

Research and analysis: Making better use of local data in flood frequency estimation

Flood frequency estimates are an essential part of flood risk management. They tell us what flood flows are expected to occur for a given rarity. They are central to many important decisions, such as the design and operation of flood defences, flood mapping, informing planning decisions in flood risk areas and long-term investment planning.

Methods described in the Flood Estimation Handbook (FEH) published in 1999, and its many subsequent updates, are considered the industry standard for flood estimation in the UK. They are used extensively by hydrologists from both the public and private sectors.

Flood frequency estimates (also known as design flood estimates) are associated with many sources of uncertainty. These hydrological uncertainties are often the most uncertain component in any flood risk assessment. As a result, any reduction in the uncertainty of flood frequency estimation has considerable benefit. One way to reduce uncertainty is to incorporate complementary local data to refine the results obtained using the FEH methods.

Research and analysis: Accounting for residual uncertainty: an update to the fluvial freeboard guide

The Environment Agency has developed a new guide that will help flood risk managers identify and manage the uncertainty in their flood risk assessments and flood defence designs.

This new guide replaces the Environment Agency's Fluvial Freeboard Guidance Note (report W187) published in 2000. It is written for all flood risk management authorities, developers, and engineering consultants who work on their behalf.

News story: Biotechnology innovation: apply for business funding

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UK businesses can apply for a share of £2 million for biotechnology projects to reduce global dependence on fossil resources.

Innovate UK has up to £2 million to invest in business projects as part of the European ERA-NET cofund on biotechnologies.

The funding will support UK businesses in joint projects with organisations from other countries to investigate how biotechnology could support sustainable industrial development.

The aim is to help transform the global economy from dependence on fossil raw material to use of more sustainable, bio-based resources.

Projects are expected to include at least one of the following processes:

- synthetic biology
- systems biology
- bioinformatic tools to identify and use metabolic pathways
- biotechnological approaches (possibly in combination with chemical ones)

They should also cover one of the competition's specific research topics, which include:

- sustainable production and conversion of different types of feedstocks and bioresources
 - new products, value-added products and supply services
 - sustainable industrial processes
 - the competition is open, and the deadline for submitting pre-proposals is midday on 2 March 2017
 - projects are expected to last up to 3 years and must include at least 3 partners from different contributing countries
 - businesses could attract up to 70% of their project costs
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[News story: GC collaborates in research about dangers in food supplements](#)

Hidden ingredients in food supplements

Food supplements of herbal origin are now commonly used by many people as part of their personal healthcare regimens and there has been a tremendous growth in the supplies and sales of supplements. However, food supplements are at risk from contamination on a global scale with illegal ingredients.

According to a team of experts from Queen's University Belfast, Kingston University and the Government Chemist at LGC that included Emeritus Professor Duncan Burns, Dr Michael Walker and Professor Declan Naughton, many food supplements contain hidden pharmaceutical ingredients that could be causing serious health risks.

Their research, outlined in a peer-reviewed paper, found that over-the-counter supplements – commonly advertised to treat obesity and erectile dysfunction problems – are labelled as fully herbal but often include potentially dangerous pharmaceutical ingredients, which are not listed on the label.

Professor Burns, Queen's University, explained:

Our review looked at research from right across the globe and questioned the purity of herbal food supplements. We have found that these supplements are often not what customers think they are – they are being deceived into thinking they are getting health benefits from a natural product when actually they are taking a hidden drug.

These products are unlicensed medicines and many people are consuming large quantities without knowing the interactions with other supplements or medicines they may be taking. This is very dangerous and there can be severe side effects.

Health consequences

The research raises serious questions about the safety of slimming supplements (Sibutramine, withdrawn from license in 2010) and undeclared ingredients in erectile dysfunction supplements (Tadalafil, sulfoildenafil). These ingredients can react with other medications, for example those containing nitrates, and cause serious health problems.

Professor Burns noted:

This is a real issue as people suffering from conditions like diabetes, hyperlipidemia and hypertension are frequently prescribed nitrate containing medicines. If they are also taking a herbal supplement to treat erectile dysfunction, they could become very ill.

Next steps

The research paper describes the laboratory methods and techniques that can help with supplement testing in the future to ensure the safety of consumers. It highlights the vital role research and, in particular, techniques like data-mining, can play in informing regulators about current trends in supplement contamination.

Dr Michael Walker commented:

The laboratory tests we describe in our paper will assist regulators to tackle this problem proactively to protect consumers and responsible businesses.

Professor Declan Naughton explained:

This is very important to ensure effective testing strategies and, ultimately, to help keep the public safe.

The research described has been published by the Journal of the Association of Public Analysts (online) and can be accessed [here](#).

[Press release: Report 02/2017: Collision at Plymouth station](#)

Summary

At 15:34 hrs on Sunday 3 April 2016, the 13:39 hrs passenger train service from Penzance to Exeter collided with an empty train which was already waiting in platform 6 at Plymouth station. The collision occurred at a speed of about 15 mph (24 km/h) and resulted in injuries to 48 people and damage to both trains.

The signaller intended that both trains should share the platform because the empty train was to form a service to London and some passengers from the Penzance service were expected to join it. Lift refurbishment work meant that

without platform sharing, passengers would have needed to use the stairs and a subway when changing trains. Permissive signalling arrangements were in place at Plymouth to permit two trains to share the same platform.

The signaller misjudged the amount of space available behind the London train and wrongly believed there was room for the Penzance train. He was aware that the platform sharing arrangement required an unusual form of permissive working, but did not communicate this to the Penzance train driver, and the rules did not require him to do so.

The Penzance train driver incorrectly believed he would not be sharing a platform with the London train. There was insufficient distance to stop his train by the time he realised his mistake and had applied the emergency brake.

Great Western Railway, the operator of both trains, and Network Rail the owner of the infrastructure, had not identified the risk of a collision due to the combination of an unusual form of permissive working, the track alignment on the approach to Plymouth station, and an inexperienced driver.

Recommendations

The RAIB has made three recommendations. The first, addressed to Great Western Railway and possibly also relevant to other train operators, seeks improvements to the training and assessment of new drivers. The second, also addressed to Great Western Railway and possibly relevant to other train operators, arises from difficulties encountered during passenger evacuation and seeks improvements to emergency door release controls. The third recommendation, addressed to Network Rail and to be undertaken with the assistance of appropriate train operating companies, seeks a review of permissive working arrangements at stations.

Two learning points stress the care needed by drivers when undertaking permissive moves, and the value of preventing passengers boarding or alighting from trains when permissive movements are taking place in the same platform.

Simon French, Chief Inspector of Rail Accidents said:

This collision caused great distress to the large numbers of passengers and staff involved, particularly those who suffered injuries. It occurred when a train was routed into a platform that was already occupied by a stationary high speed train. This form of train working, known as permissive platform working is not unusual on the UK's busy network and is usually performed safely. Platform sharing allows trains to be joined together or, as was intended in this case, can facilitate the easy movement of passengers between connecting train services.

This accident reinforces the need for drivers to take great care when signalled into an occupied platform – assumptions should never be made about the length of platform that is unoccupied. This

learning applies to all drivers but is particularly applicable to those who are inexperienced or new to a route. For this reason we have today issued a recommendation to Great Western Railway concerning the training and assessment of new drivers to better prepare them for permissive platform working. I am also urging other train operators to think about how well they prepare their drivers for similar circumstances.

Although the RAIB recognises the need for permissive working in station platforms, we have recommended that Network Rail, in conjunction with train operators, carries out a review of the way it is implemented at all stations where permissive platform working is currently authorised. This should include an assessment of a range of risk factors, including the information provided to the signallers when deciding whether or not to route a train into an occupied platform.

Notes to editors

1. The sole purpose of RAIB investigations is to prevent future accidents and incidents and improve railway safety. RAIB does not establish blame, liability or carry out prosecutions.
2. RAIB operates, as far as possible, in an open and transparent manner. While our investigations are completely independent of the railway industry, we do maintain close liaison with railway companies and if we discover matters that may affect the safety of the railway, we make sure that information about them is circulated to the right people as soon as possible, and certainly long before publication of our final report.
3. For media enquiries, please call 01932 440015.

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