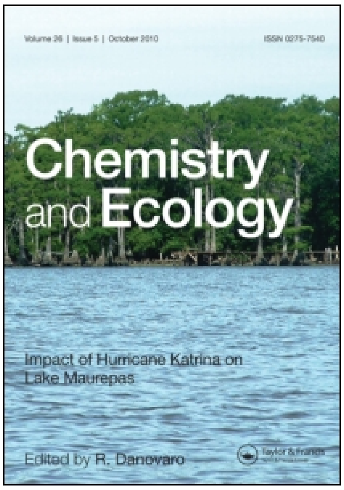

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Comment

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COMMENT

The following comment on the paper by T. Jackson and P. Taylor comes from Dr. John Portmann and Dr. Velimir Pravdic, who were, respectively, secretary and chairman of the GESAMP Working Group on Environmental Capacity; their report was published in 1986 (Rep. #30). In addition, Dr. Portmann was associated with assessment of mercury discharges to Liverpool Bay (Preston and Portmann, 1981). He is a current member of GESAMP.

The precautionary principle – does it prevent marine pollution?

In the previous paper, Jackson and Taylor argue that the Precautionary Principle is a better means of preventing pollution than the Assimilative Capacity approach. We could argue that it is simply a late realisation of what the Assimilative Capacity approach, as defined by GESAMP, really meant. As Jackson and Taylor define it, precautionary action represents a whole new concept in the sequence of perceptions of the need to protect the marine environment. The first of these assumed that there was no need to protect the environment because its Assimilative Capacity was infinite. It was then recognized that there were, after all, finite limits within which it was necessary to operate if pollution was to be avoided. Their supposedly new perception aims to extend the degree of avoidance by promoting clean technology and avoidance of release generally, i.e. precautionary or preventive action. In fact, we said much the same thing when we suggested that once limits had been defined, effort should be exerted to keep inputs to a minimum.

Jackson and Taylor wisely stop short of advocating zero discharge and acknowledge that it makes no sense to avoid pollution of one environmental sector if the consequence is equal or greater ecological damage in another sector. They give a sound explanation of their concept of what precautionary action involves and argue that it should involve science. Unfortunately, they then skate over the fact that, in introducing the concept, they too encounter the sort of difficulties which they criticise others for accommodating.

The GESAMP advocacy of an Assimilative Capacity approach to pollution control and prevention is based on two fundamental principles. The first is that a definable quantity, even of the most harmful substance imaginable, can be released to the environment without causing pollution. This is not to say that certain physical, chemical and biological changes do not occur, merely that they are not of sufficient scale to be regarded as harmful. This forms the basis of the second principle, namely that there is a difference between contamination, which represents a detectable change, and pollution, which is that level of change (physical, chemical or biological) which society regards as unacceptable, i.e. harmful. GESAMP recognized that the definition of acceptability is subjective and will change according to society's priorities and expectations.

On the basis of these two fundamental principles, GESAMP argued that it is at least theoretically possible to establish what needs to be protected and what a safe level of exposure to a particular substance or activity might be. It fully acknowledged that there would be uncertainties in this process and that caution would be required in defining the "safe" level of exposure and hence input limits and that these would necessitate a review of the risk assessment process and the risk management measures. Accordingly, scientific prudence (= precaution) would dictate that the permitted level of activity should be kept well below the defined limit. GESAMP further argued that monitoring to check the validity of all of the predictions is an essential component of the Assimilative Capacity approach.

Jackson and Taylor cite two cases as instances where the Assimilative Capacity approach failed to provide adequate protection. We do not agree.

In the case of the application to mercury discharges to Liverpool Bay, the aim was to establish whether it would be safe to permit a lower level of mercury input or whether it would be necessary to eliminate that input in order to achieve safe levels of mercury in food fish. As a practical consequence of eliminating input would have been the closure of chlor-alkali plants, with attendant disruption of the production of chlorine, caustic and numerous downstream chemicals, with attendant job losses and impacts on the economy, there were real social costs to be balanced. It was concluded that interim measures to reduce mercury inputs in the short term, phasing them out in the longer term, would suffice, public health would be protected and the risk to it would be reduced. True, the effect of the mercury reservoir in the offshore sediments was overlooked at the time, and the decline in levels of mercury in fish has been slower than predicted as a consequence, but due to the conservative assumptions made (and the safety factors applied) the levels did stay below the then defined safe limit of 0.3 mg kg^{-1} in food fish, and are now below 0.2 mg kg^{-1} and are still falling. Human health was protected and even the local fish-eating population of seals (initially regarded as unimportant) is no longer seriously at risk due to mercury. Subsequent changes in the value that society puts on seals would today mean that their protection would be more important than it was 15 to 20 years ago.

In the case of the radioactivity discharges from Sellafield, the approach used incorporates regular monitoring checks of what are known as the assessment procedures; these identified a change in human shellfish eating habits. The physical resuspension pathway back to land was known but was quantified by the use of these checks: it is of minor importance in terms of exposure to the public. The safety factors built into the defined discharge limits served to keep the human population within the internationally defined safe exposure limits, even when those limits were later revised downwards in the light of changes in what is regarded as an unacceptable level of risk. The acceptable level of input was revised for these and other reasons, but this was provided for within the system used.

Jackson and Taylor argue for avoidance of inputs to the marine environment in an "ecologically sensible" way, which they then define as avoiding ecological damage (i.e. harm) as being a significant perturbation to physical, chemical or biological components of the ecosystem. They argue, as does GESAMP, that science has a role in assisting society in the matter of defining "significant" and "harm". They envisage particular scientific inputs in matters such as establishing persistence, toxicity including carcinogenicity and mutagenicity, bioaccumulation potential, and fluxes of the substance through the ecosystem – all factors used in the Assimilative Capacity approach. The only real difference is that they argue that no input should be allowed if it can be avoided.

We would not disagree with that, and it certainly does not conflict with the concept of the Assimilative Capacity approach as promoted by GESAMP. We support the pressure to use cleaner technologies and to reduce inputs as far as practicable. However, economic realities mean that these are best applied first to new installations and then gradually to old processes as plants are updated according to priorities based on the risk of pollution actually occurring.

Even then, if one is to ensure environmental protection, assessment of safe levels of activity, i.e. of Assimilative Capacity, is essential. Without that step, more precautionary action to minimise inputs will certainly increase the chances of preventing marine pollution but it will not be assured.

We would argue further that had the scientifically based precautionary approach proposed by Jackson and Taylor been applied to the real situation faced by those tackling the Sellafield situation when it started, and the Liverpool Bay mercury problem when it was recognized, the end result would not have been different from that which actually transpired.

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