CHAIN REACTION

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WATER FEATURE

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www.foe.org.au

Chain Reaction is produced in Melbourne, Newcastle and Perth. We acknowledge the traditional owners of these lands and the fact that Aboriginal land has never been ceded.

EARTH NEWS

Lake Cowal Easter Gathering

Since 2001, Traditional Owners and supporters have spent Easter at Lake Cowal defending the rights of the Wiradjuri people to access land and protect their sacred sites from mining. Barrick Gold, now the biggest gold mining company in the world, owns and operates an open-cut gold mine at Lake Cowal using cyanide leaching to process the gold. Lake Cowal is part of an intricate wetland, in the centre of the Murray Darling basin. Come and camp out at Lake Cowal this Easter weekend for music, action and learning with the Mooka Kalara united families and supporters.

More information <www.protestbarrick.net>, <www.myspace.com/lakecowal> Contact: Mia Pepper <bar_barrick@yahoo.com.au> 0415 380808

Alistair Hulett

Alistair Hulett, an icon of Scottish folk music, international socialism, and Australian punk rock died in early February, aged 57. Fellow musician David Rovics said: "He lived for 25 years in Sydney and was on the ground floor of the Australian punk rock scene, playing in towns and cities throughout Australia with his band, Roaring Jack. The band broke up decades ago but still has a loyal following throughout the country. Roaring Jack was a brash, in-your-face musical experience, championing the militant end of the Australian labour movement and leftwing causes generally, fueled by equal parts rage against injustice, love of humanity and alcohol." Since the 1990s Alistair has lived in his native Glasgow. He was an organiser, a historian of social movements, and an inspiring human being.

Gunns 20 case settled

The Gunns 20 court case finally came to a close on January 29 when Gunns agreed to a settlement with the four remaining defendants. This occurred ahead of the trial, set for the following week, with Gunns company secretary stating the settlement was a "commercial decision to avoid a lengthy and expensive court case". The case started in 2004 when Gunns sued 20 individuals and groups for $6.4 million for loss of business as a result of protest activities. Forests and free speech activists around Australia are celebrating this long awaited victory. Gunns has paid $1.3 million in settlement costs to Gunns 20 defendants and $2.8 million in legal costs.

The company continues legal action against 13 people in relation to a protest at the Triabunna woodchip mill.

More information <www.gunns20.org>

Greenhouse trigger dumped

Friends of the Earth Australia condemned the announcement late last year by federal environment minister Peter Garrett that the government would no longer support the inclusion of a climate change trigger in the Environmental Protection and Biodiversity Conservation Act. Garrett announced the breaking of this election promise while releasing the Hawke report into the EPBC Act.

Information on the Hawke review is posted at <www.environment.gov.au/epbc/review/index.html>

Progress towards an anti-biopiracy treaty

Over 15 years of lobbying and negotiation by developing countries may pay off this year, as prospects rise for the finalisation of a Protocol on Access and Benefit Sharing under the Convention on Biological Diversity. Developing country governments and organisations representing Indigenous Peoples' rights have been campaigning for years to put an end to the misappropriation of biological resources and traditional knowledge. Although many national laws exist around such biopiracy, campaigners argue that once biological resources and/or associated knowledge are removed from the country of origin, it becomes very difficult to enforce such laws and rights.

To support these rights, developing countries have been calling for a single international, legally binding agreement. In 2005, formal negotiations began to form such an agreement but were resisted by developed countries, backed by business interests such as the pharmaceutical and biotechnology industries.

In late 2009, there was a significant shift in the international sphere, indicating that more developed countries may be willing to agree to a Protocol. The details are yet to be determined, with the final text likely to be negotiated before being sent to the Conference of Parties in October 2010.

Source <www.twnside.org.sg/title2/resurgence/2009/231-232/cover1.htm>

UN report recognises impacts on Indigenous Peoples

The United Nations recent report 'State of the World's Indigenous People' reveals that land-grabbing by state authorities and state supported private interests is contributing to the high levels of abject poverty amongst Indigenous Peoples. Released in January, the report confirms that the dispossession of Indigenous Peoples from lands and territories is ongoing, promoted by development and globalisation policies. The report notes that despite the 2007 Declaration on the Rights of Indigenous Peoples and other international documents recognising the rights of Indigenous Peoples, abuse, displacement and marginalisation is ongoing.

The report is posted at <www.un.org/esa/socdev/unpfii/en/sowip.html>.

ANZ Bank funding terror weapons, Uniting Church says

The ANZ Bank is funding terror weapons whose manufacture, trade and use have been banned under a convention signed by Australia, the Uniting Church said late last year. The church's Victorian social justice

spokesperson, Mark Zirnsak, said ANZ had joined a global consortium lending money to Lockheed-Martin, which manufactures cluster bombs.

More information <http://blogs.victas.uca.org.au/mediaroom/?p=506>

GE-free gains traction

Four major brands, Nestle, Schweppes, Lindt and Fosters have committed to keeping their Australian brands free from genetically engineered (GE) ingredients, creating easier choices for people wishing to avoid GM foods. This was revealed in Greenpeace's 2010 Truefood Guide, which provides options for consumers where labelling laws fail to provide protection. Despite this recent win, and continuing public concern over the health impacts of GE ingredients, they are reportedly making it into an increasing number of products on supermarket shelves.

Truefood Guide <http://truefood.org.au>
Source <www.ecovoice.com.au/eco-news/84>

NT project highlights housing plight

A central Australian Aboriginal community has built a house to protest against the lack of government support for housing. Residents of Ampilatwatja, north-east of Alice Springs, have been living in a camp since walking off their community in July in a protest about poor housing standards.

They enlisted the support of interstate trade unions to build a demountable at the protest camp this week. Martin O'Malley from the Construction, Forestry, Mining and Energy Union said trade unions decided building a house was the best way to help Ampilatwatja residents: "It's more about giving them some facilities that they can work in and then build from and I think in some ways it's a political statement to say that look, you can actually put a house up a lot quicker than what's being done."

Funding appeal for NT intervention film

Actively Radical TV is planning a documentary on the NT Intervention to document its impacts on local Aboriginal communities. ARTV will be distributing the film around the country, holding film screenings and launches and using them as an opportunity for indigenous leaders to speak with audiences. ARTV is calling for donations to support this project. You can donate by posting a cheque to PO Box 3275, Marrickville Metro LPO, NSW, 2204. Or make a direct deposit to: Actively Radical TV, Commonwealth Bank, BSB 062193, Acct No 1003 2805.

If you donate, please email Jill Hickson <jill@artresistance.com.au> so ARTV knows it is a donation to support the NT video documentary project.

People's blockade of world's biggest coal port

Hundreds of people will peacefully occupy Newcastle Harbour, and prevent the passage of coal ships, on March 28. This will be the fifth action of its kind in Newcastle. No-one has been arrested at these actions.

At the last, in March 2009, all ship movements in the harbour were stopped for the day. Newcastle, already the world's biggest coal port, is set to open a massive new coal terminal this year, bringing the export capacity of the Hunter Valley coal chain to 178 million tonnes of coal a year. The protest is being organised by Rising Tide <www.risingtide.org.au>.

WWF confronted for greenwashing palm oil

An open letter signed by more than 80 organisations from 31 countries was delivered in November to the Roundtable on Sustainable Palm Oil (RSPO) and to World Wildlife Fund (WWF).

The organisations urge an end to the certification of palm oil plantations as being "sustainable". According to the open letter, palm oil companies certified by the RSPO are directly responsible for much social and environmental damage, dislocation of local populations' livelihoods, destruction of rainforests and peat lands, pollution of soils and water, and contributing to global warming.

The letter states that the certification delivered by the RSPO is insufficient and unreliable and that the real goal of the RSPO certification is not to protect people or the environment but "to legitimise an expansion in the demand for palm oil" and to serve "to 'greenwash' the disastrous social and environmental impacts of the palm oil industry".

More information <www.wrm.org.uy>, <www.regenwald.org/international/englisch/news.php?id=1445>, <www.biofuelwatch.org.uk>, <www.rainforest-rescue.org>, <www.ecoearth.info/newsdesk>

First socialist elected to Fremantle Council

Sam Wainwright, a co-convenor of Socialist Alliance in Western Australia and activist in the Maritime Union of Australia, was elected to Fremantle Council last October.

Wainwright said: "I think I'm the first socialist elected to public office in WA for a long time, if not ever. Most candidates for council try to appeal to the middle ground and keep their political affiliations quiet. I don't believe in that approach. I think it's better to be upfront about your beliefs."

"Throughout the campaign I emphasised that I was a staunch socialist, unionist and environmentalist. With three different Greens members running for mayor I was worried that they would takes votes from each other and allow a more conservative candidate to win. However Brad Pettit's win was emphatic and I extend my congratulations to him for his strong and vibrant campaign. There has been a real changing of the guard on the council."

More information <www.samforhilton.blogspot.com>, <http://freoreport.net>

China biggest renewable energy producer

Over the past two years, China has overtaken other countries as the lead producer of wind turbines and solar panels. Vestas of Denmark recently constructed the world's largest wind turbine producing factory in China. Although much of this growth in the industry is due to China's own demand and push for renewable energy, manufacturers are also increasingly looking to the export market for their products.

The growing energy demand in China means that despite the investment in renewables, these is also heavy investment in coal and nuclear. China aims to have 8% of its stationary energy demands met by wind and solar by 2020, with approximately two-thirds provided by coal and the remainder by nuclear and hydropower.

Source <www.nytimes.com/2010/01/31/business/energy-environment/31renew.html?ref=science>

FOE AUSTRALIA NEWS

Friends of the Earth Australia is a federation of independent local groups. You can join FoE by contacting your local group. For further details, please see <www.foe.org.au>.

There is a monthly email newsletter which includes details on our campaigns here and around the world. You can subscribe via the FoE website.

Peter Milton

Long-term FoE member Peter Milton passed away last October. Peter, Joyce and their three children moved to Australia as '10 pound Poms'. From 1980-90, Peter was the Labor member for the seat of La Trobe in the federal Parliament.

The highlight of his political career was his appointment as chair of the House of Representatives environment and conservation committee. Under his leadership, the committee completed about 20 reports on issues ranging from the Ash Wednesday bushfires, food irradiation, uranium mining, land degradation, and the protection of unique areas such as the Great Barrier Reef and Antarctica.

Peter, John Scott and Lewis Kent caused an uproar in parliament in 1986 when they walked out on Paul Keating's budget speech when the treasurer announced the government's decision to resume uranium sales to France.

Radioactive Exposure Tour – May 14-23, 2010

Friends of the Earth is hosting the annual Radioactive Exposure Tour from May 14-23. Since the 1980s, these tours have exposed thousands of people to the realities of 'radioactive racism' and to the environmental impacts of the nuclear industry.

After travelling from Melbourne to Adelaide then heading north to the SA desert, we'll visit BHP Billiton's Olympic Dam uranium mine at Roxby Downs, the largest uranium deposit in the world. We'll watch sunset over Lake Eyre and see the Mound Springs – oases which are fed by the underlying Great Artesian Basin and host unique flora and fauna. Sadly, some of the Mound Springs have been adversely effected or destroyed altogether by the massive water take for the Olympic Dam mine – over 35 million litres daily. The water is taken from Arabunna land and we'll hopefully get to spend time with Arabunna elder Uncle Kevin Buzzacott, Co-President of the Australian Nuclear Free Alliance.

We'll hear first-hand accounts of the British nuclear bomb tests from Maralinga veteran and whistle-blower Avon Hudson (also a Co-President of the Australian Nuclear Free Alliance). We'll learn about ongoing WMD proliferation risks arising from the uranium mining and export industry.

After stopping for a swim at Coward Springs, we'll head east and camp in the beautiful Gammon Ranges and visit the not-so-beautiful Beverley uranium mine. This mine uses the in-situ leach uranium mining method, which leaves underground aquifers polluted with a toxic cocktail of radionuclides, heavy metals and acid. We'll hear about the impacts of uranium mining in the region and the ugly history of the Beverley mine including police attacks against Adnyamathanha Traditional Owners and 'greenies' in May 2000.

We'll visit the magnificent Arkaroola Wilderness Sanctuary and hear about the current struggle to prevent uranium mining there, and we'll camp in the Sanctuary and in one of the beautiful gorges further south. We're particularly keen for you to come along if you are involved in anti-nuclear campaigning or if you're interested in getting involved.

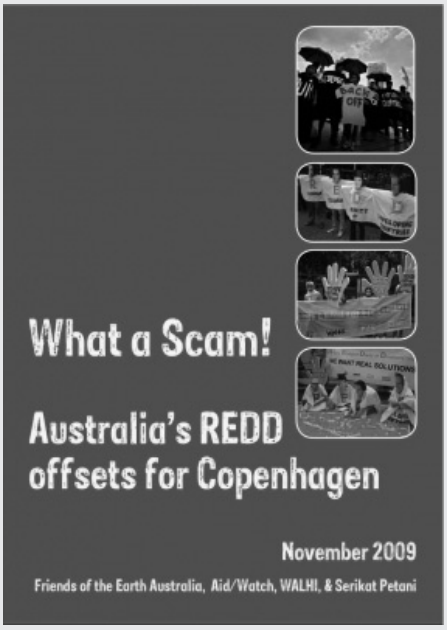
More information on the Radioactive Exposure Tours is posted at <www.foe.org.au/anti-nuclear> or contact Kasey <writewithya@gmail.com> 0425 862834.

Launch of the transition decade

The Transition Decade is a community-wide mobilisation campaign which aims to achieve the structural changes to the economy and lifestyles that are needed to restore a safe climate. The campaign was launched at Melbourne Town Hall on February 14. FoE was one of the five organisations that initiated the project.

The Transition Decade campaign has been designed to harness the power of collaboration. An alliance of committed groups has been formed to drive a collaborative framework through a decade of structural and social change.

While the launch is initially for a Victorian-based project, many people are expressing interest from interstate. You can find out more, and ways to get involved, at <www.t10.net.au>.



REDD scare

FoE Australia and AidWatch have released a joint report 'What a Scam – Australia's REDD Offsets for Copenhagen', examining the Australian and Indonesian governments' program to create carbon 'offsets' from reduced deforestation. The report details the adverse social and environmental outcomes of sham carbon 'offset' program.

The report is endorsed by WALHI (FoE Indonesia, Indonesia's largest environment organisation) and Serikat Petani Indonesia (Indonesian Peasants Union).

'What a Scam' can be downloaded at <www.sydney.foe.org.au> or <tiny.cc/5iF09>

Nano cosmetics and sunscreens

Over the summer months, the use of untested, unlabelled nanoparticles in sunscreens and cosmetics was again a focus for FoE's Nanotechnology Project.

In a world first, in late November FoE released the results of cosmetics testing we commissioned that was carried out by the Australian Microscopy and Microanalysis Research Facility at Sydney University. The testing found nanoparticles in ten out of ten foundations and concealers by leading brands including Revlon, L'Oreal, the Body Shop, Yves Saint Laurent and others. The only product to label its use of nanoparticles was a foundation by Christian Dior. The cosmetics test results were widely reported, on Channel 7's 'Today Tonight', several newspapers and radio stations.

In December we released the new 2009-10 Safe Sunscreen Guide. The guide lists 25 brands whose sunscreens are now nano-free and 16 brands whose secondary sunscreens (moisturisers or cosmetics that contain UV protection and that have SPF ratings) are now nano-free. We had a wonderful public response to the guide's release and also received newspaper and radio media coverage.

It was good to see Prof. Ian Olver of the Cancer Council Australia acknowledging to the Daily Telegraph that if the nanoparticles in sunscreen penetrate skin, they could increase the risk of skin cancer. Now we just need to see action from Australia's sunscreen regulator, the Therapeutic Goods Administration, to ensure that unsafe nano-sunscreens are kept off the market.

Most uses of nanoparticles in Australia are unlabelled and effectively unregulated. FoE Australia is not aware of a single nano-product that has gone through nano-specific safety assessment. We are therefore pleased that Australia's regulator of cosmetics, secondary sunscreens and industrial chemicals has commenced consultation on new regulations to manage the health and environmental risks of nanoparticles.

For details about the proposed regulations, including how you can make your own views known, visit our website <http://nano.foe.org.au>

FoE national meeting

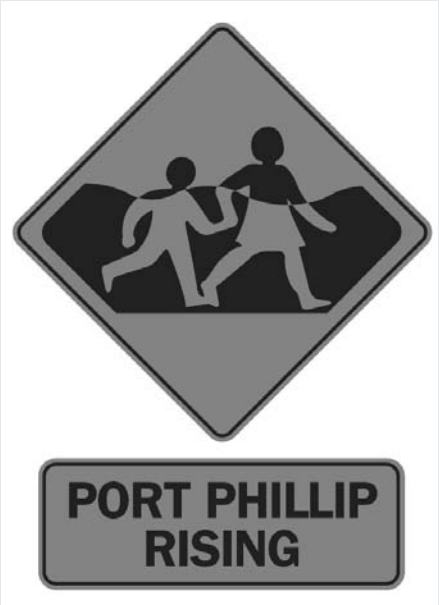
The summer meeting of FoE Australia was held in the upper Yarra Valley, east of Melbourne, in February. Delegates from Adelaide, Brisbane, Hobart, Melbourne, Perth and Sydney held sessions on campaign planning, developing the network, and considered proposals for new member groups and affiliates. The FoE network continues to grow, and included an enthusiastic presence from WA. Hopefully details on a new group in Fremantle will be included in the next Chain Reaction.

Climate Justice Kit

FoE Sydney has released its new Climate Justice Kit. The 16-page booklet is a resource for climate justice action – for people organising in their communities and in their workplaces.

FoE Sydney states: "We think climate justice is about which solutions to the climate crisis we campaign for, and how we campaign for them. This Climate Justice Kit includes short stories from across the world of communities that are fighting for clean air and secure livelihoods in the face of big polluters and offset entrepreneurs; as well as ~~some key facts, like who is going to bear the~~ heaviest burdens of climate change."

The Climate Justice Kit can be downloaded from <www.sydney.foe.org.au> or <http://tiny.cc/KW2Qg>. If you would like printed copies mailed to you, let <foesydney@gmail.com> know how many you want, your name and address.



Sea level rise report may underestimate problem

FoE welcomed a Senate Committee report released last October examining the threat of sea level rise from climate change, but cautioned that the report may have underestimated the problem. The report focuses on sea level rises of 0.8m, but recent climate science suggests that rises could be more than two metres by the end of the century. The Senate Committee report is posted at: <www.aph.gov.au/house/committee/ccwea/coastalzone/report.htm>

In November, FoE activists marked the threat of sea level rises around Port Phillip Bay with a 100 km walk from Sorrento to Port Melbourne. Details and photos are posted at <www.portphilliprising.org>.

Wild Law conference

Last October, 60 people including scientists, students, lawyers, government workers, activists, educators and other concerned individuals from all over Australia and the world gathered in Piccadilly, South Australia for 'Wild Law', Australia's first conference on Earth Jurisprudence.

You can read about the conference and Earth Jurisprudence issues on the FoE Adelaide website: <www.adelaide.foe.org.au/?page_id=233>

Eco market and community hub in South Melbourne

FoE has long held plan to develop a series of eco markets around Australia. These are intended as viable alternatives to the large chains, with around 70% of the range of items you would expect to find in a conventional supermarket, but with stock decisions based on sustainability and equity criteria.

After months of work investigating many locations, we now have one in South Melbourne. Because of the unique location (an old primary school) and the partner (the parish of well known priest Father Bob Maguire) we are going to develop a combined eco market and community hub. It will feature: a food co-op / grocery store; café; meeting space; bookstore; a weekly eco market; permaculture gardens; workshop space; offices for NGOs and community groups; and much more!

For further details on the project and how to get involved, visit: <www.foe.org.au/sustainable-food>.

FoE online shop

Visit FoE's online shop at <www.foe.org.au/shop>

FOE INTERNATIONAL NEWS

Friends of the Earth International is a federation of autonomous organisations from all over the world. Our members, in 77 countries, campaign on the most urgent environmental and social issues, while working towards sustainable societies. <www.foei.org>

You can sign up for 'Voices', the bimonthly email newsletter of FoE International, at <www.foei.org/en/get-involved/voices>.

Copenhagen climate actions

FoE International (FoEI) was extremely disappointed by the outcome of UN climate conference in Copenhagen in December. However, it was an important event for the growing climate justice movement. FoEI held two impromptu actions in the public meeting area of the conference, donning blue ponchos and chanting "We stand with Africa. Don't kill Kyoto targets." Many people stopped what they were doing and joined in the actions, which received extensive media coverage. See how the sit-in unfolded on this video: <www.foe.org/copenhagen-video-blog>.

On December 12, more than 5000 people from around the world joined FoEI's 'Flood for climate justice' action in Copenhagen to demand climate justice and an end to offsetting carbon emissions. The crowd included FoE activists from more than 20 different countries, many of FoEI's allies including Via Campesina and the World March for Women, and a large number of Danish people. The event also involved mock carbon traders trying to sell carbon offsets to protesters, and a fake carbon stock exchange. It ended in front of the Danish Parliament with the creation of a massive human banner reading "Offsetting is a false solution".

FoEI's 'climate capsule' project collected hundreds of messages, in all languages and all forms, from communities and people around the world who are affected by climate change, and took them to Copenhagen. They were displayed at the venue of the UN climate negotiations and presented at the parallel Klimaforum <www.klimaforum09.org>. A selection of the messages are posted at <www.foei.org/en/what-we-do/un-climate-talks/global/2009/climate-capsule>.

The winner of the Angry Mermaid Award 2009 was biotech giant Monsanto. Monsanto attracted 37% of the total vote for promoting its genetically modified crops as a solution to climate change and pushing for its crops to be used as biofuels. Oil giant Shell took second place for lobbying to sabotage effective action on climate change, followed by the American Petroleum Institute. Ten thousand people voted! For more information visit <www.angrymermaid.org>.

La Via Campesina and FoEI organised a series of events in Copenhagen on December 15 to mark the Global Day on Agriculture. The events called for governments to 'Change the food system not climate!' They included a press conference at the Bella Center, a mass mobilisation, and a screening of the film 'Killing Fields: the battle to feed factory farms' in front of the headquarters of the Danish Agriculture and Food Council. For more information on the film, which highlights the environmental and social impacts of soya plantations in South America, see <www.feedingfactoryfarms.org>.

Real World Radio

FoE's multilingual web radio station broadcasts the voices of the affected people we work with and the campaigners fighting on their behalf. Recent features include news from Argentina about communities demanding their land rights and an end to logging; and an interview with Feliciano Velazquez, Coordinator of the Front in Defence of the People against Transnational Corporations of Guatemala.

Listen online (in a choice of five languages) at <www.radiomundoreal.fm>.

Engaging with the Bank of the South

On December 7, FoEI's Economic Justice – Resisting Neoliberalism Program met with Pedro Paéz, president of Ecuador's Presidential Commission on the New Regional Financial Architecture and Bank of the South. The Bank was formally constituted in September 2009 by Argentina, Bolivia, Brazil, Ecuador, Paraguay, Uruguay and Venezuela, as a means of breaking the power and influence that the Interamerican Development Bank, the International Monetary Fund, the World Bank and other neoliberal financial institutions have in the region. The meeting provided information about the overall development of the bank, and its plan to support the production of generic medicines and the development of food sovereignty in the region.

Nigerian farmers one step ahead in Shell court case

A court in the Netherlands had decided that it can and will rule on the responsibility of Shell Nigeria for damage caused by oil spills. Shell tried but failed to stop the case on a procedural point. The four Nigerian Farmers and FoE Netherlands / Milieudefensie continue their fight for justice.

To follow the court case, visit <www.shellcourtcase.org> and <www.shelllightsout.org>.

Support FoE Haiti's response to earthquake

On January 12, Haiti suffered a magnitude 7.0 earthquake, along with numerous aftershocks. Hundreds of thousands of people are believed to have lost their lives or to have been badly injured. The offices of FoE Haiti / Haiti Survie were destroyed. Thankfully the director Aldrin Calixte and all his colleagues and family members have been accounted for and are now working on the relief effort. Can you help FoE Haiti by making a contribution towards their emergency response to this disaster and the subsequent rebuilding efforts? To date, FoE groups and the public have donated more than 10,000 euros.

You can find out more and make a donation at <www.foei.org/en/get-involved/take-action>.

Jamal Juma' finally released!

Jamal Juma', the coordinator of the Stop the Wall Campaign and a key activist with FoE Palestine / PENGON has been released after a month-long detention in Israeli jails. As with other Palestinian human rights defenders in jail, there was never a case in the courtroom. Not a single charge was put forward. The reason for his arrest was purely political – an attempt to crush the Stop the Wall campaign. But the impressive support of international civil society eventually made his imprisonment too uncomfortable for the Israeli government.

More information: War On Want <www.waronwant.org>.

FoE Georgia campaigns against Economic Liberty Act

FoE Georgia / the Greens Movement of Georgia is concerned about the current political situation. President Micheil Saakashvili is pushing through the Economic Liberty Act which proposes amendments to Georgia's constitution based on the principles of neoliberalism, globalisation and neo-colonialism. FoE Georgia is starting a new campaign against this initiative.

Photo competition

FoEI's Economic Justice – Resisting Neoliberalism Program has joined the call for a fourth Enlazando Alternativas summit (Linking Alternatives 4) to be held in Madrid, 14-18 May 2010. The meeting is being organised by the EU-Latin American and Caribbean Biregional Network to provide space for those social movements and organisations resisting the EU's foreign policy, which is based on free trade agreements and the 'Global Europe' strategy. Previous Linking Alternatives meetings were held in Mexico (2004), Vienna (2006) and Lima (2008).

More information is posted in Spanish at <www.enlazandoalternativas.org>.

Linking Alternatives 4

FoEI's Economic Justice – Resisting Neoliberalism Program has joined the call for a fourth Enlazando Alternativas summit (Linking Alternatives 4) to be held in Madrid, 14-18 May 2010. The meeting is being organised by the EU-Latin American and Caribbean Biregional Network to provide space for those social movements and organisations resisting the EU's foreign policy, which is based on free trade agreements and the 'Global Europe' strategy. Previous Linking Alternatives meetings were held in Mexico (2004), Vienna (2006) and Lima (2008).

More information is posted in Spanish at <www.enlazandoalternativas.org>.

International Year of Biodiversity

This year has been designated the International Year of Biodiversity by the United Nations. The aim of the initiative is to raise awareness of the importance of conserving biodiversity. FoE groups will be marking the event in many ways throughout the year.

More information and an online photo exhibition is posted at <www.foei.org>.

USA: stop tar sands oil

FoE US is promoting a video that shows the devastating effects of oil extraction from tar sands in Canada. Extracting oil this way destroys fragile forest ecosystems and uses a very energy-intensive upgrading and refining process. It is a climate crime on a monumental scale.

More information: <http://foe.thetarsandsblow.org>.

FoEI online shop

Check out the FoEI online shop at <www.foei.org/en/get-involved/shop> for calendars, t-shirts, greeting cards, the Speechless cartoon magic publication, and subscriptions to FoEI publications.

Support Friends of the Earth

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We are part of the Australian voice of the largest grassroots environment network in the world, with groups in 72 countries. Whether you decide to get a campaign up & running, volunteer at the fabulous food coop or bookshop, or provide crucial dollars as an Active Friends monthly supporter, it is people like you who keep Friends if the Earth strong. If you are short on time, but big on commitment, take a few minutes to fill in this form.

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A Service Agreement will be sent to you upon receipt of this form. If you would also like to become a member, tick here: ❑ an additional $20 per year will go towards membership, this is not tax-deductible.

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Request you, until further notice in writing, to debit my/our account described in the schedule below, any amounts which Friends of the Earth Inc may debit or change me/us through our direct debit system. I/We understand that 1) the bank/financial institution may in its absolute discretion determine the order priority of payment by it of any moneys pursuant to this Request or any other authority or mandate. 2) The bank/financial institution may in its discretion at any time by notice in writing to me/us terminate this Request as to future debits. Bendigo Bank Direct Debit User ID no: 342785

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Water Feature

This edition of Chain Reaction is a special feature on water issues. It concentrates on water use problems and options in Australian cities. This is not to suggest that other major water consumers – especially agriculture, our major user of water – are not significant, much less that Australia is the only country facing serious problems with water depletion and pollution.

As always, we have only limited room in each edition and want to be able to go into a topic in some detail. There will be a feature on food in the next edition, and we hope to look more specifically at agriculture and water in a later issue.

We welcome your feedback and thoughts on this issue – feel free to send letters to the editor, and proposals for articles, to us by email <chainreaction@foe.org.au> or phone (03) 9419 8700.

Water in Australia

Water in Australia: the facts

1. Australia is the highest user of water per capita in the world, despite being the driest inhabited continent.
2 .Over a quarter of Australia's river systems are close to, or have exceeded, sustainable extraction limits, and two-thirds of water extracted is from these stressed systems. More groundwater is used than ever before.
3. Median annual Murray River flows to the sea are now around one-fifth of what they were in 1901. The occasions when there is no flow at the Murray mouth have increased from one year in 20 under natural conditions to one year in two under current conditions.
4. Between 50 and 80% of wetlands in the Murray Darling Basin have been severely damaged or completely destroyed. The Coorong Lake near the Murray mouth has lost 90% of the migratory wader birds that once inhabited the estuary. In fact, only 11% of the natural estuary at the Murray mouth is still intact.
5. Excessive regulation of flows and over extraction from rivers for irrigation has reached such levels that many floodplains are severely degraded. Indeed, the frequency of medium-sized floods at the South Australian border has fallen by 57%, robbing the internationally protected Chowilla Floodplain of life-sustaining flooding.
6. Water use has increased from 1985 to 1996/7 by 65% and water is overused in some regions. Water extracted for irrigation has increased by 76% between 1985 and 1996/7.
7. More than 80% of the average annual volume of water in the Murray is diverted for industry and domestic use. Irrigation accounts for 95% of this.
8. There are 30 big dams and 3,500 weirs in the Murray-Darling Basin, and nearly three times the annual average flow in the Murray River is stored in dams and weirs.
9. The threat of dryland salinity now extends across six million hectares of Australia. The cause of dryland salinity is the clearing of native vegetation. Australia clears more than any other developed nation and ranks fifth overall in terms of vegetation clearance.
10. The Murray River supplies approximately 40% of Adelaide's drinking water supply. Within 20 years, on current trends, salinity levels will exceed World Health Organisation limits for safe drinking water two days out of every five on average.
11. A half to a third of freshwater fish species native to the Murray-Darling Basin are threatened with extinction.
12. The frequency, size and persistence of harmful algal blooms in inland waters seems to have increased over the past 50 years. Algal blooms in dams cost farmers more than $30 million per year, and in rivers, storage and irrigation channels about $15 million per year.

Water consumption by sector

Water use in Australia during the 2004-05 year was 18,767 gigalitres. The sectors of the economy that used this water were:
1. Agriculture – 65% (12,191 gigalitres)
2. Households – 11% (2,108 gigalitres)
3. Water supply industry – 11% (2,083 gigalitres)
4. Other industries – 6% (1,059 gigalitres)
5. Manufacturing – 3% (589 gigalitres)
6. Mining – 2% (413 gigalitres)
7. Electricity and gas - 1.4% (271 gigalitres).

According to the Australian Water Commission, a government authority, overall water use decreased by 14% in the four years to 2004-05. Unfortunately, a large majority of the reduction was simply a result of reduced availability of water for agricultural use.

Sources: <www.water.gov.au/WaterUse/index.aspx>; Australian Conservation Foundation <www.acfonline.org.au/articles/news.asp?news_id=120>

Climate change and water - what's in store for Australia?

Cam Walker

People living in the south and south west of Australia are increasingly familiar with longer and drier summers and worse bush fire seasons. Victoria has suffered through a 13 year drought. There is now routine mainstream media reporting on the water stress being suffered by most large Australian cities and many regional centres.

The difficult task confronting climate scientists is to determine which changes are due to naturally occurring climate variability and which ones are as a result of human activity. The difficult task confronting climate scientists is to determine which changes are due to naturally occurring climate variability and which ones are as a result of human activity. What is clear is that an overall warming of the climate is well documented and unequivocal, and that this widespread warming is very likely to be due to increased greenhouse gas concentrations in the atmosphere.

In terms of expected impacts on water this century, climate science tells us that a continued drop in rainfall in south-west Western Australia is likely due to a combination of increased greenhouse gas concentrations, natural climate variability, and land use change. While warming the lower atmosphere, the greenhouse effect cools the stratosphere above it, especially near Antarctica.

This sets up a north-south temperature difference and therefore a pressure gradient that pushes the moisture-bearing westerlies southward, at times causing them to miss the Australian landmass. WA is most affected by this phenomena, then south-eastern Australia and Tasmania less so. Across southern Australia the number of droughts is projected to increase as the planet warms.

The increased summer rainfall in north-west Australia may be partly due to increased aerosol particles in the atmosphere resulting from human activity, especially in Asia. There is growing evidence that lower rainfall and reduced run-off in south-east of Australia is linked to global warming and cannot be explained by natural variation alone. Changes to rainfall patterns are even more apparent when examined over the past half century. Eastern Australia has become significantly drier, with rainfall in some areas reduced by 50 mm per 10 years, while rainfall in parts of north-western Australia have increased by the same amount.

In addition to human-induced climate change, it appears that deforestation is to blame for making our droughts longer, hotter and dryer than they would be otherwise. Over much of south-east Australia, where the drought has hit hardest, less that 10% of the original vegetation remains. Modelling has shown that this land clearance has increased the length of droughts in the area by one to two weeks per year. In years of extreme drought, the loss of vegetation caused the number of days above 35 °C to increase by 6–18 days, and the number of dry days to increase by 5–15 days.

Then there are natural weather cycles that influence our weather, and operate in ways that are not fully understood. There is the well known El Nino phenomena (commonly called ENSO), climatic engine in the Pacific, which drives the cycle of droughts and floods in Australia's south-east. Droughts hit when the eastern Pacific warms, weakening the eastern trade winds that bring rain to south-eastern Australia.

La Nina episodes reverse the pattern, bringing floods to the east of Australia. There is also an Indian Ocean equivalent, which is called the Indian Ocean Dipole. CSIRO scientists have found that this could also contribute to droughts and depress spring rainfall by up to 30% in Australia's south-east.

And with global warming set to increase the frequency of dipole events, Australia is likely to get even bigger climatic shocks than previously thought, according to computer simulations. The outlook for ENSO is bad: the past 30 years have seen the most El Nino episodes since instrumental weather records began in 1880 and the number of droughts is projected to increase as the planet warms.

In terms of water and climate change, there are a number of implications:

* Higher temperatures means increased evaporation, and hence water loss from landscapes and water bodies,
* Drying causes longer droughts, with more intense bushfire seasons. Resulting regrowth uses far more water than mature forests, reducing availability for catchments,
* Less rain, especially in the south east will impact on the nations largest river system, the Murray Darling, and food production in the region. Impacts on food production are expected in the south west of WA,
* Rain, when it comes, is more likely to be in erratic and extreme weather events – with more flooding on these occasions.

Sources:
** Cheryl Jones, May 13, 2009, 'All dry on the western front', The Australian.*
** Australian Department of Climate Change, Climate trends information sheet, <www.climatechange.gov.au/en/climate-change/trends.aspx>*
** Land clearances turned up the heat on Australian climate, 16 May 2009, New Scientist, <www.newscientist.com/article/mg20227084.700-land-clearances-turned-up-the-heat-on-australian-climate.html>*

Population and water

Cam Walker

Over the years, public conversation and concern for the environment and the impacts of population pressure has risen and fallen. In the past decade it has tended to focus around asylum seekers and more broadly migration, and the issue is often wheeled out when it comes to questions of food security and urban planning and crowding.

It has been argued that we should limit migration in order to limit our greenhouse gas emissions. At present there are also a growing number of voices saying that population growth is going to impact on available water supplies.

In the words of prominent commentator Tim Flannery, "population is the great multiplier, it's the thing that can multiply all of our environmental woes and all of our social woes". In an interesting development given his previous statements on the topic, he adds, in the same interview that it can "also bring prosperity."

At present, Australia has 22 million people and the population is rising rapidly. By 2050, the federal Treasury estimates that Brisbane and Perth's population will probably have doubled in size, while Sydney and Melbourne will be cities of seven million people. By then, Australia's population will have grown by 60% to 35 million. This has raised alarm bells for many environmentalists. And as always happens when population and the environment comes into the mainstream debate, it becomes a useful smoke screen for people and organisations with racist agendas who can then call for limitations on population growth, while purporting to be concerned about the environment.

Leaving aside the broader question of whether we should continue to grow as a nation in terms of human population, a key consideration is whether there is enough water on the Australian continent to actually support numbers to the order of 35–40 million. A reasonably common sentiment is expressed by people like John Crawford, from the Institute for Sustainable Solutions at Sydney University, who said on the ABC's 7:30 Report that: "Australia's probably the leading [developed] country facing the challenge of not enough water, too many people ... and increasing demand for food. Globally, we call this the perfect storm".

Water stress is one environmental issue that seems to worry everyone. But rather than blaming population growth, we need a more considered approach to the problem. Many of the population stabilisation advocates see population growth as being the core problem. Another way of looking at the problem is to acknowledge that we have chosen to live in sprawling, low-density cities. We could opt for a more compact model – that greatly reduced our overall footprint on the land – leaving more space for wild nature and open space, agriculture and new arrivals. So instead of blaming population growth, we could look at our own behaviour, and our current and historical choices that have lead to our large sprawling cities, with all the problems that car-dependent sprawl brings with it.

This also applies to the question of water. As has been noted by the ACF, Australians are the highest per capita users of water in the world, despite the fact that we live on the driest inhabited continent. It would make more sense to reduce our per capita water consumption and to reduce its use in agriculture and industry rather than blaming – yet again – population growth.

Ways to actually achieve reduced consumption of water are canvassed in various articles in this edition of Chain Reaction (and see Chain Reaction #91 for a collection of articles on environment, population and immigration, <www.foe.org.au/resources/chain-reaction/editions/91>).

What we require is the political maturity to approach the question of water stress without looking for the easy scapegoat of population growth.

Population densities of some cities:

City	*Population density - people per sq km*
Melbourne	1,566
Sydney	2,058
London	4,761
Amsterdam	4,459
Copenhagen	5,908
San Francisco	6,688

Climate refugees in Australia?

Cam Walker

There is rapidly growing awareness of the fact that, without concerted global action now to reduce greenhouse gas emissions, many millions of people will be displaced from their homes by global warming in coming years. Perhaps the worst case scenario envisaged by the many groups and organisations researching climate induced displacement comes from the International Organization for Migration, which has warned that climate change stands to drive as many as one billion people from their homes over the next four decades.

The plight of many low lying Island nations, such as the Maldives and Tuvalu are well known. Australia will need to accept a fair share of people who have no option but to relocate, should the global community fail to take sufficient action to halt or slow global warming.

There is also the risk of internal displacement of people in Australia. The best known example of this comes from Torres Strait, where a number of low lying inhabited islands are at immediate risk of rising sea levels, plus storm surge caused by tropical cyclones. The Torres Strait Regional Authority has written to the Prime Minister asking for $22 million for urgent mitigation work to build sea walls and other structures to reduce these impacts.

What is probably less well understood is the risk of climate displacement effectively because of water storages in inland Australia – people who could be referred to as 'water refugees'. Individual farms and small rural communities across Australia are shedding people because of relentless drought and water stress – amongst a range of other factors. Anecdotal evidence suggests that many of these people then move to larger rural communities, especially within the Murray Darling Basin, such as Mildura and Swan Hill. Yet even many of these larger towns and cities are largely dependent on irrigation from the Murray and other Rivers, and as flows continue to decrease, employment can be expected to be lost, forcing people to move elsewhere to seek other opportunities.

Australians, by and large, find it hard to imagine themselves as ever being refugees. Where displacement happens, as with the disastrous bushfires in Victoria in February 2009, there is substantial support for people to help them re-build or re-settle. Yet it appears that there is constantly a small but significant trickle of people leaving rural communities each week who are doing so because of environmental factors.

According to the authoritative survey completed in 2007 by the US-based Institute of Institutional Economics, overall Australian agricultural productivity is expected to decline by around twenty seven per cent by 2080 without action now to trim greenhouse emissions. Western Australia and Queensland will be most affected.

During the prolonged drought that has stretched for more than a decade in southern Australia, the Victorian Farmers Federation (VFF) has suggested that "thirsty farms" are a factor, amongst others, that are driving people from the land. The VFF says that farmers in their late 50s to late 60s are the main groups leaving farms, and that the agricultural sector was "suffering an attrition rate of between three and four per cent per year".

Over time, there will be shifts in the location of wheat production and other forms of agriculture, creating both opportunities as well as hardship. For instance, in Emerald, in south east Queensland, it is likely that wheat will give way to cattle. Individual farmers may simply shift from one form of agriculture to another but it is reasonable to assume that some will lose their lands or will not be able to finance the shift to new means of production.

Wheat is currently Australia's major crop, worth $4.2 billion annually. The Australian Greenhouse Office suggests that climate change could lead to reduction in wheat exports by $82 million per year by 2030. Peter Grace, a Queensland University agricultural scientist, suggests that this could be "much higher" at perhaps $1 billion in losses per annum. Professor Grace identifies the southern Mallee of South Australia, the northern Eyre Peninsula, and the Riverina of New South Wales as being the regions likely to be most affected by these changes.

In contrast, Tim Barrows from the Australian National University in Canberra suggests that farmers will actually move north, in spite of the many climate-related problems that will occur there, simply because agriculture will at least be viable there – it will be even hotter than it is at present but it will also get wetter.

These cumulative impacts are likely to see a continual slow trickle of people from affected areas to larger rural towns and the capital cities. If these people were to cross an international border, they would probably be considered economic migrants, yet, at least for the foreseeable future, they will be considered people who are seeking a better life rather than victims of global warming. This slow but cumulative process is likely to further depopulate large areas of regional Australia.

In the eastern half of the country at least, towns north and west of the divide are already struggling with water stress and rising temperatures and this will likely reduce their ability to support new arrivals. Therefore, as we hit ecological limits, many of these people seeking a new life will tend to move to areas where water stress is not yet at a critical point and may therefore help 'fill the gaps' in the current mesh of smaller cities that stretch along the temperate coasts from Adelaide as far north as Brisbane.

More information:

* Australian Greenhouse Office, Decmeber 2002, 'Living with Climate Change – An Overview of Potential Climate Change Impacts on Australia'.
* Australian Greenhouse Office, 2005, 'Climate Change Risk and Vulnerability. Promoting an efficient adaptation response in Australia'. Final report to the AGO by the Allen Consulting Group.
* Cam Walker, 'Climate refugees: the human cost of climate change'. Available from <cam.walker@foe.org.au>.

Take action:

* See Friends of the Earth Australia, 'The Citizen's Guide to Climate Refugees', <www.foe.org.au/climate-justice/activities-and-projects/climate-refugees>.

Letter to the Editor

Biochar - another dangerous technofix?

That there are no quick fixes to climate change, I agree. The bottom line of Chain Reaction #106 (August 2009) was that we all have to consume less and use renewables, and I totally agree. But when seeking to give an overview of technical solutions you have a responsibility to present glimmers of hope when they occur. Goodness knows we need them.

So I take odds with the entirely negative approach to biochar taken in Rye Senjen's article. Biochar is unproven, especially its economic viability and its fertility improvements. Also, it must never be allowed to unlease a techno-fix pyromania targeting native forests. However there are some really promising aspects for this technology to improve landcare in agricultural regions and to generate renewable energy.

Rye's article seems determined to see only the problems and fails to discuss the potentially considerable pluses. Biochar offers more than a carbon-neutral fix, but an actual carbon negative, potentially fertilising degraded soils, generating renewable power and sequestering carbon. This approach deserves R&D support to see if it does stack up.

Dr Chrissy Sharp
Balingup, WA

Black Saturday and Melbourne's water supply catchments

Simon Birrell

Since the 2003 Canberra fires, logging industry groups have been lobbying hard for an increase in logging as part of the 'solution' to bushfire risk. This campaign reached fever pitch after the devastating wildfires in Victoria in February 2009.

Aspects of the 'no fuel, no fire' argument amount to a dirty tricks campaign which muddies the debate over the causes of bushfire. For instance, it shifts attention away from the fact that native forest logging practices elevate wildfire risk on public land in a number of ways. It attempts to use community fear of wildfire to shift public attitudes against the creation of more National Parks. It argues for more logging, through thinning operations on public forested land in order to reduce wildfire risk.

This dirty tricks campaign has extended into the debate over logging within Melbourne's Water supply catchments. For years the green movement has campaigned for protection of native forests for biodiversity and a range of other values. There has been a long-running argument put forward by many scientists and environmentalists to ban logging in the ash forests of Melbourne catchments as this would allow these forests to return to old growth stage and hence produce more water run off into streams, rivers and existing dam infrastructure.

Science has shown that old growth ash forests produce significantly higher water run off than younger forests that have been clearfell logged. About 80% of Melbourne's water comes from the 50% of the catchments where ash forests grow.

Some logging industry groups argue that there is no point stopping logging of the ash forests within the designated catchments because they will be burnt out regularly by severe bushfires, and hence never become old growth. This argument is not based on fact.

Academics and science researchers have made it clear that the area of catchment ash forest which is burnt by each major fire event is totally random. The experts state that no amount of human management can ever control these fires, as ash forests only burn under extreme wildfire conditions.

This random fire behaviour means that statistically it can be expected the catchments will always contain ash forests made up of a mix of forests of different ages: generally 33% old growth (greater than 150 years old with the highest water yields), about 51% mature (25 to 150 years) and 16% young regrowth (less that 25 years). Forests in the catchments can expect a major fire frequency of once every 75–150 years, however the statistical range for a severe fire is 25–400 years.

For example, about 8% of the high water yielding ash forests were severely burnt on Black Saturday (not regarded by the experts as a major impact overall, but still significant). The fire destroyed some old growth, however significant areas of old growth were missed. Most of the 70 year old ash regrowth in the catchments (burnt by the last big fires in 1939) was not killed by fire and will continue to grow into old growth.

The experts regard clearfell logging as having the same impact as an intense bushfire on reducing water yields. In fact the loggers actively promote the idea that the practice of clearfell logging mimics extreme wildfire behaviour. The loggers use napalm when burning off logging coupes to recreate the conditions of an extreme wildfire event.

Hence the logging industry, if allowed continued access to water catchments, will permanently deny the opportunity for a significant proportion of the ash forests to ever mature into high water yielding old growth forests. From a water user's point of view, the bigger the catchment area where logging is banned, the greater the probability that some parts of the catchment will escape fire and grow into high water yielding old growth ash forests.

Logging industry groups also argue that the thinning of ash forests by commercially logging some of the younger trees can increase water yields. However there is a serious side-effect of the practice of thinning. Research has demonstrated that clearfell logging and thinning in wet forests makes these forests drier and far more fire prone. Hence logging practices are elevating the risk across the landscape of a devastating wildfire burning out the Melbourne's water supply catchments. Is the risk worth it?

More information:
'Planned burns and clearing will not stop catastrophic fire events'. Report commissioned by the ACF, Wilderness Society and the Victorian National Parks Association. Available on the websites of each organisation

Bushfire regrowth near Kinglake, Victoria, following the Black Saturday bushfire.

Making Melbourne a water-sensitive city

Cam Walker

Protest against the North South pipeline.

Water is a major issue in Victoria. Living under water restrictions, and with more than a decade of drought, it rarely seems far from people's minds.

And the challenges are growing. Melbourne's population continues to grow. Victoria's climate is becoming warmer and drier. Rainfall in the Murray Darling Basin over the past decade has been more than 50% below the long-term average. Melbourne is lucky enough to have large closed catchments to the east of the city, which have been the main source of our water for more than a century. However, many catchment areas have been receiving even larger reductions in rainfall than Melbourne itself, and dry catchments are soaking up more of the available water when rain does fall. Massive re-growth of forest after major fires and logging will reduce surface flow even more in coming years. Drought is expected to become more common, rainfall will continue to decline, and hot weather will become more common.

The response from governments has been to find ways to reduce demand for water whilst also looking for new water sources. The political parties have a keen eye on the polling about attitudes to water, leading the Labor government to believe that Melbournians feel that "water restrictions – and with them the loss of gardens, precious trees, parks and the freedom to use water in the same way we did as children – represent a shared adversity on a par with the sacrifices of wartime or natural disaster."

The government believed that the hardy folk of Victoria were likely to look for someone to blame if water restrictions were to continue, and so in 2007, it jettisoned the core elements of its long standing and well-considered approach to meeting our water needs, based on demand management and behaviour change, and announced a new policy based on two massively expensive projects – a major desalination plant on the Gippsland coast and a North-South pipeline to bring water from the Goulburn River system to Melbourne. The combined cost of these two projects is more than $5 billion.

Melbourne uses more than 400 billion litres (gigalitres – GL) of water a year. Current inflows to reservoirs have been 387 GL per year over the past 10 years (although this has varied considerably from year to year). This shortfall has driven the current debate about water. The desalination plant will deliver 150 GL a year (when it is completed in 2011) and the North-South pipeline is intended to deliver

Photo by Stuart McGuire.

75 GL a year to Melbourne from 2010. Community opposition to the desalination plant and the North-South pipeline has been significant, both in affected rural areas and many parts of Melbourne, and has continued to grow as a result of continual cost blow outs, especially with the desalination plant, which will be passed on to residential water users.

The fact that people in Melbourne have reduced their per capita water consumption shows that people care, and are prepared to change their personal behaviour when presented with information about water shortages. However we risk losing the benefits of this changed behaviour if the energy-intensive desalination plant comes on line and water restrictions are lifted.

And the North-South pipeline would draw much needed water from parched river systems north of the Divide. Other questionable and problematic proposals include piping water from Tasmania, and building new dams. The Mitchell is our last major undammed river and should be kept as such, and plans put forward by the Liberals for a new dam on the Maribyrnong River would see major water losses through evaporation.

There are a range of alternatives – outlined below and discussed in other articles in this issue of Chain Reaction – that will enshrine smart water use whilst keeping within ecological constraints and taking future climate change scenarios into account.

A water sensitive city

A water sensitive city is one that lives within its means by making more effective use of the water available to it. This will include widespread collection and use of rain and storm water, and full re-use of water that has already gone through our system and which is largely pumped out to sea at present.

To source our water in a responsible and sustainable manner we should:

Stop logging catchments - Re-growth after logging or wild fire consumes much more water than a mature forest. If we cease logging in Melbourne's catchments, this would, over time, allow much more water to flow into rivers for use in Melbourne. Researchers put the figure between 50–75 GL a year by 2050. Compare this figure with the current shortfall faced by Melbourne of around 23 GL a year.

Re-use our water - With the existing substantial inflows of high-quality water from our catchments, we could be mixing this water with recycled water for delivery throughout Melbourne. At present, there are two major waste-water facilities, and several smaller ones. These could all be upgraded to allow re-use of the water that is currently lost to sea. In particular, an upgrade of the Eastern Treatment Plant to allow production of drinking standard water would provide an additional 115–150 GL a year by 2012. The government has already made some excellent moves in this direction, with a $300 million upgrade of the Eastern Treatment Plant to produce Class A recycled water announced in October 2006. This is a welcome development, but we need to move forward as quickly as possible to ensure appropriate re-use of all water from this plant as a matter of urgency.

Use treated sewage from the Eastern Treatment Plant for industry - At present, large volumes of high-quality drinking water are being diverted from the Tanjil and Tyers catchments east of Melbourne to be turned into steam by the Latrobe Valley power industry. While new water efficiency measures are being put in place, water use still appears to be over 20 GL a year by these plants. The Maryvale pulp mill, also located in the Latrobe Valley, uses more than 20 GL of quality water per year and could instead use treated sewage from the Eastern Treatment Plant. This would allow the high quality water from the Tanjil and Tyers to be put into our drinking water supplies. As we transition to a sustainable future, it will be difficult to justify coal fired power at all, or pulp mills drawing feedstock from native forests. Renewable energy uses vastly less water than coal.

The completion of an upgrade of the Western Treatment Plant - It is expected that this would yield around 15 GL a year.

Institute storm water harvesting and substitution, for drinking water in domestic and commercial uses, parks, sporting ovals and golf courses, and recharge of aquifers. A conservative figure of 40 GL could be available by 2015. Research from Monash University suggests that up to 200 GL may eventually be able to be captured and re-used in the metropolitan area. We should develop incentives for the replacing of roads and car parks with permeable surfaces and hard gutters and concrete storm drains with swales, vegetated roadside dips and re-naturalised watercourses to slow run-off and allow it to infiltrate or be collected for treatment and re-use.

Get our housing climate change ready - Despite improvements in the efficiency of many consumer items that use water, and changed behaviour by many people, our houses are still, by and large, not very water efficient.

Amended requirements for new building stock, such as an extra pipe system for recycled water in all new homes, could reduce need for water by up to 75%.

Roll-out of rainwater tanks in 5% of suitable homes per year would provide an additional 5.25 GL a year. The Victorian Water Forum says that yields of up to 100 GL are achievable. This would require increased rebates to households, and making tanks mandatory for new buildings.

Mandate in-built grey water systems for all new homes - This would allow re-use of the water that is currently wasted within our homes, estimated to be 350 litres per household per day.

Get active - many people are already changing their personal water use habits. This is necessary but we also need community action to ensure the government adopts sound water policy.

See the FoE Melbourne website for details: <www.melbourne.foe.org.au/?q=water/home>
Other groups to support include:
- Clean Ocean Foundation <www.cleanocean.org>
- Watershed Victoria <www.watershedvictoria.org.au>

More information:

- Neil Rankine, 'Supply and Demand Analysis: Melbourne's Water', <www.watershedvictoria.org.au/content/category/tech-talk>.
- Environment Victoria, November 2008, 'Water Security, Healthy Rivers', <www.envict.org.au>.
- Target 155 – stop logging our catchments, <www.target155.org.au/Target155/Your_Water.html>.
- Stop logging our catchments, <www.greenlivingpedia.org/Stop_logging_Melbourne_water_catchments>.

Stuart McGuire and his family live in West Brunswick. Through the use of rainwater and recycled water, their mains water consumption is less than two buckets per day, or about 97% less than the typical Melbourne house. Photo from <www.greenmakeover.com.au>.

Water restrictions or water allocations?

In places like Melbourne, the government has set voluntary targets that people can aspire to in terms of their personal water consumption. In Victoria we have the 155 litres per day target. As has been shown by various people – for instance, Stuart McGuire and his family in Brunswick – and research by groups like Environment Victoria, it's really not that hard to get to a target of 100 litres per person per day. Greens MLC in South Australia Mark Parnell has taken the idea further, proposing that domestic water restrictions be dropped and replaced with a water allocation that allows householders to choose how and where they use their water.

Water restrictions tend to cover what happens outside the home, like watering gardens. Mark makes the point that this system is unfair because someone can run a tap 24 hours a day indoors without being penalised, yet we are not allowed to water our garden. This proposal would bring both internal and external water use into consideration, letting householders decide where they actually use their allocation. As he puts it "some people will be happy to take a shorter shower to allow more for their veggies."

The system would work as follows:

-Households would get an annual water allocation based on the assumed number of residents living there, with the ability to fine tune this as household population rises or falls.

- Meters would be read quarterly, and the allocation averaged over a year (allowing for greater use in the hotter months).

-The government rolls out a major campaign to inform the community about how to keep track of their water use and help people stay within their allocation.

-Where households consistently go well over their allocation, water advisers would be sent to the home to check and fix leaks, implement water efficiency measures, and provide help to reduce water consumption.

This would help foster awareness and personal responsibility amongst householders and, potentially, encourage food production in urban areas. It is a more holistic approach to dealing with water shortages than a simple restrictions-based approach.

More information: <www.markparnell.org.au>

The Watermark Australia Project

Mary Crooks

Imagine ... you walk around a city like Melbourne or Geelong. Everywhere you look there are signs of real water efficiency. Gardens flourish with beautiful drought-resistant plants watered by tank or grey water. You see suburban backyards with 10,000 litre water tanks near back fences. Go inside houses, schools, leisure centres, hospitals, public buildings, factories and business premises, and you find they have all been retrofitted with available, low cost water efficient technologies.

Larger tanks (40,000 litres) are commonplace in open spaces and on industrial sites. Other large open areas collect rainwater too. Huge rubber bladders have been "planted" under these spaces. They have also been laid down on the beds of rivers and the deeper estuaries, in harbours and coastal inlets. Stay in a hotel or motel and you find dual flush toilets, water efficient shower roses and squirt taps.

During every storm event, millions of litres of water are trapped and later treated and reticulated for use. Small solar-powered water treatment plants are dotted across the landscape.

Waste water (treated sewage) is available and able to be used outside homes and on public open space. All new suburban developments are seen as a great opportunity to construct buildings that are genuinely water and energy efficient.

City skyscrapers now test their fire sprinkler systems by flushing captured stormwater rather than wasting fresh water. The spaces under these buildings are now used to capture and store water instead of providing car parking. There are water treatments plants in the basements. When possible, industries use the same water over and over again in various manufacturing processes.

The Watermark Australia Project enabled us to come to this vision. A long-term vision like this has a simple starting point – every house or business is built or retrofitted for maximum water efficiency.

We face some harsh environment and socio/political realities in Victoria. It is now reasonably common knowledge that:

- Victoria's rainfall and stream flows are highly variable and this variability will increase with predicted climate change;
- Victoria's water use has been increasing;
- Victorians are one of the highest domestic water users per capita on Earth;
- We have been slow to capture and use stormwater in our cities; and
- We have been slow to re-use waste water.

Adelaide's water options.

Adelaide has even greater issues of water stress than Melbourne, but there are still viable alternatives to desalination. Based on the Sustainable Water Report, the SA Greens believe these are the water options that should be embraced:

-64 GL – demand management – highly cost effective with excellent environmental benefits.
-60 GL – stormwater – cost-effective with significant downstream benefits.
-82 GL – existing catchments – proven and reliable.
-15 GL – wastewater re-use – cost-effective with significant downstream environmental benefits.
-6 GL – rainwater tanks – relatively expensive but provide multiple benefits.
-Total: 227 GL
-Current use: 216 GL

Options of last resort:

-Groundwater use without recharge is inherently unsustainable.
-Desalination is expensive and energy hungry – a possible measure of last resort.
-The River Murray is failing and should not be relied on as a long-term supply.

Source: Greens Urban Water Action Plan for Adelaide, posted at <www.markparnell.org.au>.

The water crisis in Victoria is deeper and more profound than just another drought. It is accentuated when we factor in climate change and its potentially significant impacts, particularly on this south-eastern part of Australia.

Greater Melbourne will have become genuinely water efficient when per capita use of potable water has reduced by at least 50%; when suburbs, business precincts and industrial areas are configured so that at least 50% of all storm water is captured, treated, reticulated and re-used;and people are using at least 50% of treated sewage water.

We need nothing short of a revolution in our thinking and practices around water efficiency and we need to start this dramatic turnaround now.

At the very least, we should be seeing right now:

- An emphasis on real water efficiency, rather than the misleading idea that efficiency occurs simply by reducing consumption. When we significantly reduce the volumes of potable water and when we use all available water (rainfall, stormwater, treated waste water) again, and again, before we finally discharge it, we can claim to be water efficient. When we recognise the amounts of water embodied in the production and delivery of goods and services and strategies and technologies and drive these amounts down without compromising quality, we achieve greater water efficiency.
- New state targets covering domestic and industrial water saving technologies, appliances and equipment. The current 155 litres/day campaign target for domestic consumption is ludicrously high.
- A set of uniform changes to government regulations and building codes is required so that all new building construction produces homes, commercial and public buildings that meet new mandated water efficiency standards covering the use of potable water, stormwater and treated waste water inside and outside of the building.
- Compulsory reporting and auditing of water used in industries and government facilities.
- A timetable for the retrofitting of all households, business precincts and industrial areas, starting by retrofitting all low income housing, public and community facilities.
- Special purpose grants available to local governments and communities to facilitate an immediate and massive expansion of stormwater collection, treatment and reticulation.

There is widespread community anxiety and concern about the lack of vision and boldness on display in Victoria with respect to the management of water as our most critical resource.

The public impression is of a government more interested in managing urban water use for political risk rather than for achieving sustainable water use in the face of serious climate change impacts.

Despite grim warnings and over a decade of opportunity, there has been no metropolis-scale policy, program and budgetary effort to boost recycling, stormwater capture and use, and retrofitting with water efficient technologies.

Soft-stroking the public by state government is completely missing the mark in terms of the amount of industry and household behaviour change that is required to maintain Melbourne's liveability let alone provide for further population increase.

All the signs currently coming from government are that the huge investment in the desalination strategy comes at the expense of public investment in alternative water options for Melbourne. In the government's Water Policy documentation of 2007, there is scarcely a genuine reference or commitment to the wide-ranging ways to achieve real water efficiency. Instead, the document speaks of being able to take Melbournians off water restrictions – largely by increasing water supply from a high-energy, greenhouse gas emitting desalination plant, and supplemented by taking piped water from already stretched Goulburn-Murray catchment areas to satisfy a city that remains wasteful in its water use.

Bipartisan leadership and agreement is pivotal. In any other comparable situation of a deep threat, our governments – state and federal – would be expected to go on to a 'war footing'. Actions and responses would occur quickly, with total commitment and deployment of appropriate resources.

Party-political responses, adversarial politics and point scoring are a recipe for delay and disaster. We need circuit-breaking and bipartisan political leadership of a kind that we would expect in times of community threat and emergency.

Herein lies the nub of the problem. We face a potentially grim water future in the south-eastern part of the continent. But the crisis is not just about our land, rivers and freshwater resources. It seems we have a political crisis on our hands as well – democratically elected governments without a sophisticated, long term vision of sustainable water use; and not prepared to act with the boldness and tenacity necessary to deliver the deep transformations we need to secure our water future in Victoria.

Mary Crooks is Project Director at the Watermark Project. <www.watermarkaustralia.org.au>

Victoria's Bass Coast desalination plant

Chris Heislers

Cartoon from <www.watershedvictoria.org.au>

Watershed Victoria is concerned that the Victorian government has committed current and future generations to contracts that do not meet their long-term needs in relation to water policy.

A silver-bullet mentality has been seized upon, with two large infrastructure projects being proposed to solve Melbourne's water woes. The North-South pipeline should be dropped. It would be a minor part of the solution, given the effects of climate change and drought on available flows, making this a very expensive option for the dollars spent, the volumes sourced and the communities and natural environments affected.

The other, larger part of the government's so-called 'Water Plan' is a seawater reverse osmosis desalination plant under construction on the Bass Coast. The funding model chosen is a Public Private Partnership, creating a necessity to profit from water. French company Degremont / Suez, which is facing harsh international scrutiny on its social and environmental performance, is heading a consortium to implement and profit from this plant.

Seawater desalination is expensive, provides few long-term jobs, has huge climate implications and creates another effluent outfall to the marine environment. Powered by brown coal, it will result in emission of one million tonnes of CO2 annually. Claims of carbon neutrality are via 'offsetting' by the construction of 180 wind turbines many hundreds of kilometres west of the factory.

The relevant wind farms were planned regardless, just waiting for financial viability via healthy renewable energy project incentives. Using such offsets as justification for an unnecessary, polluting industry is ludicrous. All viable renewable energy projects must be constructed to reduce our reliance on brown coal, not used by polluters as a license to pollute (see James Hitchcock's 'Greenwashing Desalination' article in this edition of Chain Reaction). Like the climate implications, the marine and coastal implications of the desalination project are massive.

In summary;

- 40 tonnes of dead sealife every day via entrainment of small organisms resulting in negative food chain flow on effects.
- 8000 litres per second of effluent discharge; brine, processing chemicals and organic matter discharged into a sensitive marine environment with often poor flushing and mixing capacity resulting in a massive zone of death and ecosystem alteration.
- The contribution of the plant to a significantly increased level of underwater noise, contributing to habitat degradation for the large and growing local whale populations. Seal, penguin, Great White Shark and other populations may be similarly affected.
- Disincentive to sustainable water supply created by the project means little chance of Melbourne's ocean outfall and storm-water systems being cleaned up; currently over 200 billion litres of storm water in excess of pre-settlement environmental flow causes significant urban stream and ocean ecological damage. Additionally, over 200 billion litres of treated waste water flows into our ocean from Melbourne's treatment plants.
- Contrary to a general desire to preserve our natural spaces and coastal environment, the 100 acre desalination plant (Victoria's largest ever infrastructure project) is being built on a magnificent rural coastline, behind a pristine foreshore reserve and dune system.

Depending on conditions in the north of the state, the North-South pipeline, the desalination plant and existing water sources will supply 50-60% more water than we have been using in recent years. With this level of expensive 'new' water in the system, where will the incentive be for sustainable water policy over the coming decades?

The government has a duty to secure basic necessities like water supply, but it must consider long term social, economic and environmental outcomes. How can a Public Private Partnership provide an alignment of public and private needs to achieve these outcomes, while profiting from a desalination plant?

Will the momentum, desire, and ability to use water more wisely in Melbourne be lost? Sustainable options exist now at a fraction of the implementation, operation and environmental cost of desalination (see 'The Watermark Australia Project' and 'Making Melbourne a Water Sensitive City' in this edition of Chain Reaction). Investment in these options is unlikely for decades as result of the government signing its $5.7 billion dollar contract with Degremont / Suez. We have possibly lost the chance for low impact, high job yield solutions to our current water stresses.

More information: <www.watershedvictoria.org.au>

The Victorian North South Pipeline

The Sugarloaf Pipeline Project, more commonly known as the North South pipeline, was announced in May 2008 as part of the Victorian government's 'Our Water Our Future' plan and was approved by federal environment minister Peter Garrett in September 2008. It was completed ahead of schedule and Premier John Brumby 'turned on the tap' in February 2010.

The pipeline will bring water 70 kms from the the Goulburn River system to Sugarloaf Reservoir for use in Melbourne. The government's plan is for the pipeline to be able to move 75 billion litres (gigalitres – GL) of water each year.

This water will be made available from savings created through the Foodbowl Modernisation Project (FMP). The FMP is intended to deal with the loss of water in the Goulburn-Murray irrigation district, which is estimated at around 900 GL of water annually through irrigation leaks and inefficiencies. The FMP is intended to save around 225 GL of water a year, of which farmers would get around 75 billion litres of "new" water. The environment and Melbourne also each receive 75 billion litres of the savings under this plan. Around 10 GL has been recovered to date, and at this point, the water flowing through the pipe is coming from reserves in the Eildon Reservoir. It has been widely reported that the government has consistently overstated the amount of water likely to be saved through the FMP.

In addition to the question of whether the water will actually be available for use in Melbourne, concerns have been raised about the lack of proper process. The project was announced by the state government without any involvement from, or consultation with, the general public, or publicly available scientific evidence about whether the pipeline was the best way to secure Melbourne's future water needs.

There are a range of negative social impacts along the pipeline route as it crosses through private land. Like the Bass Coast desalination plant, there have been cost blow outs in the project, for instance when the government realised it had insufficient capacity in the Sugarloaf Reservoir to hold all the pipe water, requiring extra money to be able to pump the water to Cardinia Reservoir.

In June 2009, Friends of the Earth released a report detailing the environmental costs of this project. It shows that:

- The greatest destruction of habitat has occurred in Toolangi State Forest, where a number of endangered species have had their habitat dissected by a 12 km long, 30 metre wide clear cut. After the fires of February 2009, sections of the clearfell were made even wider, compounding the damage and creating an even wider 'desert' zone to act as a barrier to native animals.

The North South pipeline crossing the Melba Highway.

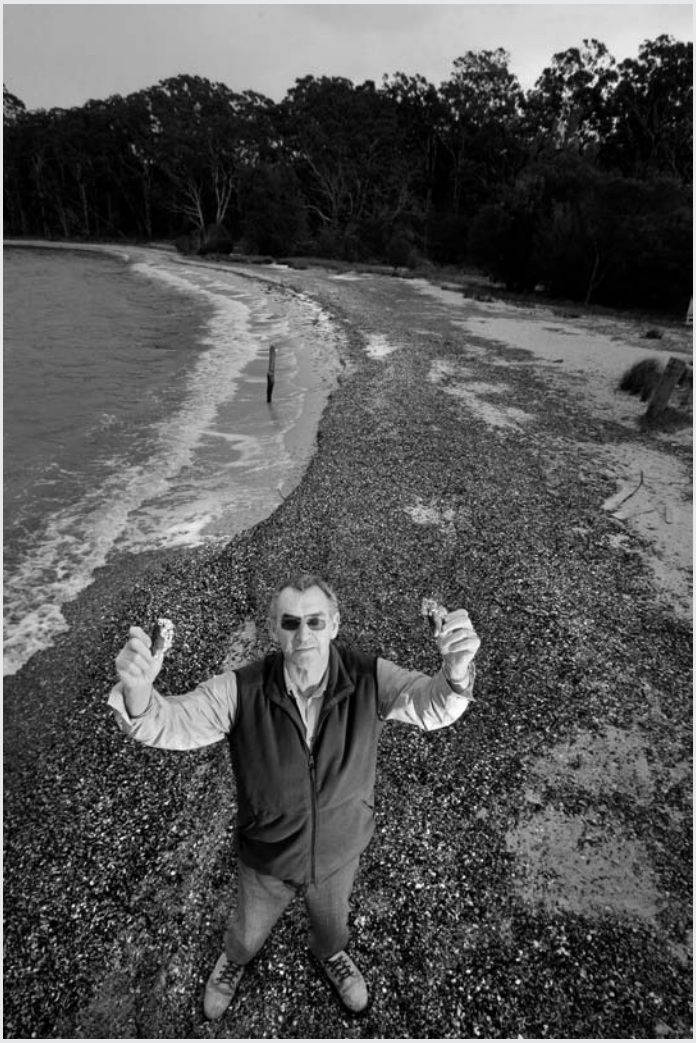
- At least four Special Protection Zones have been badly impacted by the pipe operations, especially one on Pauls Range, and one which was a linear link to protect Leadbeaters Possums, the Victorian faunal emblem. These Zones were established to protect significant habitat from logging, yet they were clearfelled for the pipeline.
- The pipe route cuts through Toolangi forest, opening the way for widespread weed invasion.
- There is the possibility of severe impacts on platypus populations in the Yea and Goulburn Rivers and a range of aquatic species including Macquarie Perch.
- It is very difficult to determine the actual impacts on a range of threatened or endangered species, such as the Growling Grass Frog, owls, and the Spot-tailed Quoll. It appears that damage has been compounded by continuing clear-felling straight after the fires of February 2009.
- There are significant greenhouse impacts associated with the project.

Although the water is now flowing – possibly as a precursor to an easing of water restrictions in Melbourne – the fact remains that our inland rivers are profoundly stressed through lack of environmental flows. The fact also remains that Melbourne wastes more water by pumping it out to sea at the Gunnamatta outfall than will ever come through the pipe. Melbourne has many job rich and economically viable ways to meet its water needs.

For details on the social impacts and community opposition to the pipe, check the Friends of the Earth website <www.melbourne.foe.org.au/?q=water/pipeline>. At the same website you can find the June 2009 Friends of the Earth report, 'Environmental Impacts of the North South pipeline'

Inspiration: Ross Scott and the Fight to Save the Gippsland Lakes

By Anthony Amis



Ross Scott

Ross Scott has been fighting for the rivers of Gippsland for the past three decades. I first met him in the 1990s through his work brokering a deal to stop the Strzelecki forests from being logged and also worked with him in exposing the notorious A-Team, a group of corporate-funded workers from the Maryvale Pulp Mill who were trained to undermine environment groups. Readers may have seen the Four Corners exposé on this outfit in September 2006, a story that was a result of Ross's energetic networking. Ross is also a tireless campaigner for the Gippsland Lakes, a system he now describes as being a 'marine morgue'.

Ross was born and raised in the Gippsland region in the 1930s. He was blessed a bush upbringing and parents who introduced him to the wonders of nature and the Australian environment. At the ripe old age of 14 years he almost started a trade, but his family put him back in school and he "just forgot to leave", later becoming a mechanical, civil and municipal engineer.

After working on roading in Fiji under Australian Aid, Ross returned to Gippsland in 1977 to take up a municipal appointment, and soon after was asked if he would accept a part-time engineer position for the Latrobe River Improvement Trust. When he returned to the rivers of his youth he was horrified to see them without aquatic life, stripped of their vegetation and for all purposes dead. Years of 'progress' in Gippsland, including paper making, coal power generation, forestry and agriculture had taken their toll on the Latrobe River and significantly impacted on the Gippsland Lakes.

According to Ross, "I think that this was the moment that changed my life, and gave me direction and the motivation to be a dedicated pain to all systems that impact adversely on our wonderful environment. Until this time, I doubt that I was even aware of the word 'environment'."

After another stint overseas, this time in Cambodia, Ross set up the Lake Wellington Rivers Authority in 1995. The Authority managed 300 named waterways in West Gippsland. "When this Authority was consumed by the flawed 'Catchment Management Authority' experiment," Ross recalls, "I became Waterway manager for Gippsland. After being structured out of the Catchment Management Authority, I then managed the Snowy River Rehabilitation Trial project."

Now in retirement and living in Paynesville, Ross has spent much of his time attempting to have the Victorian government initiate dedicated and skilled management of the Gippsland Lakes. He was a foundation member of the Save the Gippsland Lakes committee in the mid 1980's. Ross says: "Since then, under the management of the Gippsland Coastal Board, the lakes have almost died and are now a marine morgue."

Ross says: "The only thing that can now save the lakes, and possibly over time bring them back to some semblance of their former condition, is Ramsar – our international agreement to protect the habitat of migratory wading birds. Maybe if Ramsar in Switzerland is made fully aware of the lakes degraded condition, Minister Garrett may be induced to get involved; and I am working on it."

Greenwashing Desalination

James Hitchcock

Protest against the Bass Coast desalination plant, Victoria.

Huge desalination plants are coming into operation across the country, and state governments are doing their best quash public concerns about their energy demands.

With water droplets sending blues waves across our TV screens, Sydney-siders were told in dulcet tones about the wonders of our new 'wind powered' desalination plant. Securing water for us and the environment, and a child is playing in the garden with a watering-can. The Kurnell Desalination Plant opened in January; it will provide Sydney with 250 million litres of water each day. The plant – a public-private partnership between Sydney Water and Blue Water Joint Venture (John Holland and Veolia Water) – has cost $2 billion to build and is likely to cost residents another $1.6 billion over the next 10 years.

One of the major sources of concern has been the huge carbon footprint of the plant which will consume around 400 gigawatt-hours of electricity per year. The NSW government has consistently told us that the plant will be powered with renewable energy.

Phil Costa, NSW water minister on the day the plant opened, said: "Sydney's wind powered desalination plant will run for two years to ensure it is working." As baffling as the thought of needing to run something for two years just to make sure it works is, it is the repeated claim that the plant is powered by wind energy that is concerning. A quick look past the headlines reveals that the plant sources its energy from the national grid (85% of that electricity comes from coal).

Claims that it is wind powered refer to the fact that emissions have been 'offset' for 10 years of the plant's operation by the purchase of Renewable Energy Certificates (RECs) from the Capital Wind farm in Bungendore, near Canberra. Prof. Stuart White from the Institute of Sustainable Futures at UTS sums up the green claims of the desalination plant bluntly in Central Magazine: "If we didn't have the desalination plant, the wind farm could be used to power a third of the homes in Canberra."

For those in Sydney, assurances that the Kurnell plant is only for emergencies seems laughable. The plant is likely

to operate continuously for four years no matter how much water is available from other sources. After that, it will operate whenever dams fall below 70%, which is most of the time – a deal which will no doubt please French water giant Veolia. There were cheaper, cleaner and more efficient options, such as water conservation, but that seemed to come with far less ribbon-cutting photo opportunities.

Similar stories can be found when examining Australia's other two operational desalination plants. In Western Australia, the Kwinana Desalination Plant has energy demands of 180 gigawatt-hours per year. The former state Labor government claimed it was "powered by renewable energy". In fact, the plant is powered from the WA electricity grid and has purchased RECs through Western Source from the Emu Plains wind farm. It was claims like these that the Australian Consumer Competition Commission branded misleading and warned Water Corporation not to make similar claims in the future.

The Tugun Desalination Plant near the Gold Coast will use 150 gigawatt-hours per year straight from the grid to power its operations. The Queensland government's WaterSecure website lists a number of what it calls 'misconceptions' about its desalination plant including claims that desalination is highly energy intensive. The WaterSecure website responds: "... one jumbo jet engine uses approximately the same energy required to power the desalination plant at full capacity and jumbo jets cannot use renewable energy."

Stellar logic there. The government makes a mockery of what was already a ridiculous analogy by stating that the desalination plant is powered from the grid but has offset a mere 18-20 months worth of its operations through the purchase of RECs.

State governments are intending to 'offset' emissions from planned desalination plants at Wonthaggi (Bass Coast) in Victoria and Binningup in Western Australia. The South Australian government plans to purchase GreenPower for the proposed plant at Port Stanvac.

One interesting project is a planned small desalination plant in Port Augusta, SA. According to the company pursuing this project: "Imagine a shimmering field of mirrors harvesting solar energy to generate electricity and create fresh drinking water for a city of 15,000. That's the vision water and power project developer Acquasol Infrastructure Ltd has for Port Augusta, South Australia."

Hopefully the Acquasol project will go some way to meeting its green claims. But the company's website suggests that solar power will be supplemented with gas power, and further investigation reveals that the plan is for three-quarters of the power to come from a combined cycle gas plant and the remaining one-quarter from solar power (Ausra compact linear fresnel reflectors).

Some BHP Billiton literature asserts that the company plans to power a proposed desalination plant at Point Lowly in South Australia from renewable energy. The plant will supply the Olympic Dam mine. But other company literature states that the plant would be supplied from the grid with some sort of green-power arrangement with the National Electricity Market. One of a number of important, unresolved questions is whether the arrangement will lead to new renewable energy generation capacity or simply absorbs existing capacity.

The use of desalination as a solution to water shortages is the same 'techno-fix' approach governments have adopted in response to climate change. Rather than dealing with the systemic problem of unsustainable consumption of Australia's most precious resource, our water, they have gone for the band-aid approach. By engineering a solution, patterns of excessive water consumption will go on meeting the interests of the multinational water cartels, not the community.

The irony – apparently lost on the state premiers – is that the huge carbon footprints of these desalination plants will further contribute to global warming and reduced precipitation in Australia, which was the apparent reason for building them in the first place.

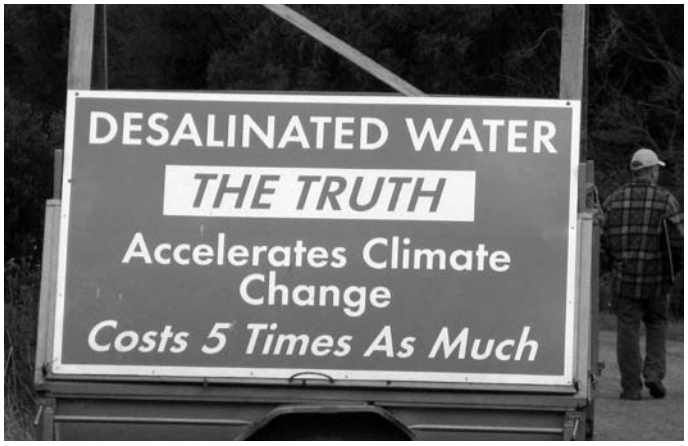
James Hitchcock is a member of Friends of the Earth, Sydney.

Protest against the Bass Coast desalination plant, Victoria.

A referenced version of this article is available from <chainreaction@foe.org.au>.

Privileged Information

Brigid Walsh



"Too much Scientia, not enough Sapientia!"
Too much science, not enough wisdom!
Lindsay Falvey, University of Melbourne.

In July 2008 Richard Denniss from the Australia Institute spoke at a forum titled 'The Power of Ideas'. Denniss began by saying: "So you think you have an idea. Well, I'm here to tell you there are a lot of people out there who don't like your idea, don't want your idea and they have the resources to fight against your idea."

This dose of realism is borne out in the management of natural resources – in particular, water management. In this area, it is not just about ideas – alternative ways of doing things or looking at things. It is also about novelty in the field of knowledge. Politicians, bureaucrats, water corporates and a cabal of 'water experts' dictate acceptable knowledge and knowers.

Political parties of both the right and the left have been dominated for decades by economic rationalism which has manifested in various gradations of neoconservative governance. There are now political apparatchiks whose plans rely upon outsourcing, Public Private Partnerships, and the minimisation of social expenditure in government budgets. There are supposed financial benefits in such arrangements while retaining and increasing the power of governments and individuals; and increasing corporate contractual relationships which benefit the post-political careers of the political apparatchiks.

Social dysfunction, smouldering dissatisfaction, social exclusion and destabilisation of communal life are not measured, nor are these costs accounted for in the national and state balance sheets. Water is emerging as a pivotal factor in measuring everything from political performance, environmental status and economic well-being, to communal life and food security. A good starting point is J.M. (Joe) Powell's book, 'Watering the Garden State: water, land and community in Victoria 1834-1988'. Powell covers the underlying issues of some of our contemporary water problems in Victoria. One fact becomes plain: there are always vested interests around water.

So what is a water expert? What goes into the making of a water expert?

A university education is the beginning – if you want the basic qualification to be deemed a knower. Universities are funded by governments and by corporations and, in addition, have their own commercial interests.

On graduation from university, the future 'expert' goes to work either for government or water corporations. The expert joins an industry and professional association. The people who join these associations come from both government and water corporations. If friendships have not already formed at university, the industry and professional associations afford this opportunity. There are opportunities to go on study tours – many of which have some form of sponsorship from water corporations. Conversations occur, opinions are formed and sooner rather than later a common 'wisdom' forms which comes to dominate submissions to government, research, university teaching, corporate research, lobbying and government/industry relationships.

There are heretics. These are the men and women who have been trained as above but have formed other opinions. Perhaps someone has been a diligent researcher and found a major university sponsor has feet of clay. One way to find out that your PhD has become a document of suspicion! Another way to become a heretic is to join forces with community organisations whose wisdom comes from practical experience, knowledge hard won from the land – uniting the wisdom of learned science with the practical wisdom worked out in winning a livelihood.

Conversely, politicians have abdicated their responsibility to the community in relation to water as a common resource and a public good. The question the electorate must ask politicians of today and of yesteryear is: "Didn't you see the water crisis coming?" If they didn't see it coming, they don't deserve their position. They are inattentive. If they did see it coming, then the electorate must ask: "Then what did you do to benefit the community and sustain our common water resource?"

My view is that politicians of the major parties have abdicated their responsibilities. As memorial to this abdication we have desalination plants, water commodification and trading, escalating water removal from communities, and declining water resources for food production. Herbert Schroeder, in his article 'Ecology of the heart: understanding

how people experience natural environments', highlights the contribution of the individual's experience of natural environments.

If we are searching for sapientia, wisdom, in the management of natural resources we must add the wisdom of experience to science and technology; the wisdom of human interactions with each other and the environment; the wisdom of diversity in the application of knowledge.

Schroeder's comments are not the only bright spot in relation to the inclusion of human and social dimensions in resource management. The Northern Agricultural Catchments Council (NACC) in Western Australia says: "There is growing concern that many of the key messages regarding natural resource management being delivered at federal, state and local levels are not being transmitted in ways that are easily contextualised by resource managers. Earlier investigations by NACC suggested the concepts 'natural resource management', 'sustainability' 'biodiversity' 'biosecurity' were not well understood by our target groups. Nevertheless, government and agency messages remain littered with this jargon and NACC has been guilty of its inclusion in some of our messages. More worrying is the observation that other than those resource managers directly engaged with NACC ... there appears to be little comprehension of NRM [natural resources management] in the wider community. But we are not alone. Those agencies and other regional bodies tasked with delivering NRM programs face similar lack of recognition regarding their functions and they too struggle to articulate these messages on the ground."

NACC's moves into the area of social science in developing NRM literacy and encouraging better management of natural resources is a work in progress. The Council's story illustrates a growing wisdom. Scientia, science, alone is insufficient. Wisdom comes from experience. Just as science progresses in knowledge and techniques, so does experiential wisdom.

Messages that don't communicate often come from people who don't want to disseminate knowledge except to the powerful. Such people appear to communicate but their communication is meaningless. Is it too far-fetched to say that, at times, this can be deliberate? Is it too far-fetched to ask that plain, jargon-free English becomes the norm? This would be a simple but good beginning so that knowing and the recognition of who knows become more inclusive and the implementation of that knowledge more holistic.

Brigid Walsh is a North Australian (North Queensland and the NT) now living in Melbourne. She is a researcher with interests in water, food security, and community advocacy, particularly for remote communities.

Witch's Brew: contaminants in sewage and waterways

Peter Fisher

Trace contaminants mixed in sewage and waterways are a real cause for concern.

Each year, truckloads of prescription drugs are administered in Australia, not to mention over-the-counter and illicit drugs. By the time the end-products of orally administered drugs, including the unmetabolised fractions, are excreted, they will comprise an unfathomable brew.

Now mix all the contributions from households, offices, public places and medical venues in the sewerage system – that grand homogeniser – as well as exposing them to other synthetic chemicals found therein. Presto, you have a witch's brew!

Signs that drugs might be entering the environment via waste water were in evidence 60 years ago: because of the scarcity of penicillin, US army teams recovered it from the urine of soldiers who had been so treated. However, until the past few decades it was taken for granted that concentrations of excreted drugs and hormones were so minuscule as to be of little consequence to human health or biota in receiving waters.

The discovery of malformed fish in a river downstream from a sewage plant in the US as a result of traces of estrone, a naturally occurring estrogenic hormone found in the urine of pregnant women, changed that perception. The find triggered research into the persistence, toxicity and degree of biological activity of feral drugs and their breakdown products.

The British, the Europeans, the Japanese and the Americans have all undertaken extensive monitoring of these emergent contaminants to establish exposure universes and are working on ways to remove them. For example the United States Geological Survey has completed a reconnaissance of the occurrence of pharmaceuticals, hormones and other organic waste water contaminants in 139 American waterways. The most frequently detected compounds were coprostanol (fecal steroid), cholesterol (plant and animal steroid), DEET (insect repellent), caffeine (stimulant), triclosan (antimicrobial disinfectant), tri (2-chloroethyl) phosphate (fire retardant), and 4-nonylphenol (non-ionic detergent metabolite).

By contrast Australia's effort has been piecemeal, albeit with some valuable contributions here and there from the likes of Latrobe University, CSIRO and Entox. The degree of complexity is indicated by recent research on Californian frogs which found that while one chemical alone may do no harm in low doses, in conjunction with others, even in doses that are individually safe, it can do serious harm (1).

Another study on human embryonic cells found that mixtures of 13 drugs at ng/L levels can inhibit cells proliferation by affecting their physiology and morphology, suggesting that water-borne pharmaceuticals can be the potential effectors on aquatic life (2).

A most recent concern is nanosilver, a widely applied nanomaterial in cosmetics and toothpaste, valued for its antibacterial properties, and known to be released during usage. So how many compounds are either not degraded or are only partially degraded to recalcitrant metabolites in a treatment process? It depends on whether that process is at a primary, secondary or tertiary level and the technology used. In the latter category, activated carbon filtration isn't too bad for starters but it's expensive and there's clearly an immediate disposal problem of the captured filtrate.

Treatment trains involving reverse osmosis, nana filtration, ozone-advanced oxidation, and even activated carbon in whole or part do far better. (Even so, pilot and lab scale studies have established that water treatment by reverse osmosis is more effective for pharmaceutically active compounds than hormones.) But these have high carbon footprints and are typically low volume compared with the high volume needs of centralised contemporary sewage treatment where existing plants have removal efficiencies as low as 30%. Historically, sewerage engineers have not had to grapple with this issue and even today it is rarely raised as a problem.

The need for a change in mindset within the industry is highlighted by the fact that European researchers last year found an association between mothers who used the insect repellent DEET (N, Ndiethyltoluamid) as applied to the skin in the earliest stage of pregnancy and an increased rate of hypospadias' in the penises of male children, i.e. where the opening is in the wrong place. DEET (along with Saccharin by the way) has been found to be one of the most ubiquitous chemicals in surface and ground water in the US – a phenomenon seemingly replicated here.

Macalister Irrigation District of Victoria

At least with discharge to sewer there's an opportunity to zap the likes of DEET (however effectively) in contrast to agriculture where it and other hide sweat, wash-offs as well as fractions contained in dung and urine from drugs used in animal husbandry / herd health programs, lodge straight to ground. Some of these could possibly wind up dosing the soil, groundwater, stream sediments or waterways. That hunch was dramatically confirmed by the results of sampling in the cow rich Macalister Irrigation District of Victoria during a recent calving season, when drug administration is at a maximum (3). Significant concentrations of DEET and antibiotics (used to combat mastitis, scour, bovine bronchopneumonia, etc.) were found in irrigation channels, recycling ponds, feeder

creeks and the Latrobe River not far from its entry into Lake Wellington. The study also showed that continually reusing water in agriculture in a closed loop situation – as is commonly advocated as a water saving measure – could increase the concentrations of potentially harmful chemicals. Particularly high levels of the antibiotic compounds oxytetracycline and sulphasalazine were discovered in an otherwise showcase recycling pond. This observed build-up of chemicals means the practice should be reconsidered.

Recent Queensland research has established that antibiotics detected near sewerage works in the Brisbane River were generating resistant strains of ecologically important bacteria. This suggests that health might also be at jeopardy when an open wound comes into contact with such water as it may not subsequently heal. Furthermore, reducing the use of antibiotics in food-producing animals leads to less drug resistance in humans.

A Precautionary Agenda.

The core elements of a long over due precautionary agenda are:

Point sources

A first step should be exercising greater control over what gets put to sewer and similarly upgrading the performance of wastewater treatment plants both in terms of their energy usage and ability to strip persistent organic pollutants.

An obvious target for source control are hotspots such as hospitals and day clinics with the establishment of preventative / waste reduction protocols especially focused on drugs known to be highly toxic and persistent on excretion. A greater awareness and selectivity by big pharma and medical professionals of the ultimate fate of some of their administrations in the environment is needed and where a less persistent drug will do the trick it should be used. For example, the anti-tumour drug _–D-Glc-IPM has the same therapeutic benefit as cyclophosphamide and infosphamide but is readily biodegradable.

Clinical protocols would direct xenobiotic waste streams to holding tanks. There would for example be no wanton discharge of half-empty syringes into wash basins. These holding tanks could feature accelerated degradation by heat/UV and other treatment processes before discharge to sewer.

A good source control management system would inevitably lead to the multifarious household. An audit of household discharges could profile the type and amount of sewered drugs and also the contents of so-called 'personal care products' with nanosilver particles, synthetic musks (known to affect amphibians), etc. Recent advances in detection and analysis would make this easier.

Similarly, California American Water's 'No drugs down the drain week' could be replicated as part of a national campaign to reduce pharmaceutical pollution in water supplies. Entry paths into drinking water catchments are leaking septic tanks and town sewer mains as well as ground water infiltration in agricultural districts.

This range of measures would materially reduce the toxicity of purple pipe water. But there is a need for a lot more research into low carbon purification techniques, especially at the bulk scale – wherever the final residue finishes up.

Diffuse sources

As dairy properties are one of the most insatiable users of agrichemicals, it would be prudent to undertake regular monitoring of streams draining dairy farm areas for these "farm escapees" and to lessen them by some straightforward measures (in the process moving the industry away from its present pill-popping culture). These measures include preventing cows drinking from dung-contaminated dams, and better maintenance of dairy access tracks – fully laden udders coming into contact with protrusions can lead to teat abrasions and thus entry/transmission points for mastitis. Also, portions with water-logging can be a source of footrot.

Improvements to effluent retention ponds – which are often undersized, poorly maintained and/or unable to cope with rainfall which is now far more peaked with climate change – would also help green the industry.

In East Gippsland alone, where dairying is close to feedlot proportions, these reforms would help protect the Ramsar designated Gippsland Lakes wetland chain – a chain already severely compromised by a combination of marine incursion from recent dredging of the ocean entrance channel and reduced freshwater flow due to present (and future) diversion of the plumbing to feed Melbourne's voracious water needs and to service Victoria's new 'Gippsland Food Hub'.

An extraordinary but neglected natural resource (eclipsed for media attention by the Coorongs), the Gippsland Lakes lost all of their bi-valves, sand worms and sea grass as well as nine dolphins in a little over a year, with 40% of the pod developing skin lesions all from an "unknown source"

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(3) Fisher and Scott, 2008, 'Evaluating and controlling pharmaceutical emissions from dairy farms', Journal of Cleaner Production 16, 1437–1446; Fisher and Scott, 2009, Letter to the editor, Journal of Cleaner Production 17, 318–320.

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Water Privatisation

Cam Walker

For decades, state and federal governments in Australia have been privatising everything that isn't bolted down ... and everything that is bolted down ... and the bolts. From the privatisation of the Commonwealth Bank, the State Electricity Commission in Victoria, to the cutting up of Telstra, to the current struggle over energy privatisation in NSW, the economic rationalists have been successful in getting their privatisation agenda through in most instances.

The same trend can be found in water. Until the 1990s, water and sewerage services in most countries were a state government responsibility. In the 1990s, multinational led water privatisation increased, along with infrastructure privatisation in general.

Since the mid 1990s, developing countries (the global South) have been encouraged and pressured to accept privatisation of water and water services through some form of public-private partnership or private sector participation. This has largely been driven by the international financial institutions who provide funds to the developing world.

In the developing world, Latin America and East Asia lead the way in water sector 'liberalisation'. In general, water sector liberalisation has been the slowest and most controversial sector, largely because water is a necessity of everyday life. In spite of this, financial institutions and water corporations are now trying to shape the UN agenda on water. There is also a growing civil society movement against this ideological dominance, shown by alliances such as 'Our World is Not for Sale' and the Council of Canadians.

In the global North, in nations like Australia, liberalisation has been driven by the dominance of the economic rationalists of the Hawke and Keating era, and finished off under the government of John Howard. Even many state governments run by the ALP have adopted aggressive privatisation agendas, softening community opposition through initially 'corporatising' public water authorities before cutting them up and selling them off.

A handful of companies, mostly based in France and England, have come to dominate the water multinationals. The largest water corporations in the world are part of the French transnational Suez and the German energy conglomerate RWE. Another is French company Vivendi. They undertake a wide variety of operations such as telecommunications, energy and waste in addition to their water-related businesses.

The top two, Vivendi and Suez, capture about 70% of the existing water market share. Suez Environment, through its affiliate Degremont, is one of the partners in the Aquasure consortium currently building the Bass Coast desalination plant in Victoria. Suez operates in 130 countries and Vivendi in over 100; their combined annual revenues are over US$70 billion.

RWE revenues are currently over US$50 billion (energy included), having acquired British water giant Thames Water. By purchasing American Water Works, RWE gained control of the largest US private water utility. This expanded its customer base from 43 million to 56 million people. Other major water corporations include Bechtel, Biwater plc, Bouygues/Saur, U.S. Water, Severn Trent, Anglian Water, and the Kelda Group.

There is growing opposition here – and this is becoming increasingly organised and vocal. As more and more of our water ventures are run as privatised or public-private ventures, we should remember the lessons from water privatisations overseas:

* When multinationals come in, rate increases tend to follow.

* Public and consumer accountability gives way to shareholder accountability.

* Private ownership reduces local control and public rights.

* In many places it has been shown to foster corruption.

* It is very difficult to reverse, yet when there are problems – as is often the case – companies can walk away.

* It can compromise the ecosystems needs for water.

* And perhaps most importantly, privatisation allows water to be seen as just one more resource to be sold at a profit, rather than an essential element of everyone's daily life.

More information:
* FoE International's Real World Radio for further information on community struggles against privatisation: <www.radiomundoreal.fm>
* The Council of Canadians <www.canadians.org>
* Australian Water Network <http://groups.google.com/group/australian-water-network>
* IATP Water Observatory <www.tradeobservatory.org/issue_water.cfm>
* 'Who are the largest water companies?' <www.citizen.org/cmep/Water/general/majorwater>

Some information in this article comes from the Institute for Agriculture and Trade Policy <www.iatp.org>

Global Water Facts

Water

* Less than 1% of the world's fresh water (or about 0.007% of all water on earth) is readily accessible for direct human use.

* Daily per capita water use in residential areas is 350 litres in North America and Japan; 200 litres in Europe; 10-20 litres in sub-Saharan Africa.

* 0.9–1.1 billion people lack access to safe water supplies.

* More than two-thirds of people without an adequate water source live on less than US$2 a day.

* Poor people living in slums often pay 5-10 times more per litre of water than wealthy people living in the same city.

* Agricultural water use accounts for about 75% of total global consumption – mainly through crop irrigation – while industrial use accounts for about 20% and the remaining 5% is used for domestic purposes.

* It is estimated that two out of every three people will live in water-stressed areas (below 1700 m3 per capita per year) by the year 2025. In Africa alone, it is estimated that 25 countries will be experiencing water stress by 2025.

Sanitation and water-releated disease and deaths

* 2.5–2.6 billion people (38% of the world's population) lack access to adequate sanitation (hygienic separation of human excreta from human contact).

* Of the 60 million people added to the world's towns and cities every year, most occupy impoverished slums and shanty-towns with no sanitation facilities.

* 3.6 million people die each year from water-related disease.

* 43% of water-related deaths are due to diarrhoea; of these, 84% are in children aged 0–14 (1.3-1.4 million deaths each year) and 98% occur in the developing world.

Impacts on Women

* Millions of women and children spend several hours a day collecting water from distant, often polluted sources.

* A study by the International Water and Sanitation Centre of community water and sanitation projects in 88 communities found that projects designed and run with the full participation of women are more sustainable and effective.

Sources: <water.org>; <www.worldwatercouncil.org>; <www.unep.org/dewa/vitalwater>

US EPA Petitioned to Regulate Chemicals in Water

The Center for Biological Diversity has petitioned the US Environmental Protection Agency to establish water-quality criteria for numerous endocrine-disrupting chemicals under the Clean Water Act, the first step in regulating and eliminating persistent and widespread chemicals that damage reproductive functions in wildlife and humans.

"Our drinking water and aquatic habitat for wildlife is being increasingly and unnecessarily contaminated by endocrine disruptors such as pesticides and pharmaceuticals," said Jeff Miller from the Center for Biological Diversity. "We should be very concerned when we see chemically castrated frogs and frankenfish resulting from these chemicals – it's time to get these poisons out of our waterways and ecosystems."

"As we start looking at this problem, we're seeing disturbing hormonal responses in fish and wildlife from pesticides, pharmaceuticals, and personal-care products that are contaminating aquatic ecosystems," said Miller. "The impacts of endocrine disruptors on aquatic wildlife are our canary in the coal mine, since these contaminated waters are often our drinking-water supply. The implications for human health are not good."

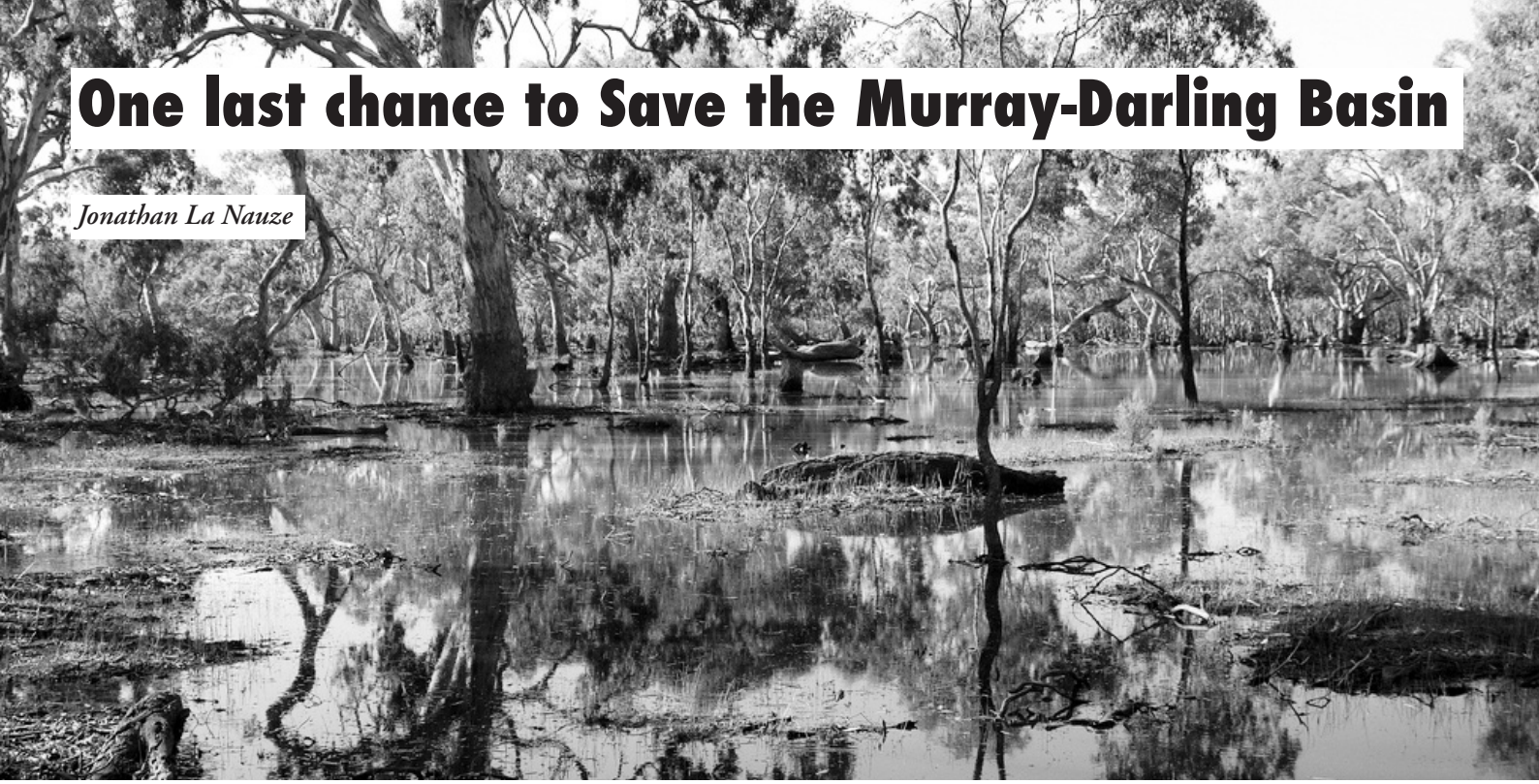
Despite its authority to do so, the EPA currently regulates some, but not all, of the endocrine disruptors in the petition. For those it does regulate, standards are not stringent enough to protect against endocrine-disrupting harm. The American Medical Association called last year for decreasing public exposure to endocrine disruptors based on overwhelming evidence that humans are unnecessarily being exposed to harmful endocrine disruptors.

An example of an endocrine disruptor that should be regulated under the Clean Water Act is the toxic compound atrazine, the most commonly used herbicide in the US, which has contaminated groundwater and drinking water over widespread areas. Recent research has linked atrazine to cancer, birth defects, endocrine disruption, and fertility problems in humans. Atrazine also chemically castrates male frogs at extremely low concentrations.

Source: Center for Biological Diversity, <www.biologicaldiversity.org>

One last chance to Save the Murray-Darling Basin

Jonathan La Nauze



Flooded red gum wetlands near Murchison, Victoria. Photo by Rahima Hayes

The Murray Darling Basin is a biogeographical and ancestral domain of global significance. It contains a vast network of rivers, streams and wetlands and is home to some 40 Indigenous Nations. It is also the site of an ecological and social catastrophe unprecedented in Australia. In the current drought, historical mismanagement is crashing headlong into a climate altered future. The resulting crisis is one we cannot avoid but that we can survive, and out of it restore a more equitable, bountiful and healthy future for the Basin and its people.

Before irrigation and river regulation, the Murray-Darling was – like much of the rest of this continent – a temperamental beast. Drought and flooding rains were no figment of McKellar's imagination – the youthful Dorothea would have seen both from the family farm. Out of the floods of the early 1890s emerged the terrifying 'Federation Drought', comparable with the current drought in terms of rainfall, but without the dams and weirs that now keep rivers flowing through dry seasons. The Darling stopped flowing for over 12 months and the 'Mighty Murray' stranded paddlesteamers for years with its low flows, isolating towns that had relied on its channel for transport, trade and life itself. Yet it was this pattern of wetting and drying to which the ecosystems of the Murray had adapted – flows ranged from 40,000 billion litres in a wet year to practically nothing in a dry one.

River regulation – rain stored in wet seasons was released in dry ones – was both a response to this uncertainty, and a result of the insatiable pursuit of economic development by the Australian farmer, politician and labourer.

Reaching the limits

Fast forward to the present, and through a tragic combination of eternal optimism, greed and dysfunctional federalism, the inevitable crash has happened. Many farmers don't have enough water to plant crops or keep orchards alive. For two years running (the 2006 and 2007 irrigation seasons), irrigators in the NSW Murray Valley received zero percent of their water entitlements. In 2008 they received 10%. Around them, whole forests of red gum are dying. And downstream the lakes at the Murray's mouth are turning into massive toxic wastelands. Something has gone drastically wrong.

The first problem is overallocation. Throughout the twentieth century, water licenses were handed out like snags at a barbie. Close to 100% of the available water in the Basin is now allocated to extractive users (mostly farms), and in some rivers total entitlements add up to more than the average annual flow. Only the physical difficulty of extracting every last drop, plus a few legal requirements such as the minimum flow owed to South Australia prevent the river being sucked literally dry to meet those impossible entitlements. Basin-wide, out of an average discharge of 12,200 billion litres, about 10,000 or 80% is removed for human use in an average year.

The second problem is that there is less water than there used to be. We are in a record-breaking drought: over the 12 years to 2009, annual rainfall was 10% lower than the long-term average in the southern Basin. Most of that decline was in autumn and winter rainfall, however, when most run-off is usually generated. The effect: the volume of water that actually entered the river system was down a massive 40%. 2006-07 saw only 1,404 billion litres flow into Basin's rivers, a record low. Even cautious institutions such as the CSIRO warn these changes are attributable to climate change, and that a drier future is highly likely. Even when this drought breaks, there will be no return to the golden days.

Just how does a river die?

In Ngarrindjeri country at the mouth of the river, the Coorong and Lower Lakes are undergoing an irreversible ecological transformation. Once a massive estuary in which fresh river water blended with seawater, recent years of low flows in the Murray have led to a build-up of salt in the Coorong. Constant dredging keeps the river's mouth from closing, but it's weak flow is not up to the task of keeping the old salt-fresh water balance, especially as the lower the flow, the higher the concentration of salt in the river water itself. As a result the Coorong has turned into a hyper-saline environment, many times more salty than the sea.

The Coorong and Lower Lakes historically supported hundreds of thousands of waterbirds every year; many flying from distant continents to breed. The salinity has killed the aquatic life on which these birds feed, however, and they are not returning. The once-common Pelican has largely abandoned the Coorong as a breeding site, and populations of many other waterbirds are crashing.

There is a new threat emerging, too. The term "acid-sulphate soils" has entered the local vernacular: a dangerous combination of historic river regulation and contemporary drought that has created a toxic time bomb. The sulphidic byproducts of certain indigenous bacteria, when combined with the right blend of soil-borne metals, then water and finally air, produce highly concentrated sulphuric acid. In many places this process has been occurring for eons without problem, as the natural cycle of drying-out and flooding again prevented the build-up of acid-sulphate mud into dangerous quantities. Where river regulation has led to permanent inundation, however, a potentially lethal build-up has occurred.

The mud itself is innocuous whilst it remains covered by water. Add a few years of drought, however, and as water levels drop it reacts with oxygen and an ecological catastrophe unfolds. At Bottle Bend near Mildura, the muddy bottom of a near dried-out lagoon registered a pH level of 1.6 in 2008 – that is nearly a million times more acidic than normal river water. On a larger scale, this nightmare is unfolding in the enormous Lower Lakes.

Unchecked, these localised problems will have disastrous flow-on effects. The strong acid in places like Bottle Bend is capable of liberating heavy metals such as arsenic from the soil, threatening drinking water for over a million people in Adelaide and hundreds of other townships. And the salinity of the Coorong is creeping upstream – for millenia the river has been a massive vein carrying salt out to sea, but the lower the flow, the less it can push out and the more the salt backs up at the bottom. Salinity is slowly creeping up the river.

Similar stories can be told about ecosystem after ecosystem throughout the Basin. In 2004 the first systematic audit of river health in the Basin was initiated by the Murray Darling Basin Commission. Its first report found that 20 of the Basin's 23 rivers were either in "poor" or "very poor" ecological condition. Over-extraction of water is not the sole cause of these problems. But as a Scientific Reference Panel reported to the Commission in 2004, of all the threats to the health of the Basin, "changes to flow regime are critical and require immediate attention" if the river is to be returned to health.

Whose water? Whose fish?

The degradation of the rivers, wetlands and streams of the Basin leaves all Australians poorer, but especially Traditional Owners. These ecosystems are the living cultural heritage of thousands of generations, they make up a spiritual landscape that exists nowhere else in the world, and they provide the resources – from fish to freshwater – of a vital contemporary cultural economy. Clean, fresh water flowing through healthy Country is a birthright of which Traditional Owners have been gradually dispossessed. Every river impoundment, every licence to pump water, every farm dam has diminished not only the right, but also that which was enjoyed.

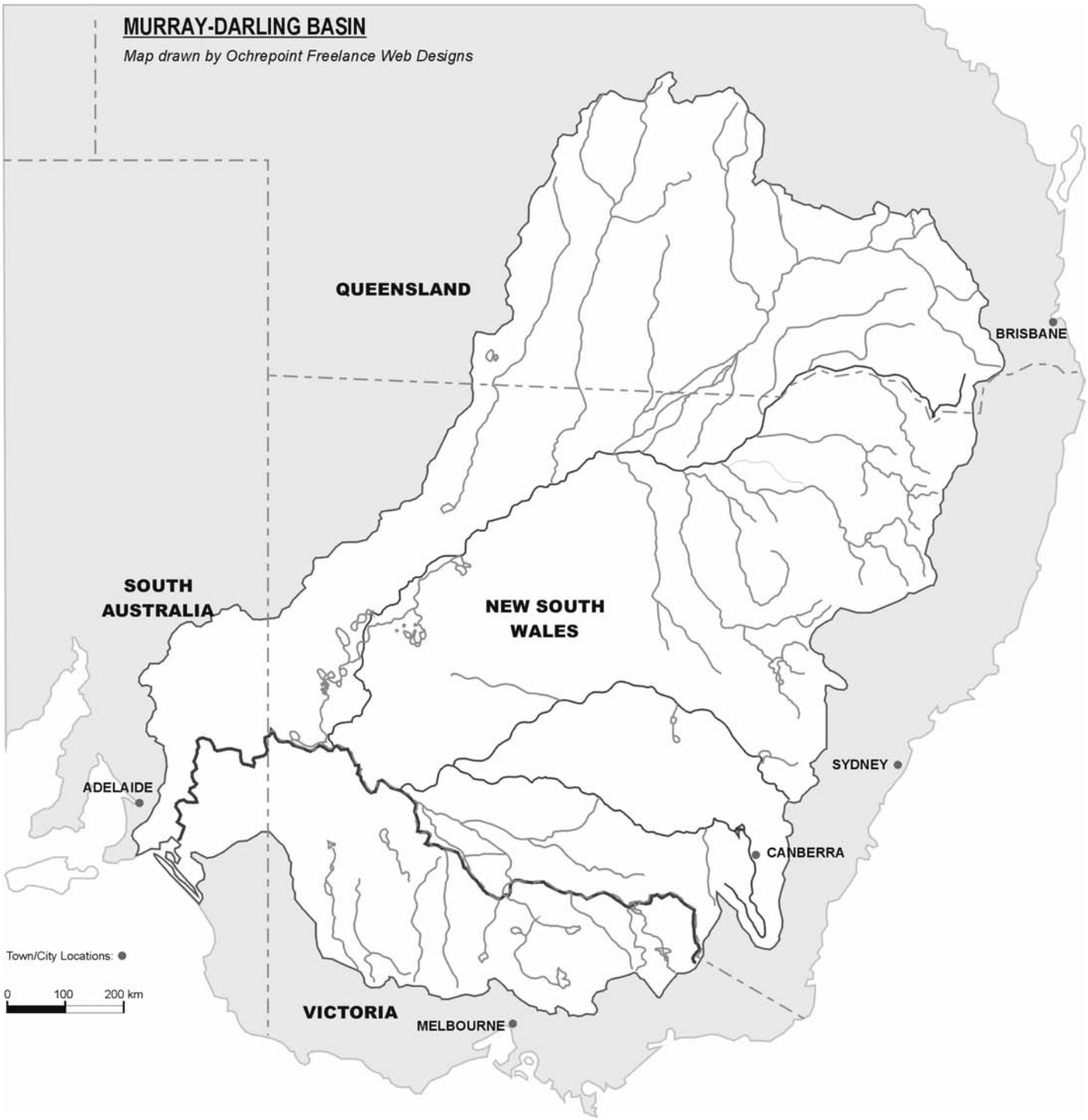
Indigenous water dispossession has thus occurred in lockstep with environmental degradation. This does not mean that environmental restoration will automatically restore Indigenous water rights, however. It will not automatically protect burial grounds from erosion, or return medicinal plants to the billabongs that are accessible to communities. It will not by default enable Traditional Owners to fulfill inherited obligations to care for their country and teach their children to do the same.

The federation Murray Lower Darling Rivers Indigenous Nations (MLDRIN) has begun to push the notion of cultural flows – water allocations that enable Traditional Owners to exercise their custodial responsibilities to care for the river system – into the policy debate. The notion is now supported by many environment groups, including Friends of the Earth. Thus far, however, the campaign work to achieve them has been left to MLDRIN.

The first two attempts at a solution

We are now in the midst of the third – and most promising – attempt by Basin governments to address this water crisis. If done well, the development of a comprehensive Basin Plan and the Rudd government's $3.9bn water buyback may set the Basin on a path to ecological recovery. But they are limited by the constraints of free-market ideology and political reality. And whilst Traditional Owners are actively participating in this process, it still fails to adequately recognise their rights to water and responsibilities to use it in caring for country.

The first significant move by governments came in the 1990s with a 'cap' on water taken from the Basin's rivers. Finalised under the Howard government, it only capped extraction by NSW, Victoria and South Australia. Queensland, which had so far only managed to divert less than 7% of the Basin's water resources and hence felt it deserved a chance to catch-up, was not covered.



Murray Darling Basin. Map from <www.murrayusers.sa.gov.au>

The cap was then followed by two major intergovernmental initiatives – the National Water Initiative and The Living Murray program. The former, initiated by an intergovernmental agreement signed in 2004, would reform the national water entitlement system to "achieve a nationally compatible market, regulatory and planning based system of managing surface and groundwater resources for rural and urban use that optimises economic, social and environmental outcomes." In other words, bring our river systems into an ecologically sustainable, free market utopia. In reality, locking us into this market-based approach has hindered socially just and environmentally effective change.

The Living Murray (TLM) program established by the Australian, NSW, Victorian, South Australian and ACT governments in 2002, was to be a massive river restoration program to "achieve a healthy working River Murray system for the benefit of all Australians," through "returning water to the River's environment" and other measures. Against intense pressure from the irrigation lobby, 500 billion

litres of water entitlements were secured for a handful of "icon sites" such as the Barmah-Millewa forest: less than an eighth of what TLM scientists said was needed to restore the Murray River to health, to say nothing of the 22 other Basin rivers.

Can we restore the ecological and cultural health of the Basin with a market based approach?

The commodification of water has been a major enabling factor – if not a driver – of ecological destruction in the Basin. The market will, we are told, enable water to be returned to the environment at the least social and economic cost. Water will flow to the most economically efficient and profitable use, reducing water wastage. Water saved will then be available for purchase at a competitive price to quench the thirst of our vast red gum forests and to flush the clogged Murray's Mouth.

There is some truth in this. Compared with the billions of dollars spent by Howard and Rudd to "save water" by improving irrigation infrastructure – against advice it was the most expensive way to return water to the environment – the Commonwealth's $3.9 billion water buyback is both cost-efficient and necessary. But in the longer view, this approach will not get us there. There is too much water needed for the environment to simply purchase it – there are neither the willing sellers nor a preparedness to find the billions in the budget. To meet the Australian Conservation Foundation's target of two thirds' natural flow restored to the river, the buyback would have to be multiplied in scale several times over.

Without the National Water Initiative, returning water to the environment would have been cheaper and fairer. Previously, there were no permanent water rights for government to buy back, only fixed-term licences that could be reduced or simply not renewed on expiry – much as with timber licences in public forests. The Initiative gave farmers what they thought they wanted – secure, tradeable rights. But as some economists warned at the time, the market has been far from equitable. The biggest winners have been massive agribusinesses with the available capital to exploit the market. The small farmers and those on the most marginal lands have generally not benefitted, and many have suffered.

So far, the amount of water actually sent out to flood wetlands, fill dry creeks or flush the salt out of the Murray's mouth has been negligible. And if the barriers to restoring environmental flows created by a privatised water market are daunting, they pale in comparison to the prospect of Indigenous rights to water being not just recognised but actualised within such a framework.

A final chance

The third attempt at rescuing the Basin has at its centre the federal Water Act 2007 – by Australian standards an exceptionally good piece of environmental legislation. It nearly didn't get off the ground when out of belligerent parochialism and political opportunism the Victorian Labor government refused to refer powers to the Commonwealth, but eventually a change of government in Canberra and several billion dollars in infrastructure bribes made it expedient to reverse that position.

At its core is the principle that human water use must remain within the Basin's ecological limits. By mid-2011, a Basin Plan must set out those limits and, importantly, how much water must be delivered to the environment and where. The states – who retain control over water infrastructure and the allocation of water rights – must comply with the plan within set timeframes, including reducing water entitlements to the new limit. Again Victorian parochialism could cause problems, however, as Premier Brumby negotiated an extra long timeframe for Victoria, who have until 2019 to comply, compared with the 2014 deadline for everyone else. That timelag could prove disastrous for ecosystems already on the brink.

But overall, with the Water Act 2007 we have a real chance at saving the Murray-Darling. For the first time since colonisation, the law says 'start by establishing what are the ecological limits, and then fit your economy within those limits', not the other way around. There are legal loopholes and get-out clauses, and vested interests will tempt our politicians to backslide. But there is a chance – and probably our last one – of getting it right for the environment.

On the other hand, the Act has does not recognise Indigenous water rights, and the attitude of the Commonwealth is that purchasing water on the open market is as much responsibility it has for helping Basin communities adapt to reduced water availability. These flaws in the plan will need to be dealt with in order to achieve a truly just and sustainable resolution.

Massive reforms to Basin water rights are urgent but they must be socially just. The long-neglected rights of Traditional Owners must be restored, and all Basin communities given the chance to participate equitably in the journey to ecological health. Pragmatically, an alliance of Traditional Owners, environmentalists and local communities would have the moral clout to demand real change.

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Competing Visions for Australia's Tropical Rivers

John Mackenzie

The tropical rivers of northern Australia have long been a source of identity, culture and associated practices for Indigenous Australians, vital for sustenance and economic life. More recently they have captured the imaginations of non-Indigenous Australians, alternatively in terms of their environmental value and development potential.

Interest in the development potential of this region has recently accelerated as over-allocation and climatic change place increasing pressure on the security and reliability of water supply, and the viability of agricultural production, in the country's south. The continuing myth of a seemingly limitless water supply in the north has prompted a suite of investigations into the agricultural potential of the region in response to these pressures.

Conversely, recent scientific analysis of the natural values of northern Australia highlights the international significance of our tropical rivers, and confirmed that northern Australia has continent's largest expanse of intact river systems and catchments (see Woinarski, et al. 2007, 'The Nature Of Northern Australia: Natural Values, Ecological Processes and Future Prospects', ANU Press).

Recognition of the unique ecological value of Australia's tropical rivers has similarly increased calls for a preservationist approach to , water and land management that protects and enhances these values. The tension between these two impulses, which could both be arguably framed as climate change adaption responses, has given rise to significant political conflict over the future of the north.

Two recent debates typify the nature of this conflict. The first occurred with the public release in 2009 of the final report of the Northern Australia Land and Water Taskforce. The Taskforce was convened by the Federal government in 2007, with a mandate to investigate and identify opportunities for new sustainable economic development, and particularly irrigated agriculture, in northern Australia. The investigation was to have specific reference to water availability and consequent environmental and social impacts of such developments. To assist in their deliberations, the Taskforce commissioned a comprehensive review of northern Australian land and water science. The Northern Australia Land and Water Science Review was coordinated by CSIRO in collaboration with some 80 of Australia's experts in northern land and water issues, and is purported to represent the most extensive review of the science related to development in Northern Australia.

The Taskforce's review found that the combination of seasonal rainfall patterns and high rates of evaporation would severely constrain the capture and storage surface water for irrigation purposes, making the liklihood of the extensive agriculture in the area extremely limited. Although the report identified possibilities in harnessing groundwater resources, and the prospects of mosaic agricultural development, it was met with a chorus of overwhelming opposition from proponents of broad-scale agriculture in the region, and most vocally from former head of the Taskforce Bill Heffernan and independent MP Bob Katter. Although both sides of the debate acknowledged the limitations to the science upon which the report is based, such responses are more indicative of conflict over deep-seated political values than over the quality of the Taskforce's review.

Conflict over the competing visions for the future of Australia's tropical rivers is also evident in debates over the operation of the Queensland government's Wild Rivers legislation on Cape York. The Wild Rivers Policy was announced by the Labor Party in February 2004 as a state election commitment, and proposed legislation to preserve the state's remaining 'wild' rivers from development that may threaten the continuation of their environmental value. Wild rivers were defined as those with the majority of their natural stream-flow and associated environmental values intact. Following Labor's re-election, the Wild Rivers Act was proclaimed in December 2005. Since its enactment, a total of nine rivers have been declared, and the Queensland government has announced an intention to consider an additional nine basins for wild river status.

According to the Queensland government, the Wild Rivers legislation provides pragmatic river protection which recognises existing rights and permits, but also provides for limited future development that maintains the ecological of the river systems. The legislation imposes prohibitions on certain forms of development in declared rivers, such as new weirs and dams, and new developments that restrict floodplain flows, stocking of non-local fish species, in-stream mining or stream 'improvements' such as alignments or levees.

In addition, the legislation places restrictions on extractions, off-stream storages and out-of-stream mining activities. It similarly proposes limits to the activities that can be undertaken in the high preservation zone, which is defined as the area within and up to one kilometre each side of the river, its major tributaries and special off-stream features, such as wetlands. From the government's perspective, the Wild Rivers legislation adheres to the state's responsibility under the National Water Initiative, the nationally endorsed

blueprint for water reform, in establishing mechanisms to ensure protection of the ecological significance of Australia's few remaining 'pristine' river systems.

A number of high profile Indigenous representative organisations in Cape York have sustained public opposition to the Wild Rivers Act since its announcement, and remain opposed to the legislation on a number of issues. Although not all Indigenous or Traditional Owner groups in Cape York share this position, the recent elevation of this opposition to the level of national policy debate has severely fractured the working relationships between many of the parties to the historic Cape York Heads of Agreement, particularly between Indigenous representative organisations and environmental NGOs. The political conflict precipitated by Wild Rivers has had an ongoing impact on the acceptability and legitimacy of water planning processes undertaken in Cape York, and in northern Australia generally.

Currently, key Indigenous organisations representing Traditional Owners on Cape York, including the Cape York Land Council (CYLC) and Balkanu Cape York Development Corporation, regard Wild River declaration proposals and the legislation itself as fundamentally flawed, unnecessarily duplicative of existing regulatory mechanisms and an unacceptable encroachment on the rights of the Traditional Owners of Cape York. The designation of rivers on the Cape as 'wild' is regarded as deeply objectionable and is seen to de-value the continuing custodianship and active management of the rivers and catchments by the Indigenous peoples of the Cape.

Concerns are also raised with regard to the lack of consistency, transparency and scientific rigour in the exercise of designating which systems meet the criteria for Wild Rivers. An additional, and perhaps the most substantial, concern relates to the inequity engendered by Wild River declarations, given that historical circumstances have excluded Traditional Owners from opportunities to access water resource allocations in these rivers.

The effect of that past exclusion means that Traditional Owners are disadvantaged over non-Indigenous peoples who have been able to secure access to water in the Cape prior to restrictions. Although the passage of environmental protections for the Cape is not opposed in general, the method of environmental protection promoted through Wild Rivers is seen to unnecessarily limit economic opportunities to the types of state-sponsored land management and eco-cultural enterprises that will be insufficient to sustain, or indeed improve, the livelihoods of the Indigenous population.

The stated position of a number of Indigenous peak organisations is that the declaration of Wild Rivers under the Act should be suspended, pending a review of declaration proposals through thorough and meaningful engagements with all Traditional Owners on Cape York Peninsula.

In an attempt to address some of the issues raised by Indigenous stakeholders and others, the Queensland government enacted the Cape York Peninsula Heritage Act (CYPHA) in 2007. Among the amendments codified through the CYPHA, Section 27(2) requires Wild River Declarations for the rivers of Cape York must "provide for a reserve of water ... for the purpose of helping indigenous communities in the area achieve their economic and social aspirations". Although not explicitly a response to Indigenous opposition to the Wild Rivers Act, the creation of a strategic reserve of water for Indigenous purposes does serve to counter some of the arguments that suggest economic development for Cape York communities is effectively stifled by the Act. To date however, and despite around 20,000 megalitres being reserved under this provision, no licenses for this water have been granted, and all parties to the debate have been conspicuously silent on the matter of these commercial water reserves.

Given the emergent interest in the water resources of the tropical north of Australia as a result of climate change, the innovative policy approaches represented by the Taskforce's investigations and the Wild Rivers legislation provided a significant opportunity to build wider community capacity in understanding and contributing to decisions about the future of region's water resources. What is most apparent in both instances is the degree of divergence in visions for Australia's northern rivers, with significant opposition still evident between visions of environmental preservation and economic development.

In implementation, these initiatives presented useful opportunities for such competing visions to be mediated, but this was not pursued. In turn, residual tensions between the competing visions persist. Had these initiatives been consciously designed to be collaborative in their implementation, there would have been scope for enhancing the capacity of the wider community to plan and manage the region's water resources in a way that adaptively responds to uncertainty, risk and competing pressures of environmental preservation and sustainable development.

In practice, the scope for meaningful and genuine collaboration between government, Traditional Owners, local stakeholders and the wider community was limited. Consequently, tensions over values and preferred futures remain locked in, and will continue to permeate throughout the planning and management of Australia's tropical river systems, and amongst the communities they sustain.

John Mackenzie is a research fellow in the Socio-Legal Research Centre at Griffith University

Uranium Miners Turning Water Into Liquid Waste

Jim Green

While many Australians are reducing their water consumption, uranium mining companies continue to deplete and pollute precious water resources.

The GAB grab

The daily extraction of about 37 million litres of Great Artesian Basin (GAB) water for the Olympic Dam uranium/copper mine in South Australia has adversely affected a number of precious Mound Springs – unique habitats which support rare and delicate micro flora and fauna, some species of which are unique to a particular Mound Spring. BHP Billiton pays nothing for this massive water take despite its record $17.7 billion profit in 2007-08.

Most users of the GAB are subject to the GAB Management Plan. Not BHP Billiton – its Olympic Dam mine is not subject to the GAB Management Plan or the SA Natural Resources Act 2004. Another problem at Olympic Dam concerns the tailings dams which are constantly expanding as water is turned into liquid waste. In 2005 it was revealed that over 100 bird deaths were recorded in a four-day period – the birds had drunk liquid tailings waste.

Ongoing seepage beneath the partly-lined tailings dams, and laterally through their rock 'armoury', are also of concern. In December 2008, an Olympic Dam mine worker provided photos of leaking tailings dams to the media (via Friends of the Earth). BHP Billiton's response was to threaten "disciplinary action" against any worker caught taking photos of the mine site.

Water depletion and pollution issues are already serious at Olympic Dam, but the problems are set to get far worse with the proposed expansion of the mine. BHP Billiton proposes increasing water consumption to over 250 million litres daily. The company proposes increasing its already unsustainable water take from the GAB from 37 million to 42 million litres daily, and also building a desalination plant in the Upper Spencer Gulf to provide an additional 200+ million litres daily.

The proposed desalination plant has raised concerns over its impacts on marine species and fishing industries – in particular from the discharge of brine. The Upper Spencer Gulf is a low flushing fragile marine environment unsuited to siting a desalination plant and BHP Billiton's preferred site is the breeding ground of the Charismatic Giant Australian Cuttle Fish. (See the ABC 'Catalyst' story transcript and video posted at <www.abc.net.au/catalyst/stories/2695601.htm>.)

At the mine site, BHP Billiton plans a massive expansion of tailings dams to cover an area of up to 44 square kms to a height of up to 65 metres. The tailings dams will leak on average three million litres of liquid radioactive tailings waste each day.

Ranger Uranium Mine

Numerous spills, leaks, incidents and reporting failures have undermined the credibility of mining company Energy Resources of Australia (ERA) and highlighted serious regulatory deficiencies in relation to the Ranger uranium mine in the Northern Territory.

In April 2000, ERA identified and repaired a leak in a tailings water return pipe located within the mine's Restricted Release Zone (RRZ). Contaminant materials in the RRZ are required to be maintained and managed in this designated area and not be released to the wider Ranger Project Area or the Kakadu environment. Between December 1999 and April 2000 an estimated two million litres of material containing high levels of manganese along with uranium, radium and a suite of other contaminants escaped from this broken pipe and the RRZ. This severe operational failure was compounded by the fact that more than 20 days elapsed before ERA notified the relevant NT and Commonwealth authorities of the leak despite the clear reporting requirement contained in section 16 of the Ranger Environmental Requirements.

Further serious operational problems were exposed at Ranger with the incorrect placement of 84,500 tonnes of low grade uranium ore from January 14 to February 26, 2002. This error resulted in the movement of large volumes of rainfall seepage through the uncompacted stockpile with the subsequent mobilisation of high concentrations of uranium. Although the incorrect dumping of material commenced on January 14, ERA failed to report both this and the resultant increases in uranium contamination in water samples until February 27, 2002. Further, during this period ERA staff provided incorrect information on the stockpile status to an inspection team comprised of Commonwealth and NT supervising authorities.

The deficiencies in infrastructure and corporate culture seen with ERA's tailings pipeline and stockpile issues were further highlighted with the high profile water contamination and vehicle clearance issues during 2004. ERA was found guilty and fined $150,000 and costs over breaches of the NT Mining Management Act in relation to a contamination incident in March 2004. Around 150 people were exposed to drinking water containing uranium levels 400 times greater than the maximum Australian safety standard. Twenty-eight mine workers suffered adverse health effects including vomiting and skin irritation as a result of the exposure.

The incidents detailed above are part of a litany of operational errors and procedural failures. There have been

about 150 leaks, spills and license breaches since the Ranger mine opened in 1981 – in addition to daily seepage of contaminated water. Whilst some of these are not of great individual impact, others are. Cumulatively they document a pattern of systemic under-performance and non-compliance and highlight the growing credibility gap that exists between ERA's self promotion and the reality of its performance.

Environmental regulators from the Office of the Supervising Scientist admitted to a Senate Estimates committee in February 2010 that water with uranium concentrations 5400 times background levels, and a cocktail of other radionuclides, is seeping from beneath the tailings dam at Ranger. The seepage is estimated at 100,000 litres of contaminated water daily.

In-situ Leach Mining

In-situ leach (ISL) uranium mining is used at the Beverley uranium mine and is the mining method proposed for use at other South Australian mines including Oban, Beverley Four Mile and Honeymoon.

ISL involves pumping acid into an aquifer, dissolving the uranium ore and other heavy metals and pumping the solution back to the surface. After separating the uranium, liquid radioactive waste – containing radioactive particles, heavy metals and acid – is simply dumped in groundwater. Proponents of ISL mining claim that 'attenuation' will occur over time – that the groundwater will return to its pre-mining state. However there is considerable scientific uncertainty about the future of ISL-polluted groundwater and uncertainty about the timeframe for attenuation if it does occur.

A 2003 Senate References and Legislation Committee report recommended banning the discharge of radioactive liquid mine waste to groundwater. The South Australian Labor government responded by commissioning a study which had all the hallmarks of a whitewash yet still acknowledged that attenuation is "not proven" and could only cite a period of "several years to decades" for it to occur. Yet the companies proposing to use ISL mining at Beverley Four Mile want to absolve themselves of any future responsibility for the site just seven years after they have finished mining. The future of ISL mining is plain to see – short-lived mines leaving a lasting legacy of polluted aquifers.

Isolation and containment of the pollutants would not be difficult or expensive, but the mining companies will take the cheaper option of polluting groundwater for as long as the politicians let them. Spills and leaks are common at ISL mines. The SA Department of Primary Industry and Resources lists 59 spills at Beverley from 1998 to 2007.

Jim Green is the national nuclear campaigner with Friends of the Earth.

The comments on the Ranger uranium mine draw heavily from a 2005 ACF submission to a federal parliamentary inquiry.

ANGELA PAMELA URANIUM MINE

"What bloody idiot came up with the idea of a uranium mine in the water catchment? Governments are responsible for looking after people, not putting them in jeopardy."

Don Wait, owner of Wayoutback Tours, commenting on the proposed Angela Pamela uranium mine, 25 kms south of Alice Springs.

"If this goes ahead, we will be eating raw uranium oxide on our Weeties in the future."

Alice Springs ALP members commenting on the folly of building the proposed open-cut Angela Pamela mine in an area prone to dust storms. The comments were contained in a confidential ALP document obtained by the Northern Territory News.

***More information** on Angela Pamela: Arid Lands Environment Centre <www.alec.org.au>.*

NUCLEAR POWER – THE THIRSTIEST ENERGY SOURCE

"Per megawatt existing nuclear power stations use and consume more water than power stations using other fuel sources. Depending on the cooling technology utilised, the water requirements for a nuclear power station can vary between 20 to 83 per cent more than for other power stations."

Guy Woods (Department of Parliamentary Services), 2006, "Water requirements of nuclear power stations", <www.aph.gov.au/library/pubs/rn/2006-07/07rn12.pdf>

***More Information** on the impacts of nuclear power and uranium mining on water resources: <www.foe.org.au/anti-nuclear/issues/oz/water-nuclear>.*

Arabunna Elder Kevin Buzzacott. BHP Billiton takes 37 million litres of water daily from bores on Arabunna land to supply the Olympic Dam uranium/copper mine in South Australia. Photo by Jessie Boylan.

Paladin to set uranium 'standard' in Malawi

Jessie Boylan

Left: A woman collecting water from the Sere River, Kayelekera. Right: Entrance to Paladin Energy's Kayelekera uranium mine. Photos by Jessie Boylan.

"We are serious about the integrity of the environment," says Neville Huxham, the country director for Paladin Energy Africa. "We're taking the uranium out of the ground, we're exporting it to be used for productive purposes, so we should be getting a medal for cleaning up the environment."

In the rolling hills 575 kilometres north of Malawi's capital city Lilongwe, lies Paladin's Kayelekera uranium mine, the first major mining development in Malawi, and the standard on which future mines will be based. The narrow, winding road to Kayelekera is mostly unsealed, crossing the North Rukuru and Sere Rivers as it makes its narrow, winding way past numerous villages hugging its edges.

"The road is much better now," Reinford Mwagonde, director of Citizens For Justice (CFJ – a member of the Friends of the Earth International network), tells us on the way out to the village. "At least four trucks carrying sulphuric acid drive this road every day – what would happen if one of them had an accident?"

Mwagonde has been campaigning against Paladin's activities since 2005, when he became aware of the company's plans to develop the mine. CFJ and four other civil society organisations took Paladin to court in 2006, challenging the company's mining licence on a number of grounds including inadequacies in the Environmental Impact Assessment (EIA) process. The case was later settled out of court but Mwagonde hasn't missed a beat since.

"The EIA didn't address serious environmental concerns around the issue of water contamination of the rivers that flow into Lake Malawi," he says. The lake is a major source of potable water and fish for millions of people in Malawi, Tanzania and Mozambique. "They say that we're anti-development," says Mwagonde, "because we're against the mine. But we're against the mine because of the long-term health and environmental implications that are unique to uranium mining that the community has not been properly informed about."

CFJ has also raised concerns that the mine would not be operating in Australia under its current configuration, and that it is taking advantage of Malawi's minimal understanding or regulation of uranium mining. John Borshoff, Paladin's director, was quoted in Melbourne's Herald Sun newspaper in 2006 saying "Australia and Canada have become overly sophisticated ... There has been an over compensation in terms of thinking about environmental and social issues in regard to uranium operations in Australia, forcing companies like Paladin into Africa."

The Malawian government has drafted legislation dealing with radioactive materials but it is yet to be passed. Concerns have been raised by civil society organisations that Paladin's input into the draft legislation has been too great, and that the company should not have been granted a licence to mine before legislation was in place. "Paladin," according to Undule Mwakasungula, director of the Centre for Human Rights and Rehabilitation, "cannot be held accountable if something happens."

For example, the closure plan outlined by Paladin in the EIA lacks an appropriate strategic, long-term tailings management plan. Rather than moving the tailings back into the mine-pit at closure, Paladin plans to leave them in the tailings dam exposed to erosion and extreme weather conditions.

On the ground

Paladin Energy Ltd. is a junior Australian mining company with only one other operating mine – the Langer Heinrich uranium mine in Namibia. Although Paladin started mining and stockpiling ore at Kayelekera in June 2008, the mine wasn't officially opened until April 2009 by Malawian president Bingu wa Mutharika and began full production at the end of last year. With a long list of shareholders anxious to begin exporting 3.3 million pounds of uranium-oxide each year from Kayelekera, it isn't surprising that Paladin was in a hurry to start digging.

Paladin has committed to, and started, various social development projects in the Kayelekera and Karonga region, which have been generally welcomed by the community. Malawi's minister of mines, Grain Malunga, noted that Paladin has been "training the villagers to undertake agricultural activities to empower the people there, like to produce vegetables to sell to the mine."

The company has also renovated the existing primary school and is paying locals to make the bricks for a new classroom. A secondary school will be built in five years, once they start receiving revenue from exports.

Once a week doctors from Chitipa visit the Kayelekera clinic to provide health services including HIV tests and counselling. Paladin also capped a bore in Kayelekera, and a water project for Karonga is under construction to augment the existing inconsistent water supply.

The population in the area around the mine is growing rapidly, placing a greater demand on minimal government services. One community member in Kayelekera expressed the view that had the government provided the village with the basic services that Paladin are offering, he would never have supported the mine.

Workers' rights

The opening of the mine has seen a huge expansion in the local population as people move to the area looking for work. This has put pressure on housing supply in both Kayelekera and Karonga with rents increasing significantly. Prices for food and other essential items have also shot up.

Gertrude Mwalwenje's family is one of the many who came to the village after hearing about potential work. She came with her husband and two year old daughter before they knew if he would even get a job at the mine. Their home is small and basic, one among the other recently constructed mud houses, a "slum village" for contract workers and their families.

Gertrude's husband now works as a pipe fitter in the processing plant. "He doesn't get paid well," she tells me on the path leading to the clinic, "just 6000 kwacha [A$45] a month, and he works seven days a week, from 6 am to 6 pm." This was a common story given by several MotaEngil workers, a company contracted by Paladin. During the construction phase employment peaked at 2000 workers, over 80% of them Malawi nationals.

"People coming from outside (from the Philippines or South Africa) who are working the same positions (as Malawians) get paid more," Mwalenje continues. With an extremely high unemployment rate, poverty is the driving factor for Malawians' willingness to work long hours for little pay.

Poverty may also explain workers' reluctance to ask questions despite concerns over occupational health and safety. "Paladin told us that radiation is bad for us, but they didn't tell us much," says James Kantukule, standing in front of the MotoEngil village on the main road in Kayelekera. "They put protective gear on us only when visitors come and when they leave they take it off again," he claims. Kantakule has lost his job since major construction ended and mining began. Like many others in his position, he is waiting in Kayelekera hoping to be employed again.

In early 2009, a welding spark ignited fumes in an enclosed area killing two workers and seriously injured a third. Workers say there have been three other unexplained deaths at the mine site. Paladin's operations and conduct, along with the legislation the company has been closely involved in drafting are likely to set the benchmark for future mining developments of this kind in Malawi. Paladin has expressed willingness to be fully open and transparent but has yet to provide access to monitoring data to enable independent analysis. "[Paladin] really needs to be held accountable and monitored," Mwakasungula said.

Creative legislation

President Bingu wa Mutharika has said the Kayelekera uranium mine will contribute as much as 10% of Malawi's gross domestic product and 20% of total export earnings. Paladin chairman John Borshoff says the country can expect $45 million in taxes and royalties from the mine each year.

But over the expected 11-year lifespan of the project, Malawi will lose more than $120 million in various taxes due to the terms agreed with Paladin. The government traded a 15% stake in the project in exchange for favourable tax rates for the company. Paladin will pay 27.5% instead of 30% corporate tax, and be exempt from a 10% rent tax. Royalties – ordinarily 5% – have been dropped to 1.5% for the first three years and 3% thereafter; the company will also be exempt from paying value added tax for up to 10 years. The terms of the tax regime are also frozen for the next decade.

Jessie Boylan is a photographer and freelance journalist based in Melbourne. From December 2008 to January 2010 she worked on photographic projects in Palestine and Israel and reported on development, mining and environmental issues for the Inter Press Service in Malawi, Mozambique and Tanzania. She has been working with Friends of the Earth's Anti-nuclear and Clean Energy campaign since 2005

Reviews

Books

1. *FOR THE LOVE OF WATER*
Flow: For the Love of Water *(DVD)*
Director: Irena Salina
Order from <www.sustainableinsight.com.au> or <http://shop.abc.net.au>
<www.flowthefilm.com>
RRP $29.95
ISBN / Catalogue Number 198740

Irena Salina's award-winning documentary looks at water crises in India, Bolivia, Africa and elsewhere. Salina builds a case against the growing privatisation of water with a focus on politics, pollution, human rights, and the emergence of a world water cartel.

'Flow' also documents democratic struggles for clean, affordable water – including some successful struggles – as well as local solutions which sometimes allow communities to bypass corporate and political elites. A 12-minute interview with the director, which includes short excerpts from the film, is included as an 'extra'. Ideal for showing at public meetings, school visits, etc.

A reviewer on Amazon notes: "What makes Flow so absolutely wonderful is that it covers it all. It's like watching a prosecutor make an indictment: needless water contamination by some rather nasty chemicals, such as pesticides, herbicides and pharmaceuticals; harm caused by World Bank and IMF policies; gross abuses of human rights by smug transnational water corporations throughout the world, including the USA; harm caused by damming many of the world's largest rivers; preventable diseases and deaths caused by polluted water, such as cholera; hormonal changes in fish and amphibians.

"On the other hand you see some incredibly brave people stand up to these mind-boggling abuses of power. Even an extemely elderly disciple of Mohandas Gandhi teaches the next generation of activists how to be effective. Plenty of brilliant and appropriate, low-technology solutions are shown."

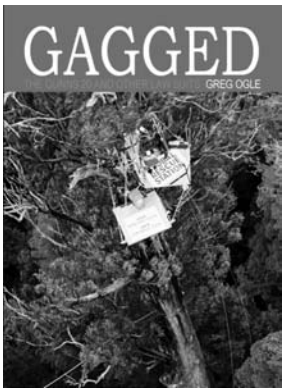
2. *BLUE COVENANT*
The Global Water Crisis and the Coming Battle for the Right to Water
- Maude Barlow, 2008
Black Inc. <www.blackincbooks.com>
RRP $29.95
ISBN: 978-1-86395-223-1

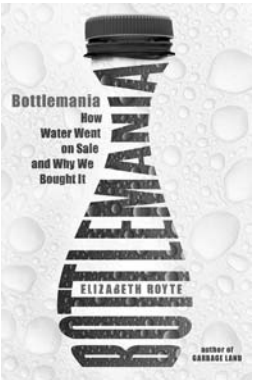
In this important book, Maude Barlow discusses the state of the world's water resources, how corporations are reaping vast profits from declining supplies, and how ordinary people around the world have banded together to reclaim the right to clean water.

Barlow warns of this looming dystopia: "Imagine a world in twenty years, in which no substantive progress has been made to provide basic wastewater service in the Third World, or to force industry and industrial agriculture production to stop polluting water systems, or to curb the mass movement of water by pipeline, tanker and other diversion, which will have created huge new swaths of desert.

Desalination plants will ring the world's oceans, many of them run by nuclear power; corporate nanotechnology will clean up sewage water and sell it to private utilities who will sell it back to us at a huge profit; the rich will drink only bottled water found in the few remote parts of the world left or sucked from the clouds by machines, while the poor die in increasing numbers. This is not science fiction. This is where the world is headed unless we change course."

Wenonah Hauter from Food & Water Watch writes: "Blue Covenant is the most important book that's ever been written on the global water crisis. It's a wake-up call that should be read by everyone from world leaders to students. Maude Barlow has done it again – taken a difficult and frightening subject and made it an absorbing read."





3. *GAGGED: THE GUNNS 20 AND OTHER LAW SUITS*

Gagged: The Gunns 20 and other law suits
- Greg Ogle, 2009
Order from Envirobook <www.envirobook.com.au>
RRP $22.95, 144pp, pb
ISBN 9780858812291 (pb)

In December 2004, forestry giant Gunns Ltd sued Bob Brown, The Wilderness Society and eighteen other environmentalists as a result of the campaign to protect Tasmania's forests. During the next five years, Gunns suffered a series of legal losses and capitulated against many of the defendants, paying them over $1m in costs. It was left with an expensive rump of a case against a handful of defendants (and those remaining cases were settled in January 2010).

This book tells the inside story of the defence of the Gunns 20 case and of a number of other similar law suits.In a personal account of more than a decade defending so-called 'SLAPP suits' over the Hindmarsh Island bridge, battery hens and the Tasmanian forests, bush lawyer Greg Ogle tells the history of the cases and their impact on the defendants and the community. It illustrates the effect of such litigation on free speech and political protest, and makes a call for law reform to ensure that these incursions on civil liberties never happen again.

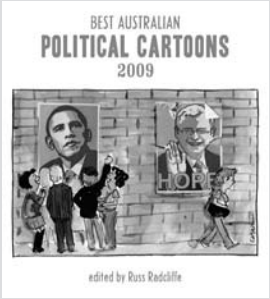
Heidi Douglas, film maker and Gunns 20 defendant, said: "I spent over 4 years being sued by Gunns, but reading this book was the first time I really knew what had happened in a court case often too complicated for even the defendants to understand. There is a dry wit in this easily digestible tale which successfully marries the details of the legal cases with the broader perspective of Australians' right to freedom of speech."

4. *BOTTLEMANIA*

Bottlemania: How Water Went on Sale and Why We Bought It
- Elizabeth Royte, 2008
Scribe
RRP $32.95
Order via <www.bottlemania.net>

Elizabeth Royte analyses the US$60 billion a year bottled water industry. Moving beyond the environmental consequences of making, filling, transporting and landfilling those billions of bottles, Royte examines the social impact of water-hungry multinationals. Bottlemania makes a case for protecting public water supplies, for improving our water infrastructure and – in a world of increasing drought and pollution – better allocating the precious drinkable water that remains.

Marina Hyde's review in The Guardian states: "Investigative writer Elizabeth Royte covers it all: the nonsense about mineral water's "health benefits"; the struggles of the communities from where this stuff is pumped in its billions of gallons; the huge environmental damage; the debunked science behind the eight glasses a day recommendation; the incredibly rare health scares related to municipal water supplies that are hyped by persons unknown (who could they be?) and drive people to purchase yet more of this stuff – supplies of which are dwindling. She fears water wars. She wonders how unworkably inconvenient it is for people to refill a reusable bottle."



5. 'REALLY COOKING GOOD FOOD'

'Really cooking good food' - Kukumbat gudwan daga – 'Really cooking good food',
Women's centres of Manyallaluk, Gulin Gulin and Wugularr
ISBN: 978-0-9756870-1-7
$7.00
80pp
Available from Batchelor Press: order online <http://batchelorpress.com>; ph (08) 8939 7352; email <info@batchelorpress.com>

Kukumbat gudwan daga (really cooking good food) is a cookbook put together by women from Manyallaluk, Gulin Gulin and Wugularr with the assistance of The Fred Hollows Foundation and includes recipes for a diverse range of dishes, from spaghetti to kangaroo tail stew.

The book was launched in Katherine in August 2009. The launch featured a cook-off between neighboring communities, using recipes from the book and relying only on wood-fueled bush woks. Shellie Morris, a musician and ambassador for The Fred Hollows Foundation, and Miliwanga Sandy (Milli), an elder from the Wugularr community, composed and performed a song in Kriol to celebrate the cookbook and how it will help Indigenous communities.

Milli said the cookbook will "help us to avoid illnesses like diabetes, heart problems – all the problems that our people have been facing for many, many generations." Megan Ferguson from Outback Stores said at the launch: "The resource you have developed is ideal because it creates healthy meals, shows the steps for making meals for large numbers of people and uses locally available products."

6. PETTY'S PARALLEL WORLDS

Petty's Parallel Worlds
- Edited by Russ Radcliffe, September 2008
High Horse Publishing <www.highhorse.com.au>
RRP: $39.95 Hard cover, 192pp

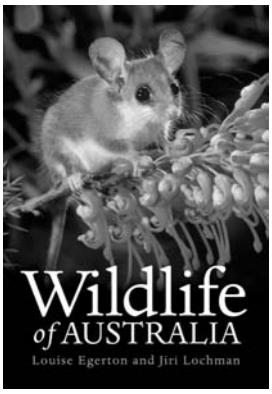
For nearly half a century Bruce Petty's anarchic art has enlivened the pages of our newspapers and magazines. This rich compilation - much of it previously unpublished - showcases the range of Petty's artistic styles as well as his intellectual and moral concerns from the inanity of the internet to the genius of Mozart, from the chicanery of Australian domestic politics to the global manoeuvrings of superpowers and the clandestine world of international finance, from first world consumerist excess to global environmental degradation.

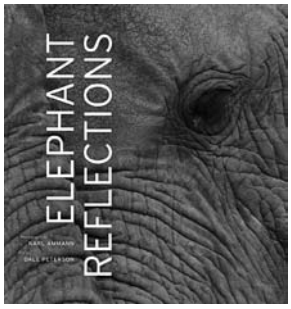
Petty is prolific in a wide range of artistic pursuits from etching to filmmaking. He won an Academy Award for his film Leisure in 1977, and several AFI awards for his satirical documentary Global Haywire in 2007. His previous books include 'An Australian Artist in South East Asia', 'The Money Book', and 'The Absurd Machine'.

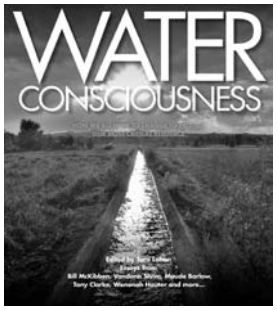
7. BEST AUSTRALIAN POLITICAL CARTOONS 2009

Best Australian Political Cartoons 2009
- Edited by Russ Radcliffe, November 2009
Scribe Publications <www.scribepublications.com.au>
RRP $29.95
Paper back, 192pp, ISBN 9781921640070

This is the seventh annual collection from Scribe and includes cartoons from well over 20 contributors. They're published each November – ideal for Christmas presents.







8. WILDLIFE OF AUSTRALIA
Wildlife of Australia
- Louise Egerton and Jiri Lochman, 2009
Jacana Books / Allen & Unwin
RRP $59.99
Hard cover, 448pp, SBN: 9781741149975

Many members of Australia's wildlife live nowhere else on Earth. They are unique, the result of evolution on a continent that has been geographically isolated from the rest of the world for 38 million years. Wildlife of Australia is an account of how these animals have developed in response to changing climates and habitats. It describes their day-to-day habits, where they live, how they find partners and care for their young, and how they protect themselves and find food and shelter.

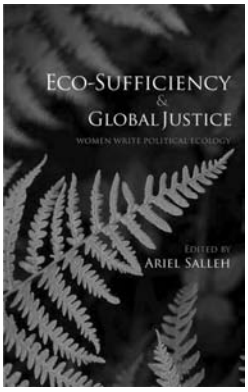
This is an encyclopaedic compendium of animals that live on the Australian continent today. It includes plenty of information and 550 colour photos. The book also contains a list of scientific names, 'good zoos' (is there any such thing?) and wildlife parks, useful websites and books, and a glossary.

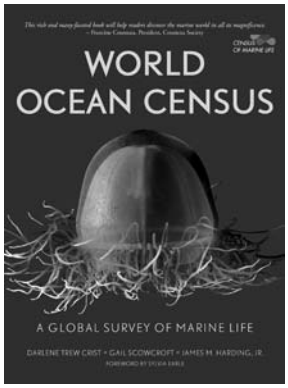
9. ELEPHANT REFLECTIONS
Elephant Reflections
- Photographs by Karl Ammann, text by Dale Peterson, 2009
University of California Press -Distributed in Australia by Inbooks <orders@inbooks.com.au>, <www.inbooks.com.au>
RRP $74.95 (available much cheaper from online book vendors) hb, 288pp

"They emerge from the dark shadows of far trees into the light—a harsh light dropping heavily from above, a tentative, flickering light rising from below—and they descend a bank of mud down to the muddy water. I see more appear at the edge of the trees and stand there, quietly peering out from the shadows as if waiting for their own curtain call." -- Dale Peterson. Elephant Reflections comprises 130 large, colour, mostly striking photos of African elephants along with about 50 pages of dense but interesting commentary on their history and conservation status, and the politics of ivory.
Jane Goodall states: "This is a stunning book. It is the best book ever about this most majestic of animals, highlighting the elephant's intelligence, love of family, and delight in the good things of life. The ideal book for anyone who lives animals, nature, and the wonder of creation."

10. ***WATER CONSCIOUSNESS***
Water Consciousness: How We All Have to Change to Protect Our Most Critical Resource
- Edited by Tara Lohen, 2008
AlterNet Books. Order via <www.alternet.org/books> or <http://waterconsciousness.com>

Water Consciousness assembles leading environmental writers, thinkers, and activists – including Bill McKibben, Vandana Shiva, Maude Barlow, Tony Clarke, Deborah Kaufman, Alan Snitow, and Wenonah Hauter – to delve into the crisis and what we can do about it. The book addresses how much water is available and where it is, the threat of privatisation, the folly of bottled water, the quagmire of dams, the role of agriculture, and how the water crisis is linked with global warming. Contributors also cover the possibility of conservation and efficiency, the role of new technology and design, and the need for policy that protects water for all people as a common trust and not a commodity. Water Consciousness is especially useful for those of us who don't have the time or concentration span to wrestle with long, text-heavy books – the essays are broken up with many photos, diagrams, fact-boxes, and a water calculator. The book would be great for school students. The website is also worth a look <http://waterconsciousness.com> and you can read an excerpt from the book at <http://tiny.cc/eFdtA>.





11. WOMEN WRITE POLITICAL ECOLOGY

Eco-Sufficiency & Global Justice: Women Write Political Ecology

- Edited by Ariel Salleh, 2009
Pluto Press <www.plutobooks.com>
ISBN: 9780745328638

Review by Hannah Elvery

This collection of articles, compiled and edited by Ariel Salleh, was a challenge: a challenge to start, to continue and – eventually – a challenge to my thinking. After the engaging and expansive introductory chapter by Salleh, which left me with new ideas, 20 new books on my 'to read' list and a thirst for more, I then spent three months picking up the book, putting it down and never really getting anywhere.

When I embarked again on the 27-hour train journey between Brisbane and Melbourne, though, I made one last attempt, determined to find out what this collection of writings offered (and knowing that it had to be valuable due to the quality of female writers involved). And so I started ... again.

I was absorbed and interested in what the authors had to share. The academic writing style in some sections was still a challenge, as was some of the economic theory, but as the NSW landscape passed by my eyes in the breaks between chapters, the concepts became clearer. Nothing too revolutionary, and many ideas that I've heard before, but a great compilation, some new words for thought, and an interesting journey through the past and present of women's experiences in the world. Be wary when reading in one continuous stream though – the extensive overview of history and experiences may bring to light that the world is, well, in trouble. Don't despair, keep reading. It's slow to come and not quite enough to balance the negative (one may ask whether this is just an accurate reflection of reality), but examples of women's leadership in both protecting the non-human world and self-empowerment do come, and do provide hope. The book presents a considered and comprehensive critique of the market economy and the processes of globalisation which have been consistently degrading women's rights and cultural autonomy around the world, particularly in majority world countries.

It is a blow-by-blow account of the challenges facing everyone who is fighting for justice and sustainability, while providing some examples of positive changes and theoretical frameworks for a different economic structure based on the concept of 'eco-sufficiency'.

12. WORLD OCEAN CENSUS

World Ocean Census: A Global Survey of Marine Life

- Darlene Trew Crist, Gail Scowcroft and James Harding Jr., 2009
UWA Press <www.uwap.uwa.edu.au>
RRP $55 hb
ISBN 9781921401536

Review by Daisy Barham

Over a decade in the making, World Ocean Census is well worth the wait. A fascinating chronicle of life in the deep blue ocean, this book brings home the importance of our marine environment to all life on earth. Reflecting the changing nature of our oceans, the book is organised into three parts discussing the past, present and future of our marine treasures.World Ocean Census is a product of over 2000 scientists from 82 nations, though it reads less like a scientific review and more like a fascinating description of a hidden world.

The book includes over 250 stunning photos and provides a chilling look into the future of what ocean acidification, rising water temperatures and changing currents may mean for the global oceans. This book has inspired me to learn to scuba dive to see the life of the oceans – before it's too late.

Celebrity scientists and nuclear power

Review by Jim Green

The Hot Topic: How to Tackle Global Warming and Still Keep the Lights On
Gabrielle Walker and Sir David King
Bloomsbury <www.bloomsbury.com>
Published in Australia by Allen and Unwin
2008, RRP $29.95, <www.thehottopic.net>

Core Issues – Dissecting Nuclear Power Today
Steve Kidd
2008, £25
Order from Nuclear Engineering International <www.neimagazine.com>.

'Hot Topic' offers political, technological and economic prescriptions to address climate change. Gabrielle Walker is a UK-based author and journalist who ought to have more sense than to co-author a book with celebrity scientist Sir David King, who was until late 2007 the UK's chief science adviser and now holds posts at Cambridge and Oxford.

The only thing of note in the book is the wildly inaccurate section on nuclear power. The authors optimistically claim that uranium resources will last for several centuries even in the event of a significant expansion of nuclear power. But known, reasonably-assured conventional uranium resources will last about 270 years at the current rate of consumption.

They state that uranium resources could be extended for several thousand years by reprocessing, but they fail to note that reprocessing is the most polluting stage of the nuclear chain and there is no mention of the connection between plutonium separation in reprocessing plants and the proliferation of Weapons of Mass Destruction (WMD).

They conflate nuclear waste from civil and military sources to concoct a disingenuous argument that we needn't be concerned about high-level nuclear waste from future reactors. In any case, they reassure us, a handful of countries are "investigating" options for deep underground dumps – which is the best possible spin that could be put on the reality that the industry has no better way to manage nuclear waste than to bury it and hasn't established a single high-level nuclear waste dump anywhere in the world.

Walker and King falsely claim that designers of nuclear plants have made "significant advances" with regard to safety including a "drive" towards walk-away safety. If such a drive exists, it is a meandering, Sunday-afternoon drive that frequently gives way to commercial imperatives and could never overcome the obstacle that there's always a fool to prove that nothing's foolproof.

They falsely claim that "the materials for a nuclear bomb don't arise automatically in a nuclear power station". They falsely claim that designers are "working hard" to address the WMD proliferation risks associated with nuclear power.
They falsely claim that the International Atomic Energy Agency carries out "thorough inspection routines". In fact, safeguards inspections vary from being partial and periodic at best, to being tokenistic (e.g. China) or non-existent (e.g. Russia). The recently-retired head of the IAEA, Mohamed El Baradei, acknowledged that the IAEA's basic inspection rights are "fairly limited" and that efforts to tighten the safeguards system have been "half hearted".

Walker and King falsely claim that the IAEA has "to date picked up suspicious activities extremely quickly". But to give one example which gives the lie to that claim, the IAEA completely failed to detect the massive nuclear weapons program in Iraq from the 1970s to 1991 including the repeated use of 'safeguarded' nuclear facilities to advance the weapons program.

They claim that "the motivation for any country to try to develop nuclear weapons has very different origins from the need for energy from nuclear power plants", which misses the point that many countries (including Australia) have deliberately moved closer to a nuclear weapons capability through expansion of their civil nuclear programs, and ignores the fact that five of the 10 countries to have produced nuclear

Former science minister Peter McGauran as depicted in the Australian Financial Review in 2002.

Celebrity scientist Dr. Strangelove.

weapons did so with crucial political cover and/or technical support from their 'peaceful' nuclear programs.

Celebrity scientists and nuclear knights

Self-described eccentric James Lovelock describes 'Hot Topic' as "masterful" and "authoritative", which comes as no surprise since the book peddles the same pro-nuclear junk science that Lovelock is renowned for. Tim Flannery describes 'Hot Topic' as "fantastic". Flannery has attracted front-page headlines for (allegedly) supporting nuclear power and uranium mining only to later acknowledge that: "What I know about uranium you could write on the back of a postage stamp."

Amazing how much junk science comes from scientists themselves, with celebrity scientists punching above their weight. Spout enough pro-nuclear hocus-pocus and you're likely to be knighted, as David King has. Lovelock is routinely described as 'Sir' by his fans, including former Prime Minister John Howard, though he only has an 'Order of the Companions of Honour'.

Australian scientist Sir Gus Nossal is another pro-nuclear knight (though he was knighted for unrelated scientific work). To give one example of Nossal in full flight, he publicly argued in 2003 that there were no problems whatsoever siting a nuclear waste dump adjacent to a missile testing range in South Australia and that we ought to have full confidence in then science minister Peter McGauran. Two independent studies found that siting a nuclear dump adjacent to a missile testing range was unwise, and McGauran was later demoted for mishandling the failed attempt to impose a nuclear dump in SA.

Wollongong University academic Brian Martin wrote a book about Sir Ernest Titterton and Sir Philip Baxter – nuclear knights who routinely peddled junk science and were central to the push to develop nuclear weapons in Australia in the post World War II generation (<www.uow.edu.au/arts/sts/bmartin/pubs/80nk>). It's worth a look - many of the same lies are peddled by today's nuclear knights and celebrity scientists.

'Core Issues'

Steve Kidd, a director of the World Nuclear Association and author of 'Core Issues – Dissecting Nuclear Power Today', is another type of pro-nuclear advocate altogether. For starters, Kidd is well-informed. He offers insights that only an industry insider could. He is honest; for example, every nuclear advocate knows that reprocessing is "environmentally dirty" but Kidd is one of very few to have said so publicly.

'Core Issues' covers the entire nuclear fuel chain from mining and milling, conversion, enrichment, fuel fabrication, to reactors and waste management. There's much to disagree with in Kidd's book but it is vastly superior to the drivel served up by Walker and King. That said, there's no point buying Kidd's book because you can read many of his articles at <www.neimagazine.com>.

Jim Green is the national nuclear campaigner with Friends of the Earth.