BRISTOL FLOATING HARBOUR’S ‘GET ON BOARD’ CAMPAIGN

The Get On Board campaign also provided information to local users, including boat owners, to encourage them to use the new pump-out facilities for grey and black water discharges. Boat owners using the Floating Harbour are being asked to review their wastewater disposal techniques to make sure they are environmentally acceptable and legally compliant. Where they fall short, they are being encouraged to work towards a solution by 2009.

SEWAGE AND WASTE WATER DISCHARGES FROM BOATS

The impact of grey and black water discharged from recreational craft on water quality is explored in this fact sheet.

IDENTIFYING THE IMPACTS

Levels of sewage input from recreational craft are thought to be small compared to direct inputs from sewage treatment works. However, the effects are serious and sewage and grey water discharges from recreational vessels can potentially affect water quality in the following ways:

- Raw sewage introduces microbial pathogens into the environment, posing a potential health threat for immersion sports (e.g. swimming, diving).
- Chemical pollutants found in grey water discharges may be toxic to aquatic species by locally reducing the biochemical oxygen demand (BOD).
- Grey water discharges contain phosphates and nitrates which can potentially lead to nutrient enrichment (and algal blooms) if introduced in sufficient quantities. Algal blooms reduce light penetration, further reducing dissolved oxygen levels.
- Black water (raw sewage) discharges are likely to become less common as, since 2006, the Recreational Craft Directive (RCD) has required the new vessels have provision for a holding tank to be fitted. In the majority of cases, the waste water from onboard sinks and showers (known as grey water discharges) empties directly into the water. In some parts of Europe boats are strongly encouraged not to discharge grey water.

WHAT WE KNOW ABOUT...

DISCHARGES FROM BOATS

- A sea toilet where the sewage is pumped directly out into the water.
- Chemical toilets which must be emptied into the main sewage system onshore.
- Toilets with holding tanks where sewage is stored on board then discharged into a suitable shore side facility or disposed of well out to sea.

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In 2002, Geertz-Hansen\(^2\) published a study investigating bacterial levels in Georgian Bay, concluding that bacterial levels (E Coli) rarely or never exceeded the relevant water quality objectives for surface waters, although total coliforms were higher on Mondays than Thursdays, which was attributed to weekend recreational discharges.

LeBreton\(^3\) published a study that investigated the contribution from boats to the Baltic Sea. The author concluded that the significance of such discharges to the overall effect was likely to be larger than the percentage level indicated but still considered insignificant in the overall picture.

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In 2002, Geertz-Hansen\(^5\) published a report estimating the load of nitrogen and phosphorus from pleasure craft, in comparison with other sources of pollution into the Baltic Sea. The study used various assumptions, such as the number and types of boat, time spent on board (particularly overnight stays), number of people and sanitary facilities. A number of scenarios were presented, including worst case to realistic, with or without on-board toilets. The realistic scenario for all craft types estimated that nitrogen and phosphorus from recreational craft represented 0.017% and 0.05% respectively of the land based total. The report concluded that the significance of such discharges to the overall effect was likely to be larger than the percentage level indicated but still considered insignificant in the overall picture.

LeBreton\(^6\) published a study investigating bacterial levels in Georgian Bay, concluding that bacterial levels (E Coli) rarely or never exceeded the relevant water quality objectives for surface waters, although total coliforms were higher on Mondays than Thursdays, which was attributed to weekend recreational discharges. Estuaries are subject to many pressures including agricultural, industrial and urban run-off and discharges, making it difficult to quantify the exact impact from recreational vessels.\(^6\) Large populations of water birds and wild fowl (particularly geese) can also cause a significant adverse effect on water quality in localised areas.

It is also important to remember that discharging sewage from boats in inshore areas can be anti-social, for example when visiting crowded anchorages or swimming and watersports take place. In these circumstances, a holding tank or chemical toilet should be used.

Researchers from the University of Portsmouth\(^6\) tested the toxicity of some well known cleaning products on marine algae. The author concluded that the washing up liquid and toilet cleaners tested were safe to discharge into marine waters.

The Green Blue website has a list of natural alternatives to strong cleaning products. As good practice, boat owners should avoid using cleaning products that contain these chemicals: Phosphates, E.C.T.A. (ethylene diamine-tetra-acetic acid), sodium tripolyphosphate (STPP), enzymes, optical brighteners, chlorine bleaches, chemical plasticisers, formaldehyde, sodium gallate, synthetic dyes and perfumes, triclosan and titanium di-oxide.\(^7\)

**THE LEGAL FRAMEWORK**

Coastal Waters

Discharge of boat sewage to coastal waters is regulated through the International Convention on the Prevention of Pollution by Ships (MARPOL\(^8\), 378). This does not apply to small craft carrying less than 15 passengers. Disposal at sea is therefore a value judgement but accepted convention is that holding tanks should not be emptied less than three miles offshore.

Legislation, through implementation of local byelaws, can impose restrictions on disposal of greywater. Greywater discharges from vessels can also prohibit the use of sea toilets within a marina. Since 2006, The Recreational Craft Directive has been in force. There are no current restrictions on discharging grey water from sinks or showers.

Inland Waters

Sewage discharges from vessels in rivers, canals and lakes are regulated by many navigation authorities through byelaws and the Environment Agency has overarching powers of regulation. Discharges from sanitation systems are not generally permitted. Chemical or closed toilet systems using holding tanks must be used and sea toilets are not permitted to be sealed on entering most inland waterways. This is enforced through the Boat Safety Scheme on many inland waterways (including those run by British Waterways and the Environment Agency) who inspect boats on a four yearly cycle. Navigation authorities and marinas provide sanitary stations at key locations.

Grey water from sinks and showers may be discharged but guidance by the Environment Agency states that care should be taken to avoid the release of polluting materials such as strong cleaning agents and cooking oil (Environment Agency, 2004).\(^8\)

**CONCLUSIONS**

The Green Blue has found little quantifiable evidence demonstrating damage to habitats caused by black or grey water discharges from boats. In fact, recent ‘spot checks’ of water quality in marinas in the South East showed that water quality in the marinas sampled during the off-season was generally very good. It would therefore appear that, on balance, current controls are sufficient. Nevertheless, with the number of vessels afloat on the increase and the leisure marine sector continuing to grow by 6% a year, the Green Blue would urge boat users to adhere to best practice and minimise all discharges from their vessels.

**EFFETS FROM SINKS AND SHOWERS**

As discussed, grey water discharges from sinks and showers adds nutrients to the receiving water body. When taken in comparison to inputs from other sources, the contribution from boats is very small.\(^1\) Gleaner et al\(^2\) identified the two main sources of phosphates entering surface water as municipal wastewater and agriculture. Phosphorus is a naturally occurring mineral and an estimated 10% of the total phosphorus in European surface waters is estimated to come from boating.

LeBreton\(^7\)’s report, cited above, examined grey water discharges from power boats in Ontario. On average, 21.7 litres per person per day of grey water was discharged, with the mean phosphorus, total solids and suspended solids levels being similar or slightly above that found in water from urban water treatment facilities. The author concluded that due to the low volume of discharges from recreational craft, the actual impact on the environment was small. The report cited above by Cole et al\(^1\) also concludes that grey water discharges typically occur in a very dilute form and that any impacts from this source are likely to be negligible in coastal areas.

**REFERENCES**

7. The Ecologist.
9. The Green Blue has published a directory of pump out (sanitation) facilities online at: www.thegreenblue.org.uk