



Environmental Management of Hull Fouling in Cardiff Bay.

Analysis of environmental significance within recreational boating

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Abstract

Existing research into the use of antifouling products (AFPs) to control the build up of hull bio-fouling in UK freshwaters is limited. AFP usage patterns and underlying environmental management assumptions for Cardiff Bay have not been investigated. This study surveyed AFP usage in a sample of recreational boats at Penarth Quays Marina by online questionnaire. Data was compared to that available for other UK freshwaters.

Elevated levels of Cu and Zn within surface waters and sediment can be toxic to aquatic organisms. The use of copper based antifouling paints and zinc sacrificial anodes present a potentially significant input of these metals into Cardiff Bay from recreational boats. Data from water quality monitoring by Cardiff Harbour Authority at 9 sampling sites around the bay from 2003 to 2006 has been collated. Annual average levels of dissolved Cu and Zn in surface waters were analysed. Baseline data for Cu and Zn in the sediment at each sampling site was measured and referenced to current UK sediment quality guidelines.

94% of the sample used AFP, giving an estimated annual usage of 1000L within the marina. Outside the marina, annual average dissolved Cu levels in Cardiff Bay surface waters were found to be within UK environmental quality standards (EQS). Within the marina, current annual average levels of dissolved Cu exceeded EQS (12.5ug/l)

Sediment analysis identified levels of Cu and Zn falling between threshold effects level (TEL) and predicted effects level (PEL) of Environment Agency sediment quality guidelines 2004.

The total input of dissolved Cu and Zn outside the marina, including current hull antifouling practices for current number of recreational boats has not generated levels that exceed EQS. Using this measure, they are deemed within safe limits for effects on aquatic organisms.

Practical measures for supporting recreational boat owners to minimise the input of antifouling biocides within Cardiff Bay are discussed.

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Contents

	Page
1. Introduction	
1.1 Cardiff Bay environment and its management.	1
1.2 Recreational boating activity and importance in bay	2
1.3 Biofouling process and significance to recreational boating	2
1.4. Biofouling control techniques and their environmental significance	4
1.5 Minimizing the potential environmental impact of AF practices in Cardiff Bay	7
2 Aims and objectives of this study.	11
3 Analysis of patterns in anti-fouling usage within recreational boating in Cardiff Bay.	
3.1 Review of existing knowledge	12
3.2 Survey rationale and design	14
3.3 Questionnaire survey results	15
3.4 Questionnaire survey analysis	18
3.5 Conclusion	20
4 Analysis of patterns in the levels of total dissolved Cu and Zn in surface waters of Cardiff Bay	
4.1 Water quality sampling methodology	22
4.2 Water quality sampling results	23
4.3 Water quality sampling analysis	34
4.4 Conclusion	34

5	Analysis of patterns in Cu and Zn in the sediment of Cardiff Bay.	
5.1	Sediment sampling methodology	35
5.2	Sediment sampling results	37
5.3	Sediment sampling analysis	3
5.4	Conclusion	39
6	Future environmental management of anti-fouling in recreational boating in Cardiff Bay.	
6.1	Conclusions	40
6.2	Discussion	41
6.3	Recommendations	43
7	References	44
8	Bibliography	47
	APPENDIX I: Cardiff Bay Boat Owners' Antifouling Survey	51
	APPENDIX II Online survey form	54
	APPENDIX III Pilot survey data	58
	APPENDIX IV AFP usage calculations.	62

Figures

No	Title	Page
1	Cardiff Bay	1
2	Recreational Boat Pontoons	2
3	Zebra mussels	3
4	The Green Blue	4
5	Technologies and strategies to combat bio-fouling on submerged surfaces.	10
6	Water quality monitoring locations	24
7	Site 4 Dissolved Cu Levels (Jan 03 – Apr 05)	25
8	Site 5 Dissolved Cu Levels (Jan 03 – Apr 05)	25
9	Site 6 Dissolved Cu Levels (Jan 03 – Apr 05)	26
10	Site 9 Dissolved Cu Levels (Jan 03 – Apr 05)	26
11	Site 10 Dissolved Cu Levels (Jan 03 – Apr 05)	27
12	Site 15 Dissolved Cu Levels (Jan 03 – Mar 06)	27
13	Site 16 Dissolved Cu Levels (Jan 03 – Apr 05)	28
14	Site 19 Dissolved Cu Levels (Jan 03 – Apr 05)	28
15	Site 4 Dissolved Zn Levels (Jan 03 – Mar 06)	29
16	Site 5 Dissolved Zn Levels (Jan 03 – Mar 06)	29
17	Site 6 Dissolved Zn Levels (Jan 03 – Mar 06)	30
18	Site 9 Dissolved Zn Levels (Jan 03 – Mar 06)	30
19	Site 10 Dissolved Zn Levels (Jan 03 – Mar 06)	31
20	Site 15 Dissolved Zn Levels (Jan 03 – Mar 06)	31
21	Site 16 Dissolved Zn Levels (Jan 03 – Mar 06)	32
22	Site 19 Dissolved Zn Levels (Jan 03 – Mar 06)	32

Tables

No	Title	Page
1	Environmental Quality Standards (EQS) for hardness related List 2 dangerous substances, EC Dangerous Substances Directive (76/464/EEC)	6
2	US EPA surface water quality guidelines for dissolved Cu and Zn	7
3	Water Quality Sampling Sites	22
4	Draft freshwater sediment quality guidelines (SQG)	35
5	Decision matrix for determination of SQG	35
6	Sediment heavy metal sampling analysis 22/8/06	36
7	Sediment heavy metal sampling analysis (Bebb 2001) (post Barrage construction)	36