responding to outages to Aids to Navigation.

¹ Policy paper: Port marine safety code <https://www.gov.uk/government/publications/port-marine-safety-code>

² Website: <http://www.iala-aism.org/>

03

Purpose

The Commissioners of Irish Lights discharges its statutory duty in respect of local AtoN by a combination of consent to changes, audit, inspection and quarterly reporting. This includes the duty of superintendence and management, to ensure that AtoN maintained by other authorities meet the agreed international standards.

The Irish Lights Board reviewed Local AtoN inspection procedures on 31 May 2014 and agreed the following policy points:

- Biennial inspection of Unlighted and Lighted AtoN, Racons, AIS and Stone Beacons.
- Biennial audit of AtoN Maintenance Management systems and records of Local Lighthouse Authorities.
- Where the LAtoN Lead is satisfied that during an audit an LLA has been found to be fully compliant with Irish Lights' recommendations, the subsequent audit schedule can be extended to every 4 years.
- Local Lighthouse Authorities and providers showing a poor record of compliance are given special attention and where appropriate reports on their non-compliance may be submitted to the relevant government departments. The experience to date has been that engagement with poor performers results in improvement and it has not been necessary to report any LLA to their parent department.
- The alignment of Sectors and Leading Lights are checked from seaward by ILV Granuaile every two years and every five years respectively.

Site Visits

Site visits are an important element in the interaction between the Local Lighthouse Authority and Irish Lights. These visits:

- Allow authorities the opportunity to discuss with the Inspecting Officer all matters relating to their AtoN provision.
- Allow Irish Lights the opportunity to discuss, face to face, the level of local AtoN provision.
- Enable Irish Lights to more effectively review the level of provision and support risk assessments to consider changes to the level and/or to the maintenance regimes.
- Allow Irish Lights to offer advice on equipment and installations

Many Local Lighthouse Authorities welcome this annual visit, as they consider the audit/inspection to form an important external audit element of their port safety management systems.

While inspection provides a snapshot of the standard of provision on a specific day, the audit of records allows a more detailed examination of performance over a longer period. Within Irish Lights both audit and inspection functions are generally carried out by the Local AtoN Inspector but may at times be delegated to other suitably qualified personnel or ILV Granuaile.

In 2017, in a review of the LLA system of management, a second resource was added to conduct an in-depth audit of all LLAs in order to assess the current LLA structures and implement an improved working strategy for how Irish Lights engages with the LLA.

04

Inspection and Auditing Process



4.1 Inspections

Inspections are arranged by direct contact with the LLA responsible for the provision of local AtoN. Local information and at times local assets are provided by the authorities to assist and inform the inspecting process. Local authorities are invited to provide a representative to accompany the Inspecting Officer and the results of the inspections are notified to the authorities. Discrepancies are dealt with through a Corrective Action Request process. Inspections assess whether the AtoN is performing as published on the Admiralty chart and the Statutory Sanction.

There are three main outcomes an AtoN can achieve in the inspection:

As Required – Where the AtoN is as described on the chart.

Minor Discrepancy – Where the AtoN is not fully compliant but not a risk to navigation.

Major Discrepancy – Where the AtoN is not compliant and considered a risk to navigation.

Seaward observations are conducted by use of local boats, or ILV Granuaile. All boats used comply with relevant statutory requirements and have passenger licences. Inspections of permanent offshore platforms are carried out annually by ILV Granuaile.

4.2 Results of the 2017 Local AtoN Inspections

At 31 December 2017 there were 3,259 (3,205 in 2016) active AtoN listed on the Local AtoN Management System. Of these 858 are associated with aquaculture development and 2,401 are non-aquaculture AtoN. This information is expanded in Table 1 (page 24). The increase is due to new AtoN established in 2017.

An intensive exercise has been undertaken to align the aquaculture sites on the Irish Lights AtoN database with the most recent DAFM licensing data to remove duplications between sites marked under SUMS/CLAMS schemes and individual sites. This has resulted in a reduction in the recorded aquaculture sites.

1,612 (51%) of the 3199 AtoN within the relevant 2-year cycle were inspected in 2017 (50.7% in 2016). Of the 1,612 AtoN inspected, there were 45 major discrepancies identified, and 92 minor discrepancies. There is a modest decreasing trend in discrepancies from previous years reflecting the improved condition of aids attended. In most cases the LLA addressed major discrepancies immediately. However, in some cases, for example the Valley Pier on Achill Island, an immediate response was not possible as the beacon had to be replaced with a buoy, a process which took over 3 months. Most discrepancies are covered by RNW until corrected. There were 56 permanent AtoN established, 5 disestablished and 22 amended in 2017. Seven AtoN were not physically inspected within the 2-year period. These AtoN are far offshore and include the UK Met Buoys. Updates of the deployment and condition of these are obtained from either

the LLA or ILV Granuaile. These AtoN will be inspected at the next deployment phase if practicable in agreement with the LLA.

The Statutory Sanction process continues to operate effectively. The number of AtoN with applications for Statutory Sanction increased in 2017 from 85 to 121. Of the AtoN established, disestablished or altered, 91 applications were from Local Lighthouse Authorities, (31 in 2016) and 30 were connected to the BIM Special Unified Marking Schemes (SUMS) Aquaculture marking schemes or other aquaculture projects (54 in 2017).

4.3 Local Lighthouse Authority Audits

Audits of LLA maintenance records and procedures continued throughout 2016-2017. 60 LLA audits were conducted in 2017. This high number is due to the aforementioned auditing review process undertaken by Irish Lights to assess the level of competence and the suitability of LLA procedures where it comes to Local AtoN. The Review identified areas for improvement in many LLA maintenance systems

In addition to formal audits the Local AtoN Inspector has continued to work closely with BIM to develop appropriate policies and procedures for the management of AtoN within the aquaculture industry. This central approach has resulted in the production of AtoN management policy documents covering a total of 8 distinct regional areas around Ireland, each of which is serviced by a BIM Regional development officer.



The transfer of responsibility for smaller ports to County Councils under the National Ports Policy continues to yield further opportunities to develop centralised policies and procedures for Local AtoN management. In most cases the transfer is taking longer than anticipated, allowing Irish Lights to make contact and aid in familiarising staff new to the sector with the relevant information required. Wicklow, Wexford and Waterford have assigned Marine Officers to provide better marine infrastructure management for all the Ports and Harbours in their areas. Over the course of 2017 the reform of Local Government in Northern Ireland continued to be rolled out. This process had reduced the number of Local Authorities from 26 to 11 however, there has been need to respond to staff changes to ensure that proper attention is given to the LLA role.

From 2015 water infrastructure such as treatment plants and outfall systems have begun to be taken over by Irish Water. This includes all associated LAtoN. Irish Water has been designated as an LLA and staff have been briefed on all matters relating to their role and responsibility. This approach will continue in 2018 with training of all new staff in LLA contact roles.

4.4 Local AtoN Availability

Local AtoN under the responsibility of LLA and other providers are required to be maintained in accordance with the availability criteria laid down by the General Lighthouse Authorities, which are based on IALA guidelines.

Availability is calculated based on a three-year rolling average. There are three AtoN minimum availability targets, which are as follows:

Category 1	(99.8% Availability)
Category 2	(99.0% Availability)
Category 3	(97.0% Availability)

Please see the Non-Aquaculture IALA Categories table (page 25).

When AtoN components fall below the advertised values for that station it is regarded as an outage and the details are then included in the calculation for availability. The General Lighthouse Authorities require quarterly availability reports from LLA to demonstrate conformance with the required standard.

The Internet based Local Aids to Navigation Management System developed by Irish Lights is designed to facilitate on line reporting of all outages by LLA. Seasonal and temporary AtoN, are not included in the availability calculations, although outages to these AtoN are subject to audit.



4.5 Results of the 2017 Local AtoN Availability Returns

Quarterly Reporting by LLA has improved in 2017. Most Local Lighthouse Authorities provided Quarterly Reports and the overall response was 90% (70% in 2016). This increased response is mainly due to the work carried out with the LLA assessment and audit. Work will continue to improve these figures and a concerted effort will be made to continue compliance in 2018. Those not reporting are being specially targeted for audit and compliance in 2018.

Automatic reminders are sent every quarter and attention will be paid to those authorities who have failed to report for a prolonged period. It is a matter of course that LAtoN web portal training is offered at every opportunity. Availability reporting is expected to remain high and be sustained over the coming year. An improved AtoN reporting system should aid in encouraging the remaining LLA to transfer to the online model.

Several Lighthouse Authorities are implementing maintenance contracts with local contractors to include inspection and availability reporting. This will further improve availability reporting for the coming years.

4.6 General Overview of the Local AtoN Results

Over the period from January 2015 to December 2017 Local AtoN inspections and audits have been carried out in accordance with projected targets.

One opportunity that has been present over the last three years has been the consolidation of many ports and harbours into Local County Councils, or under the responsibility of a nearby Tier 1 Port. This stems from the 2013 National Ports Policy³

The National Ports Policy categorises ports which handle commercial freight into:

Ports of National Significance:

Tier 1:

Dublin Port Company
Port of Cork Company
Shannon Foynes Port Company

Tier 2:

Port of Waterford Company
Rosslare Europort

Ports of Regional Significance:

Drogheda Port Company
Dun Laoghaire Harbour Company
Galway Harbour Company
New Ross Port Company
Wicklow Port Company
Dundalk Port Company
All other ports that handle commercial freight.

This process is progressing, but issues remain in ports such as New Ross Port Company being transferred to Wexford County Council, the transfer of shares of Drogheda Port Company to Louth County Council and the future of Dun Laoghaire Harbour.

³ National Ports Policy: <http://www.dttas.ie/sites/default/files/node/add/content-publication/National%20Ports%20Policy%202013.PDF>



The most significant change in LLA allocation is in Northern Ireland where the reform of local government reduced 26 councils to 11. This has provided a good opportunity to amalgamate small ports and harbours LLA into their respective Local Authorities.

The resulting consolidation of the LLA over the past three years, once all of them have been finalised will bring a reduction from 80 LLA contacts to 56 LLA contacts. This will reduce the number of audits per year required and provide for greater efficiency in communications and training.

The standard of AtoN continues to improve and there is a growing focus on the use of new technology such as:

- Self-contained solar charged LED lights; Self-contained lanterns provide a much more reliable and cost-effective solution for LLA and third-party providers, particularly for lower range AtoN.
- Rotation moulded buoys; integrating the daymark and AtoN topmark profile as part of the buoy structure. These units improve conspicuity and reliability.
- Automatic Identification System (AIS); there is a growing interest to the use of AIS as a local AtoN solution. There are a number of Local AIS AtoN installed with more being considered.
- LED Port Entry Lights; these efficient and accurate sector lights have been installed in several areas and have proven to be successful, efficient and reliable.
- Units with automatic monitoring of AtoN position and performance; the GSM enabled AtoN have been employed by some LLA with others expressing interest.

- LED linear leading lights and LED projector sector lights; these have been installed in several locations replacing less reliable incandescent lanterns to give an improved AtoN service.

During audits LLA are asked to conduct reviews of their current assets and assess whether improvement is required. As a matter of course, LLA are encouraged to review their LAtoN every five years from a navigational safety standpoint, considering local developments, trends in marine usage and other factors, such as the leisure industry.

In 2015 and 2017 there had been damaging storms on all coasts. As a result, a number of AtoN outages had occurred and some LLA were less effective than others in responding to the situation. RNWs were issued for prolonged periods of time due to the inability of the relevant LLA to respond promptly. This issue was not as severe in 2016.

Other challenges have been around safe access to AtoN that had been damaged. With improved health and safety procedures, many LLA found they had to defer to contractors, or indeed Irish Lights to provide them with the necessary solutions to restore an AtoN in a safe manner.





4.7 ILV Granuaile

The ILV Granuaile is a multifunctional vessel which can operate in difficult sea conditions. Fitted with Class 1 dynamic positioning, the vessel's primary function is to place and service Irish Lights buoys, which warn mariners of the location of sand banks, reefs and other offshore hazards near shipping routes. The vessel is often in a port or area with many LAtoN and is an ideal platform from which to assist the LAtoN Inspector in conducting inspections.

During 2017 the LAtoN Inspector has continued working with the ship in inspections, sector checking, monitoring of outages and validating LAtoN installations.

The ship has proven to be a valuable asset in Local AtoN operations. In areas such as Cork Harbour or Dublin Bay, the LAtoN Inspector will arrange to meet the ship at port, transfer to the RIB and conduct a local inspection. In such a case, many more AtoN can be inspected given the speed, manoeuvrability and the range of the rib. Local tenders tend to be less capable of the task in hand as they are usually commercial tenders or workboats with passenger licences. There are limitations to the Irish Lights RIB, many areas such as Castlemaine or Dungarvan have Aquaculture AtoN that can only be accessed at high water, or with a flat-bottomed boat with a draft of 300mm or less. For such inspections BIM or Local Authority vessels must be used.

In addition to the provision of the RIB for inspections, the LAtoN Inspector has accompanied ILV Granuaile in the deployment of the M6 data buoy in 2016. It was a rare opportunity to inspect the new buoy in position as these are so far offshore it would not normally be feasible to arrange an inspection.

The ILV Granuaile is also involved, when convenient, in checking aids to navigation other than those mentioned above, including lights, traffic signals, lighted/unlighted beacons and lighted/unlighted buoys, these are checked for light character, range, conspicuity of daymark and for floating aids to navigation (buoys), conspicuity of topmark and geographical position.

Any major issue in the provision of AtoN, where there is a risk to safe navigation is relayed to the relevant LLA. The presence of the ILV Granuaile in their area and the feedback from the Bridge crew is welcomed by the LLA. There is always an opportunity for the LLA contact to benefit from the expertise and experience of the crew in relation to the deployment, maintenance and monitoring of their aids. From time to time LLA have engaged the ILV Granuaile, on a commercial basis, to conduct operations in order to ensure the continued services they provide.

05

Notable Developments

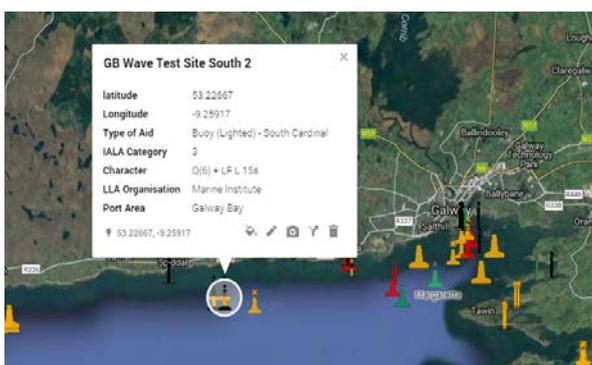
5.1 Local AtoN Management System and Complementary Technologies

The LAtoN Web Portal is an extension to the LAtoN Database, whereby an LLA can login and view their stored data in relation to their AtoN. In addition to submitting their quarterly reports LLA may use the statutory sanction form in the portal to make an application to Irish Lights to establish, disestablish or alter aids in their area. Secure access is provided in the form of a Username and Password assigned to the reporting contact.

A User Guide to the web portal is available online. The database elements of the Local AtoN Management System have proven to be very effective. The operation and benefits of the system has been explained to many users. There is strong support, and positive feedback surrounding the introduction of the online reporting and applications system. The Northern Lighthouse Board and Trinity House also use the system.

The increased focus on the records and reporting of LLA in 2017 underlines the importance of the LAtoN portal as a valuable tool at the LLA's disposal.

An improved, more intuitive map-based user interface has been proposed, enabling secure, public access to the main LAtoN positions with contact and technical details of the AtoN. This will allow the users to report on the condition of the LAtoN.



Example of map based LAtoN interface

The interface will also provide a secure access to the LLA to verify technical details, apply for LAtoN Statutory Sanctions and report on the status of those LAtoN, feeding into their quarterly reports.

5.2 Automatic Identification System (AIS) and GIS

The Automatic Identification System (AIS)

The Automatic Identification System (AIS) is an automatic tracking system used on ships (and some leisure and fishing vessels) and by Vessel Traffic Services (VTS). AIS information complements the array of bridge-based navigation information systems for vessels, port authority traffic management systems and relevant marine authority tracking systems (such as that of Irish Lights, the Navy, the Irish Coast Guard and the Maritime & Coastguard Agency).

The service infrastructure is provided by Irish Lights, the Irish Coast Guard (ROI) and the Maritime and Coastguard Agency (NI).



Several offshore structures are now transmitting AIS messages. Where the message has an Aid to Navigation role there is a requirement for Statutory Sanction under the Merchant Shipping Acts. Arrangements have been put in place with Comreg (ROI) and Ofcom (NI) for cooperation in the Licensing / Statutory Sanction processes and 24-hour response to serious incidents of interference.

Statutory Sanction applications for AIS as a Local AtoN have continued this year. LLA consider it a valuable addition to their AtoN options and are encouraged to consider the implementation of AIS where appropriate in all new Statutory Sanction applications. Bantry Bay Harbour Commissioners also have AIS at the Whiddy terminal facility. There are currently 13 AIS enabled Local AtoN in operation in 2017. The Kinsale Gas Field Platforms Alpha and Bravo platforms also have AIS AtoN installed.

Geographical Information System (GIS)

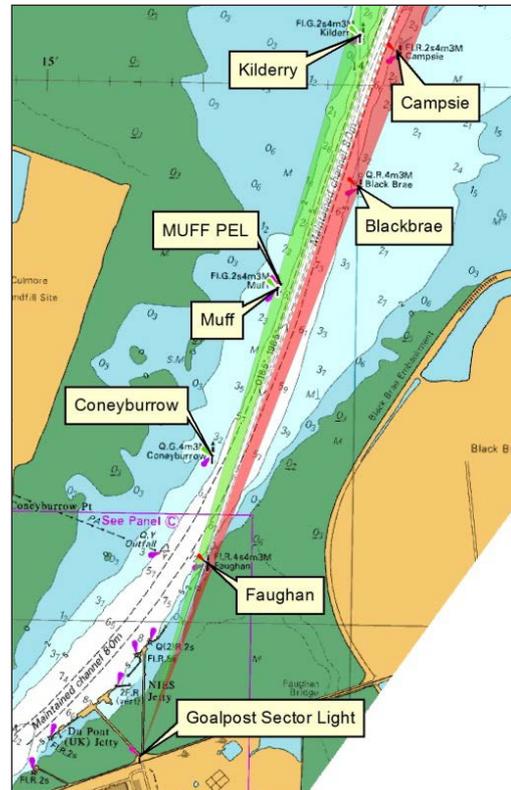
The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) recommendation No. O-138 advocates the use of GIS systems throughout the General Lighthouse Authorities.

In 2008, Irish Lights integrated the Local Aids to Navigation database and ESRI mobile GIS software to produce a mobile inspection solution which the Local AtoN Inspector carries with him.

This system comprises of a geographical view of all Local AtoNs, remote access to individual Local AtoN attributes, automated inspection forms on a handheld device and automated upload of inspection and accurate location data to the Local AtoNs database. The aforementioned updates to the AtoN database are reflected on the device.

Further improvements in the system, as well as reporting and analysis of the data will be progressed in 2018, particularly in the provision of raster charts for the publication of board reports and navigational analysis.

Upgrading of the GIS hardware and software in 2016 has allowed for improved analysis tools, better accuracy and better performance in creating reports, assessments, charts and statistical analysis for the future.



Typical ArcGIS map for a Board report showing the sectors of a PEL light and LAtoN

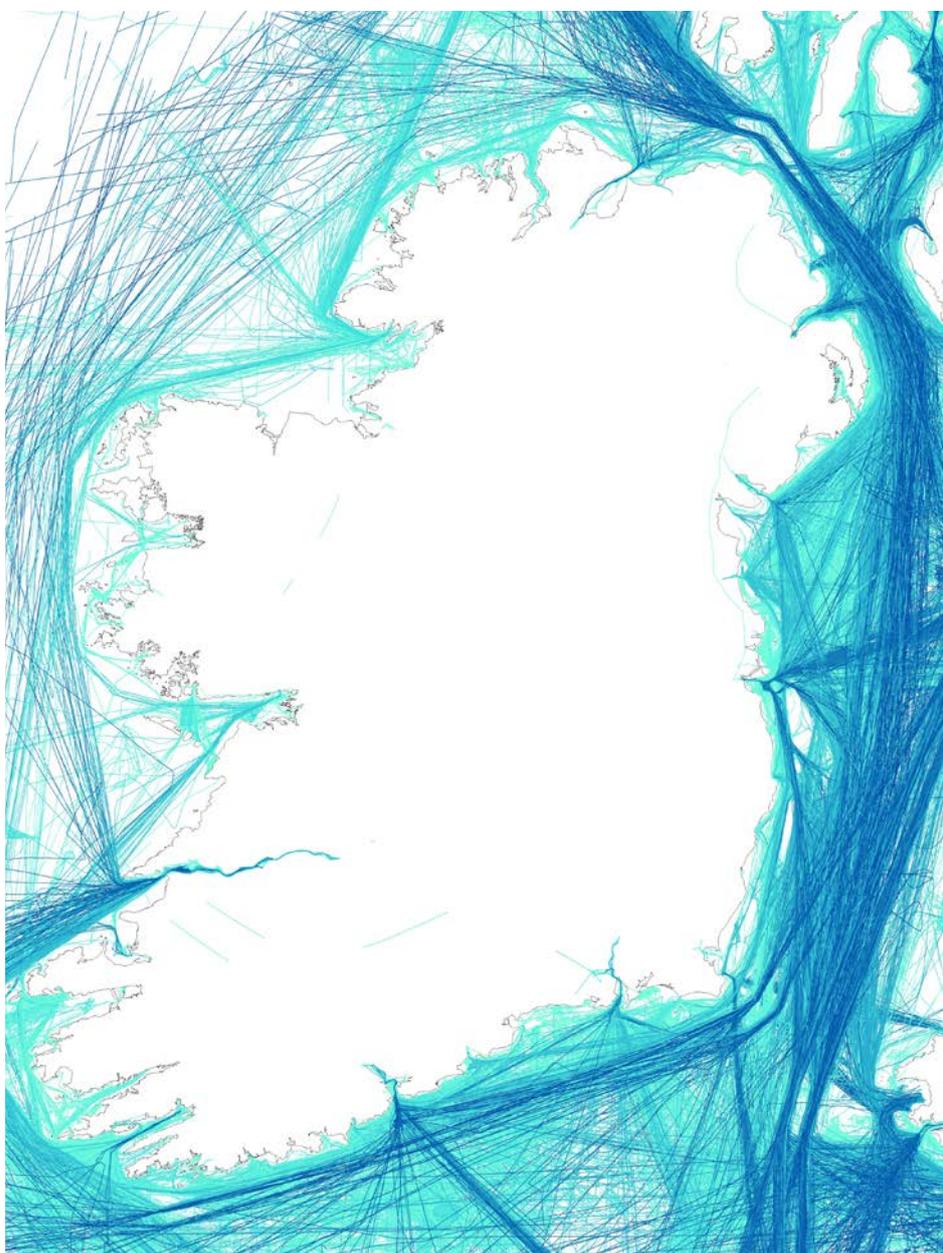
It is envisaged that data analysis from the GIS software will increasingly enhance the effectiveness and planning of the management of LAtoN in the future. This data should enable Irish Lights to enhance the service provided to the LLA in sanctioning Aids and highlighting concerns with recurring LAtoN issues.

BIM and DAFM both use GIS to distribute and evaluate Aquaculture infrastructure, licence applications and LAtoN design and verification. INFOMAR and the Department of Defence also distribute their data in GIS format.

GIS and AIS combined

Statistical analysis of AIS data has proven to be invaluable in risk assessment, outage analysis and LAtoN suitability assessment. The ability to interrogate the data produced further improves the provision and management of AtoN in the future. GIS has been identified as a useful tool in Irish Lights for Marine Spatial Planning and combined with digital charts and AIS data will play a major role in navigational risk assessment, reporting and marine incident modelling.

IALA have a recommendation on The Use of GIS and Simulation by Aids to Navigation Authorities. The LAtoN Inspector has provided LLA with data and maps to assist in risk analysis to improve their AtoN and port management procedures over the past year. Furthermore, internal publications, Statutory Sanction Application analysis and vessel trend analysis greatly benefit from the use of these systems.



5.3 LLA Maintenance Systems Review

Introduction:

LLA management of their AtoN was central to a High Court action in 2016. As part of its response to this judgement, Irish Lights has provided a temporary additional resource to focus on assessment of LLA Maintenance Management Systems and to support LLA to improve their systems where required.

Local Lighthouse Authority Responsibilities:

Irish Lights has always been keen to highlight the risk of civil action in addition to the statutory responsibility for LLA for the provision and maintenance of AtoN in their area.

In 2017, a resource from the Granuaile was seconded to the Operations & Navigation Services Team to undertake an intensive assessment of LLA maintenance management systems and records and to advise LLA on potential improvements. In doing so, training was conducted with LLA staff on the LAtoN web portal, and in some cases the LLA used the opportunity to update policies and reassign staff.

Document Management:

The LLA reassessment project highlighted the need for some LLA to improve their management systems. Moving to electronic only Statutory Sanction applications and quarterly reports will help to address the issue. Furthermore, all inspection results will be shared with the LLA in question, this is in addition to any corrective action requests and ad hoc contacts during the inspection process. It is important that positive reporting on the condition of AtoN, as opposed to failure only reporting is conducted to highlight the fact that inspections are carried out without formal notification from time to time.

Procedures for LLA:

A list of recommendations which will allow the LLA to address the issues highlighted in the case will be published and circulated in 2018. This document is a result of the work carried out by the additional resource with the LLA.

This will be accompanied with the following documentation:

- Inspection checklist templates for Buoys and Beacons, highlighting the relevant areas for compliance.
- Revised instructions on reporting on AtoN and Applications for AtoN on the Local AtoN Portal. This will be rolled out once the system has been updated
- Corrective Action Request template example, with suggested reply/confirmation.
- Navigational Risk Assessment template.
- Case studies for navigational risk assessment.
- IALA MBS (Maritime Buoyage System)⁴ document and other IALA guidelines and recommendations relevant to LLA.

5.4 Aquaculture

Aquaculture in Ireland has grown to be a significant industry, with over €150m of production value a year. Many of the aquaculture farmers do not come from a maritime background and, as such have little experience of the installation and maintenance of AtoN. With many the AtoN around the coast marking aquaculture infrastructure, the LAtoN Inspector has partnered with a network of BIM Regional Development Officers to advise and support aquaculture developers in the marking of their sites.

The proliferation of inadequately marked aquaculture developments remains a cause of concern. However, the Coordinated Local Area Management Schemes (CLAMS) and the Special Unified Marking Scheme (SUMS) processes, which are overseen by BIM, are continuing to bring an improvement in marking and compliance. This is a slow process, involving resources from the BIM, Aquaculture Initiative and consultation with producers. However overall the implementation of these processes has dramatically improved the marking of aquaculture sites.

4 MBS Document: <http://www.irishlights.ie/media/11141/IALA-MBS.pdf>

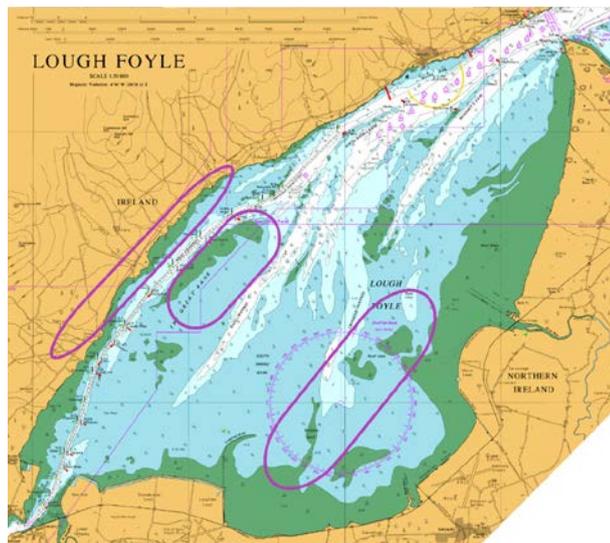


The status of the Aquaculture sites around Ireland remains varied. In the data from the Department of Agriculture, Food & the Marine and excluding the refused, revoked, withdrawn, unlicensed and surrendered sites there remains 1352 sites that have consent or are proceeding through the application process. All licenced sites, whether they have AtoN or not, are recorded on the AtoN database. A facility to input the information from the DAFM data source is being incorporated into the Irish Lights AtoN database. In 2017 the Minister instructed the Department to assess and approve 300 sites per year in 2018 and 2019. This will be an opportunity for Irish Lights to work with BIM to properly assess the LAtoN for each of these sites, and where suitable, implement SUMS schemes.

In 2017 an overhaul of the Aquaculture information on the AtoN database continued. This has allowed for more detailed assignment of site status for planning and analysis of proposed LAtoN in the industry. There had been no formal mechanism for determining which sites had been removed, as often sites would change hands or be abandoned for several years before being reactivated. However, by working with BIM Development officers and GIS technicians, most of these sites have been removed from the database. In 2018, data of the Aquaculture Database will be sourced directly from the Department to improve the accuracy of the LAtoN Database.

In Northern Ireland there is a lower level of aquaculture activity and the LAtoN Inspector is working with developers in relation to Carlingford, Dundrum Bay and Strangford. Liaison with the Aquaculture Section of DAERA and the BIM development officer for NI will continue to ensure proper administration of AtoN management. One area of significant concern is the deployment of oyster trestles on Lough Foyle. BIM, Donegal County Council and the Loughs Agency are endeavouring to address the situation. In late 2017 an assessment of the sites on the Lough highlighted the extent of the development in the centre of the lough. BIM have highlighted this area as a priority.

The main issue with the allocation of LAtoN in this area is there is no authority with the legal remit to approve the licencing of such sites. BIM and the LAtoN Inspector continue to work with the Loughs Agency to address the situation. From a navigation standpoint the infrastructure should be adequately marked. However, this must be done in such a way as to prevent legitimising the site applications. This project may take the form of a SUMS type scheme where there are no designated sites attached to the LAtoN, and with either BIM or the Loughs Agency as the LLA



Map of Lough Foyle with risk area highlighted.

BIM Allocation of Aquaculture Sites

BIM Allocation of Aquaculture Sites, regions T1 to T12 are divided between the 7 Regional Development officers and the Aquaculture Initiative in Northern Ireland

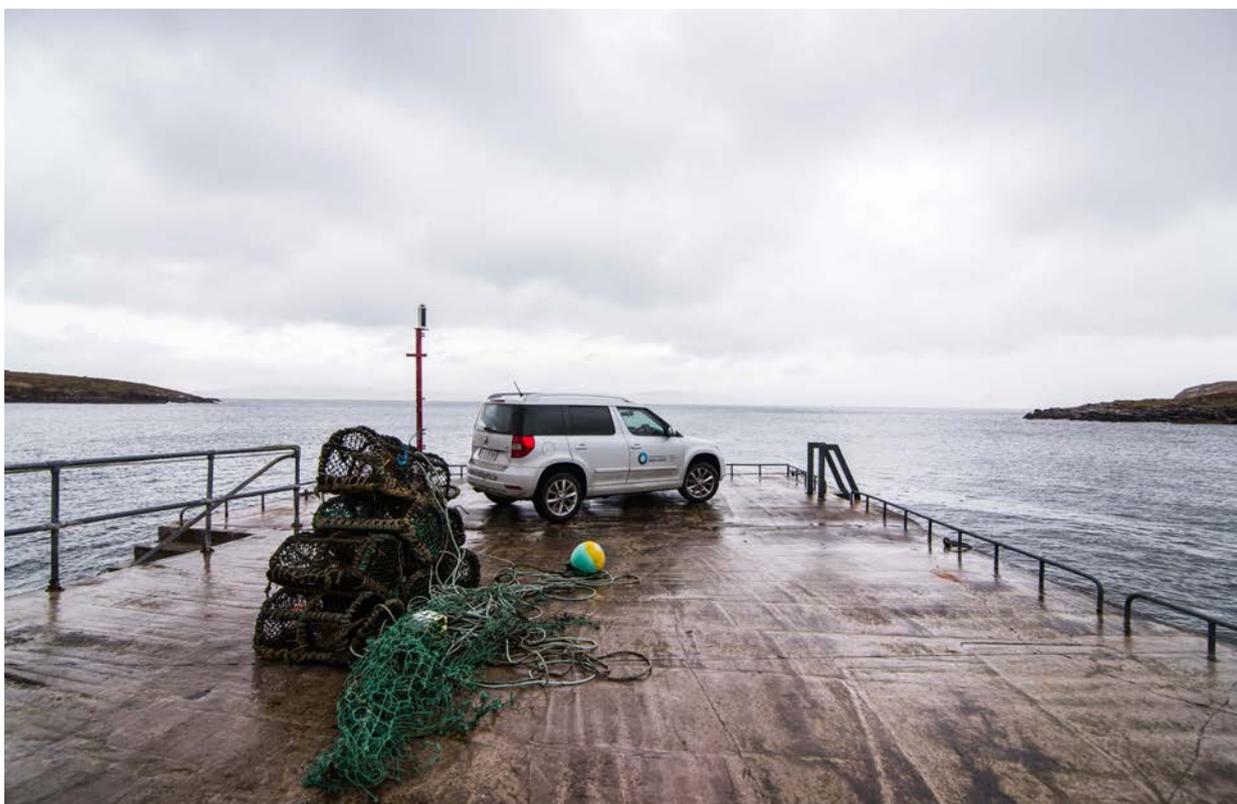
The LAtoN Inspector cooperated in surveying, inspecting and assessing unified schemes in conjunction with BIM, the MSO, the Loughs Agency and DARDNI. The LAtoN Inspector also attended CLAMS meetings around the coast and discussed AtoN responsibilities and procedures with operators. Areas of responsibility have been assigned to Regional Development Officers and all aquaculture sites have been given a designation determining their development officer.

In November 2017 a workshop was held in BIM Dun Laoghaire with the BIM Regional Development Officers to enhance cooperation and improve standard operating procedures and to streamline the Aquaculture Statutory Sanction Application process. Because of this, the previously published Statutory Sanction procedures were clarified with the Regional Development Officers. Other topics covered included procedures for aquaculture in AtoN management, Inspection and audit of aquaculture sites.

During this meeting it was also decided to develop a draft document of procedures for the application and organisation of Aquaculture Statutory Sanctions.

During inspections, the LAtoN Inspector meets with the regional development officer to progress the applications, survey the sites and discuss future developments. The LAtoN Inspector also worked with BIM in drafting specifications for tenders for AtoN, the implementation of best practice for deployment, maintenance and reporting on AtoN.

Cooperation has also been carried out with the producers themselves in relation to selection of AtoN, cooperation for SUMS and CLAMS projects and maintenance of AtoN on their facilities. The image of BIM Areas on page 30 shows the distribution of Aquaculture sites under their regional designations. It highlights the underdevelopment of the East and North coasts for aquaculture. Development of aquatic plant farming is another area of growth with a few developments requiring marking and sanction.





5.5 Alternative Energy

The Seagen Marine Current Turbine in Strangford Lough was established in March 2008 and commenced full power remote operation in late 2009; it was decommissioned in 2017, and the infrastructure is to be removed in 2018. A temporary AtoN scheme will be required during the decommissioning.

Arklow Bank⁵ is currently the only offshore wind farm and consists of seven turbines with a total installed capacity of 25 MW.

The planned wind farm expansion for Ireland includes the following:

Arklow Bank wind farm - lease includes provision for up to 200 turbines (525 MW) in total⁶

Oriel Wind Farm⁷ - consent for 55 turbines (330 MW)

Dublin Array⁸ - application for 145 turbines (725 MW)

Codling Wind Park⁹ - lease for 220 turbines (1100 MW)

In 2017 the LAtoN Inspector and the NSPO met with ESB International in Dublin to discuss procedures to assess wind infrastructure off the East Coast of Ireland. These installations will require considerable marking and monitoring. To progress the installations, at an early stage, a comprehensive Navigational Risk Assessment will be essential. The LAtoN Inspector will work with the developers and LLA to ensure the correct AtoN solution is provided at each site.

Tidal energy devices are proposed for the North Antrim coast and various wave energy devices are proposed along the west coast of Ireland. An experimental wave energy development has been established at the Belmullet Energy Test Site, with wave test buoys continuing to monitor conditions on site.

The Galway Bay Wave Energy Test Site¹⁰, run by the Marine Institute¹¹ continued to operate throughout the period of this report with several more devices deployed. The LAtoN at this site were reviewed in 2016 and it was decided to upgrade the Buoys to larger units with a higher focal plane to make them more conspicuous to passing vessels. The site has its foreshore licence renewed and the new AtoN has been deployed.

5 Arklow Bank Phase 1 Website: <http://www.4coffshore.com/windfarms/arklow-bank-phase-1-ireland-ie01.html>

6 Arklow Bank Phase 2: <http://www.4coffshore.com/windfarms/arklow-bank-phase-2-ireland-ie01.html>

7 Oriel Wind Farm Website: <http://www.orielwind.com/>

8 Dublin Array Website: <http://www.dublinarray.com/>

9 Codling Wind Park Website: <https://codlingwindpark.ie/>

10 Galway Bay Wave Energy Test Site Website: <https://www.marine.ie/Home/site-area/infrastructure-facilities/ocean-energy/galway-bay-test-site-0>

11 Marine Institute Website: <https://www.marine.ie/Home/home>

Other developments, in various stages of planning are:

The Atlantic Marine Energy Test Site (AMETS)¹² is developed by Sustainable Energy Authority of Ireland (SEAI)¹³ to facilitate testing of full scale wave energy converters in an open ocean environment.

The West Wave¹⁴ project is expected to install full scale wave energy devices off the coast of Clare. Irish Lights are represented at the Safety & Navigation committee meetings for these developments.

Tidal Ventures at Torr Head¹⁵ proposes for the development of a 100 MW tidal energy array.

DP Energy proposes the Fair Head Tidal project¹⁶, another 100MW tidal energy array.

5.6 Offshore Platform Inspections

The MOU with the CER has resulted in the offshore platform inspections being identified as an 'Area for Cooperation and Co-ordination'. It is intended that significant cost and resource savings will be achieved through this process. The auditing and inspection of offshore platforms will be reported to Irish Lights as part of this process.

Details of exploration platform audits are provided by the CER under an MOU, prior to the arrival on the platform.

The permanent offshore structures at the Kinsale Head Gas Field¹⁷ are inspected annually by ILV Granuaile. A daytime inspection of these platforms was undertaken by the LAtoN Inspector in 2014. Inspections of the Kinsale Alpha and Bravo platform structures are facilitated by the operators. The management of the platforms has changed, and the new management has been in discussion with the LAtoN Inspector and CER on the compliance of the AtoN on the structures.



5.7 Cooperation with Other Bodies



The Royal National Lifeboat Institution¹⁸ (RNLI) is the largest charity that saves lives at sea around the coasts of the UK, the Republic of Ireland, the Channel Islands and the Isle of Man as well as on some inland waterways.

The RNLI has cooperated with the LAtoN Inspector by providing their vessels in the inspection of areas of mutual interest as well as cutting Irish Lights AtoN sectors lights. On occasion the RNLI has advised the LAtoN Inspector on observations, in particular, harbours or waterways, as a result the LLA or installation providers have been engaged to attend to the issues. By conducting training exercises in cooperation with Irish Lights this provides an ideal opportunity for the benefit of both organisations. The LAtoN Inspector has also liaised with local organisations that provide supplementary safety and lifesaving services within LLA areas to help those LLA to improve their services.



The Loughs Agency¹⁹ is one of the cross-border bodies set up under the 1998 Agreement between the governments of UK and Ireland. The Agency is involved with the conservation, management, promotion and development of the fisheries and marine resources of the Foyle and Carlingford Areas.

12 AMETS Website: <http://www.oceanenergyireland.ie/TestFacility/AMETS>

13 SEAI Website: <https://www.seai.ie/>

14 ESB West Wave Website: <https://www.esb.ie/being-innovative/future-energy/ocean-energy>

15 Tidal Ventures Website: <http://www.tidalventures.com/>

16 Fair Head Tidal Website: <http://dpenergy.info/fht/>

17 Kinsale Head Gas Field Website: <http://www.kinsale-energy.ie/gas-production.html>

18 Royal National Lifeboat Institution Website: <https://rnli.org/>

19 The Loughs Agency Website: <http://www.loughs-agency.org/>

The LAtoN Inspector has conducted surveys and inspections in cooperation with the Loughs Agency in Carlingford Lough and Lough Foyle. Further cooperation is planned to survey and address the issues of aquaculture infrastructure in Lough Foyle.



Bord Iascaigh Mhara²⁰ is the Irish state agency with responsibility for developing the Irish marine fishing and aquaculture industries. It helps to develop the Irish Seafood Industry by providing technical expertise, business support, funding, training and promoting responsible environmental practice. The LAtoN Inspector has extensive contacts with the agency and works with the Regional Development Officers to ensure the industry complies with requirements for the marking of sites and infrastructure. BIM also draws on Irish Lights to provide technical and navigational advice in the planning for and deployment of aquaculture AtoN.

²⁰ Bord Iascaigh Mhara Website: <http://www.bim.ie/>

As part of the consultation and information sharing process, the LAtoN Inspector has met, in cooperation with the BIM RDOs, with producers, CLAMS and SUMS participants to ensure compliance and improve the efficiency of the provision of LAtoN in these areas.

The Marine Survey Office (MSO) is part of the Irish Maritime Administration²¹ (IMA). MSO is responsible for the implementation of all national and international legislation in relation to safety of shipping and the prevention of pollution of the marine environment from ship-based sources. The LAtoN Inspector has worked with the MSO to ensure decisions made by the LLA do not negatively interfere with current navigation procedures, areas of navigational importance, such as safe anchorages and routes used conventionally are not disrupted.

²¹ Irish Maritime Administration Website: <http://www.dttas.ie/maritime>



06

Conclusion

The numbers of Local AtoN continue to increase year on year. The UK and Irish Governments continue to promote alternative energy generation which is likely to result in an increased interest in the offshore energy sector.

Irish Lights' obligations in relation to Local Aids to Navigation Superintendence and Management have been satisfactorily discharged during the 2015-2017 period. The single point of contact that is the LAtoN Lead is a distinct advantage in dealing with stakeholders. It is envisaged that the considerable improvements and efficiencies achieved in the past year will be built on into the future.

The following objectives are to be completed in 2018:

- Continue to improve the usability of the AtoN database system, and implement a tighter reporting and application system for LAtoN. This will simplify the processes of the LAtoN database user.
- Improve the accuracy of the AtoN database Aquaculture information.
- Continue to improve the Standard Operating procedures in cooperation with BIM and the Aquaculture Initiative development officers. This will include an alternative application form streamlined for Aquaculture applications.
- Improve the efficiency of the inspection process by planning the most effective inspection of LAtoN and take advantage of ONS assets infrastructure, such as ILV Granuaile.
- Complete the physical inspection of the remaining 50% of local AtoNs (approximately 1630 AtoN) prioritising those exceeding or close to the biennial target.
- Continue to work with BIM, DARDNI and the Aquaculture industry to improve the management and supervision of aquaculture LAtoN.
- Meet with LLA and where necessary provide training in Irish Lights web site availability reporting system, discuss best practice in deployment and maintenance and discuss any issues arising.
- Publication of the LLA assessment and audit document.
- Host meetings at Irish Lights for AtoN providers to consult with stakeholders in an effective manner to ensure service is matched to requirements.
- Continue to up-skill in operation of Geographical Information System (GIS).
- Produce formal procedures for specific tasks carried out by the Local Aids Lead.
- Provide training and documentation for the Business Continuity Plan.
- Continue to research solutions for identifying individual LAtoN such as NFC tags (Near Field Communication tag), labels and dynamic QR code (Quick Response Code) domains for mobile devices.
- Improve LAtoN Inspector hardware and the implementation of an improved GIS Software solution.

Mark Devlin

Local Aids to Navigation Inspector

Table 1: Local Aids to Navigation

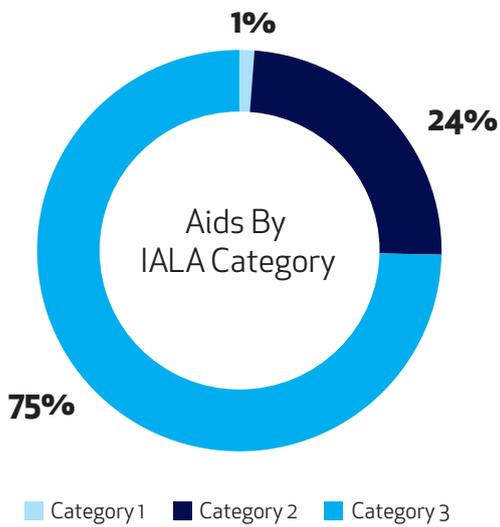
2017	Class	Lighthouses	Beacons			Buoys		Fog Signals	Total
			Lighted	Synthetic AIS	Unlighted	Lighted	Unlighted		
	Permanent	24	1012	2	491	664	125	0	2,318
	Temporary		4			36			40
	Seasonal					1	42		43
	Total	24	1016	2	491	701	167	0	2,401

2016	Class	Lighthouses	Beacons			Buoys		Fog Signals	Total
			Lighted	Synthetic AIS	Unlighted	Lighted	Unlighted		
	Permanent	24	995	2	492	648	124	1	2,286
	Temporary		4			25			29
	Seasonal					1	33		34
	Total	24	999	2	492	674	157	1	2,349

2015	Class	Lighthouses	Beacons			Buoys		Fog Signals	Total
			Lighted	Synthetic AIS	Unlighted	Lighted	Unlighted		
	Permanent	24	981	2	493	638	125	1	2,264
	Temporary		4			30			34
	Seasonal					1	33		34
	Total	24	985	2	493	669	158	1	2,332

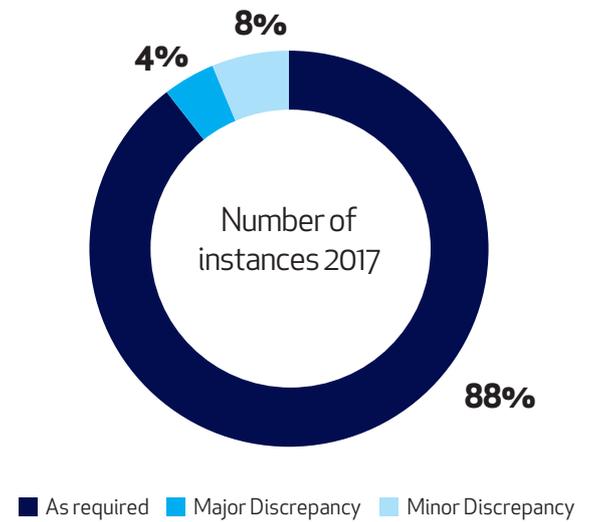
Non-Aquaculture IALA Categories:

Aids by IALA Category	Number
Category 1	23
Category 2	571
Category 3	1807
Grand Total	2401

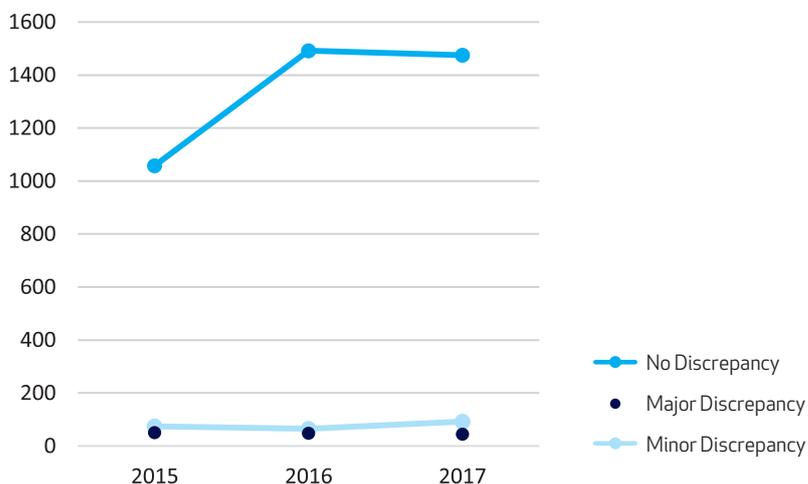


Inspection Results (Non-Aqua)

Result	Number		
	2017	2016	2015
No Discrepancy	1475	1492	1058
Major Discrepancy	45	48	50
Minor Discrepancy	92	65	74
Grand Total	1612	1605	1182



Trends over 3 years



Major Discrepancies may be the result of the following outcomes:

- Missing
- Unlit
- Incorrect sector/character
- Out of Position
- Substandard
- Not Sanctioned/Charted

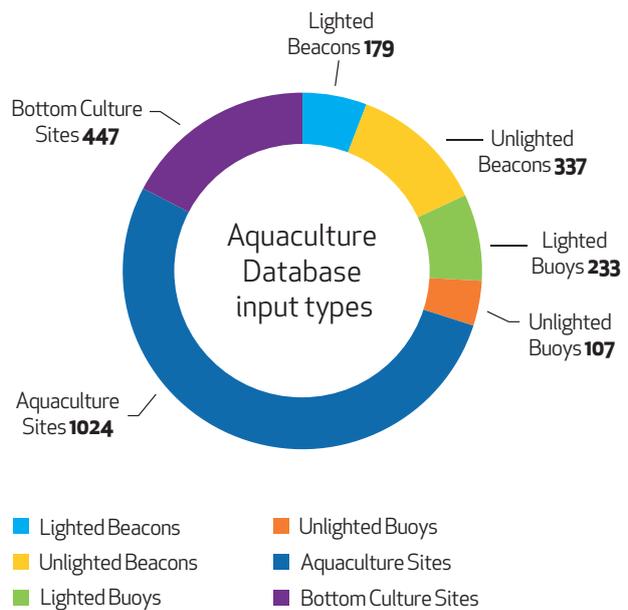
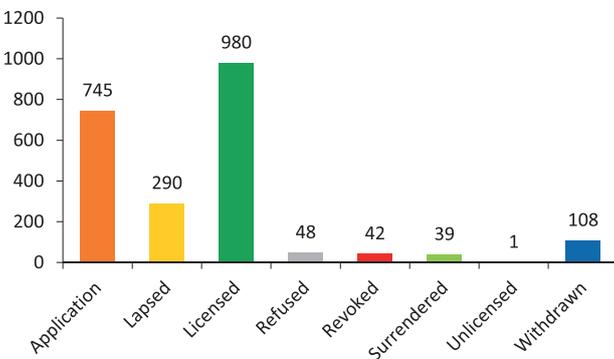
Minor discrepancies may be the result of:

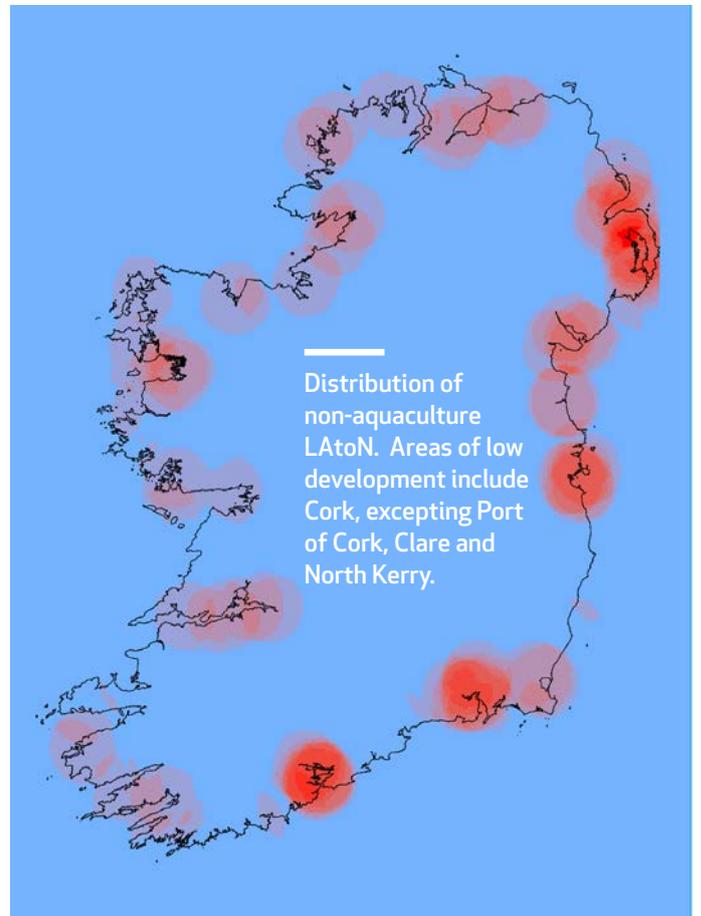
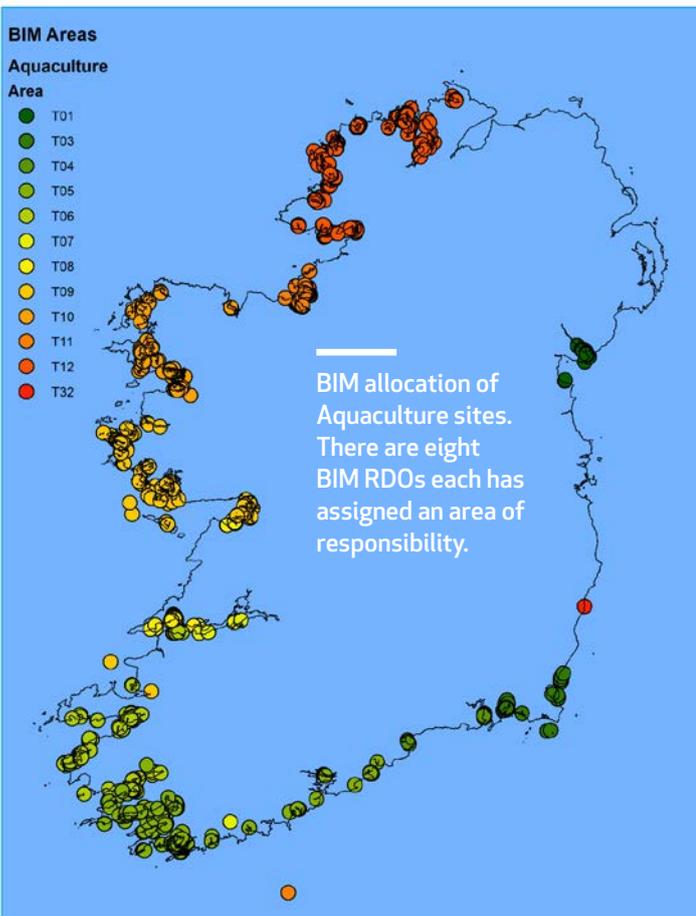
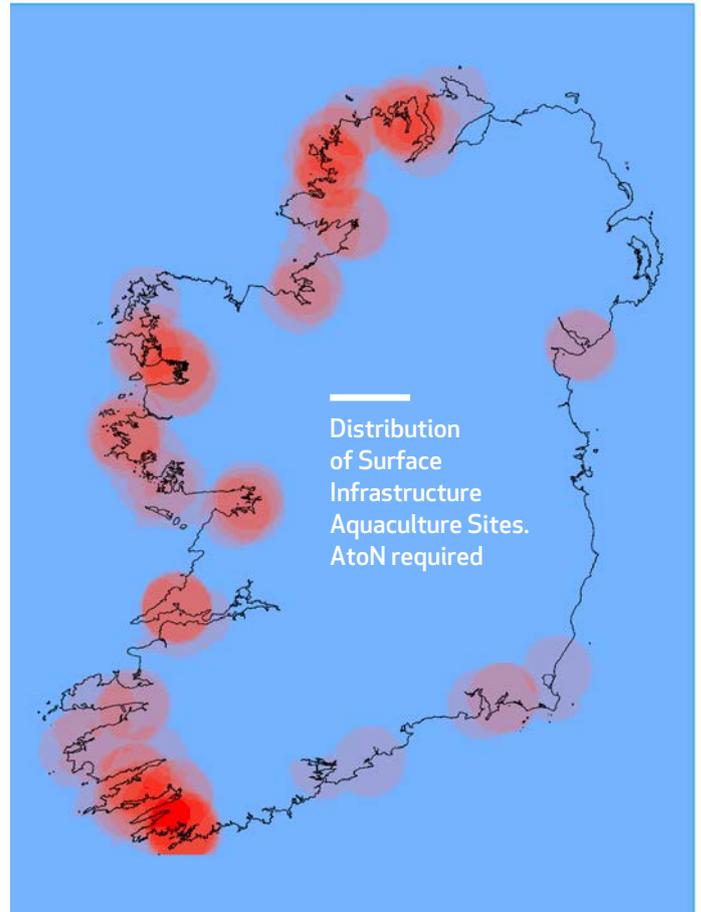
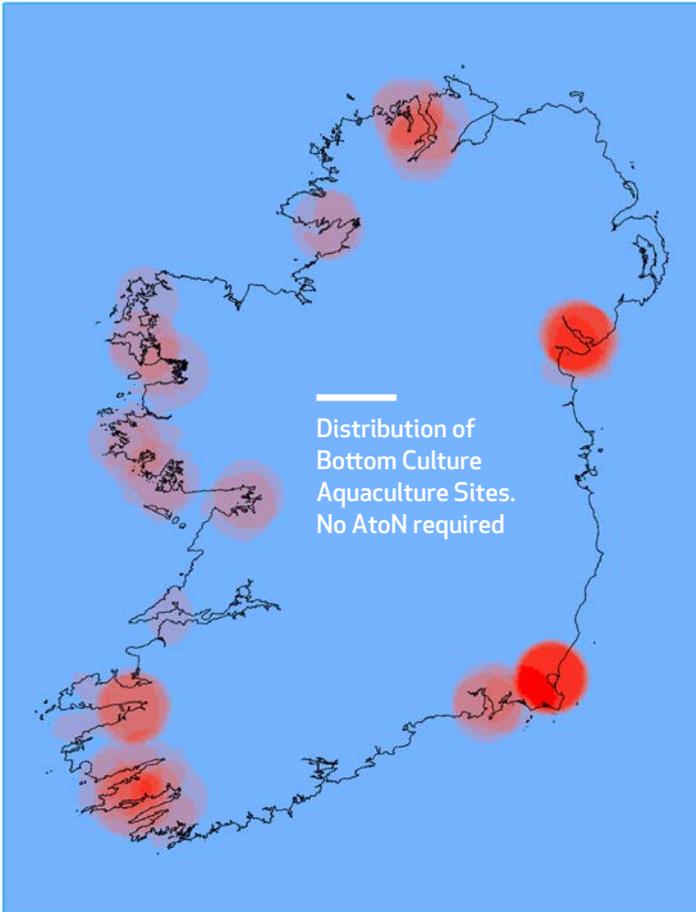
- Conspicuity poor under certain conditions
- Poor condition of top mark
- Slightly out of position, though not enough to affect safe Navigation

Aquaculture Database

Type	Lighted Beacons	Unlighted Beacons	Lighted Buoys	Unlighted Buoys	Sites	Total
AtoN	179	337	233	107		856
Bottom Culture Sites	Bottom Culture – No marks required, Irish Lights consulted regarding the suitability of location:				447	
Surface & Intertidal Sites	Ongoing depending on completion of Statutory Sanction/Licensing Procedures: See Aquaculture Status Table				1024	
Total	Aids and Sites					2327

Aquaculture Database Site Status





List of current LLA and LLA Changes

AES - Kilroot Power Limited	Killybegs Fishery Harbour Centre
Ards and North Down Borough Council	Kinsale Energy
Arklow Energy Limited	Larne Borough Council
Belfast Harbour Commissioners	Londonderry Port
BIM	Lough Neagh
Carlingford Lough Commissioners	Louth County Council
Carrickfergus Borough Council	Marine Institute
Castletownbere Fishery Harbour Centre	Mayo County Council
Causeway Coast and Glens District Council	Mid and East Antrim District Council
Clare County Council	Moyle District Council
Coleraine Harbour Commissioners	New Ross Port Company
Cork County Council	Newry, Mourne and Down District Council
Defence Estates NI	Northern Ireland Fishery Harbours Authority Kilkeel
Department of Agriculture, Environment and Rural Affairs	Northern Ireland Fishery Harbours Authority Portavogie
Dept of Agriculture, Fisheries & Marine	Northern Ireland Fishery Harbours Authority Ardglass
Dingle Fishery Harbour Centre	Northern Ireland Water
Donegal County Council	Oriel Wind Park
Drogheda Port Company	Phennick Cove Marina
Dublin City Council	Port of Cork Company
Dun Laoghaire Harbour Company	Port of Larne
Dun Laoghaire Rathdown Council	Port of Waterford Company
Dunmore East Fishery Harbour Centre	Rossaveal Fishery Harbour Centre
ESB Energy International Ltd	Rosslare Europort
Fingal County Council	Shannon Foynes Port Company
Galway County Council	Sligo County Council
Galway Harbour Company	South Tipperary County Council
Greencastle Harbour	UK Met Office
Howth Fishery Harbour Centre	Warrenpoint Harbour Authority
Irish Water	Waterford County Council
Kerry County Council	Wexford County Council
	Wicklow County Council

LLA Changes in 2016/2017

LLA	Status
Ards Borough Council	Merged into Ards and North Down Borough Council
Baltimore & Skibereen Harbour Board	Transferred to Cork County Council
Coleraine Borough Council	Merged into Causeway Coast and Glens District Council
Department of Regional Development	Merged into the Department of Agriculture, Environment and Rural Affairs
Dept of Transport	No AtoN
Drogheda Port Company	To be transferred to Louth County Council
Dun Laoghaire Harbour Company	To be transferred to Dun Laoghaire Rathdown County Council
Dundalk Harbour Commissioners	Managed by Dublin Port
Kilmore Quay Harbour	Transferred to Wexford County Council
Kinsale Harbour Commissioners	Transferred to Cork County Council
Marathon	Now Kinsale Energy
New Ross Port Company	To be transferred to Wexford County Council
Newry & Mourne District Council	Merged into Newry, Mourne and Down District Council
Newtownabbey Borough Council	Merged into Antrim and Newtownabbey Borough Council
North Down Borough Council	Merged into Newry, Mourne and Down District Council
SSE Renewables	No AtoN
Youghal Harbour Authority	Transferred to Cork County Council



Commissioners of *Navigation
and Maritime
Services*
IRISH LIGHTS

Commissioners of Irish Lights

Harbour Road
Dun Laoghaire
Co. Dublin
Ireland

P +353 1 271 5400

F +353 1 271 5566

E info@irishlights.ie

W irishlights.ie