

Water Pollution in Ireland: The Water Quality of Ireland's Rivers and Lakes

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Fling the Rocky Portals wide
Western ocean, western ocean
Bend ye hills, on either side
In solemn, deep devotion
While before the rising gales,
On his heaving surface sails

Half the wealth of Erin's vales
With undulating motion.
Hail, our own beloved stream,
Flowing ever, flowing ever,
Silent in the morning beam,
Our own majestic river!

-Gerald Griffen

Introduction

Many painters and writers describe Ireland as a land with a green countryside and sparkling rivers and lakes. This image continues to draw people to Ireland and, in fact, rivers and lakes are important features of the landscape that help to promote tourism. (Toner et al., p. 101) Historically Ireland has had the reputation of being a rural country with a large portion of the labor force in the agricultural industry. While most other European countries were experiencing the Industrial Revolution, Ireland continued as a primarily agricultural country. In doing so Ireland avoided the negative aspects and images associated with industrialization, such as smoke-belching factories and slums, that many other European countries faced. Therefore, until the 1970s Ireland was able to

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maintain its pastoral image, and the Irish enjoyed a relatively pristine environment. As explained in Ireland's Environmental Protection Agency (EPA) Millennium Report:

It is worth noting that the late development of much of the industrial sector [in Ireland], as well as the lack of those basic resources, such as coal and iron, which facilitate more polluting types of industrial activities, has greatly reduced the importance of that sector as a threat to the Irish environment when compared to its past impact on most other EU states. (Toner, pp.187-88)

In recent decades, however, Ireland has faced increasing environmental pollution problems that threaten the green, agricultural image that the country earned for itself centuries ago and has continued to maintain even in recent years. As further explained in the EPA Millennium Report, since the 1970s “developments in the agricultural and industrial sectors, in particular, as well as increases in population and urbanization have created a greater potential for environmental damage.” (Toner, p. 187) The recent economic prosperity has yielded more jobs and more opportunities for the Irish and for people immigrating to Ireland, but prosperity has had negative impacts on the environment.

Compared to other European countries, Ireland is still considered a rural country, and only a small fraction of the land surface is used for urban and industrial activities. (Toner, p.188) Agriculture remains an integral part of life in Ireland, and 63 percent of the land is farmed. (Kraats, p.137) While farming, the main industry that helped to promote and maintain Ireland's green image in the last few decades, is still a crucial part of the Irish economy, new farming techniques, such as an increase in the use of fertilizer, are having a negative impact on the environment. As cited in the EPA's Millennium Report, the amount of artificial fertilizers used in Ireland increased significantly during

the twenty years up to 1980. (Stapleton et al., p. 19) Ireland is truly feeling the negative effects of industrialization in every sector of commerce, including farming.

The rising level of pollution in rivers and lakes is one of the main environmental concerns facing the country today. While Ireland is not facing the immediate danger of extreme levels of water pollution, there is a concern that pollution levels of the inland waters will increase substantially in the next few years if the problem is not mitigated soon. Water quality surveys prove that the quality of the inland waters has decreased since they were first assessed in the 1970s. According to the EPA, “While this deterioration in the quality of the aquatic ecosystem is relatively minor in many cases, it signals a change from the near pristine conditions which obtained in many areas up to the 1970s.” (Toner et al., p. 120)

In this article, I examine the main causes and effects of the rising levels of pollution in Ireland’s lakes and rivers. I outline the history of water quality legislation in Ireland and also include a brief overview of how water quality is presently monitored and regulated in Ireland. My main focus is on eutrophication, which is the primary cause of water pollution in Ireland, and the measures that Ireland has taken in order to fix this problem. Later in the article, I also include a case study on the Shannon River Bill. The Shannon River Bill is the only bill in the history of the Oireachtas (Irish Parliament) to pass all the critical levels of debate and then be overturned in the final round.

Water Quality

The European Council, the legislative body of the European Union (EU), sets standards and directives with which Ireland, as a member state, must comply.

(“Institutions of the European Union”) In recent years water quality standards within the European Union have become more stringent. One of the most important pieces of EU environmental legislation is the Council Directive 76/464/EEC, commonly referred to as the Dangerous Substance Discharges Directive. This Directive was established in 1976 and offers a framework for how member states are to reduce discharges of dangerous substances to inland and coastal waters. (“EU Environmental Legislation – Water”) As part of the framework for this Directive, all member states must adopt pollution reduction programs that focus on meeting water quality objectives. (“Dangerous Substances...”) Since its enactment, Ireland has struggled to meet these requirements.

The European Commission, the European Union’s executive body, sent a first warning letter in 1997 and then a second warning to Ireland in 2000 for failure to comply with the requirements set by Directive 76/464/EEC. There are three main reasons why these warning letters were sent to Ireland. The first reason is Ireland’s failure to adopt pollution reduction programs outlined in the Directive, and the second is that many Irish local authorities are unfairly exempt from authorizing their discharges at the present time. The third reason is Ireland’s failure to properly regulate phosphorous emissions, which has proved to be the main cause of the decline in water quality in recent years.

(“Dangerous Substances...”)

Even though the European Union asserts its right to enforce water quality standards in all member states, it has not yet stepped in and taken any serious action against Ireland or any other states. In response to the European Commission’s second warning, Eithne Donnellan of the *Irish Times* commented: “While the Commission acknowledged some steps had been taken by the state in response to the earlier warning,

it is not satisfied at what is being done to prevent pollution and warned that more radical action is needed.” (Donnellan) The European Commission itself acknowledges that more action is needed and has even threatened to take the issue to the Court of Justice in Luxembourg (Donnellan), but the Commission has yet to take any major step towards forcing Ireland to improve its water quality.

Even though the European Union does claim to exert authority over water quality, the primary responsibility for enforcing water quality regulations in Ireland lies with individual local government authorities. The Local Government (Water Pollution) Act, established in 1977 and amended in 1990 and 1996, provides the primary legal framework for controlling water pollution. (“EU Environmental Legislation – Water”) Each local government oversees and controls all aspects of water quality monitoring within its jurisdiction.

The Irish government must comply with the water quality standards set by the EU. This requirement places the national government in an awkward position, since it has already given local governments the authority to control water quality in their own jurisdictions. In order to meet the EU standards, therefore, the national government will have to monitor and regulate all the different areas in the country. One possible way for it to accomplish this goal is to take some authority away from local governments. Another way is for the national government to provide central technical help, such as by training different local authorities to use the same water quality management procedures.

The EPA, as an agency of Ireland’s national government, helps to bring all the local authorities into conformity with the same set of standards. The EPA strives to complete this task by supervising all of the local authorities and by setting national water

goals. It also tests for water quality and publishes reports summarizing the overall state of water quality in Ireland every few years. The reports are useful because they help to educate the general public on water quality issues, and they enable local authorities to evaluate how one area's water quality compares to another.

As Mr. Dan Wallace, the Minister of State of the Department of the Environment and Local Government, has explained, "Statutory responsibility for the protection and improvement of water quality lies with local authorities under the Local Government (Water Pollution) Acts. The Environmental Protection Agency is also responsible, in the context of activities licensable by the EPA in relation to environmental protection."

("River Shannon Council Statements") While this system appears to work reasonably well, there still are some major problems. Like the European Union, the EPA really does not have much authority over the state of water quality in Ireland. This body can effectively identify any water pollution problem and offer useful advice to local authorities, but it does not have the effective means to enforce compliance with its goals.

A further problem with the present hybrid system in Ireland is that different groups have different standards for water quality. The European Union has recently expressed concern that it has a different standard than the EPA. Water considered polluted under EU regulations may be considered unpolluted or "satisfactory" under the EPA's classification. (Donnellan) For example, the EPA classifies water quality in Ireland's largest lake, Lake Corrib, as satisfactory. Yet, the European Commission cites how the disappearance of a rare pollution-sensitive fish species, the Artic Charr, indicates a problem with Lake Corrib's water quality. (Donnellan) It becomes even more difficult

for local government authorities to enforce any type of water pollution standard if the EU and EPA are not able to decide on a jointly acceptable one.

Eutrophication: The Main Problem

The main water pollution concern in Ireland today is eutrophication, a process caused by excess nutrients in water, which foster an increased amount of rooted plant and algae growth. As plants and algae die, the decay process uses dissolved oxygen in the water. Fish begin to die because there is a lack of dissolved oxygen in the water. As Lorna Siggins, marine correspondent for the *Irish Times*, explains, “Recent reports indicate an increase in moderate pollution which causes degeneration of fish habitat and is a ‘silent’ killer of fish.” (Siggins) One of the worst cases of fish kills recently occurred in a stream that feeds into the Shannon River in County Offaly. In June of 2000, the dead fish count in this stream alone approached 2,000. (Cassidy) Not only does the degraded water cause changes in the ecosystem, it is not aesthetically pleasing. The area can begin to smell and look unpleasant to residents. A more serious concern is that residents might face health problems if the situation is not remedied.

Eutrophication is caused by a variety of factors in Ireland. The Environmental Protection Agency believes that excess phosphorous is the primary cause of eutrophication and that all sectors of economic activity contribute to this problem. (Toner, p. 190) Since Ireland traditionally has been a predominately agricultural country, many people cite farming as the main cause of eutrophication of inland waters. It is undeniable that farming does contribute to the eutrophication problem, but many other

practices contribute as well, such as sewage discharge and industrial waste. At the local level, other industries, such as fish farming, forestry development, and road building, also cause phosphorous enrichment of water. (Toner, p. 190)

Ireland recognizes that eutrophication is the most serious problem affecting the environmental state of the county. (Toner, p. 191) This problem has now been fully recognized at the national government level, and the government has issued publications outlining how it plans to solve the problem using a catchment-based strategy. (Toner et al., p.120) The excessive phosphorous enrichment of water has the potential to become an even greater problem in the future if no changes are made. The Environmental Protection Agency is concerned because, as the scale of economic activity continues to increase in Ireland, the likelihood of phosphorous loss to water also increases. (Toner, p. 190) Currently, both the rivers and lakes of Ireland are in danger of increased pollution due to eutrophication.

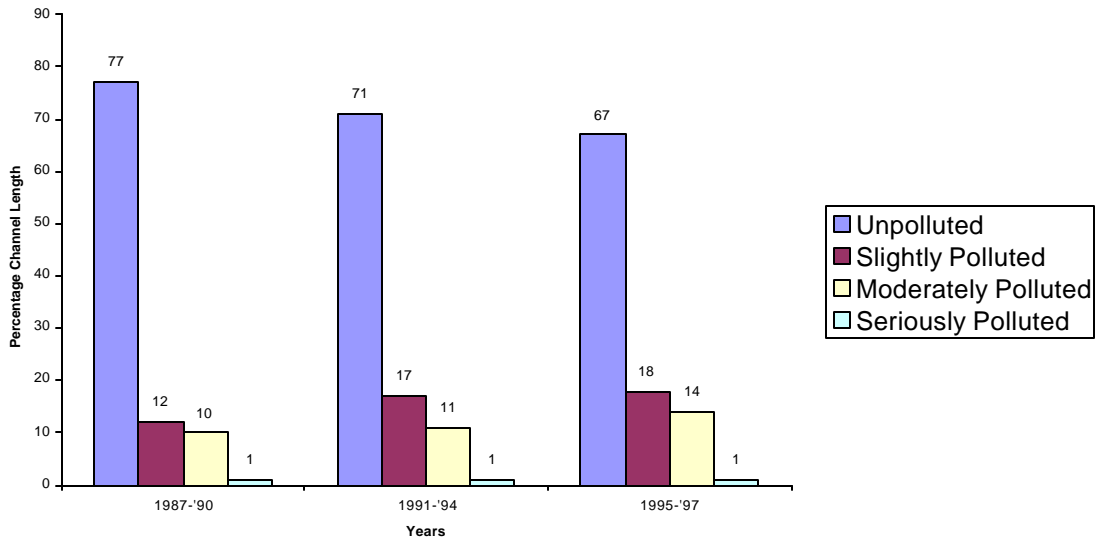
Rivers

The first national river water survey was carried out in 1971 by An Foras Forbatha (AFF), an organization established in 1964 to provide education, training, and technical services for the physical environment. (“Irish Planning...”) This survey measured the biological river water quality of about 2,900 km of the most important rivers and largest tributaries. The length of river channel included in the survey is approximately equal to that of the Rio Grande River. (“Water Facts”) Since this first survey, additional surveys have been broadened to include more rivers, and several national reports have been published. (“Inland Waters”) Currently the EPA assesses the biological quality of rivers and streams at about 3,200 locations every three years, and

this survey covers 13,100 km of river channel. (Toner et al., pp. 103-4) The most recent survey spans the years 1995-1997, and the expanse of river channel covered is approximately equal to twice the size of the Nile River. (“Water Facts”)

The biological quality of rivers is classified in the surveys from Class A (unpolluted) to Class D (severely polluted). The 1995-97 survey classifies 67 percent of rivers as Class A (unpolluted), 18 percent as Class B (slightly polluted), 14 percent as Class C (moderately polluted) and 1 percent as Class D (severely polluted). (Toner et al., p. 104) In recent years, there has been growing concern over the rising pollution in rivers that are already classified as slightly or moderately polluted. The number of slightly polluted rivers rose from 17 percent in 1991-94 to 18 percent in 1995-97. The number of moderately polluted rivers rose from 11 percent to 14 percent over these two periods. In addition, the number of unpolluted rivers fell from 71 percent to 67 percent, while the number of seriously polluted rivers remained steady at 1 percent. Efforts are now being focused on reducing the growing number of slightly and moderately polluted rivers.

Figure 1
Recent River Water Quality Trends



Source: Toner et al., "Inland Waters," in *Ireland's Environment: A Millennium Report*. Larry Stapleton, Micheal Lehane, and Paul Toner, eds. Wexford: Environmental Protection Agency, April 2000, p. 108.

Lakes

The first lake monitoring surveys were carried out by the former Inland Fisheries Trust, which is now the Central Fisheries Board, in the late 1960s and early 1970s. ("Lake Water Quality") In 1973 An Foras Forbartha also began to monitor lake water quality, and this monitoring is continued today by the EPA. ("Lake Water Quality")

Eutrophication of lakes is assessed by chlorophyll concentration levels. This plan of assessing the amount of pollution in lakes by measuring the chlorophyll levels was proposed by the Organization for Economic Co-Operation and Development (OECD) in 1982. This procedure of measuring chlorophyll concentration also indicates the amount of biomass of algae present (Toner et al., p. 113), which is another measure of eutrophication. This plan has been modified to include phosphorous concentrations and water transparency readings as well. (Toner et al., p. 113) There are six levels of

classification in this system ranging from oligotrophic (an extremely low level of pollution) to hypertrophic (an extremely high level of pollution). The most recent EPA survey from 1995-97, which included 124 lakes, found that 48 percent of the lakes were oligotrophic, 32 percent were mesotrophic (a low level of pollution), 6 percent were moderately eutrophic (a moderate level of pollution), 6 percent were strongly eutrophic (a high level of pollution), 4 percent were highly eutrophic (an even higher level of pollution), and 4 percent were hypertrophic. (Toner et al., p. 113)

The overall state of lake water appears more positive than the overall state of river water based on the most recent set of surveys because in the lake water quality survey roughly 80 percent were determined to be oligotrophic or mesotrophic, which means they can be accepted as satisfactory. (Toner et al., p. 113) There is a major problem, however, with lake water quality testing. The 1995-97 Lake Water Quality Survey included only 124 lakes while it is estimated that there are over 6,000 lakes in Ireland of area greater than 1 hectare (2.47 acres). (Toner et al., p. 102) Therefore, the scope of the lake water surveys must be expanded.

Ireland has a large number of lakes compared to other areas of equal size. For example, Pennsylvania has slightly over 2,500 lakes (“Pennsylvania Lakes and Reservoirs”) and has a land area of 44,820 square miles. (“The Land That Is Pennsylvania”) Ireland is smaller in size with a land area of 27, 136 square miles, but it has over twice as many lakes.

Solutions to the Problem

Catchment Management Plans

Many steps have been taken to correct the problem of eutrophication. The most recent step has been the implementation of catchment management plans, which are initiated at the national level and then monitored by local government. Catchment management refers to the controlling of a body of water and its surrounding area, and it involves government agencies, voluntary groups, local communities, and other interested organizations. These groups are willing to work together towards the common goal of creating a healthier catchment (the land surrounding a body of water) in an environmentally sensitive manner in order to improve local communities. (“Catchment Management...”) Many different groups are affected by each river or lake system in Ireland, and catchment management plans allow all groups to voice their opinions and present their concerns on issues affecting water quality.

Catchment management plans have been launched in six catchments including: Loughs Derg, Ree, and Leane and the Rivers Suir, Boine, and Liffey. The main catchment management plan is for the Lough Derg and Lough Ree catchments of the Shannon River. Most of this plan (80-85 percent) is being financed by the EU Cohesion Fund. (“Sustainability and Water”) The main long-term objective of this plan is to return both Lough Derg (presently classified as moderately eutrophic) and Lough Ree (presently classified as strongly eutrophic) to their mesotrophic states. (“Sustainability and Water”) Currently, the directors of the plan are focusing on achieving three interim targets: to eliminate seriously polluted rivers, to reduce the number of rivers currently classified as

slightly or moderately polluted, and to improve those lakes which are currently hypertrophic. (“Lough Derg and Lough Ree,” p. 1)

Other Solutions

The government has also initiated other measures to reduce the rising number of polluted rivers and lakes in Ireland. All current water quality management plans will be revised within the next ten years, and the revisions will include the objectives and recommendations proposed by the government against eutrophication, the phosphorus regulations of 1998, and all applicable EU Directives. (Clenaghan and Crowe, p. 227)

The phosphorus regulations require improvements in phosphorous concentrations of rivers and lakes to be completed within in a ten-year time period. (“Water Management”)

Ten years, however, is a long time, especially since the declining water quality is a primary environmental concern for the country today.

Several different industries in Ireland have also developed plans to reduce their contributions to water pollution. For example, the laundry detergent industry has put forth a major effort to lower the amount of phosphorus in detergents. On December 14, 1999, Mr. Noel Dempsey, T.D., who is the Minister for the Environmental and Local Government, completed a voluntary agreement with the Irish Detergents and Allied Products Association (IDAPA) that guarantees that the industry will stop marketing phosphate-based domestic laundry detergent in Ireland. (Doyle, p. 15) This agreement is important because it will substantially reduce the amount of phosphorus in sewage. (Doyle, p. 15)

Members of the agricultural industry are also trying to help reduce the eutrophication problem in Ireland. According to J.A. van de Kraats, editor for the Norwegian Institute for Water Research,

Policy initiatives to reduce nutrient inputs from agriculture include the introduction of a Rural Environmental Protection Scheme (REPS) administered by the Department of Agriculture and Food and partly EU funded. It requires farmers to manage organic manure effectively, and imposes an upper limit on stocking density, phosphorus, and organic nitrogen use. (Kraats, p. 146)

REPS was first introduced in Ireland in 1994 under Council Regulation 2078/92. Today, 31 percent of farmers follow REPS guidelines. (Clenaghan and Crowe, p. 231) This percentage is expected to rise in the next few years as the government begins to offer farmers more financial incentives to follow REPS. In addition to these measures, a campaign is in effect to encourage all farmers to adopt nutrient management plans for their farms and to base fertilizer inputs on expected exports in farm produce. (Kraats, p. 146) If farmers cooperate and develop such nutrient management plans, then the eutrophication problem is expected to decrease in the upcoming years.

The national government is also threatening to impose taxes on fertilizers in order to further decrease fertilizer use. As explained in the EPA's Millennium Report, "The Tax Strategy Group does not recommend increasing value added tax (VAT) on fertilizers, as farmers can recover their input costs. However, the sale of fertilizers could be subject to a new excise type of tax, which would not be refundable and should impact consumption." (Lehane, p. 212) A major problem with imposing such a tax is that it will hurt farmers with small farms more than it will hurt farmers with large farms who are doing more damage to inland waters because they use more fertilizer. The government explains that this type of tax could be beneficial because the tax revenue could be used to

fund environmental monitoring and education. (Lehane, p. 212) No excise tax has been implemented in Ireland at this point.

Sewage systems in Ireland are also being improved in order to help reduce urban waste. Urban waste is considered to be domestic wastewater, a mixture of domestic and industrial wastewater, or run-off water. The wastewater from these sources is collected and brought to treatment plants before it is discharged in rivers and lakes. (Cunningham, p. 42) Until recently, a major problem with this system was that treatment plants did not follow uniform procedures in eliminating waste. Some plants would effectively eliminate waste while other plants would not, thus allowing waste to enter into water bodies. Based on an EU directive, the Irish government in 1994 passed a law that provided the framework for upgrading sewer systems and treatment plants, and today the government is investing a substantial amount of money to complete this endeavor. (Cunningham, p. 44)

Case Study: The Shannon River

One of the major water pollution problems that Ireland faces is that in many cases several different groups monitor the same body of water. With several groups monitoring a river or a lake, no one group has enough control to enforce regulations properly. For example, the primary responsibility for water pollution control lies with each local government authority; but some rivers, such as the Shannon, fall within the jurisdiction of more than one local authority so it becomes harder to enforce uniform regulations along the entire river.

An interesting bill, the Shannon River Bill, aimed to correct this multi-level monitoring problem and was brought to the Oireachtas (Irish Parliament) two separate

times in the last two years. Members of the Fianna Fail party first proposed the bill in 1998, and then Senator Kathleen O'Meara of the Labour Party revived it in 2000. The objective of the bill was to establish a Shannon River Council, consisting of 20 members, a chairman, and chief executive. This council would have proposed policies for the improvement of water quality in the Shannon River and its catchment area and protected and improved the environment and the natural habitats of bird life and fish life in the region. ("Shannon River Council Bill, 1998: Second Stage")

Currently, there are 26 local authorities responsible for various portions of the Shannon River, and the river is part of 13 counties. ("Shannon River...Second Stage (Resumed)") Too many different local government authorities as well as a variety of interest groups have an impact on and are affected by Ireland's longest river. With such a large number of groups trying to make decisions that impact the Shannon, it becomes nearly impossible to monitor and control pollution levels and enforce proper regulations for the entire river. Furthermore, when problems arise with the Shannon, such as the flooding of 1995, no interest group or local authority wants to take responsibility.

After passing all crucial levels of debate, the Shannon River Council Bill was overturned during the final round. This bill is the only one in the history of the Oireachtas to pass all the critical levels of debate and then finally be overturned. ("Shannon River...Final Stages") Many Senators, such as Maurice Manning, were very angry at the outcome of the Shannon River Council Bill. According to Manning, "The Bill was reported and received for final consideration yet on the Fifth Stage it will be thrown out. That has not happened in the history of these Houses. It is the worst night's work in the history of the Seanad." ("Shannon River...Final Stages")

Perhaps the wrong decision was made on the Shannon River Council Bill. Mr. Martin Cullen, the Minister of State at the Department of Finance in Ireland, cited two major reasons that the bill did pass. The first was that Ireland already must follow EU Directives and does not need a Shannon River Council to draft yet another set of Directives. The second was that one of the new cross-border bodies, as agreed upon by Great British and Irish, was scheduled to take over the responsibility of navigating the Shannon on April 1, 2000. Some members of the Senead considered it unfair to grant this organization control of navigation on the Shannon and then grant another organization, the proposed Shannon River Council, control of all aspects of the river, including navigation. (“Shannon River...Second Stage (Resumed)”) While the two main arguments against the bill have some merit, having one comprehensive regulatory body appears to be exactly what is necessary to control the rising pollution levels in the Shannon River.

Conclusion

Today, eutrophication is the most serious environmental concern in Ireland. (Toner, p. 190) At the present time, catchment management plans are the primary way that the Irish government intends to restore water quality, but only six catchment management plans have been initiated so far. It is too early to judge whether catchment management will be able to effectively reduce the number of slightly and moderately polluted rivers. Ireland has also made progress in initiating other measures to further reduce eutrophication in lakes and rivers, such as improving sewer systems to reduce urban waste. Different industries, such as the laundry detergent and agricultural industries, have also promised to reduce phosphorous emission levels. While Ireland has

taken many necessary initial steps to remedy its eutrophication problem, it still has a long way to go before the problem is fully under control. Most of the measures that Ireland has taken are relatively new, and it is still too early to judge their effectiveness.

Ireland also must reevaluate its overall water quality standards. The different monitoring groups, specifically the EU and EPA, must enact common water quality standards in order for local governments to successfully implement improvement procedures. In addition, Ireland must expand the number of lakes included in its lake quality surveys. Only 124 lakes are currently included in lake water quality surveys.

In the future, Ireland will continue to face the problem of pollution due to its growing economy. As the scale of economic activity increases, the likelihood of phosphorous loss to water also increases, which is the main cause of eutrophication. Overall, however, Ireland is heading in the right direction with regard to resolving its water quality problems and fervently hopes to preserve its scenic, environmentally sound reputation so that tourists will continue to venture to the beautiful countryside of this “Green Isle.”

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Biography

Erin Munley will graduate from Lehigh University in May 2002 with a Bachelor of Arts in English and a Masters degree in economics. Since she came to Lehigh, Erin has been inducted into both Phi Beta Kappa and Phi Eta Sigma honorary societies and she is a member of the Order of Omega Greek Leadership Society. Erin also served as chapter relations chairperson for Alpha Omicron Pi sorority and participates in the Roy C. Eckardt College Scholar Program in the College of Arts and Sciences. Erin is currently completing her fourth year at Lehigh.

Abstract

In this article the author analyzes how the recent economic prosperity has affected water quality in Ireland. The main focus of this paper is on eutrophication, which is the primary cause of water pollution in Ireland