

# References

## Chapter 1 Introduction

- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- ANZECC & ARMCANZ 1994. *Policies and principles: A reference document*. National Water Quality Management Strategy Paper No 2, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- ANZECC & ARMCANZ 2000. *Australian guidelines for water quality monitoring and reporting*. National Water Quality Management Strategy Paper No 7, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- ESD Steering Committee 1992. *National strategy for ecologically sustainable development*. December, Commonwealth of Australia, Canberra.
- New Zealand Ministry of Health 1995a. *Drinking-water standards for New Zealand*. New Zealand Ministry of Health, Wellington.
- New Zealand Ministry of Health 1995b. *Guidelines for drinking-water quality management*. New Zealand Ministry of Health, Wellington.
- NHMRC & ARMCANZ 1996. *Australian drinking water guidelines*. National Water Quality Management Strategy Paper No 6, National Health and Medical Research Council & Agricultural and Resource Management Council of Australia and New Zealand, Australian Government Publishing Service, Canberra.



## Chapter 2 A framework for applying the guidelines

- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- ANZECC & ARMCANZ 2000. *Australian guidelines for water quality monitoring and reporting*. National Water Quality Management Strategy Paper No 7, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- ARMCANZ & ANZECC 1998. *Implementation guidelines*. National Water Quality Management Strategy Paper No 3, Agriculture and Resource Management Council of Australia and New Zealand & Australian and New Zealand Environment and Conservation Council, Canberra.
- Folke C, Perrings C & McNeely JA 1993. Biodiversity, conservation with a human face: Ecology, economics and policy, *Ambio* 22 (2–3), 62–63.
- French JRJ 1991. Population and sustainable development, *Search* 22 (4), 122–123.
- GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Pollution) 1986. *Environmental capacity: An approach to marine pollution prevention*. United Nations Regional Seas Reports and Studies 30, Rome.
- IUCN, UNEP & WWF 1991, *Caring for the Earth: A strategy for sustainable living*. Gland, Switzerland.
- Jenkins BR 1991. Changing Australian monitoring policy practice to achieve sustainable development. *Science of the Total Environment* 108, 33–50.
- Mapstone BD 1995. Scalable decision rules for environmental impact studies: Effect size, Type I, and Type II Errors. *Ecological Applications* 5, 401–410.
- Mapstone BD 1996. Scalable decision criteria for environmental impact assessment: Effect Size, Type I, and Type II errors. In *Detection of ecological impacts: Conceptual issues and application in coastal marine habitats*, eds RJ Schmitt & CW Osenberg, Academic Press, San Diego, 86–106.
- Masini RJ, Simpson CJ, Kirkman H, Ward T & Crossland C 1992. *The concept of assimilative capacity as a management tool in temperate coastal waters of Western Australia*. Environmental Protection Authority Technical Series 48, Perth.
- NZ Ministry for the Environment 1999. *Making every drop count: A draft national agenda for sustainable water management*. New Zealand Ministry for the Environment, Wellington.
- UNESCO 1988. *Eutrophication in the Mediterranean Sea: Receiving capacity and monitoring of the long-term effects*. UNESCO Reports in Marine Science 49, Bologna, Italy.
- WADEP (WA Department of Environmental Protection) 1996. *Southern Metropolitan coastal waters study (1991–1994)*. Final Report, Report 17, November, Perth.
- WAEPA (WA Environmental Protection Authority) 1990. *Annual Report 89/90*. Perth.
- WAWA (Water Authority of Western Australia) 1994. *Wastewater 2040 Discussion Paper*. Leederville, Western Australia.



## Chapter 3 Aquatic ecosystems

### Section 3.1 Introduction

- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- ANZECC & ARMCANZ 2000. *Australian guidelines for water quality monitoring and reporting*. National Water Quality Management Strategy Paper No 7, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- Biodiversity Unit 1994. *Biodiversity and its value*. Biodiversity Series Paper 1, Department of Environment Sport and Territories, Canberra.
- Biodiversity Working Party 1991. *The conservation of biodiversity as it relates to ecologically sustainable development*. ESD Secretariat, DASETT, Canberra.
- DEST (Department of Environment, Sport and Territories) State of the Environment Advisory Council 1996. *Australia, State of the Environment: An independent report*. CSIRO Publishing, Collingwood.
- Finlayson BL & McMahon TA 1988. Australia vs the world: A comparative analysis of stream flow characteristics. In *Fluvial geomorphology of Australia*, ed RF Warner, Academic Press, Sydney.
- Harris GP 1996. *Catchments and aquatic ecosystems: Nutrient ratios, flow regulation and ecosystem impacts in rivers like the Hawkesbury-Nepean*. CRC for Freshwater Ecology Discussion Paper, Canberra.
- Harris G & Baxter G 1996. Interannual variability in phytoplankton biomass and species composition in a subtropical reservoir. *Freshwater Biology* 35, 545–560.
- Hodgkin EP 1994. Estuaries and coastal lagoons. In *Marine Biology*, eds L Hammond & R Synnot, Longman Cheshire, Melbourne, 315–332.
- Schofield NSJ & Davies PE 1996. Measuring the health of our rivers. *Water* 23, 39–43.
- Simpson HJ, Cane MA, Herczeg AL, Zebiak SE & Simpson JH 1993. Annual river discharge in south-eastern Australia related to El Nino-Southern Oscillation forecasts of sea surface temperatures. *Water Resources Research* 29, 3671–3680.
- Ward TJ & Jacoby CA 1992. A strategy for assessment and management of marine ecosystems: Baseline and monitoring studies in Jervis Bay, a temperate Australian embayment. *Marine Pollution Bulletin* 25, 163–171.



## Section 3.2 Biological assessment

- ANZECC & ARMCANZ 2000. *Australian guidelines for water quality monitoring and reporting*. National Water Quality Management Strategy Paper No 7, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- Cairns Jr J, McCormick PV & Niederlehner BR 1993. A proposed framework for developing indicators of ecosystem health. *Hydrobiologia* 263, 1–44.
- Chessman BC 1995. Rapid river assessment using macroinvertebrates: A procedure based on habitat-specific family level identification and a biotic index. *Australian Journal of Ecology* 20, 122–129.
- ESD Steering Committee 1992. *National strategy for ecologically sustainable development*. December, Australian Government Publishing Service, Canberra.
- Hodson PV 1990. Indicators of ecosystem health at the species level and the example of selenium effects on fish. *Environmental Monitoring and Assessment* 15, 241–254.
- Humphrey CL, Thurtell L, Pidgeon RWJ, van Dam RA & Finlayson CM 1999. A model for assessing the health of Kakadu's streams. *Australian Biologist* 12, 33–42.
- Lenat DR & Barbour MT 1994. Using benthic macroinvertebrate structure for rapid, cost-effective, water quality monitoring: Rapid bioassessment. In *Biological monitoring of aquatic ecosystems*, eds SL Loeb & A Spacie, Lewis Publishers, Boca Raton, 187–215.
- Mapstone BD 1995. Scalable decision rules for environmental impact studies: Effect size, Type I and Type II Errors. *Ecological Applications* 5, 401–410.
- Mapstone BD 1996. Scalable decision criteria for environmental impact assessment: Effect Size, Type I, and Type II errors. In *Detection of ecological impacts: Conceptual issues and application in coastal marine habitats*, eds RJ Schmitt & CW Osenberg, Academic Press, 86–106.
- Resh VH & Jackson JK 1993. Rapid assessment approaches to biomonitoring using benthic macroinvertebrates. In *Freshwater biomonitoring and benthic macroinvertebrates*, eds DM Rosenberg & VH Resh, Chapman & Hall, New York, 195–233.
- Resh VH, Norris RH & Barbour MT 1995. Design and implementation of rapid assessment approaches for water resource monitoring using benthic macroinvertebrates. *Australian Journal of Ecology* 20, 108–121.
- Stewart-Oaten A 1993. Evidence and statistical summaries in environmental assessment. *Trends in Evolution and Ecology* 8, 156–158.
- Suter GW 1996. Abuse of hypothesis testing statistics in ecological risk assessment. *Human and Ecological Risk Assessment* 2, 331–347.
- Wright JF, Moss D & Furse MT 1998. Macroinvertebrate richness at running-water sites in Great Britain: A comparison of species and family richness. *Verhandlungen Internationale Vereinigung für Theoretische und Angewandte Limnologie* 26, 1174–1178.



### Section 3.3 Physical and chemical stressors

- AEC 1987. *Nutrients in Australian waters*. Australian Environment Council Report 19, Australian Government Publishing Service, Canberra.
- Alabaster JS & Lloyd R 1982. *Water quality criteria for freshwater fish*. Butterworths, London.
- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- ANZECC & ARMCANZ 2000. *Australian guidelines for water quality monitoring and reporting*. National Water Quality Management Strategy Paper No 7, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- Cary JL, Masini RJ & Simpson CJ 1995. *Long term variations in water quality in the water quality of the southern metropolitan coastal waters of Perth, Western Australia*, Technical Series 63, Department of Environmental Protection, Perth.
- CCREM 1991. *Canadian water quality guidelines*. Canadian Council of Resource and Environment Ministers, Inland Waters Directorate, Environment Canada, Ottawa.
- Cosser PR 1989. Nutrient concentration-flow relationships and loads in the South Pine River, south-eastern Queensland, I. Phosphorus loads. *Australian Journal of Marine and Freshwater Research* 40, 613–630.
- CSIRO/Melbourne Water 1996. *Port Phillip Bay environmental study: The findings 1992–1996*, CSIRO, Melbourne.
- Davies-Colley RJ, Hickey CW, Quinn JM & Ryan PA 1992. Effects of clay discharges on streams, I. Optical properties and epithelion. *Hydrobiologia* 248, 215–234.
- DWR-NSW 1992. *Blue-green algae: Final report of the NSW blue-green algal task force*. Department of Water Resources, Parramatta, NSW.
- Finlayson BL & McMahon TA 1988. Australia v the world: a comparative analysis of streamflow characteristics. In *Fluvial geomorphology of Australia*, ed RF Warner, Academic Press, Australia, 17–40.
- Harris G, Batley G, Fox D, Hall D, Jernakoff P, Molloy R, Murray A, Newell B, Parslow J, Skyring G & Walker S 1996. *Port Phillip Bay environmental study final report*. CSIRO, Canberra.
- Harris GP & Baxter G 1996. Interannual variability in phytoplankton biomass and species composition in a subtropical reservoir. *Freshwater Biology* 35, 545–560.
- Hart BT 1974. *A compilation of Australian water quality criteria*. AWRC Technical Paper 77, Australian Government Publishing Service, Canberra.
- Hart BT, Breen P & Cullen P 1997. Use of ecological risk assessment for irrigation drain management. In *Proceedings of multi-objective surface drainage design workshop*, Drainage Program Technical Report No 7, Murray Darling Basin Commission, Canberra, 7–23.
- Hart BT, McKelvie ID, Shalders R & Grace M 1999. Measurement of bioavailable phosphorus concentrations in natural waters. In *NEMP Workshop on phytoplankton growth: limiting nutrients*, ed A Robinson, Land and Water Resources Research and Development Corporation, Canberra.
- Hart BT, Ottaway EM & Noller BN 1987. Magela Creek system Northern Australia I. 1982–83 Wet-season water quality. *Australian Journal of Marine and Freshwater Research* 38, 261–288.
- Johnstone P 1994. *Algal bloom research in Australia*. Occasional Paper 6, Water Resources Management Committee, Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- Jones G 1992. Algal blooms in the Murrumbidgee River. *Farmer's Newsletter* 139, 9–12.
- Keough MJ & Mapstone BD 1995. *Protocols for designing marine ecological monitoring programs associated with BEK mills*. Technical Report 11, National Pulp Mills Research Program, CSIRO, Canberra.
- Koehn AH & O'Connor WG 1990. *Biological information for management of native freshwater fish in Victoria*. Department of Conservation & Environment, Melbourne.
- Lawrence I 1997a. *Development of models for assessing estuarine water quality and setting sustainable loads*. Draft Report, CRC for Freshwater Ecology, August 1997, Canberra.
- Lawrence I 1997b. *Development of models for assessing water quality and sustainable loads for standing and flowing waters*, Draft Report, CRC for Freshwater Ecology, May 1997, Canberra.
- MacKinnon MR & Herbert BW 1996. Temperature, dissolved oxygen and stratification in a tropical reservoir, Lake Tinaroo, northern Queensland, Australia. *Marine and Freshwater Research* 47, 937–949.

- Mapstone BD 1995. Scalable decision rules for environmental impact studies: Effect size, type I and type II errors. *Ecological Applications* 5, 401–410.
- Masini RJ, Simpson CJ, Kirkman H, Ward T & Crossland C 1992. *The concept of 'assimilative capacity' as a management tool in temperate coastal waters of Western Australia*. Technical Series 48, WA Environmental Protection Authority, Perth.
- Masini RJ, Simpson CJ & Mills DA 1994. Nutrient-effects ecological modelling of temperate oligotrophic marine ecosystems in Western Australia. In *International congress on modelling and simulation*, eds M McAleer & A Jakeman, Vol. 4, Modelling and Simulation Society of Australia, Canberra
- McComb AJ & Davis JA 1993. Eutrophic waters of southwestern Australia. *Fertilizer Research* 36, 105–114.
- McDougall BK & Ho GE 1991. A study of eutrophication of North Lake, Western Australia. *Water Science and Technology* 23, 163–173.
- MDBC 1994. *Algal management strategy for the Murray-Darling Basin*, Murray-Darling Basin Commission, Canberra.
- NZ Ministry for the Environment 1992. *Water quality guidelines no 1: Guidelines for the control of undesirable biological growths in water*. NZ Ministry for the Environment, Wellington, NZ.
- NZ Ministry for the Environment 1994. *Water quality guidelines no 2: Guidelines for the management of water colour and clarity*. NZ Ministry for the Environment, Wellington, NZ.
- NZ Ministry for the Environment 1999. *Making every drop count: A draft national agenda for sustainable water management*. NZ Ministry for the Environment, Wellington.
- Schnoor JL 1996. *Environmental modelling: Fate and transport of pollutants in water, air and soil*. John Wiley & Sons, Brisbane.
- SKM 1997. *Environmental audit protocol for irrigation drains*. Report for Goulburn-Murray Water, Sinclair Knight Merz, Melbourne.
- Stumm W & Morgan JJ 1996. *Aquatic chemistry*. 3rd edn, John Wiley and Sons, New York.
- Sydney Water 1995. *Hawkesbury River: Dynamic water quality model calibration – draft report*, Water Resources Planning, Sydney Water Corporation, September 1995, Sydney.
- Townsend SA 1999. The seasonal pattern of dissolved oxygen, and hypolimnetic deoxygenation, in two tropical Australian reservoirs. *Lakes and Reservoirs: Research and Management* 4, 41–53.
- Townsend SA, Boland KT & Wrigley TJ 1992. Factors contributing to a fish kill in the Australian wet/dry tropics. *Water Research* 26, 1039–1044.
- USEPA 1986. *Quality Criteria for Water – 1986*. US Environmental Protection Agency, Washington DC.
- WADEP (WA Department of Environmental Protection) 1996. *Southern Metropolitan coastal waters study (1991–1994)*. Final Report, Report 17, November, Perth.
- WAEPA 1988. *Peel inlet and Harvey estuary management strategy, environmental review and management program: Stage 2*. Bulletin 363, WA Environmental Protection Authority, Perth.
- WAWA 1995. *Wastewater 2040 strategy for the Perth region*. Water Authority of Western Australia, July 1995, Perth.
- Webster IT, Jones GJ, Oliver RL, Bormans M & Sherman BS 1996. *Control strategies for cyanobacterial blooms in weir pools*. CEM technical report 119, Centre for Environmental Mechanics, CSIRO, Canberra.
- Wetzel RG 1975. *Limnology*. WB Saunders, Philadelphia.

### Section 3.4 Water quality guidelines for toxicants

- Aldenberg T & Slob W 1993. Confidence limits for hazardous concentrations based on logistically distributed NOEC toxicity data. *Ecotoxicology and Environmental Safety* 25, 48–63.
- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- ANZECC & ARMCANZ 2000. *Australian guidelines for water quality monitoring and reporting*. National Water Quality Management Strategy Paper No 7, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- Burkhard LP & Ankley JL 1989. Identifying toxicants: NETAC's toxicity-based approach. *Environmental Science and Technology* 23, 1438–1443.
- CCME 1997. Protocol for the derivation of Canadian tissue residue guidelines for the protection of wildlife that consume aquatic biota. Canadian Council of Ministers of the Environment, Ottawa.
- CCREM 1987. *Canadian water quality guidelines*. Canadian Council for Resource and Environment Ministers, Inland Waters Directorate, Environment Canada, Ontario.
- Chapman JC 1995. The role of ecotoxicity testing in assessing water quality. *Australian Journal of Ecology* 20, 20–27.
- Clesceri LS, Greenberg AE & Eaton AD (eds) 1998. *Standard methods for the examination of water and wastewater* 1998, 20 edn, American Public Health Association, USA.
- Manning TM, Evans JL & Chapman JC 1993. The development of toxicity identification and evaluation procedures in Australia. *Chemistry in Australia*, August, 398–400.
- Markich SJ, Brown PE, Batley GE, Apte SC & Stauber JL 2000. Incorporating metal speciation and bioavailability into water quality guidelines for protecting aquatic ecosystems. *Australasian Journal of Ecotoxicology* 6, in press.
- Menzie C, Henning MH, Cura J, Finkelstein K, Gentile J, Maughan J, Mitchell D, Petron S, Potocki B, Svirsky S & Tyler P 1996. Special report of the Massachusetts Weight-of-Evidence Workgroup: A weight-of-evidence approach for evaluating ecological risks. *Human and Ecological Risk Assessment* 2, 277–304.
- OECD (Organisation for Economic Co-operation and Development) 1992. *Report of the OECD workshop on extrapolation of laboratory aquatic toxicity data to the real environment*. OECD Environment Monographs 59, OECD, Paris.
- OECD (Organisation for Economic Co-operation and Development) 1995. *Guidance document for aquatic effects assessment*. OECD Environment Monographs 92, OECD, Paris.
- Warne M StJ 1998. *Critical review of methods to derive water quality guidelines for toxicants and a proposal for a new framework*. Supervising Scientist Report 135, Supervising Scientist, Canberra.



### Section 3.5 Sediment quality guidelines

- Aldenberg T & Slob W 1993. Confidence limits for hazardous concentrations based on logistically distributed NOEC toxicity data. *Ecotoxicology and Environmental Safety* 25, 48–63.
- Allen HE 1993. The significance of trace metal speciation for water, sediment and soil criteria and standards, *Science of the Total Environment* Supplement, 23–45.
- Allen HE, Fu G & Deng B 1992 Analysis of acid volatile sulfide (AVS) and simultaneously extracted metals (SEM) for the estimation of potential toxicity in aqueous sediments. *Environmental Toxicology and Chemistry* 12, 1441-1453.
- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- IMO (International Maritime Organization) 1997. *Waste assessment framework: Development of the action list and underlying principles for describing national action levels. A geochemical and biological basis for marine sediment quality guidelines*. International Maritime Organization Scientific Group 20th Meeting document No LC/SG/20/2/1.
- Long ER, MacDonald DD, Smith SL & Calder ED 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. *Environment Management* 19, 81–97.
- Loring DH & Rantala RRT 1992. Manual for the geochemical analysis of marine sediments and suspended particulate matter. *Earth-Science Reviews* 32, 325.
- USEPA 1991. *Methods for aquatic toxicity identification evaluations. Phase 1 toxicity characterization procedures*. US Environmental Protection Agency, eds TJ Norberg-King, DA Mount, EJ Durham, GT Ankley, LP Burkhard, JR Amaato, MT Lukasewycz, MK Schubauer-Berigan & L Anderson-Carnahan. EPA-600/6-91/003.
- Wang F & Chapman PM 1999. Biological implications of sulfide in sediment: a review focussing on sediment toxicity. *Environmental Toxicology and Chemistry* 18, 2526–2532.



## Chapter 4 Primary industries

### Sections 4.1 Introduction

- ARMCANZ, ANZECC & NHMRC 2000. *Guidelines for sewerage systems — use of reclaimed water*. National Water Quality Management Strategy Paper No 14, Agriculture and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council & National Health and Medical Research Council, Canberra.
- NHMRC & ARMCANZ 1996. *Australian drinking water guidelines*. National Water Quality Management Strategy Paper No 6, National Health and Medical Research Council & Agricultural and Resource Management Council of Australia and New Zealand, Australian Government Publishing Service, Canberra.
- NZ Ministry of Health 1995a. *Drinking-water standards for New Zealand*. New Zealand Ministry of Health, Wellington.
- NZ Ministry of Health 1995b. *Guidelines for drinking-water quality management*. New Zealand Ministry of Health, Wellington.

### Sections 4.2 & 4.3 Agricultural water uses (irrigation and general water use; livestock drinking water quality)

- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- ARMCANZ, ANZECC & NHMRC 2000. *Guidelines for sewerage systems — use of reclaimed water*. National Water Quality Management Strategy Paper No 14, Agricultural and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council & National Health and Medical Research Council, Canberra.
- Cape J 1997. Irrigation. In *Australian agriculture: the complete reference on rural industries*, 6th edn, ed F Douglas, Morescope Publishing, Hawthorn East, Victoria, 367–374.
- Carmichael WW & Falconer IR 1993. Diseases related to freshwater blue-green algal toxins, and control measures. In *Algal toxins in seafood and drinking water*, ed IR Falconer, Academic Press, London, 187–209.
- DEST (Department of Environment, Sport and Territories) State of the Environment Advisory Council 1996. *Australia, State of the Environment: An independent report*. CSIRO Publishing, Collingwood.
- DNR 1997a. *DNR Water Facts: Irrigation water quality, salinity and soil structure stability*, No. W55, Department of Natural Resources, Brisbane.
- DNR 1997b. *Salinity management handbook*. Department of Natural Resources, Brisbane.
- DWAF 1996. *South African Water Quality Guidelines*. 2<sup>nd</sup> edn, Vol 4, Agricultural use: Irrigation, Pretoria.
- Gill JY 1986. *Agricultural water quality assessment*. Queensland Department of Primary Industries Q186018, Brisbane.
- Hunter HM, Eyles AG & Rayment GE (eds) 1996. *Downstream effects of land use*. Queensland Department of Natural Resources, Brisbane.
- Maas EV 1990. Crop salt tolerance. In *Agricultural salinity assessment and management*, ed KK Tanjii, ASCE Manuals and Reports on Engineering Practice 71, ASCE, New York, 262–304.
- McLaughlin MJ, Maier NA, Correll RL, Smart MK, Sparrow LA & McKay A 1999. Prediction of cadmium concentrations in potato tubers (*Solanum tuberosum* L) by pre-plant soil and irrigation water analyses. *Australian Journal of Soil Research* 37, 191–207.
- NHMRC & ARMCANZ 1996. *Australian drinking water guidelines*. National Water Quality Management Strategy Paper No 6, National Health and Medical Research Council & Agricultural and Resource Management Council of Australia and New Zealand, Australian Government Publishing Service, Canberra.
- NZ Ministry of Health 1995a. *Drinking-water standards for New Zealand*. New Zealand Ministry of Health, Wellington.
- NZ Ministry of Health 1995b. *Guidelines for drinking-water quality management*. New Zealand Ministry of Health, Wellington.
- Pearson GA 1960. Tolerance of crops to exchangeable sodium. Agricultural Information Bulletin 206, Agricultural Research Service, US Department of Agriculture, Washington DC .



## Section 4.4 Aquaculture and human consumers of aquatic foods

- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- ANZFA 1996. *Food standards code*. Australia New Zealand Food Authority, Australian Government Publishing Service, Canberra (including amendments to June 1996).
- ASSAC 1997. *Australian shellfish sanitation control program operations manual*. Australian Shellfish Sanitation Advisory Committee, Canberra.
- Boyd CE 1989. *Water quality management and aeration in shrimp farming*. Fisheries and Allied Aquacultures departmental series 2, Alabama Agricultural Experiment Station, Auburn University.
- Boyd CE 1990. *Water quality in ponds for aquaculture*. Alabama Agricultural Experiment Station, Auburn University.
- Coche AG 1981. *Report of the symposium on new developments in the utilisation of heated effluents and of recirculation systems for intensive aquaculture*. Stavanger 29–30 May 1980, EIFAC technical paper 39. Stavanger, Norway.
- Duchrow RM & Everhart WH 1971. Turbidity measurement. *Transactions of the American Fisheries Society* 100, 682–690.
- DWAF 1996. *South African water quality guidelines*. 2nd edn, Vol 4, Agricultural Use, Freshwater Aquaculture. Pretoria, Department of Water Affairs and Forestry, Draft.
- Florence M & Batley G 1988. Chemical speciation and trace element toxicity. *Chemistry in Australia* October, 363–367.
- Goyal SM, WN Adams, ML O'Malley & DW Lear 1984. Human pathogenic viruses at sewage sludge disposal sites in the Middle Atlantic region. *Applied and Environmental Microbiology* 48 (4), 758–763.
- Handlinger J 1996. Diseases as causes of fish kills. In *Fish kills: causes and investigations in Australia*, ed D O'Sullivan, Sourcebook no 13, Turtle Press, Tasmania, 35–40.
- IWBDE 1972. *Guidelines for water quality objectives and standards*. Technical Bulletin 67, Inland Water Branch, Department of the Environment, Ottawa.
- Jackson K & D Ogburn 1998. *Fisheries Research Development Corporation Report 96/355*, Canberra.
- Klontz GW 1993. Environmental requirements and environmental diseases of salmonids. In *Fish medicine*, ed MK Stoskopf, WB Saunders Company, Philadelphia, 333–342.
- Langdon JS 1988. Investigation of fish kills. In *Fish diseases: Proceedings 106*, Post Graduate Committee in Veterinary Science, University of Sydney, 167–223.
- Lannan JE, Smitherman RO & Tchobanoglous G 1986. *Principals of pond aquaculture*. Oregon State University Press, Corvallis, Oregon.
- Lawson TB 1995. Water quality and environmental requirements. Chapter 2 In *Fundamentals of Aquacultural Engineering*, Chapman & Hall, New York, 12–39.
- MBMB 1996. *National marine biotoxin management plan*. Marine Biotoxin Management Board, Wellington, New Zealand.
- McKee JE & Wolf HW 1963. *Water quality criteria*. Publication 3-A, Resources Agency of California, State Water Quality Control Board.
- Meade IW 1989. *Aquaculture management*. Van Nostrand Reinhold, New York.
- NAS (National Academy of Science)/NAE (National Academy of Engineers) 1973. *Committee of Water Quality. Water quality criteria 1972*. Publication 3-A, Environmental Studies Board, State Water Quality Control Board.
- O'Sullivan D & Roberts N 1999. *Status of Australian aquaculture in 1997/98*. Austasia Aquaculture Trade Directory 1999, Turtle Press, Hobart, Tasmania, 14–28.
- Pillay TVR 1990. *Aquaculture principals and practices*. Fishing News Books Ltd, Oxford.
- Schlotfeldt HJ & Alderman DJ 1995. *What should I do? A practical guide for the fresh water fish farmer*. European Association of Fish Pathologists/Warwick Press, Weymouth.
- SECL 1983. *Summary of water quality criteria for salmonid hatcheries*. Rev edn, Sigma Environmental Consultants Ltd for Canadian Department of Fisheries and Oceans, Canada.
- Svobodova Z, Lloyd R, Machova J & Vykusova B 1993. *Water quality and fish health*. EIFAC technical paper 54, FAO, Rome.
- Tebbutt THY 1977. *Principals of water quality control*. Pergamon Press, Oxford.

- University of California, Davis 1997. Web site of the University of California Davis ([www.seafood.ucdavis.edu/Pubs/safety1.htm](http://www.seafood.ucdavis.edu/Pubs/safety1.htm) and [www.seafood.ucdavis.edu/haccp/compendium/chemical/natural.htm](http://www.seafood.ucdavis.edu/haccp/compendium/chemical/natural.htm)).
- USEPA 1986. *Quality criteria for water*. US Environmental Protection Agency, Washington DC.
- Zweig RD, Morton JD & Stewart MM 1999. *Source water quality for aquaculture: a guide for assessment*. The World Bank, Washington DC.

## Chapter 5 Guidelines for recreational water quality and aesthetics

- ANZECC 1992. *Australian water quality guidelines for fresh and marine waters*. National Water Quality Management Strategy Paper No 4, Australian and New Zealand Environment and Conservation Council, Canberra.
- Cabelli VJ 1983a. Public health and water quality significance of viral diseases transmitted by drinking water and recreational water. *Water Science and Technology* 15, 1–15.
- Cabelli VJ 1983b. *Health effects criteria for marine recreational waters*. EPA 600/1-80/031. US Environmental Protection Agency, Cincinnati, Ohio.
- Cabelli VJ 1989. Swimming-associated illness and recreational water quality criteria. *Water Science and Technology* 21, 13–21.
- Cabelli VJ, Dufour AP, McCabe LJ & Levin MA 1982. Swimming-associated gastroenteritis and water quality. *American Journal of Epidemiology* 115, 606–616.
- Cabelli VJ, Dufour AP, McCabe LJ & Levin MA 1983. A marine recreational water quality criterion consistent with indicator concepts and risk analysis. *Journal of the Water Pollution Control Federation* 55, 1306–1314.
- CCREM 1991. *Canadian water quality guidelines*. Canadian Council of Resource and Environment Ministers, Inland water Directorate, Environment Canada, Ottawa.
- Codd GA 1990. Cyanobacterial toxins and associated problems in European waters. Blue-green algae seminar. November 21–22 1990, NSW Water Board, Sydney.
- Daly H 1991. *Recreational water quality indicators: A brief discussion paper*. Information Bulletin WQ2/91. Victorian Environment Protection Authority, Melbourne.
- Davies-Colley RJ 1991. *Guidelines for optical quality of water and for protection from damage by suspended solids*. Consultancy Report No 6213/1. Water Quality Centre, Hamilton, New Zealand.
- Davies-Colley RJ & Smith DG 1990. *A panel study of the detectability of change in turbidity of water induced by discharge of suspensoids to a small stream*. Water Quality Centre Publication No. 17, Hamilton, New Zealand.
- Dufour AP 1984. *Health effects criteria for fresh recreational waters*. EPA 600/1-84/004. US Environmental Protection Agency, Cincinnati, Ohio.
- Elliot EL & Colwell RR 1985. Indicator organisms for estuarine and marine waters. *Federation of European Microbiological Societies Microbiology Reviews* 32, 61–79.
- Falconer IR 1990. Cyanobacterial toxicity. Blue-green algae seminar, November 21–22 1990, NSW Water Board, Sydney.
- Hart BT 1974. *A compilation of Australian water quality criteria*. AWRC Technical Paper No 7. Australian Government Publishing Service, Canberra.
- Health & Welfare Canada 1983. *Guidelines for Canadian recreational water quality*. Federal Provincial Advisory Committee on Environmental and Occupational Health, Ottawa.
- Kirk JTO 1983. *Light and photosynthesis in aquatic ecosystems*. Cambridge University Press, Cambridge.
- Kirk JTO 1988. Optical water quality: What is it and how should we measure it? *Journal of the Water Pollution Control Federation* 60, 194–197.
- McBride GB, Cooper AB & Till DG 1991. *Microbial water quality guidelines for recreation and shell-fish gathering waters in New Zealand*. NZ Department of Health, Wellington.
- McBride GB & Salmond C 1996. *Feasibility of bathing/health effects study for New Zealand freshwaters*. NZ Ministry for the Environment, Wellington.
- McNeill AR 1985. *Microbiological water quality criteria: A review for Australia*. Australian Water Resources Council Technical Report No. 85. Australian Government Publishing Service, Canberra.
- Mood EW 1968. *The role of some physico-chemical properties of water as causative agents of eye irritation of swimmers*. National Technical Advisory Committee on Water Quality Criteria, Federal Water Pollution Control Administration, US Department of the Interior, Washington.
- NHMRC 1989. *MRL-Standard. Standard for maximum residue limits of pesticides, agricultural chemicals, feed additives, veterinary medicines and noxious substances in food*. National Health and Medical Research Council, Canberra.
- NHMRC 1990. *Australian guidelines for recreational use of water*. National Health and Medical Research Council, Canberra.
- NHMRC & AWRC 1987. *Guidelines for drinking water quality in Australia*. National Health and Medical Research Council & Australian Water Resources Council, Australian Government Publishing Service, Canberra.

- NZ Ministry for the Environment 1999. *Recreational water quality guidelines: Guidelines for the management of waters used for marine and freshwater recreation and recreational shell-fish gathering*. NZ Ministry for the Environment & NZ Ministry of Health, Wellington.
- Quinn JM 1991. *Guidelines for the control of undesirable biological growths in water*. Consultancy Report No 6213/2. Water Quality Centre, Hamilton, New Zealand.
- Shilo M 1981. The toxic principles of *Prymnesium parvum*. In *The water environment: Algal toxins and health*, ed WW Carmichael, Plenum Press, New York, 37–47.
- Smith DG & Davies-Colley RJ 1992. Perception of water clarity and colour in terms of suitability for recreational use. *Journal of Environmental Management* 36, 225–235.
- Smith GD, Cragg AM & Croker GF 1991. Water clarity criteria for bathing waters based on user perception. *Journal of Environmental Management* 33, 285–299.
- Thornton JA & McMillon PH 1989. Reconciling public opinion and water quality criteria in South Africa. *Water (South Africa)* 15, 221–226.
- USEPA 1986. *Bacteriological ambient water quality criteria for marine and fresh recreational waters*. US Environmental Protection Agency, Cincinnati, Ohio.
- WHO 1998. Guidelines for safe recreational-water environments: Coastal and fresh-waters. Draft for Consultation, EOS/DRAFT/98.14, World Health Organization, Geneva.
- WHO 1999. Health-based monitoring of recreational waters: The feasibility of a new approach (The ‘Annapolis Protocol’), WHO/SDEW/WSH/99.1, World Health Organization, Geneva.

## Chapter 6 Drinking water

- NHMRC & ARMCANZ 1996. *Australian drinking water guidelines*. National Water Quality Management Strategy Paper No 6, National Health and Medical Research Council & Agricultural and Resource Management Council of Australia and New Zealand, Australian Government Publishing Service, Canberra.
- NZ Ministry of Health 1995a. *Drinking-water standards for New Zealand*. New Zealand Ministry of Health, Wellington.
- NZ Ministry of Health 1995b. *Guidelines for drinking-water quality management*. New Zealand Ministry of Health, Wellington.



## Chapter 7 Monitoring and assessment

- Andrew NL & Mapstone BD 1987. Sampling and the description of spatial pattern in marine ecology. *Oceanography and Marine Biology: An Annual Review* 25, 39–90.
- ANZECC & ARMCANZ 2000. *Australian guidelines for water quality monitoring and reporting*. National Water Quality Management Strategy Paper No 7, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- Batley GE 1989. Collection, preparation and storage of samples for speciation analysis. In *Trace Element Speciation: Analytical Methods and Problems*, ed GE Batley, CRC Press Inc, Boca Raton, Florida, 1–24.
- Chow SC & Liu JP 1992. *Design and analysis of bioavailability and bioequivalence studies*. Marcel Dekker, New York.
- Clarke KR & Green RH 1988. Statistical design and analysis for a 'biological effects' study. *Marine Ecology Progress Series* 46, 213–226.
- Clarke KR & Warwick RM 1994. *Change in marine communities: An approach to statistical analysis and interpretation*. Natural Environment Research Council, Plymouth, UK.
- Cohen J 1988. *Statistical power analysis for the behavioural sciences*. 2nd edn, Lawrence Earlbaum Associates, Hillsdale, New Jersey.
- Cressie NAC 1993. *Statistics for spatial data*. Rev edn, John Wiley and Sons, New York.
- Davies PE & Nelson M 1994. Relationships between riparian buffer widths and the effects of logging on stream habitat, invertebrate community composition and fish abundance. *Australian Journal of Marine and Freshwater Research* 45, 1289–1305.
- Downes BJ, Lake PS & Schreiber ESG 1993. Spatial variation in the distribution of stream invertebrates: Implications of patchiness for models of community organization. *Freshwater Biology* 30, 119–132.
- Fairweather PG 1991. Statistical power and design requirements for environmental monitoring. *Australian Journal of Marine and Freshwater Research* 42, 555–567.
- Faith DP, Dostine PL & Humphrey CL 1995. Detection of mining impacts on aquatic macroinvertebrate communities: Results of a disturbance experiment and the design of a multivariate BACIP monitoring programme at Coronation Hill, Northern Territory. *Australian Journal of Ecology* 20, 167–180.
- Faith DP, Minchin PR & Belbin L 1987. Compositional dissimilarity as a robust measure of ecological distance. *Vegetation* 69, 57–68.
- Finlayson CM 1996. The Montreux Record: A mechanism for supporting the wise use of wetlands. In *Proceedings of the sixth meeting of the Conference of the Contracting Parties of the Convention on Wetlands*, Ramsar Convention Bureau, Gland, Switzerland, Technical Sessions: Reports and presentations Vol 10/12 B, 32–38.
- Furse MT, Moss D, Wright JF & Armitage PD 1987. Freshwater site assessment using multi-variate techniques. In *Use of invertebrates in site assessment for conservation*, Proceedings of a Meeting Held at the University of Newcastle-upon-Tyne, 7 January 1987, eds ML Luff, Agricultural Environment Research Group, University of Newcastle-upon-Tyne, Newcastle-upon-Tyne, UK.
- Galpin JS & Basson B 1990. Some aspects of analysing irregularly spaced time dependent data. *South African Journal of Science* 86, 458–461.
- Gilbert RO 1987. *Statistical methods for environmental pollution monitoring*. Van Nostrand Reinhold Company, New York.
- Green RH 1979. *Sampling design and statistical methods for environmental biologists*. John Wiley and Sons, New York.
- Green RH 1989. Power analysis and practical strategies for environmental monitoring. *Environmental Research* 50, 195–205.
- Humphrey CL, Faith DP & Dostine PL 1995. Baseline requirements for assessment of mining impact using biological monitoring. *Australian Journal of Ecology* 20, 150–166.
- Humphrey CL, Storey AW & L Thurtell 2000. AUSRIVAS: operator sample processing errors and temporal variability — implications for model sensitivity. In: *Assessing the biological quality of fresh waters. RIVPACS and other techniques*. eds JF Wright, DW Sutcliffe & MT Furse, Freshwater Biological Association, Ambleside, 143–163.
- Hurlbert SH 1984. Pseudoreplication and the design of ecological field experiments. *Ecological Monographs* 54, 187–211.

- Keith LH 1991. *Environmental sampling and analysis: A practical guide*. Lewis publishers, Chelsea, Maine.
- Keough MJ & Mapstone BD 1995. *Protocols for designing marine ecological monitoring programs associated with BEK mills*. National Pulp Mills research program 11, CSIRO, Canberra.
- Keough MJ & Mapstone BD 1997. Designing environmental monitoring for pulp mills in Australia. *Water Science & Technology* 35, 397–404.
- Legendre P & Anderson MJ 1999. Distance-based redundancy analysis: testing multispecies responses in multifactorial ecological experiments. *Ecological Monographs* 69, 1–24.
- Legendre P & Legendre L 1998. *Numerical Ecology*. 2nd English edn, Elsevier, Amsterdam, The Netherlands.
- Maguire LA 1995. Decision analysis: An integrated approach to ecosystem exploitation and rehabilitation decisions. In *Rehabilitating damaged ecosystems* 2nd edition, ed J Cairns, Jr, Lewis Publishers, Boca Raton, FL, USA, 13–34.
- Mapstone BD 1995. Scalable decision rules for environmental impact studies: Effect size, Type I, and Type II Errors. *Ecological Applications* 5, 401–410.
- Mapstone BD 1996. Scalable decision criteria for environmental impact assessment: Effect Size, Type I, and Type II errors. In *Detection of ecological impacts: Conceptual issues and application in coastal marine habitats*, eds RJ Schmitt & CW Osenberg, Academic Press, San Diego, 86–106.
- McDonald LL & Erickson WP 1994. Testing for bioequivalence in field studies: Has a disturbed site been adequately reclaimed? In *Statistics in Ecology and Environmental Monitoring. Otago Conference Series 2*, ed DJ Fletcher & BFJ Manly, University of Otago Press, Dunedin, New Zealand, 183–197.
- McPherson G 1990. *Statistics in scientific investigation: Its basis, application and interpretation*. Springer-Verlag, New York.
- Morrisey DJ, Howitt L, Underwood AJ & Stark JS 1992. Spatial variation in soft-sediment benthos. *Marine Ecology — Progress Series* 81, 197–204.
- Norris RH 1986. Mine waste pollution of the Molonglo River, New South Wales and the Australian Capital Territory: Effectiveness of remedial works at Captains Flat mining area. *Australian Journal of Marine and Freshwater Research* 37, 147–157.
- Ramsar Convention 1996. Resolution VI.1. In *Proceedings of the sixth meeting of the Conference of the Contracting Parties of the Convention on Wetlands, Resolutions and Recommendations*. Ramsar Convention Bureau, Gland, Switzerland.
- Reynoldson TB, Bailey RC, Day KE & Norris RH 1995. Biological guidelines for freshwater sediment based on Benthic Assessment of Sediment (the BEAST) using a multivariate approach for predicting biological state. *Australian Journal of Ecology* 20, 198–219.
- Rossi RE, Mulla DJ, Journel AG & Franz EH 1992. Geostatistical tools for modeling and interpreting ecological spatial dependence. *Ecological Monographs* 62, 277–314.
- Schofield NJ & Davies PE 1996. Measuring the health of our water. *Water* 23(May/June), 36–43.
- Smith EP 1998. Randomization methods and the analysis of multivariate ecological data. *Envirometrics* 9, 37–51.
- Smith SDA 1994. Impact of domestic sewage effluent versus natural background variability — an example from Jervis Bay, New South Wales. *Australian Journal of Marine & Freshwater Research* 45, 1045–1064.
- Sokal RR & Rohlf FJ 1981. *Biometry*. 2nd edn, WH Freeman and Company, San Francisco, CA.
- Stewart-Oaten A 1996a. Goals in environmental monitoring. In *Detecting ecological impacts: Concepts and applications in coastal marine habitats*, eds RJ Schmitt & CW Osenberg, Academic Press, San Diego, 17–28.
- Stewart-Oaten A 1996b. Problems in the analysis of environmental monitoring data. In *Detecting ecological impacts: Concepts and applications in coastal marine habitats*, eds RJ Schmitt & CW Osenberg, Academic Press, San Diego, 140–173.
- Stewart-Oaten A, Bence JR & Osenberg CW 1992. Assessing effects of unreplicated perturbations: No simple solutions. *Ecology* 73, 1396–1404.
- Stewart-Oaten A, Murdoch WW & Parker KR 1986. Environmental impact assessment: ‘Pseudoreplication’ in time? *Ecology* 67, 929–940.
- Suter GW 1996. Abuse of hypothesis testing statistics in ecological risk assessment. *Human and Ecological Risk Assessment* 2, 331–347.
- Thompson KW, Deaton ML, Foutz RV, Cairns J Jr & Hendricks AC 1982. Application of time-series intervention analysis to fish ventilatory response data. *Canadian Journal of Fisheries and Aquatic Sciences* 39, 518–521.

- Thrush SF, Pridmore RD & Hewitt JE 1994. Impacts on soft-sediment macrofauna: The effects of spatial variation on temporal trends. *Ecological Applications* 4, 31–41.
- Toft CA & Shea PJ 1983. Detecting community-wide patterns: estimating power strengthens statistical inference. *American Naturalist* 122, 618–625.
- Underwood AJ 1991a. Beyond BACI: Experimental designs for detecting human environmental impacts on temporal variations in natural populations. *Australian Journal of Marine and Freshwater Research* 42, 569–587.
- Underwood AJ 1991b. Biological monitoring for human impact: How little it can achieve. In *Proceedings of the 29th Congress of the Australian Society for Limnology*, Jabiru, Northern Territory, 1990, eds RV Hyne, Australian Government Publishing Service, Canberra, ACT.
- Underwood AJ 1993. The mechanics of spatially replicated sampling programmes to detect environmental impacts in a variable world. *Australian Journal of Ecology* 18, 99–116.
- Underwood AJ 1994. On beyond BACI: Sampling designs that might reliably detect environmental differences. *Ecological Applications* 4, 3–15.
- Welsh DR & Stewart DB 1989. Applications of intervention analysis to model the impact of drought and bushfires on water quality. *Australian Journal of Marine and Freshwater Research* 40, 241–257.
- Westlake WJ 1988. Bioavailability and bioequivalence of pharmaceutical formulations. In *Biopharmaceutical Statistics for Drug Development* ed KE Peace, Marcel Dekker, New York, 329–352.
- Wiens JA & Parker KR 1995. Analyzing the effects of accidental environmental impacts - approaches and assumptions. *Ecological Applications* 5, 1069–1083.
- Wright JF 1995. Development and use of a system for predicting the macroinvertebrate fauna in flowing waters. *Australian Journal of Ecology* 20, 181–197.
- Wright JF, Furse MT & Armitage PD 1993. RIVPACS: A technique for evaluating the biological quality of rivers in the UK. *European Water Pollution Control* 3 (4), 15–25.

