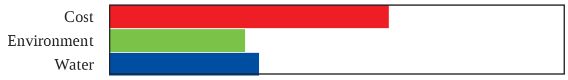
Make rain clouds



Roy Johnston, a student at the Hydro Electric Commission in Tasmania in 1951, witnessed Australia's first tentative trials of creating rain clouds. Last year, Roy contacted Alan Jones on radio to urge for an examination by the Farmhand Foundation into the technology he remembers as 'cloud seeding', as a way of beating the drought.

Cloud seeding involves artificially making rain clouds produce rain when they would not normally, or making the clouds produce more rain. This is normally done by sprinkling particles into the cloud, usually from a plane, though it has been tried from the ground. Wing mounted pyrotechnic flares is the most common technique for distribution of the seeding material in the US (Forrest, 2002).

The important point is that cloud seeding only works with existing rain clouds; cloud seeding does not make rain out of thin air.

The particles introduced into a rain cloud are usually silver iodide (a light yellow powder), dry ice pellets or using flares to generate smoke full of salt. The side-effects of adding silver iodide are still being debated. (Highfield, 2002)

Cloud seeding experiments began in 1946 at the General Electric laboratories in the USA and a year later in Australia. The Australian scientific community, in particular the CSIRO, from 1950 to 1970, were world leaders in investigating the potential for rainfall enhancement with cloud seeding. (Forrest, 2002)

Brian Ryan, a scientist with the CSIRO, and Brian Sadler, of the Agricultural and Resources Management Council of Australia and New Zealand, carried out a review of the Australian experience with cloud seeding in 1995. They noted that many trials and experiments were conducted in Australia from 1947, with the most recent reported trial being in 1994. Trials were conducted in NSW, Victoria, South Australia, Western Australia, Queensland and Tasmania. They looked at the results of the various trials and determined that cloud seeding was not a simple technique and the success of the technique was very dependent on the type of rain cloud that was seeded and on the weather pattern. (Ryan and Sadler, 1995) In NSW, widespread and extensive cloud seeding operations ceased in 1974 (McDonald, 1983).

Subsequent analysis by the CSIRO of the cloud seeding work carried out in Australia between 1948 and 1981, concluded that rainfall enhancement is unlikely to be effective for winter and spring over the inland plains of southern and eastern Australia, and for summer rainfall over plains of eastern and north eastern Australia. (King, 1982 cited in Ryan and Sadler, 1995)

Pollution Effects

Professor Daniel Rosenfeld of the Hebrew University of Jerusalem has found that pollution can stifle precipitation by stopping the small water droplets from coalescing into larger droplets. His findings suggest that human activities may be disturbing rainfall patterns on a global scale. (Highfield, 2002) Along with a colleague Ronen Lahav, Professor Rosenfeld also found that clouds can be seeded with sea spray to overcome the effects of pollution. The increased salt levels on the landscape were not studied. (Williams, 2002 & Lahav and Rosenfeld, 2003)

Ryan and Sadler noted that many utility groups are either negative or doubtful about the effectiveness of cloud seeding. Based on the results reported by the Tasmanian Hydro Electric Commission (now known as 'Hydro Tasmania'), Ryan and Sadler did note however that the region where cloud seeding seems to be effective is in orographic regions where the flow

figure 72 - Aircraft fitted with flares for cloud-seeding (Photo courtesy of John Forrest)

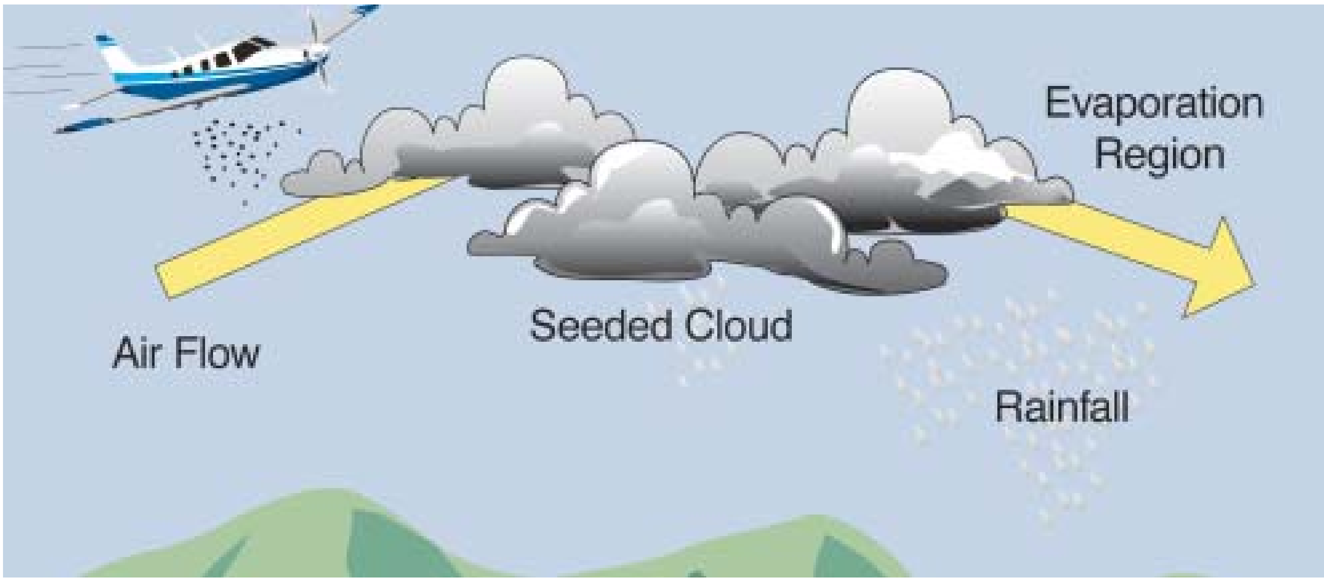


figure 73 - How cloudseeding works (Kathryn Keeley, adapted by News Ltd)

over the mountains substantially enhances the rainfall. (Ryan and Sadler, 1995)

The CSIRO agrees that cloud seeding is most likely to be effective when used on cumulus or stratiform clouds in air forced up over mountains and notes that "cloud seeding will never break droughts; cloudless skies will never produce rain." (Holper, 2001)

Ryan and Sadler concluded that "apart from Tasmania the prospect of cloud seeding based on the simple static hypothesis of cloud seeding seems to be very limited". (Ryan and Sadler, 1995)

Issues

According to Charles Doswell, a scientist from the University of Oklahoma, the environmental concerns of cloud seeding lie primarily with the use of silver iodide to seed the clouds. Precipitation contains and concentrates this substance, which is taken up by plants and groundwater when it has fallen. Silver iodide concentrations in seeded precipitation are typically low due to the seeding agents being widely dispersed, however, studies to date have failed to consider the long-term effects of bio-accumulation on the receiving ecosystems. (Doswell, 1999)

A review in 1970 by Cooper and Jolly pointed out that the current experimental practice of seeding clouds with silver iodide to promote rainfall may lead to new hazards for both human and natural biological systems if the practice is extended. (Cooper and Jolly, 1970)

Scientists are concerned that if a cloud that is on the brink of condensing into rain is seeded, the rain will be forced to fall prior to where it would have fallen (Forrest, 2002). 'Meddling' with nature in this way can have disastrous effects on ecosystems that depend on the natural patterns and locations of rainfall. In terms of agriculture, the process of cloud seeding may also interfere with crops whereby farmers downwind of the seeded cloud miss out on rainfall due to the rain falling prior to its intended location (Doswell, 1999). This opens the way for 'class action' lawsuits if people or communities consider that they may incur damages from such actions.

The use of aircraft to deliver the cloud seeding agent is relatively expensive and energy intensive, however, it is the most efficient method at delivering the seed to its intended location. The use of aircraft allows cheaper alternatives to chemical agents to be used, such as dry ice (Doswell, 1999).

Hydro Tasmania reported economic success for its cloud seeding operations, principally because the additional water can be used to generate electricity. However it still viewed cloud seeding as a marginal benefit and its inclusion in the power generating system presented a number of managerial, design and operational problems (Ryan and Sadler, 1995).

Cloud seeding is not suitable to generate rain in times of drought due to the absence of rain-bearing clouds (Doswell, 1999).

A study by the South Australian Government in 1989 estimated that, in areas where cloud seeding would work, the water would cost $0.75/kL (SA Govt, 1989). Allowing for inflation since then, the cost of water from cloud seeding would be about $1 per kilolitre or $1,000 per megalitre.

A final comment...

Cloud seeding needs rain clouds to work and only seems really possible in mountainous areas, such as in Tasmania. Cloud seeding will never break droughts and the effects of changing the pattern and possible location of where rain falls is a major social issue.

Whip up a cloud

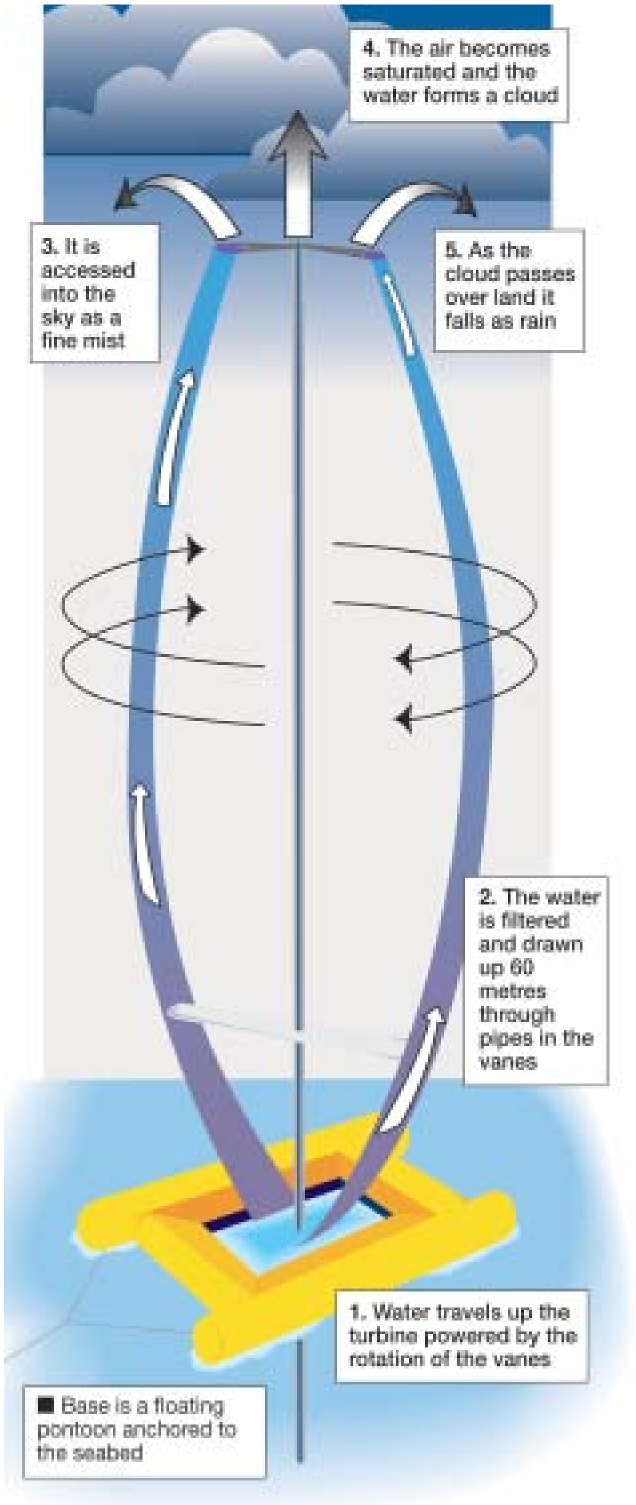


figure 74 - How to whisk up a rain cloud
(Sun Herald, 8 December 2002, adapted by News Ltd)

A new recipe for rain has been proposed. The ingredients are seawater and a spray turbine and the method is to whisk.

The idea was brought to the attention of the Farmhand Foundation by Chris Shaw, who, while scanning his old high school website, found that his former classmate Stephen Salter, had an idea for an 'egg whisk' style machine which could theoretically create rain. Stephen suggested to Chris that it might be a viable option for harnessing more water in Australia.

Professor Stephen Salter of Edinburgh University has designed a 'rain-maker' machine that he believes could provide for a small country if 200 machines were anchored off the coast (Fitzmaurice, 2002).

The design consists of a spray turbine mounted onto a floating platform anchored to the ocean floor. The turbine consists of vanes, driven by the wind, that suck up water through pipes in the vanes. The water driven through the vanes is filtered, and released into the sky as fine droplets. These droplets saturate the air, and form clouds, which rain as they are passing over land (Fitzmaurice, 2002).

The proposed machine would be 1000 square metres wide (roughly the size of two netball courts) with a blade height of 70 metres (the height of the Sydney Opera House) (Salter, 2002).

The salt contained within the seawater is crystallised during the evaporation process and falls back into the ocean.

Wind is required to drive the turbines and wind is also required to blow the newly formed clouds towards arid inland areas where the rain is needed most. A suitable wind speed required to power the turbine would be 8 metres per second, which would produce 100 kilowatts of power (Fitzmaurice, 2002). Due to the turbines being powered by the wind, the weather would have to be monitored and only set the turbines going when there are suitable conditions.

Evaporation is naturally slow from the sea surface due to a stagnant layer of high humidity air just above it. It has been claimed the spray turbine would break through this humid layer and increase the area available for evaporation (Salter, 2002).

Professor Salter has persuaded the UK Engineering and Physical Sciences Research Council to take his idea seriously enough to award a £105,000 ($255,000) development grant (Browne, 2002).

Issues

The microphysics of cloud formation are complex. As many people would know, just because there are clouds, doesn't mean that rain will follow.

The idea has been developed in Scotland and relies on climatic conditions of the Northern hemisphere.

Professor Salter claims that the machines "would not work in areas that were too dry because the artificial clouds would never generate the critical mass needed, and they would need to be used in areas where there were already clouds but not enough to produce rain" (Browne, 2002).

The coastal areas that might presumably look to the spray turbine for rain creation such as South and Western Australia, would not meet the climatic requirements for the machine to work.

Australia already has kilometres of whitecap waves in the Southern Ocean, which produce a lot of seaspray in the air. While the eggwhisk idea may have some merit in regions that don't have many waves, it is unlikely to produce any significant rain for Australia.

According to Professor Salter, the form of the rain produced would be gentle, and is therefore likely to fall near the coast, as it would not have the force or velocity to travel further inland to where it is needed. Winds blowing towards the coast would be required before the machine can be of use.

A concern of the designers of the machine is that plankton will be sucked up the vanes in the water and will become trapped in the fine exit slit. A large area of filter will have to be fitted to trap and remove them. The proposed fabric of the filter is terylene, a polyester fabric. There may be ongoing maintenance issues.

figure 75 - Cumulus cloud

figure 76 - Professor Salter demonstrates the concept of the rain-producing whisk. (Browne)

There will be a local increase in the salinity of seawater downwind of the spray turbine, as the crystallised salt formed from the evaporation process will be deposited back into the ocean or coastal areas.

A spray turbine in the ocean would disrupt fish, ship and bird migration. The anchors may disturb sea grass and damage coral. There would be a negative visual impact if scores of spray turbines were anchored along our coastlines.

Professor Salter has noted that if mass production allows 1,000 square metre machines to be built for $455,000 each we could get 3,000 of them for the cost of one B2-A Stealth bomber (Salter, 2002).

If it could work in Australia, it is estimated that it would produce water for just under $3,000 per mega-litre (HWA, 2003).

A final comment...

Further research may shed some more light on the spray turbine. At present, Australian scientists don't think it will perform in our climatic conditions. And the cost is far more than most irrigators currently pay for water.

Dig a transcontinental canal

The early colonies relied on Australia's deep, wide, mainly coastal rivers as the main form of transport and trade. These rivers have long since been too shallow to allow large shipping, but the dream of a system of canals that would 'open up' inland Australia remains.

In response to Alan Jones' broadcast call for ideas from Australians on ways to solve our water crisis, John West presented 'The Great Australian Canal'.

First proposed publicly by West in 1998, 'The Great Australian Canal' would split the country into two islands by a large open saltwater channel starting in Darwin running southwards, turning south-west after Alice Springs then via Coober Pedy and Woomera, until finally emptying into Spencer Gulf in South Australia. The proposed 2,300km transcontinental canal is to provide a commercial shipping and passenger vessel route through the centre of Australia as well as creating freshwater for irrigation and domestic use by large desalination plants, thereby 'greening' inland Australia.

The canal would run close to Uluru, and incorporate the construction of a large lake for tourist purposes. West argues his case for the canal with a 'populate or perish' philosophy, claiming we can never become a major world player if we allow "the biggest percentage of Australia [to] lie almost dormant, doing nothing, forever." (West, 1998)

The transcontinental canal would be 14 times the length of the Suez canal (163km) and 28 times the length of the Panama canal (80km).

The second option West promotes would be a canal of 1,600km through Queensland, running along the Norman and Diamantina rivers following the Birdsville track into Spencer Gulf (West, 1998).

Both proposals rely on regular tidal regimes to flush and replenish the canals with water from the ocean. Twelve desalination plants are proposed along the canal route to convert the saltwater to fresh. Irrigation pipes or canals would be installed at intervals along the canal running east-west dispersing water into arid Australia. Four artificial lakes and dams would serve tourist purposes along the canal. (West, 1998)

Issues

Arid and semi-arid lands cover 70% of Australia, but are inhabited by only 2% of our population (CSIRO, 2000). The transcontinental canal plans to 'green' the outback, theoretically making it available for all the land uses we associate with the coastal regions, such as traditional agriculture.

> The 'footprint', or total surface area, of the transcontinental canal would be equivalent to 23,000 football fields (HWA, 2003).

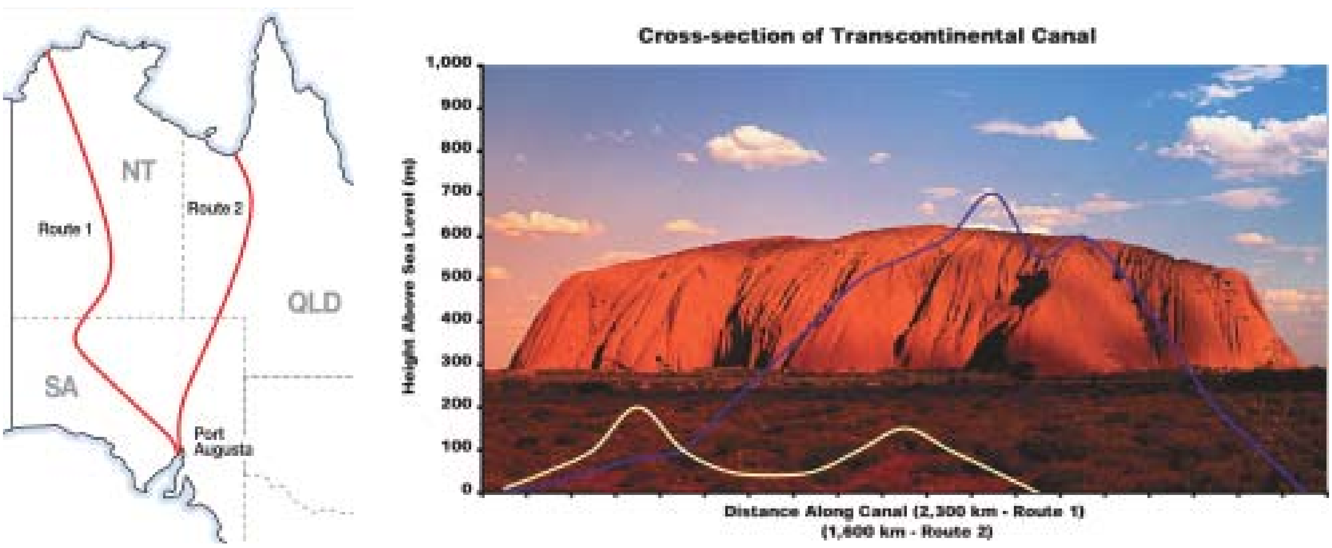


figure 77 - Map and cross-section of the two proposed Canal Routes (adapted by News Ltd)

figure 78 - An artist's impression of the proposed canal (News Ltd)

However far from lying dormant, Australia's arid interior is host to a vast range of native plants and animals, which have adapted to the harsh climatic conditions of the region. Considerable variations in geology, soils, climate and vegetation contribute to a great diversity of ecosystems, species and genetic pools. The resulting biodiversity is integral to the function and health of the arid landscapes. (CSIRO, 2000)

Conversion of interior landscapes to agricultural land uses, either irrigated crops or pastoral uses would have significant implications on interior ecosystems and fragile inland soils.

Underlying much of the proposed location for canals of both options is the Great Artesian Basin. Depending on the exact location within the Great Artesian Basin, the canal may cut into the ground water aquifer. This could drain the Basin if there wasn't a watertight seal along the canal. If the canal was going through one of the Great Artesian Basin's recharge areas (crucial for replenishing the Basin), then the seal would be needed to stop the saltwater from the canal from contaminating the freshwater in the Basin.

One of the options proposed is to utilise some of our rivers such as the Norman and Diamantina as canals. The impact on river ecology would be enormous, essentially turning the rivers into concrete lined channels and destroying riparian vegetation due to saltwater intrusion.

Ship movements pose problems. Oil tankers pose a risk for the occurrence of an oil spill, the effects of which include the blocking of sunlight and a reduction in the availability of oxygen. Ballast water (water that is carried in the empty hull to make the ship stable and released before being loaded) commonly contains exotic organisms that compete with native species and cause environmental problems.

A large amount of energy would be expended in the construction of the canal and the energy requirements of the region once the canal is complete would increase, especially due to desalination which requires a great deal of energy to operate.

The amount of water available for irrigation would depend on the capacity of the numerous desalination plants along the canal length. Ongoing maintenance of the canal would be required to remove silt from wind and shipping erosion. If the canal fails to flush naturally, a likely scenario due to its length, algal blooms would likely occur and be costly to remove.

The capital cost to build the transcontinental canal, excluding any side canals or desalination units, has been estimated as more than $200 billion. Including the surface area of Lake Eyre and Lake Torrens, it is estimated that at most about 500,000ML of extra

figure 79 - An artist's impression of the proposed canal (News Ltd)

runoff would be generated through natural evaporation. If it were assumed that the canal is for both shipping and water supply, then this produces water at a cost of about $10,000 per ML. Desalination units would cost extra and produce water at a cost of about $2,200 per ML. (HWA, 2003)

A final comment...

A canal splitting our country in two would have a huge price tag. Freshwater could be produced but at a price far above that in our major cities.

In China

The Grand Canal in China is the world's oldest and longest canal at 1,745 km. It was built to transport goods from the North (Beijing) to the South (Hangzhou) of the country. During its life it silted up, resulting in the entire canal being dredged and re-built (Holiday China, 2002).

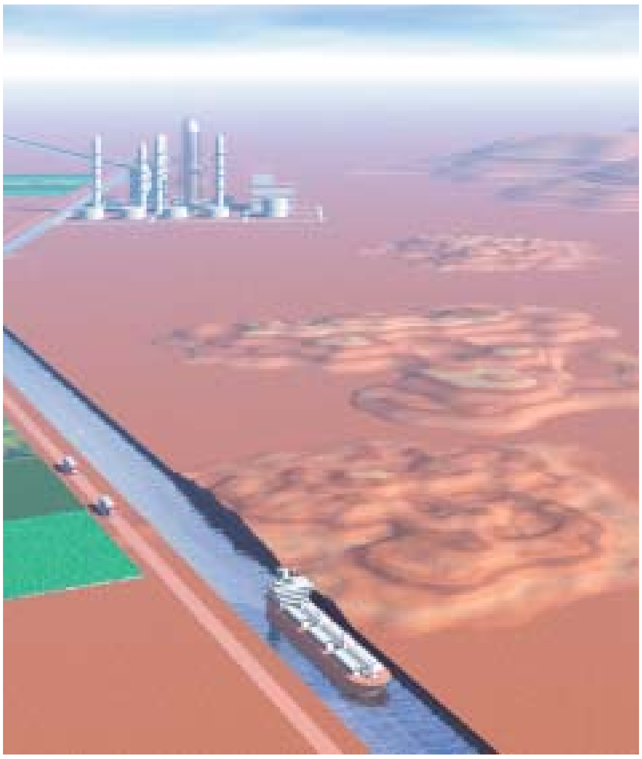


figure 80 - An artist's impression of the proposed desalination plants on the canal (News Ltd)

Connect Lake Eyre to the sea

At a Boy Scout camp in the 1950s, Ken Knudson and other scouts listened as an elderly professor divulged to them his theory on how to water the inland. By pumping water from Spencer Gulf to Lake Eyre, evaporation in the flooded Lake could produce rain clouds to water inland Australia. The professor urged the boys to see his idea into fruition. Ken Knudson heeded the call of Alan Jones' invitation for ideas on water, by relaying what he heard many years ago about one way to create more rain.

The early Australian myth of a huge inland sea would become a reality under the proposal to turn the oceans inland and create a permanent salt lake in the Lake Eyre Basin. As early as 1883, it was suggested that saltwater from Spencer Gulf in South Australia could be channelled or piped to inland Lake Eyre, a usually dry saltwater lake, to create the conditions for additional precipitation in agricultural regions to the east. The government of the day rejected the proposal (Kotwicki, 2003).

A recent proponent of the scheme is political party One Nation, who see the flooding of Lake Eyre as a necessary step towards irrigating the northern arid regions of South Australia (One Nation, 2002). They envisage a 350km canal into the Lake with desalination plants at the site to provide additional freshwater.

Bob Beatty from Camira in Queensland has submitted a brand new proposal to the Farmhand Foundation for a flooding of Lake Eyre. The Bosmin Lake Eyre Development Proposal plans to permanently fill the Lake using two separate canals as pictured in figure 81. The first canal, dubbed the 'Bosmin' Canal, would be 15m deep and extend 350km through Lake Torrens and onto Lake Eyre South via a non return weir system. The second canal, dubbed the 'Nimsob' Canal which would flush the salt, is proposed to be 10m deep and 768km long. The proposal sees benefits in the flooding such as 2000km of permanent inland waterway beachfronts for home and tourist purposes, hydropower generation, the possibility of increased rainfall, a secure naval facility, aquaculture farming opportunities, transport opportunities to a large region of inland South Australia, and a drainage system for saline land.

The Lake Eyre Basin covers one sixth of the Australian continent. The Basin is one of the world's last unregulated wild flowing river systems, holding some of the rarest, least exploited ecosystems on the planet. In 1840 Edward John Eyre visited Lake Eyre as the first white person. It was considered permanently dry until the first recorded filling in 1949. At 15 metres below sea level, Lake Eyre is the lowest point in Australia (LEBCG, 2003). It also experiences the lowest rainfall in Australia of 100mm annually (ABS, 2003).

Lake Eyre has a surface area of 9,500 square kilometres and is 15 metres below sea level (Geoscience, 2003). The Lake Eyre Basin covering

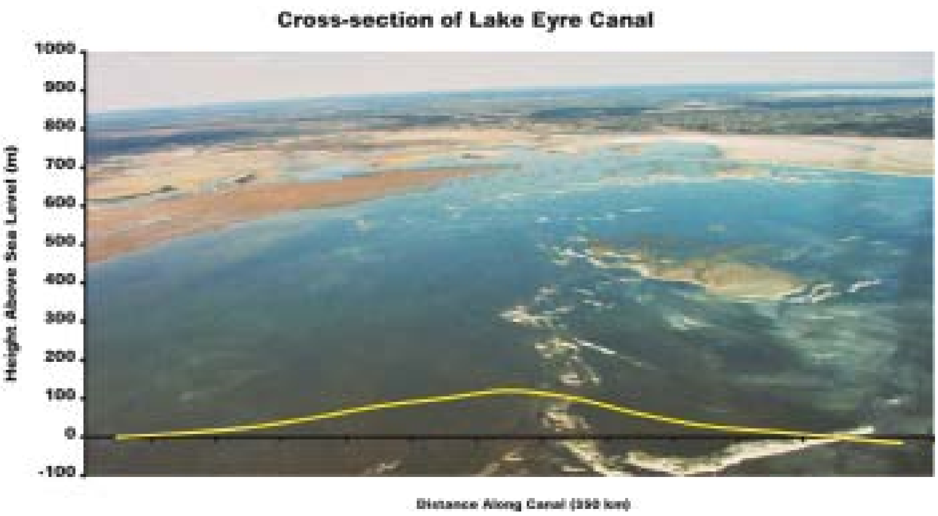


figure 81 - Map and cross-section of the proposed Lake Eyre Canal (adapted by News Ltd)

some 1.2 million square kilometres is the world's largest drainage system (LEBCG, 2003). Transporting water to the Lake from the coast would involve raising the water up to 150 metres above sea level. The proposals suggest either pumping the water through pipes to empty into Lake Eyre South, or excavating a canal at sea level to flow to the Lake. A further option is to pump the water to the highest point and release it into a canal to let gravity drain it into the Lake.

As Australia's largest salt lake, Lake Eyre is rich in environmental and cultural values. Lake Eyre is part of a 13,492 square kilometre National Park declared in 1987, which has recently been identified by the CSIRO as part of a wetland complex of World Heritage value.

Issues

The extreme arid conditions of Lake Eyre have created an ecological niche of adapted flora and fauna, many of which cannot be found anywhere else, such as the Lake Eyre dragon. When Lake Eyre naturally fills, the surface water is fairly fresh and drinkable, however with constant filling from the sea, it would retain a much saltier composition (SA DEH, 2002).

Part of the World Heritage listing is founded on Lake Eyre's many areas of cultural significance and long history of Aboriginal settlement. Lake Eyre is of significant importance to indigenous peoples such as the Arabunna and Kokatha people who retain strong cultural and spiritual ties with the area.

Lake Eyre continues to be an archaeologist's delight. There is a large abundance of Aboriginal stone chips, grinding stones and other artefacts in their vicinity. Human and megafaunal bones have been found in and around Lake Eyre from the Holocene age (10,000 years ago) (AHC, 1996). A large number of bird fossils have been found from the Late Oligocene (30-25 million years ago) (Australian Museum, 2001). Nearby, the snout of a 120 million-year-old fish lizard, an ichthyosaur, was discovered 30 years ago (ABC, 2002).

Many of the environmental issues are the same as those for a transcontinental canal. There is much doubt attached to the theory of significant increases in rain through encouraging evaporation. Studies conducted in 1949/1950 following the natural flooding of Lake Eyre, found that only an area within 2 kilometres of its margins encountered a milder climate, while the countryside beyond remained dry (Learmonth and Learmonth, 1971). The Spencer Gulf and the Red Sea, as further evidence, have little if any effect on rainfall in the surrounding country (Kotwicki, 2003).

figure 82 - Coongie Lakes, a Ramstar listed wetland in South Australia, which is fed by Cooper Creek in the Lake Eyre Basin (Baljet and Hoevenaars, 2002)

The amount of water available for irrigation would depend on the capacity of the numerous desalination plants. Pumping and maintenance costs would be significant. The costs of the desalinated water for irrigation would be over 10 times higher than that paid in some other parts of Australia for drinking water.

The estimated capital cost to build the canal is around $92 billion (HWA, 2003). As for the transcontinental canal, it is estimated that at most about 500,000ML of extra runoff would be generated through natural evaporation. For this proposal however, the main purpose is water supply and the water produced through evaporation would cost about $9,000 per ML. Again, desalination units would cost extra and produce water at a cost of about $2,200 per ML. (HWA, 2003)

A final comment...

The claims of extra rainfall from flooding Lake Eyre are questionable, while the financial burden of building and maintaining canals, pipes and desalination plants is enormous. It also requires flooding of an internationally significant National Park.

Stop Press!

A recent decision has protected a large area of wetlands within the Lake Eyre Basin.

In July 2003, the South Australian Government announced a new 27,900 hectare National Park to protect much of the Coongie Lakes in the state's far north, putting to rest two decades of environmental controversy. A further 87,740 hectare area of the lakes has been excluded from cattle and petroleum activities.

The spectacular lakes are internationally recognised Ramsar-listed wetlands, home to tens of thousands of water birds.

figure 83 - An existing irrigation channel (News Ltd)

Build a mountain

A particularly ambitious proposal submitted to the Farmhand *Fencepost* was to build a new mountain range in the West of Australia, so as to create rain in the dry interior.

The idea, first suggested by L.H Hogan in his book *Man Made Mountain*, is to build a very large mountain range 4km tall, 10km wide at the base, with a 2km plateau at the top and covering a distance of 2,000km. The range would run north to south across Australia from the Great Southern Ocean to the Timor Sea following the borders of Western Australia with the Northern Territory and South Australia (Hogan cited in Kruszelnicki, 2003).

Climate is a very complicated science. The option to build a mountain range in the West of Australia is designed to dramatically change our present climate. The basic concept underlying the idea is the 'orographic effect'.

As high as a mountain

Australia's highest mountain is Mawson's Peak on Heard Island in the Southern Ocean. It is 2,745 metres high and forms the summit of an active volcano called Big Ben. Mt Kosciuszko is the highest mountain on the mainland at 2,228 metres high. (Geoscience, 2002)

The orographic effect occurs when air is forced upwards by a barrier of mountains or hills. Cloud formation and rainfall is often the result. Moist air from Antarctica and the Gulf of Carpentaria may also be channelled between this new mountain range and the Great Divide.

Australia's heaviest rainfall occurs on the Queensland coast and in western Tasmania, where prevailing air streams are forced to lift over mountain ranges. Also many mountainous areas, including the Great Divide of eastern Australia, are wetter than adjacent lower regions for this reason. (BOM, 1993)

The grand plan involves building a rectangular grid of 49 cities on the newly 'greened' landscape.

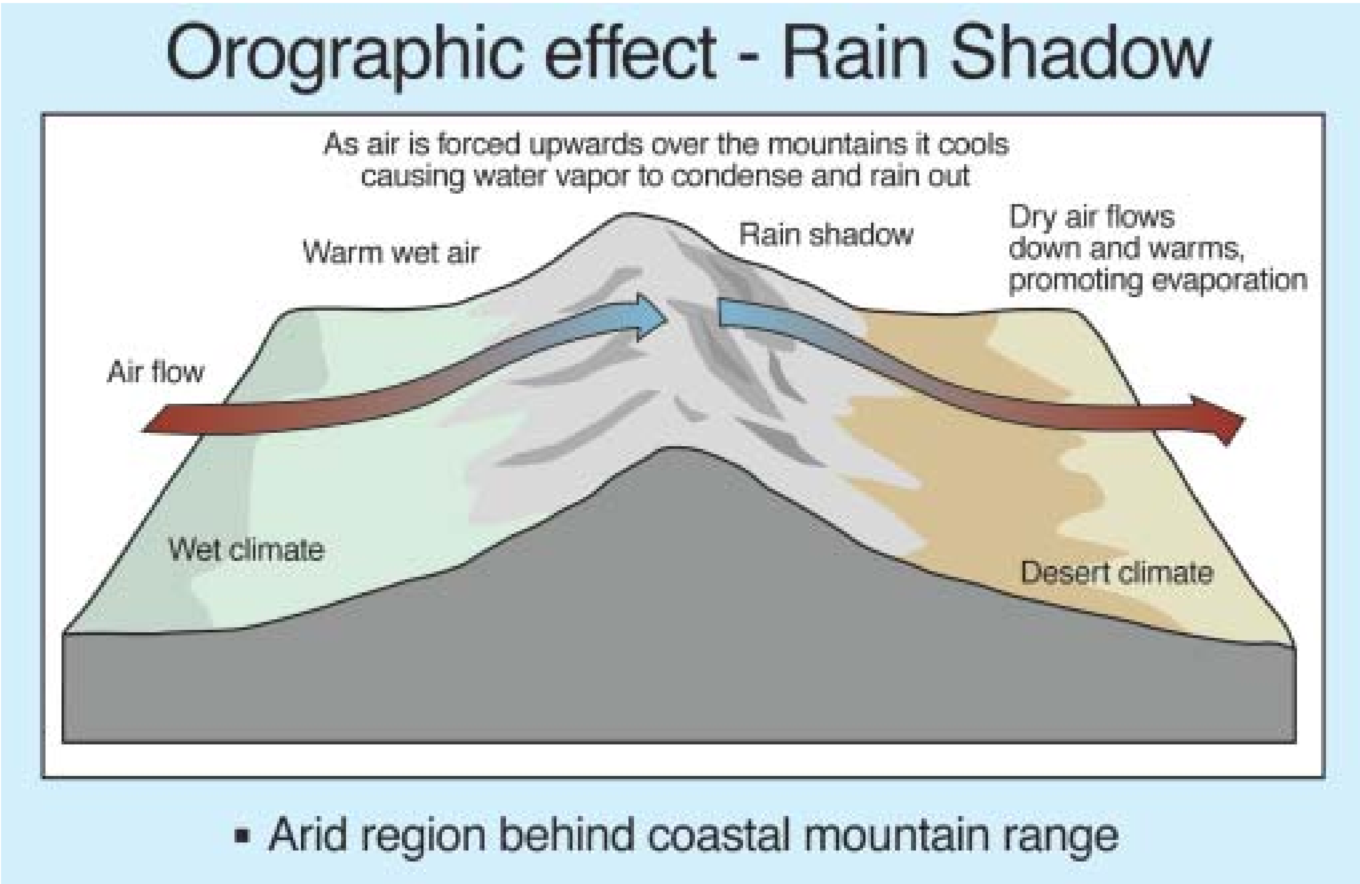


figure 84 - The orographic effect (adapted by News Ltd)

figure 85 - Proposed new mountain range

The material required to construct the artificial mountain would be 40 million million cubic metres.

A geology research professor at the University of Maine has estimated that the total amount of earth moved by all human activity since we've been on the planet is 8 million million cubic metres. This figure includes all mining and construction activity, farming and agriculture, as well as dust and soil movement as a result of landclearing. (Hooke, 2000)

The amount of earth to be moved in order to build a mountain across Australia is 5 times all the earth moved in the whole of human history.

As tall as a skyscraper

The world's tallest skyscraper is the Sears Tower in Chicago USA. It was built in 1974, has 108 floors and the top floor is 436.2 metres above the ground (the antenna is 527.3 metres above the ground). The Petronas Tower in Kuala Lumpur, Malaysia, is the world's second tallest skyscraper with the top floor 375.0 metres above the ground and the spire is 451.9 metres above the ground. A tower is being built in Taipei, which will be the world's tallest skyscraper with a top floor at 438 metres and a spire at 508 metres above the ground. (Skyscraperpage.com, 2003)

Issues

The physical footprint of the mountain would be approximately 420,000km^2, almost twice the size of Victoria.

The mountain range would be 10km wide and 2,000km in length (20,000km^2). A trench approximately 100 metres deep, 200km wide and 2,000km long would be necessary to provide the amount of material to build the mountain range (400,000km^2).

Creating a mountain range in the West would bring unquantifiable changes to both sides of the mountain.

Ecosystems would be destroyed, drainage lines would be altered, and wind and rainfall would be affected in unknown ways. The existing vegetation would be dramatically altered. A much more seasonal climate would likely be created. It would also form a barrier to transport of resources and services from the east and west coasts of Australia.

The mountain would need to be vegetated to reduce erosion. If trees were planted on a 10 metre grid, more than 4 billion would be required. The location of the mountain would destroy Aboriginal land and National Parks from the Nullarbor to the Kimberley.

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As the proposal involves deliberately changing the climate in a dramatic way, it is not known how much extra rain the proposed mountain would generate. Currently a large part of arid Australia has very little rainfall (less than 400mm a year) and a huge potential evaporation of between 1.2 metres and 2 metres (BOM, 2003). These would probably change.

Currently less than 2.2% of rainfall in the area soaks into the ground or ends up as stream flow, resulting in just over 10 million ML of runoff each year (annual runoff in the Murray-Darling Basin is just under 24 million ML) (NLWRA, 2000).

It has been estimated that the construction of such a mountain would be more than $100,000 billion (HWA, 2003). Given our national budget is $178 billion, the price tag would be 500 times the national budget.

If the new mountain were to create an extra 50 million ML of runoff each year, then the cost of the water would be more than $100,000 per ML (HWA, 2003).

A final comment...

Building a mountain to produce rain would bankrupt the country thousands of times over, and change the location of where rain fell, rather than necessarily producing a lot more rain overall.