

THE WINSTON CHURCHILL MEMORIAL TRUST OF AUSTRALIA

Report by CHRISTINE COUGHANOWR –2001 Churchill Fellow

To investigate successful estuary management programs

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EXECUTIVE SUMMARY

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During the period between 15 July and 1 October 2001, I visited estuarine systems in the Pacific Northwest (Fraser River, Columbia River and San Francisco Bay), the Atlantic Northeast (Chesapeake Bay, Narragansett Bay, Buzzards Bay and Massachusetts Bays) and the south of England (Thames, Exe, Tamar and Fal estuaries). In addition, I participated in the Coastal Zone 2001 conference (Cleveland, Ohio) at the start of my trip and visited several intergovernmental coastal zone programs at the end of my trip (UNESCO and IOC, Paris). The organisations I visited ranged in scale from large international non-government organisations such as UNESCO to multi-state/federal programs (e.g. Chesapeake Bay) to small, local programs (e.g. Waquoit Bay). Some were predominantly government run, other were land trusts, research institutes or community organisations. The intent of the trip was to see how these programs had made the transition from planning to management and to identify specific tools and approaches that could be effective in an Australian/Tasmanian context. I found the following programs and tools to be particularly effective and relevant:

- Puget Sound Program – low impact development, effective funding arrangements, indicators and reporting;
- City of Portland – low impact development, stormwater management techniques;
- Association of Bay Area Governments – San Francisco Bay Trail;
- San Francisco Estuarine Institute – research, modelling, introduced marine pest rapid surveys;
- Aquariums – Monterey, Vancouver and particularly Seattle;
- Chesapeake Bay Program – science-based management, modelling, indicators and reporting, water quality criteria, Year 2000 management agreement;
- Chesapeake Bay Foundation – effective/inspiring NGO, education, green office building;
- State of Maryland and Prince Georges County – growth controls and stormwater management;
- Narragansett Bay – management forum, monitoring;
- Buzzards Bay – pragmatic focus on projects and assistance to local governments;
- Waquoit Bay – science/management integration, training workshops;
- Cape Cod Commission – regional agency with statutory clout, effective land bank;
- State of Massachusetts – Wetlands Protection Act, State Watershed Initiative;
- City of New Bedford – clean up of contaminated sediments, waterfront revitalisation, whaling museum;
- University of Rhode Island/Coastal Research Center – practical yet academically rigorous framework for ICZM; Washington County and Aquidneck Island projects;
- Tamar Estuary – port-oriented program; good integration of overlapping management plans;
- Thames Estuary – well-structured program, broad range of issues;
- U.K. National Trust – very inspiring NGO that own and manage one third of U.K coast;
- European Union – pilot project on ICZM, European directives.

As a broad generalisation, it seems that the most effective outcomes are achieved where there is a combination of effective statutory-driven management, well-funded land trusts and outspoken watchdog/advocacy NGOs. The U.S. has some very effective regulatory tools at the federal level (e.g. Clean Water Act), at the State level (e.g. MA Wetlands Protection Act) and even at the county and local government levels (e.g. Cape Cod Commission, Prince Georges County). The UK's land planning controls appear to be extremely effective in managing sprawl – the visual contrast between extreme urban sprawl in the USA and UK was startling. The UK's National Trust also plays a critical role, owning and managing over 30% of the coastline. Litigation has great influence in the U.S., with both positive and negative consequences – a great deal of management takes simply to avoid potential lawsuits. Finally, consistent long-term funding is clearly essential – with continuity perhaps more important than the overall amount.

LESSONS LEARNED

There are a number of approaches and tools that will be very useful to my work in the Derwent. These include:

- Continuation/enhancement of our science-based approach. Hold a science/management forum, continue development of indicators, objectives and criteria, improve monitoring, enhance links with research and educational facilities;
- work towards development of more quantitative management goals;
- field-based education and awareness programs;
- low-impact-development approach to stormwater management (source controls).
- develop/enhance a more active network of estuary/coastal managers at both the state and national level to share information, provide a support network and develop a collective voice to lobby for funding.

INTRODUCTION

In July 2001, I set off on a Churchill Fellowship with the objective of visiting estuary and coastal management programs in North America, the United Kingdom and France. The intent of the trip was to learn how successful management programs have made the transition from planning to implementation. I investigated both 'big picture' issues (effective management structures, financing, links to political and community spheres, integration of science and management), as well as more technical aspects that we are trying to address in the Derwent Estuary in Tasmania (e.g. management of heavy metal contamination, stormwater, introduced marine pests).

Three months later, I find I have spoken with over 50 individuals from nearly 40 different organisations and my head is spinning with observations and new ideas. The majority of people I met were very helpful and generous with their time – sharing information and insights, documents (over 40 kilos...) and in some cases meals, homes and kayaks. The experience has been invaluable as a means of gaining new practical knowledge, professional contacts and allowing me to step back from my day-to-day work and gain a broader perspective. My heartfelt thanks to the Churchill Foundation for this wonderful opportunity, to the Tasmanian Department of Industries, Water and Environment for their Special Leave support and to the many programs and individuals that hosted my visits overseas!

PROGRAMME

The programs and individuals visited during my nine-week fellowship are summarised in the attached table, with more detail provided in the subsequent sections.

Dates	Program	Location	Main contacts
July 16-19	Coastal Zone 2001 Conference	Cleveland, Ohio	
WEST COAST USA PROGRAMS			
August 2-7	Puget Sound Program	Olympia, WA	Duane Fagergren, Deputy Director
Aug 6	Port of Olympia – Cascade Pole project	Olympia, WA	Don Bache, site manager
Aug 8-10	Fraser Basin Commission	Vancouver, B.C.	Steve Litke, Project Coordinator
Aug 8	Fraser Estuary Management Program & Briard Inlet Management Program	Vancouver, B.C.	Reena Lazar, Water & Land Use Coordinator
Aug 10	Fraser River Discovery Centre	New Westminster, B.C.	
Aug 12	Vancouver Aquarium	Vancouver, B.C.	
Aug 13	Columbia River Estuary Management	Portland, OR	Debrah Marriott, Director; Nate Alexander, Office Manager
Aug 14	Columbia River Estuary Study Taskforce	Astoria, OR	Matthew Van Ess, Director
Aug 15	Seattle Public Utilities – Green Street Project	Seattle, WA	Denise Andrews
Aug 15	Seattle Aquarium	Seattle, WA	
Aug 16-17	San Francisco Estuary Program	Oakland, CA	Carol Thornton, Env. Planner
Aug 16	Association of Bay Area Governments	Oakland, CA	Janet McBride, SFB Trail Director
Aug 16	California Water Control Board	Oakland, CA	Khalil Abu-Saba, mercury expert
Aug 17	San Francisco Bay Model	Sausalito, CA	
Aug 18	Monterey Aquarium	Monterey, CA	
EAST COAST USA PROGRAMS			
Aug 21-24	Chesapeake Bay Program	Anapolis, MD	Greg Peck, a. Deputy Director plus others
Aug 23	Potomac Watershed Forum	Potomic River	Mary Apostolico
Aug 24	Chesapeake Bay Foundation	Anapolis, MD	Linda Tyson, Don Baugh (education)
Aug 24	Maryland Stormwater demo project	Near Washington	Ken Pensyl
Aug 27-29	Narragansett Bay Program	Providence, RI	Richard Ribb, Director
Aug 30-31	Buzzards Bay Program	Wareham, MA	Joe Costa, Director
Aug 31	Barnstable County SS demo site	Cape Cod, MA	George Heufelder, Progr Manager
Sept 4	Cape Cod Commission	Barnstable, MA	Tom Camberieri, hydrogeologist
Sept 4	Waquoit Bay NERR	Waquoit, MA	Christine Gault, Manager
Sept 5-6	Mass Bays Program	Boston, MA	Jan Smith, Program Manager
Sept 6	Mass Coastal Zone Management	Boston, MA	
Sept 7	City Of New Bedford	New Bedford, MA	Scott Alphonse, Environmental Planner
Sept 7	New Bedford Whaling Museum	New Bedford, MA	
Sept 7	Coastal Research Center – University of RI	Narragansett, RI	Virginia Lee
UNITED KINGDOM PROGRAMS			
Sept 11	Devon County Coastal Program	Exeter, Devon	Aidan Winder, Devon Coastal Coord
Sept 11	Devon Wildlife Trust	Exeter, Devon	Richard White
Sept 12	Salcombe-Knightsbridge Estuary Program	Salcombe, Devon	Nigel Mortimer, Estuary Officer
Sept 13	Tamar Estuary Program	Plymouth, Devon	Phillip Moore
Sept 13	National Trust - Cornwall	Truro, Cornwall	Phil Dyke
Sept 14-16	Cornwall coast	Cornwall	
Sept 17	Exe Estuary Program	Exeter, Devon	Richard Hill, Natasha Barker
Sept 19-21	Thames Estuary Partnership	London	Caroline Davis, Manager
INTERNATIONAL PROGRAMS			
Sept 24-25	UNESCO – Coasts and Small Islands	Paris	Dirk Troost, Program Manager
Sept 27-28	IOC – Coastal Zone Management	Paris	Julian Barbieri, Program Manager

COASTAL ZONE 2001 SYMPOSIUM

16-19 July, Cleveland, Ohio, USA

This was the 12th biennial international symposium on coastal and ocean management, held over a 4-day period on the shores of Lake Erie – one of the North American Great Lakes. Over 500 oral and poster presentations were featured, as well as workshops, displays and field trips. The symposium offered an excellent opportunity to get an overview of the current ‘state-of-play’ of programs and initiatives around the world, particularly those in the United States. I made a number of very helpful contacts at this meeting, a number of whom I was able to visit later in my trip. Other highlights of the symposium are listed below:

- Participated in one-day Coastal America workshop – useful overview of USA programs and initiatives;
- Attended over 25 presentations on issues ranging from coastal wetland restoration to dredging;
- Presented poster on Derwent Estuary Program;
- Viewed posters and collected large numbers of documents;
- Visited Cleveland’s revitalised waterfront on Lake Erie and the Cuyahoga River (waterfront walks, parks, Rock & Roll Hall of Fame).

PUGET SOUND

2-7 Aug and 15 August, Olympia, Tacoma and Seattle, Washington, USA

Setting and major issues

Puget Sound is an enormous, sheltered marine system – deep, cold, and with strong tides – that is shared by U.S. and Canada. Key habitat and species include intertidal flats, kelp beds, herring, salmon, seals and orcas. The area is experiencing rapid population growth, particularly in the vicinity of Seattle and Vancouver. Major uses include shipping, shell-fishing and recreational boating. Management issues include urban sprawl, species decline (especially salmon and orcas) and localised toxicant contamination.

What did I do in Puget Sound area?

- Interviewed staff at Puget Sound Water Quality Action Team (PSWQAT);
- Visited Cascade Pole remediation site (Olympia docks);
- Visited Seattle Green Streets Project;
- Visited Olympia waterfront;
- Visited Tacoma waterfront;
- Visited Seattle waterfront;
- Toured Seattle aquarium;
- Went sea-kayaking near Olympia;
- National Wildlife Refuge – walk and interpretation centre;
- Visited PSWQAT staff in Bellingham.

Highlights

- PSWQAT is an excellent, well-established program; good management plan and review process and well-financed/resourced, professional, friendly staff. High quality newsletter and other publications. Good monitoring program – biennial conference, reporting, indicators. Low Impact Development (LID) program was particularly interesting. Also have a long-running Public Involvement and Education (PIE) grant program that is financed through a tobacco tax.
- Washington State (Department of Ecology) has strong regulatory tools and uses them - particularly growth management and stormwater controls.
- Cascade Pole remediation – good example of intertidal remediation of contaminated sediments (phenols, creosote).
- Tacoma waterfront revitalisation – very similar setting and issues as Hobart.

- Seattle aquarium – best of the three I visited. Not overly high-tech; whole-habitat focus (birds, fish, plants in same exhibit); nice integration of art and environment (bronze sculptures, Chihuly glass jellyfish, ceramics). Excellent educational extension programs.
- Sea-kayaking – working shellfish farms, seals, etc. Puget Sound seems to be an incredibly productive ecosystem.
- Seattle Green Streets Project – reconstruction of ‘typical’ suburban street to incorporate stormwater detention using landscaping, reduction of paved areas and native vegetation. Wow!

Challenges

- It is clearly difficult to manage an estuary that extends over such a large area. Regional coordinators are a good first step, but is it possible/desirable to integrate more with regional and local projects?
- Interesting that the PSWQAT does not yet have quantitative targets or goals;
- Curious lack of integration with academic and research institutions. Surprising that such a large program/area does not make more use of deployed moorings or other remote methods for monitoring;
- Focus seems to be mainly at State and Federal levels and then again at community level (PIE projects) – not much seems to be happening with local governments and industries;
- Large amounts of litigation going on – this has both positive and negative aspects, but tends to slow action to a glacial pace.

Things to consider integrating into DEP

- Research conference;
- Indicators;
- Tools for contaminated sediment assessment and remediation (e.g. triad assessment process, intertidal remediation techniques);
- Green Street type demo project to showcase stormwater management techniques;
- Small aquarium/arts/education facility.

FRASER RIVER BASIN/ESTUARY

8-12 August, Vancouver, British Columbia, Canada

Setting and major issues

The Fraser is the largest river/catchment on Canada’s Pacific Coast, where it discharges to Georgia Straits. The main stem has not been dammed and the Fraser is a powerful, wild river system with huge flows, high silt loads and lots of woody debris (an interesting contrast to Columbia River!); floods in mid-summer due to snow melt. The Fraser is one of most productive salmon rivers in the world, also important for migratory birds on the Pacific Flyway. Habitats include riverine/riparian forests, intertidal mudflats and wetlands – large areas have been diked for agriculture and flood control towards estuary mouth. Adjacent marine habitats include cold water ecosystems as in Puget Sound (kelp beds, etc.). Key species include herring, salmon, seals, orcas and birds; sturgeon are threatened. Major uses of the river and estuary include shipping, fishing, agriculture, tourism, industries (esp. wood-based), recreational boating; also forestry and mining further upstream. British Columbia is experiencing rapid growth. And environmental issues include urban sprawl, sewage and stormwater discharges, gravel mining and dredging, flooding, woody debris, and localised toxicant contamination.

What did I do in Fraser River area?

- Visited Fraser Basin Commission (FBC);
- Visited Fraser Estuary Management Program (FREMP);
- Went sea kayaking;
- Visited Fraser River Discovery Center;
- Visited Vancouver Aquarium;
- Explored Vancouver waterfront, including commuter ferries and Stanley Park foreshore trails.

Highlights

- The Fraser Basin Commission is a relatively new initiative (1997) with strong emphasis on economic and social issues. Commission is well-staffed (17) and resourced; director was formerly a politician. FBC is financed in short-term by partners but is looking to be half public/half private funded within 5-years. Commission tends to facilitate controversial regional issues seeking to achieve consensus, these issues include mine remediation, flooding, and agricultural nutrients. Currently completing project to develop indicators (has taken 2+ years), also hold biennial State of the Fraser forums. Still early days – current director is moving on.
- FREMP is predominantly run by statutory managers, with a strong ports flavour; focus is on estuary foreshore and subtidal lands between dikes. Interesting initiatives include coordinated project review process, habitat inventory/classification, dredge management planning, land use plans (ports and municipalities), study of interpretive themes and recreational access.
- Fraser River Discovery Centre – information/education/tourism centre focusing on the Fraser River and its catchment. Some good ideas, though most are not yet implemented.
- Vancouver Aquarium – a major tourism attraction in Vancouver; good opportunity for public education and inspiration, but no estuary focus. Interesting exhibits on salmon migration and habitats.
- Greater Vancouver Regional District– liquid waste management plan: sensible approach to managing the stormwater/sewage spectrum (though GRVD’s proposed approach is controversial). Also have an interesting regional planning process/blueprint.
- University of British Columbia (Patrick Condon) – some very, very interesting initiatives here with sustainable communities and subdivision design (e.g. Headwaters Project).

Challenges

- How will FBC evolve, and who will lead next? No quantitative targets or goals, but these may become clearer once indicators are established.
- Research and information does not seem to be very well developed or integrated in FBC or FREMP.
- Do community NGOs/watchdogs play much of a role in the region? Any major land trusts?

Things to consider integrating into DEP

- Biennial forums;
- FBC approach to defining indicators;
- Certain aspects of Fraser River Discovery Centre and Vancouver Aquarium;
- Liquid waste management plans.

LOWER COLUMBIA RIVER ESTUARY

13-14 August, Portland and Astoria, Oregon, USA

Setting and major issues

Columbia River has a huge catchment area and is analogous to the Fraser in many ways, but with extensive hydropower development (over 60 dams) and intensive use for regional shipping and transportation. Major issues include fish barriers, environmental flows, habitat and species loss (especially salmon), dredging and contaminated sediments (Superfund sites around Portland); also presumably (?) industrial, sewage and stormwater discharges. A large and controversial channel-deepening project has recently been proposed by the U.S. Army Corps of Engineers (USACE).

What did I do in Columbia River Estuary area?

- Visited Lower Columbia River Estuary Program in Portland;
- Visited Columbia River Estuary Study Team (CREST) in Astoria;
- Visited habitat restoration sites around Astoria, and waterfront;

- Visited Willapa Bay National Wildlife Refuge.

Highlights

- The Lower Columbia River Estuary Program (LCREP) focus is on the tidal area below Bonneville dam; fairly new program – Management Plan just completed in 1999. Good children’s education/stewardship program – ‘Kids for the Columbia’ (boat trips, school curricula, awards, grants, family festival). Also an interesting urban run-off (NEMO) project. Have recently shifted to non-profit status, with a heavy emphasis on fund-raising, including private sector sponsors.
- City of Portland – some very interesting stormwater management/landscaping projects (e.g. water gardens, rooftop gardens, planter boxes).
- CREST is an independent organisation with strong focus on research, monitoring and projects. Nice people, very hands on. Implementing a number of habitat restoration projects by improving tidal connections (e.g. culvert and tide gate modifications). Constrained by funding
- Headwaters to Ocean (H2O) Project – educational NGO that runs historic tugboat/educational trips for kids. Good way to link different stretches of very large system.
- USACE has recently been awarded megabucks for a regional habitat restoration program.
- Astoria is a beautiful town at estuary mouth - somewhat economically depressed. Some interesting waterfront restoration projects in progress, including a maritime museum and tramway.

Challenges

The Columbia River system is in serious trouble, as illustrated by the loss of salmon. ‘Dam-busting’ is a hugely controversial and political issue. LCREP seems to avoid some of the more highly charged, controversial issues (i.e. industrial and sewage discharges, environmental flows and barriers). This may be a pragmatic survival technique, but not clear that the full range of issues is being addressed by other organisations either.

Things to consider integrating into DEP

- Non-profit status (but consider time required for fund-raising);
- Education/stewardship program that focuses on kids;
- H2O boat trips using historic vessels;
- Portland stormwater/landscaping initiatives;
- Restore flows to wetlands by modifying tidegates and culverts.

SAN FRANCISCO ESTUARY

16-18 August, San Francisco, Oakland and Monterey, California, USA

Setting and major issues

San Francisco Bay is the West Coast’s largest estuary (1600 sq mi/drains 60,000 sq mi) and is fed by the Sacramento and San Joaquin Rivers at its northern end. The Bay is relatively shallow (most is <4 m deep) and the delta at its northern end is an important feature (‘Everglades of the West’), with extensive wetland, mud flat and island habitats – important birds and fish nursery areas. The rivers are extensively used for hydropower, irrigation (most flows are diverted to the Central Valley), water supply and transportation. The Bay itself is used for shipping, salt manufacture and recreation. Major issues include urban sprawl, environmental flows, severe habitat and species loss (>90% of wetlands lost), marine pests (most infested estuary in USA), dredging, and contaminated sediments and seafood (particularly with mercury). A controversial airport runway extension has recently been proposed. On the whole, the Bay has been severely degraded through a combination of mining, hydropower, irrigation, dredging and filling of wetlands, as well as rampant growth and development.

What did I do in San Francisco area?

- Visited San Francisco Estuary Program in Oakland;
- Visited Association of Bay Area Governments in Oakland;

- Attended a presentation on mercury contamination in the Bay by the SF Water Quality Control Board;
- Visited the Bay Model in Sausalito;
- Visited Monterey waterfront and aquarium.

Highlights

San Francisco Estuary Program:

- excellent publications, especially the bi-monthly newsletter, Ecosystem Goals, Species and Community Profiles, and the Bay-Delta Report Card;
- Sediment and erosion control training courses and materials;
- biennial conferences.

Wetlands restoration projects – scores of these are underway or planned by a wide range of organisations;

Research and monitoring programs – particularly through San Francisco Estuarine Institute (SFEI), which I was unfortunately not able to visit.

- Delta salinity and flow management (volume of water is ‘banked’ and released for fisheries) – CALFED;
- Toxics budget – SFEI;
- Bioaccumulation model (selenium) – USGS;
- Mercury criteria and TMDL management approach – SF Water Quality Control Board;
- Rapid assessment surveys for marine pests – SFEI.

Bay Trail and associated publications –project to develop a ‘round the Bay’ walking trail;

Bay model – scale model of the Bay, with water, tidal action, etc, very interesting educational tool;

Monterey aquarium – amazing! Focus is predominantly on local and regional ecosystems. Excellent jellyfish and seahorse displays.

Challenges

- The Bay area seems to have dozens of overlapping and competing programs and players – highly politicised and fragmented. No clear lead agency, though CALFED seems to be by far the largest player;
- Surprisingly little emphasis on regional approaches to diffuse source pollution (e.g. urban runoff, agricultural inputs) or on low impact development/growth controls;
- Huge amounts of litigation going on – again, there are pros and cons of this approach.

Things to consider integrating into DEP

- Biennial conference;
- Ecosystem goals/profiles approach;
- Sedimentation and erosion control project;
- Bay Trail and handbook;
- Mini-aquarium;
- University of California water reduction project (50%);
- ‘Day-lighting’ of urban streams (e.g. San Luis Obispo);
- WQO/TMDL process for heavy metal contamination; salinity management regime for fisheries.

CHESAPEAKE BAY

21-24 August, Annapolis, Maryland, USA

Setting and major issues

The Chesapeake is the East Coast's largest estuary, with an enormous watershed that falls within four states/districts (Maryland, Virginia, Pennsylvania and Washington D.C.). It is a relatively shallow estuary with a very convoluted shoreline and extensive wetlands, underwater grasses and oyster reefs that provide habitat for birds (waterfowl, bald eagles) and many species of fish and crabs. The Bay is used for fishing, recreation, shipping and some water dependent industries (e.g. naval facilities), and has been seriously degraded as a result of land clearing/development and overfishing (oysters, shad, menhaden, blue crab). Major issues include eutrophication (turbidity and nutrients), low dissolved oxygen, loss of wetlands, underwater grasses and oyster reefs, rapid growth/sprawl and toxicants (3 main hot spots). The Chesapeake has been classified as an impaired water by the USEPA, and water quality objectives (WQOs) and associated Total Maximum Daily Loads (TMDLs) are required to be developed. The Chesapeake Bay Program is currently in the process of setting objectives, criteria and apportioning loads. There are a very large number of organisations in region – and the degree of coordination between them is unclear.

What did I do in Chesapeake Bay area?

- Visited the Chesapeake Bay Program (CBP);
- Walked around the Annapolis waterfront;
- Attended a one-day Potomac Watershed Forum;
- Visited the Chesapeake Bay Foundation;
- Visited the State of Maryland's stormwater management demonstration site.

Highlights

Chesapeake Bay Program

- Rigorous science-based approach – indicators, WQOs, criteria, modelling, monitoring – links to TMDLs;
- 2000 Chesapeake Bay Agreement – clear goals, backed by EPA mandate under Clean Water Act;
- Excellent indicator and monitoring reports;
- Community Watershed Initiative – useful documents packaged for community groups and local governments; seed grants are also being disbursed for specific projects;
- Toxics program – 3 main hotspot focus areas; different remediation approaches being trialed in each;
- New education focus ('meaningful CB experience') starting with an Education Summit;
- Just starting to address stormwater – first step is to manage stormwater runoff at government-owned sites;
- Gateways Network initiative – regional linkage of attractions and trails into a 'virtual national park'.

State of Maryland

- Excellent stormwater management approaches at both state and county levels (Prince Georges County) – regulations (% reduction), BMP demo site; guidelines for new developments;
- Growth controls;
- Sea level rise regulations;
- Environmental education (Living Classrooms).

Chesapeake Bay Foundation

- Mega-NGO – parallels/competes with the CBP; currently lobbying for US\$8 billion in congressional funding to reduce nutrient loads;
- Brilliant environmental education program – over 50 full-time educators lead field trips (canoes, skipjacks and island camps), develop school curricula and train teachers;
- Independent newsletters, analyses and reporting (CB Index, State of the Bay reports);
- Recently constructed new headquarters - Phillip Merrill award-winning green office building;
- Habitat restoration projects (seagrass, oysters).

Challenges

- CBP's modelling approach seems excellent, but how to address expense and uncertainties?
- How do various organisations fit together? Seems to be considerable overlap/competition between CBP and CBF (alternative State of Bay reports). Maybe this is good to get range of views, but is very confusing to outsider...
- Role and involvement of local governments and industries is unclear, not very well networked;
- Issues of sprawl, agricultural and urban runoff seem to be managed in a fairly piecemeal way;
- Monitoring is surprisingly low-tech (i.e. no deployed meters, 3-day collection time) given low DO issues and scale of programs;
- Unclear what is going on regionally with habitat restoration – is there a central clearing-house to assess, monitor and report on outcomes?

Things to consider integrating into DEP

- Indicators, WQOs, modelling, monitoring, TMDL approach;
- Develop quantitative program goals and include in next DEP agreement;
- Survey of community groups to assess their needs;
- Field-based education programs;
- Consider Maryland- type stormwater approach – 10% reduction, BMPs demo site, start with government-owned sites;
- Consider toxic remediation approaches being developed at 3 hotspots;
- Virtual park approach – node(s) and associated sites;
- Water trail in upper estuary;
- Annual watershed forum;
- Eel ladder (a la Susquehanna River).

NARRAGANSETT BAY

27-29 August and 7 September, Providence, Rhode Island, USA

Setting and major issues

Narragansett Bay is 300 sq km in size, with a 3000 sq km catchment in two states (RI and MA). Two million people live within the catchment and it has a long history of industrial and urban development. The Bay is relatively deep (30'), with low river flows and a one-month residence time. It contains important salt marsh wetlands, tidal flats and island habitats, but has very little remaining seagrass. Key fauna includes birds (waterfowl, shorebirds, osprey) and fish. The Bay is heavily used for recreation, shell- and fin-fishing, shipping (a major fuel import/distribution port) and some water dependent industries (navy submarine yard, boatbuilding, marine electronics). Major issues include poor water quality (low dissolved oxygen, faecal contamination of shellfish beds, nutrient enrichment and thermal pollution), fisheries decline (oysters, scallops, migratory fish, flounder), loss of wetlands and seagrass, rapid growth/urban sprawl, combined sewer overflows (over 100), contaminated sediments and oil spills. Current controversy over proposed new port development.

What did I do in Narragansett Bay area?

- Visited Narragansett Bay Estuary Program (NBEP);
- Boat tour of Bay;
- Visited several small towns and wetland restoration sites;
- Visited University of Rhode Island's Coastal Research Center (URICRC);
- Spoke with Save the Bay.

Highlights

Providence has many similarities to Hobart– old urban/industrial area, economically depressed, growing tourism market, waterfront revitalisation. Narragansett Bay is also similar in scale to the Derwent, and has a number of issues in common. The Narragansett Bay Estuary Program (NBEP) is currently in the process of reviewing/revising their management plan. NBEP sits within the state government, but is not well supported – looking to move to more neutral forum (URI?). Rhode Island is a very small state – local politics at state and county levels. There are several other major player in region, particularly Save the Bay and URI's Coastal Resource Centre.

- NBEP projects and initiatives of particular interest include:
 - Habitat restoration – mapping, prioritisation and projects;
 - Better management of sewage treatment to achieve toxics reduction (90%) and denitrification;
 - Combined sewage overflow programs (including drilling of enormous storage tunnels in bedrock underneath Providence);
 - Phosphate reduction legislation;
 - Excellent program on boat wastes – no discharge zones, pump-out facilities and marina BMPs;
 - Monitoring – volunteer DO surveys, deployed moorings, new research vessel (Bay Windows); recent indicators workshop;
 - Review/revision of CCMP – starting with 2-day Bay Summit; shift to neutral forum.
- Save the Bay – educational programs for schools, families and general public;
- URI-CRC – Washington County and Aquidneck Island coastal planning projects;
- City of Providence waterfront revitalisation;

Challenges

- Unclear how state and local governments fit into broader management picture for the Bay; political pressure for big development (e.g. new port) at state level;
- Very little State funding has gone into NBEP;
- Better links with academic and research institutes?

Things to consider integrating into DEP

- Habitat mapping and prioritisation approach;
- Better sewage management through trade waste management and denitrification;
- Boat waste management approach;
- Move DEP out of State Govt and into neutral forum?
- Bay summit approach;
- Save the Bay type educational programs – school programs, summer camps and general public programs

BUZZARDS BAY AND CAPE COD

30 Aug to 4 September, Cape Cod area, Massachusetts

Setting and major issues

Buzzards Bay has a relatively small watershed (<1000 sq km), and scattered population (250,000) - New Bedford is the only city. The Bay is a deep, predominantly marine embayment and is well-flushed and clean, with exception of small restricted harbours and the New Bedford area. Important habitats/species include salt marsh and tidal wetlands, eelgrass, fish and birds (osprey). Issues include rapid population growth/urban sprawl, shellfish bed closures and nutrient enrichment in localised areas (mostly linked to septic systems and stormwater runoff). New Bedford has major sediment contamination problems (PCBs and heavy metals), as well as sewage and CSO issues. Cape Cod's coastal areas are managed through a range of different programs (2 NEPs, 1 NERR, various state, regional and local initiatives).

What did I do in Buzzards Bay area?

- Visited Buzzards Bay Estuary Program, (BBEP);
- Visited several stormwater management projects (wetland, infiltrating catch basins);
- Visited Barnstable County's alternative septic system design and monitoring facility;
- Visited Waquoit Bay National Estuarine Research Reserve (WQNERR);
- Visited the Cape Cod Commission – a regional planning authority;
- Visited New Bedford (City offices, whaling museum and waterfront revitalisation).

Highlights

- Buzzards Bay Estuary Program: focus is on local government technical assistance and demonstration projects. Particularly good projects and initiatives include:
 - Stormwater infrastructure maps, treatment wetlands, infiltrating catch basins;
 - Alternative septic system test site and SepTrac program;
 - Salt marsh tidal restriction atlas;
 - Open space and recreation plans.
- Buzzards Bay Coalition: main citizens group/watchdog in the region. Good education programs, citizens monitoring, and links with scientists at UMass Dartmouth. The Coalition also supports the Bay Lands Center (regional network of land trusts).
- New Bedford is very, very similar to Hobart/Derwent: historic whaling town, industrial history, severe sediment contamination. City is in major period of transition and revitalisation, including massive sediment remediation (EPA superfund site), redevelopment of waterfront, tourism, and arts. City has an excellent whaling museum, and plans for an Oceanarium, also a lot of brownfields redevelopment. City center is now a National Park – lots of federal funding pouring in.
- Cape Cod Commission: a regional planning authority 'with teeth'. Consistent planning guidelines and assessment of major projects for the entire Cape. Have also initiated an excellent Land Bank, funded through property tax surcharge.
- Waquoit Bay NERR – good integration of research, education and management. Strong links with research institutes, including Woods Hole. Excellent/attractive waterfront facilities help make this possible. Coastal decision-maker workshops.

Challenges

- Is the BBEP's pragmatic focus on technical assistance and projects enough, or is there a need for a broader, long-term vision and management 'blueprint'?
- The Cape does not seem to have a very coordinated approach to CZM – mosaic of different programs and projects.
- Cape Cod Commission just squeaked in (52% vote) and there were many concerns about imposition of regional programs/policies at the time. How has this panned out?

Things to consider integrating into DEP

- Specific projects – stormwater treatment wetlands, stormwater infrastructure maps, industrial pre-treatment program (New Bedford); salt marsh atlas as means for identifying priorities;
- New Bedford sediment remediation approach – first characterise sediments, next clean up major hotspots, finally implement more regional restoration. This has been funded by the U.S. federal government – the Derwent will also need federal funding or the clean-up will never happen. Could funding from national salinity/water quality type program eventually be directed towards this?
- DEP could benefit from attractive waterfront facilities;
- New Bedford revitalisation – whaling museum, oceanarium, arts, brownfields redevelopment – possible links with Hobart as a sister city?
- Cape Code-type Land Bank.

MASSACHUSETTS BAYS AND BOSTON HARBOUR

5 - 6 September, Boston, Massachusetts

Setting and major issues

Massachusetts Bay has a very large watershed and population, made up of over 50 coastal communities, including Boston. The Bay is essentially an open marine ecosystem with many small embayments. Tides are significant (3 m) and important habitats/species include tidal flats, salt marshes, fish and birds (esp. waders). The area also contains the Stellwagen Marine Sanctuary, with many whales. Issues include population growth/urban sprawl; localised closure of shellfish beds, pollution from stormwater, sewage, combines sewage overflows (CSOs) and septic - also localised contamination of sediments (e.g. Boston Harbour) and dredging issues. The Mass Bays National Estuary Program is relatively small and most staff are associated with regional planning agencies. The Massachusetts office of Coastal Zone Management plays a big role, as does State Watershed initiative. A huge sewage and CSO treatment project has just been completed for the Boston area, which discharges to Mass bays via ocean outfall. Boston Harbour and islands are now becoming a bigger focus for development, as water quality has improved. Mega-transportation project will also result in large areas of open space, including foreshore – expect a big harbour transformation within the decade?

What did I do in Mass Bays/Boston area?

- Visited Massachusetts Bays National Estuary Program;
- Visited Mass Coastal Zone Management – information on dredging/contaminated sediments;
- Boston waterfront walk.

Highlights

- Mass Bays NEP: trying to strike a balance between centralised and regional management approaches. Management and Action plans currently under revision. Interesting initiatives include: shellfish restoration program; Healthy Habitats Initiative; land use/growth management tools (Green Neighbourhoods program); Great Marsh campaign; EPA-funded monitoring program.
- Mass CZM: interesting work with confined aquatic disposal of contaminated sediments in Boston Harbor, dredged materials management plan (identification of disposal sites).
- Other effective State programs include: Watershed Initiative, Wetlands Protection Act, Smart Growth, brownfields redevelopment, open space and recreational planning.
- Many, many active land trusts in MA – including the Cape Cod Compact and Bay Lands Center.

Challenges

MBNEP seems under-resourced for such a large area and population base. Many, many federal, state, regional and local players - links between the various programs are unclear.

Things to consider integrating into DEP

- Regional open space and recreational plans;
- Tasmania needs some wetlands protection legislation – the MA Wetlands Protection Act has been incredibly successful in preserving habitat;
- Confined aquatic disposal of contaminated harbour sediments;
- How to encourage land trusts?

EXE ESTUARY

11, 12, 17 September, Exeter, Devon, UK

Setting and major issues

The Exe Estuary is surrounded by a rural/urban catchment, 1500 sq km in size. It is a shallow, tidal estuary with extensive mudflats, wetlands, sand spits and dunes at mouth – an important area for birds. The estuary is in transition from a commercial port to predominantly recreational resource. Uses include boating, fishing, tourism, foreshore trails and bike tracks. Issues include river and ocean flooding, conflicts over harbour management (i.e. introduction of user fees), conflicts between recreational users and birds, and (presumably) agricultural and urban runoff. The Exe Estuary program is small (one officer) and has a history of conflicts over harbour management and somewhat tenuous funding. It is currently evolving towards a more community-oriented approach. Exeter has recently undergone a fair amount of waterfront revitalisation.

What did I do in Exeter area?

- Visited Exe Estuary Program;
- Visited Devon Wildlife Trust;
- Walked along estuary/wetlands track;
- Boat trip on nearby Salcombe-Knightsbridge Estuary.

Highlights

- Annual public forums, including field trips;
- Exe Explorer pamphlet and series of sign boards;
- Walking trails and bike paths.

Challenges

- Issue of harbour management/fees is highly controversial;
- Seem to be multiple plans (Habitats Directive, Local Environmental Action Plan) in region that are not particularly well integrated;
- Very little water quality focus in estuary – LEAP mainly seems to address river water quality rather than marine or estuarine;
- Uncertainty of long-term funding is a major issue.

Things to consider integrating into DEP

- Annual public forums, including field trips;
- Exe Explorer-type pamphlet and series of sign boards.

TAMAR ESTUARY

13 September, Plymouth, Devon, UK

Setting and major issues

The Tamar catchment contains both rural and urban land uses and is located in two counties (Devon and Cornwall), with a population of approximately 400,000. The estuarine system consists of a complex of several river estuaries, plus the more marine Plymouth Sound. The Tamar is strongly tidal with large areas of mudflats and important bird habitat. Uses include shipping, recreational boating, waterfront recreation and tourism. Issues seem to mainly focus around waterfront use and access. The Tamar program seems to be very well-coordinated, with good integration between the various statutory authorities and planing frameworks. Considerable effort went into documents, reports and raising the public profile early on. The program has a good history of attracting external funding (over 1 million pounds) and support for maintaining core funding. The main emphasis seems to be on port-related issues, collection of information, waterfront access, infrastructure and interpretation. The

program is relatively well-staffed (2+ officers). Considerable waterfront revitalisation is currently underway in the Plymouth area.

What did I do in Tamar area?

Visited Tamar Estuary Program (unfortunately did not have time to visit waterfront and aquarium).

Highlights

- Good information, communications, practical documents;
- Very successful at raising outside funding;
- Various statutory plans (LEAP, SAC/LPA) have been well-integrated;
- Waterfront access, walkways and interpretation.

Challenges

- Curious lack of focus on habitat or water quality ‘issues’ given density of population and diversity of uses in the area – these issues seem to be handled by English Nature (SAC/LPA) or Environment (LEAP);
- Not much information about monitoring/investigations of water quality or habitat. Links with Plymouth Marine Lab and aquarium?
- Community role in planning process is unclear.

Things to consider integrating into DEP

- Small craft guide;
- Water zoning maps – uses and restrictions;
- Audit of shoreline change;
- Waterfront inventory (access points) and Port of Plymouth recreation study;
- Waterfront walkway pack (guide, audiotape, CD), enhancement, access signage, interpretation.

FAL ESTUARY

14 - 16 September, Falmouth, Cornwall, UK

Setting and major issues

The catchment to Fal Estuary is mainly rural with several mid-size towns. The estuary is deep with strong tides and extensive flats – an important bird habitat. The region is somewhat economically depressed – previous regional industries centered around pilchard fishery, mining and agriculture, now shifting towards ports/dockyards (fuel bunkering), deep-water fishing fleet and tourism. Issues include water pollution (sewage, oil spills, agricultural run-off), sediment contamination (mining, china clay pits), shellfish contamination, habitat loss (e.g. calcified seaweed harvest, anchoring of large vessels in seagrass), fisheries and bait collection. The area is in transition to more intensive tourism, with some development pressures around resort areas. A fair amount of EU funding is available due to ‘economically depressed area’ status. A big new maritime museum complex is being built in Falmouth. The estuary program is currently in limbo – no funding for officer – and may be replaced with a statutory plan, as required under the new EU Habitats Directive, but there are concerns that this may not be as comprehensive as the original plan. The National Trust owns and manages large areas of the estuary shoreline.

What did I do in Fal area?

- Visited National Trust;
- Explored Falmouth waterfront;
- Visited other areas of Cornwall coast (Lands End, Penzance).

Highlights

- National Trust - powerful, independent land-owner and manager;
- Tour of National Trust's Messack Farm – working farm with wildlife-friendly practices;
- Cornwall coast and National Coastal Path;
- Falmouth waterfront – nice mix of working port, historic features and recreational uses;
- Estuary historic audits.

Challenges

Estuary program is currently in limbo – no one at the helm. No clear continuity or linkages with LEAP or Habitats Plan.

Things to consider integrating into DEP

- We need a National Trust to buy up and manage coastal lands!;
- Estuary historic audit;
- Pamphlets: Out and About on the Fal, Birdlife on the Fal Estuary

THAMES ESTUARY

17-21 September, London, U.K.

Setting and major issues

The Thames has a very large and densely populated catchment (12 million people). The estuary is strongly tidal and contains large areas of tidal flats and marshes near the mouth, providing important bird habitat and fish nurseries (SPA and Ramsar sites). Uses include ports/shipping, waterfront development, recreation and fishing. Issues include water pollution (sewage, CSOs, stormwater), low dissolved oxygen (Thames bubbler was installed to improve oxygen levels), flooding, dredging, waterfront development, use and access. The Thames Estuary Partnership (TEP) has been running since 1993; management plan published in 1999. The program has operated with minimal resources (one officer) until recently, but has now attracted considerable EU funding, added staff and reconfigured as a charitable trust. The TEP supports numerous Action Groups, publications, a website, newsletters – very dynamic program.

What did I do in Thames area?

- Visited Thames Estuary Partnership;
- Walked along Southbank area.

Highlights

- TEP annual forum and annual report format;
- Research forum;
- Strong archaeology action group;
- Interesting publications:
 - Newsletter
 - Recreation study (land and water-based)
 - Education action plan
 - Habitat Action plan.

Challenges

- Program area extends only to mid-London and does not include land catchment areas;
- Minimal resources for such a large, heavily populated, complex system – a big ask, despite talented staff. Have only been able to expand due to EU funding;

- Not a great deal of community interest/support – Thames seems to be surprisingly cut off from most of London;
- Not much participation/support from industry or local government.

Things to consider integrating into DEP

- Annual forum;
- Annual report format;
- Recreation study;
- Research forum.

International Coastal Zone Programs

24-28 September, Paris, France

There are a number of international coastal zone programs coordinated by UNESCO and other international NGOs that link and support management initiatives in different countries. During the final week of my trip I contacted and met with a number of programs and individuals to learn more about the ‘state-of-play’ of these programs. Programs and activities of particular interest include:

UNESCO’s Coasts and Small Islands Initiative

- Field projects;
- Wise practices internet forum.

Intergovernmental Oceanographic Institution – Integrated Coastal Area Management Program

- Methodology manuals;
- Symposia and workshops.

European Union – Environment Directorate

- ICZM Demonstration Project (35 case studies);
- Coastal tourism study.

CONCLUSIONS

In summary, during the period between 15 July and 1 October 2001, I visited nearly 40 organisations, ranging in scale from international NGOs such as UNESCO to multi-state/federal programs (e.g. Chesapeake Bay) to small, local programs (e.g. Waquoit Bay). Some were predominantly government run, other were land trusts, research institutes, community organisations, etc. The intent of the trip was to see how these programs had made the transition from planning to management and to identify specific tools and approaches that could be effective in an Australian/Tasmanian context. The following programs and tools seem to have been particularly effective:

- State of Washington – Growth Management Act, stormwater management guidelines;
- Puget Sound Program – low impact development, effective funding arrangements, indicators and reporting;
- Greater Regional Vancouver District – growth management approach, liquid waste management planning;
- City of Portland – low impact development, stormwater management techniques;
- San Francisco Regional Water Board – mercury contamination management approach;
- Association of Bay Area Governments – San Francisco Bay Trail;
- San Francisco Estuarine Institute – research, modelling, introduced marine pest rapid surveys;
- Aquariums – Monterey, Vancouver and particularly Seattle;
- Chesapeake Bay Program – science-based management, modelling, indicators and reporting, water quality criteria, Chesapeake Bay 2000 management agreement;
- Chesapeake Bay Foundation – effective/inspiring NGO, education, green office building;
- State of Maryland – growth management regulations, stormwater guidelines, environmental education;
- Prince Georges County – stormwater management and demo project;
- Narragansett Bay – management forum, monitoring;

- Buzzards Bay – pragmatic focus on projects and assistance to local governments;
- Waquoit Bay – science/management integration, training workshops;
- Cape Cod Commission – regional agency with statutory clout, effective land bank;
- State of Massachusetts – Wetlands Protection Act, State Watershed Initiative;
- City of New Bedford – clean up of contaminated sediments, downtown/waterfront revitalisation, excellent whaling museum;
- University of Rhode Island/Coastal Research Center – practical yet academically rigorous framework for ICZM; Washington County and Aquidneck Island projects;
- Tamar Estuary – port-oriented program; good integration of overlapping management plans;
- Thames Estuary – well-structured program, broad range of issues;
- U.K. National Trust –very inspiring NGO that own and manage one third of U.K coast;
- European Union – pilot project on ICZM, European directives.

As a broad generalisation, it seems that the most effective outcomes are achieved where there is a combination of effective statutory-driven management, well-funded land trusts and outspoken watchdog/advocacy NGOs. The U.S. has some very effective regulatory tools at the federal level (e.g. Clean Water Act), at the State level (e.g. MA Wetlands Protection Act) and even at the county and local government levels (e.g. Cape Cod Commission, Prince Georges County). The UK's land planning controls appear to be extremely effective in managing sprawl – the visual contrast between extreme urban sprawl in the USA and UK was startling. The UK's National Trust also plays a critical role, owning and managing over 30% of the coastline. Litigation has great influence in the U.S., with both positive and negative consequences – a great deal of management takes simply to avoid potential lawsuits. Finally, consistent long-term funding is clearly essential – continuity is perhaps more important than the overall amount.

RECOMMENDATIONS

There are a number of approaches and tools that will be very useful to my work in the Derwent Estuary Program. These include:

- continuation and enhancement of our science-based approach. Hold a science/management forum, continue-development of indicators, objectives and criteria, improve monitoring, enhance links with research and educational facilities;
- work towards development of more quantitative management goals;
- field-based education and awareness;
- low-impact-development approach to stormwater management (source controls).

In addition, it is clear that we need to develop/enhance a more active network of estuary/coastal managers at both the state and national level to share information, provide a support network and develop a collective voice to lobby for funding.

On the whole, I found the CHF to be an extremely valuable and invigorating experience.

A few practical notes for future Fellows:

Starting my trip at a major professional conference was an excellent way to get an overview of the international big picture and to network. I met a number of very helpful people who were able to advise me on particularly good organisations and individuals to visit later in my trip. I would also suggest that Fellows leave a little space in their schedules to follow up on interesting programs and individuals that you discover along the way.

A brief word of caution regarding expenses... The Aussie dollar collapsed several months before my departure and had I not been in the fortunate position of being able to stay with many family and friends (and occasionally with hosts) along the way, I would have had to bear considerable financial costs. I found costs overseas to be very high, even at the extreme budget end. Rental cars – particularly short-term – cost at least \$US50/day – and this was essential for the type of programs I was visiting. A cheap hotel in the U.S. typically cost \$US 75 to \$100 (more in major cities) and even YMCAs were about \$50 for a spartan room with shared bath. Camping and youth hostels are not really feasible if you are trying to maintain a professional appearance and plug in a lap-top in the evenings. Costs in the U.K were similar.

Small Australian gifts were very welcome, particularly Australian fauna/flora coffee mugs and maps (Australian Geographic's giant inflatable red back spiders were a particular hit with kids!).