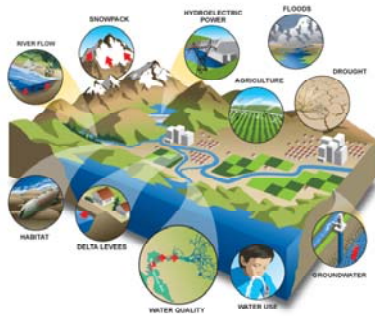


**Start preparing Sydney, warming is inevitable**

KELSEY MUNRO SMH February 23, 2010

- Cities like Sydney should take pragmatic measures to prepare for an inevitable degree of warming, for example by **planning to lift port infrastructure as sea levels rise, building new water supply systems and devising plans to minimise heatwave-related deaths**, said Michael Oppenheimer, a geoscientist at Princeton University and a lead author of the third and fourth assessment reports of the Intergovernmental Panel on Climate Change

## FEATURES OF CLIMATE CHANGE



## CLIMATE CHANGE

- DROUGHT
- SEA CHANGE
- DISASTERS
- SUSTAINABILITY
- RIGHTS TRADING
- ADVOCACY
- CARBON SEQUESTRATION

## SURVEYORS ARE INVOLVED – WHERE'S WALLY??

WILLIAM PENTLAND



## CADASTRAL SURVEYOR

- LOCATION
- MEASUREMENT
- PROPERTY BOUNDARIES
- PROPERTY RIGHTS
- OTHER RIGHTS ?

## DROUGHT

- RIVER BOUNDARIES
- WATER INFRASTRUCTURE
- COMMUNITY TITLE
- DISASTERS

## DRY RIVER BED



## CASTLEREAGH RIVER - COONAMBLE



## SHRINKING RIVER BOUNDARIES

Google image



## RIVER BOUNDARIES

NSW SURVEYOR GENERAL'S DIRECTIONS

- **"bank"** means the limit of the bed of a lake or river.
- **"bed"** means the whole of the soil of a lake or river including that portion -
  - (a) which is alternately covered and left bare with an increase or diminution in the supply of water; and
  - (b) which is adequate to contain the lake or river **at its average or mean stage** without reference to extraordinary freshets in time of flood or to extreme drought;
- **"river"** includes any stream of water, whether perennial or intermittent, flowing in a natural channel, and any affluent, confluent, branch or other stream into or from which the river flows.

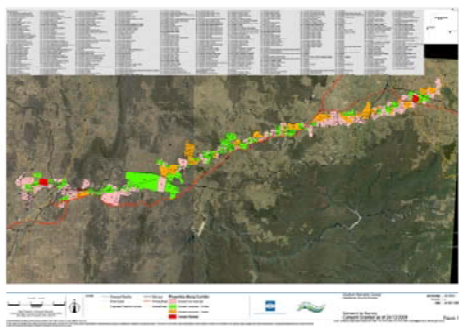
## COTTER DAM

Canberra Times



## GOULBURN – WINGECARRIBEE PIPELINE

GHD



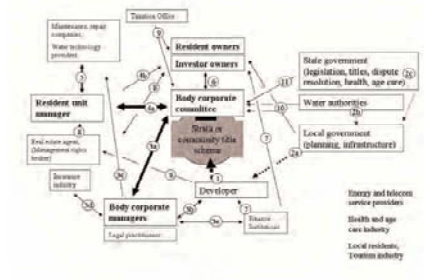
## SYDNEY DESALINATION PLANT

Sydney Water



## COMMUNITY TITLE

Australian Government National Water Commission



## Merryville Estate Water Allocations

### Merryville Estate Community Association

- Residents in the Estate receive an allocation of water via a metered tap for use in their garden or for stock. The water is sourced from either the dam or the bore located off Merryville Drive opposite the dam and is pumped to the two header tanks located in the community land off Thoroughbred Drive and reticulated to residents by gravity feed.
- The dam has a maximum capacity of 55.8 mega litres and the bore allocation is 19 mega litres per annum; the bore allocation is based on a harvestable right of ground water and, consequently, if the allocation from the bore is exceeded the entitlement for the following year is reduced accordingly. The amount of water in the dam varies depending on climatic conditions - rainfall and evaporation rate. The Community Association sets the annual allocation to each lot based on an estimate of the amount of water that will be available in each particular year.

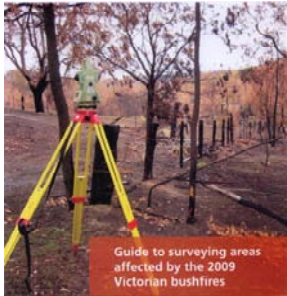
## MERRYVILLE ESTATE MURRUMBATEMAN FLICKR



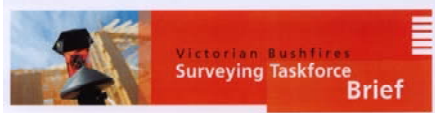
## DISASTERS

- FIRE
- LAND SLIP
- FLOODS
- TSUNAMIS

## FIRE



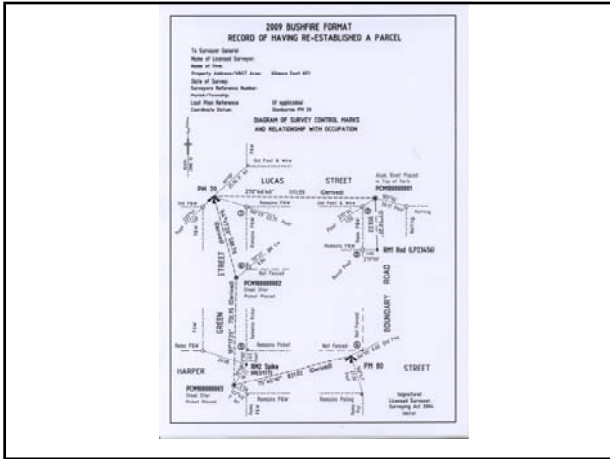
## SURVEYING AFTER VICTORIAN BUSHFIRES



- Establishment of survey control networks of coordinated permanent marks (SGV)
- Establishment of GNSS master base stations at the affected localities (SII)
- Preparation of Survey Guidance Notes (SGV & RMIT)
- Establishment of a single register to record offers of assistance (ACSV)
- Identification of areas requiring survey marks and monuments to be recovered and referenced (SGV)
- Recovery, referencing and recording of surviving survey marks and substantial monuments such as brick corners and fence posts (volunteer surveyors)







## LANDSLIP AND SURVEYOR

- DETERMINING MOVEMENT OF BOUNDARIES.
- DEFINING BOUNDARY LOCATION
- PROVIDING EVIDENCE OF LAND MOVEMENT.

## LANDSLIP

S.F. DAILY JOURNAL – JAN 19, 2005

- **“There Goes the Neighborhood -- Slowly Shifting Land in The East Bay Hills Causes Legal Disputes Between Neighbors Over Who Owns What”**

- By Robert Selna, Daily Journal Staff Writer

## LANDSLIP

LANDS AND PROPERTY MANAGEMENT NSW



## TSUNAMIS

Dr Craig Roberts School of Surveying and Spatial Information Systems - UNSW

- “But imagine the situation faced by surveyors in Indonesia in the aftermath of the Boxing Day Tsunami. The Tsunami wiped out whole villages and took with it all the survey marks, all evidence of existing land boundaries, many of the land records in the local Lands Department buildings and tragically many of the occupants of the land were also killed. Some land was permanently submerged under the ocean and some new land just emerged. **Where would the local surveyors possibly start to re-establish people’s rights and ownership over their land?**”

## FLOOR AND SITE LEVELS

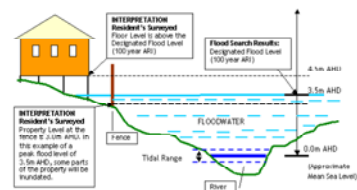
- COUNCIL PLANNING AMENDMENTS
- HIGHER FLOOR LEVELS
- SITE LEVELS EXTENDING BEYOND BOUNDARIES
- HIGH WATER MARK?

## SEA CHANGE

- SEA LEVELS
- COASTAL PROTECTION
- BUILDING LEVELS
- PROPERTY BOUNDARIES

## FLOOR LEVELS

GOLD COAST CITY COUNCIL





COLLARROY



COLLARROY



COLLARROY



COLLARROY FROM ABOVE  
"Six view" – NSW Dept. of Lands



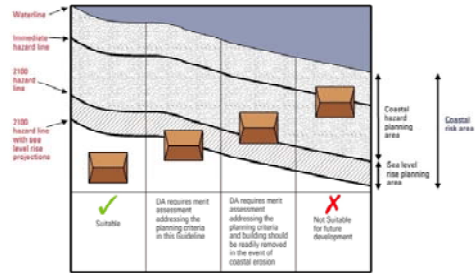


## OLD BAR COAST



## NSW GUIDELINES PLANNING NSW

Figure 4 - Coastal erosion consideration in DA assessment

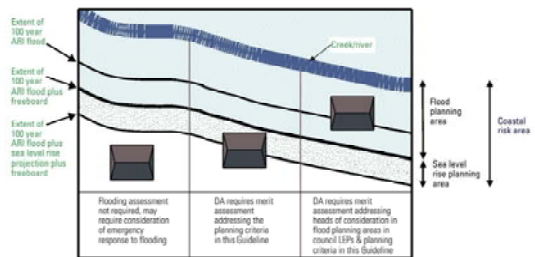


## BYRON BAY



## NSW GUIDELINES PLANNING NSW

Figure 5 - Coastal flooding consideration in DA assessment



## BOAT HOMES – HOLLAND

By [Gizmodo US Edition](#) on [February 9, 2008](#)



## SUSTAINABILITY

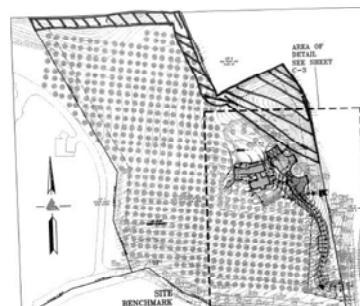
- EASEMENTS AND/OR RESTRICTIONS
- DUE DILIGENCE
- FLOOR AREAS
- MEDIUM DENSITY ESTATES
- HIGHER DENSITIES
- OTHER

## GALVESTON ON STILTS

[Galveston and Texas History Center, Rosenberg Library](#)



## OPEN SPACE EASEMENT



## “STORY POLES”



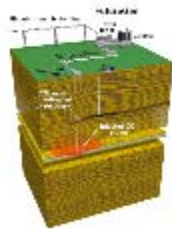
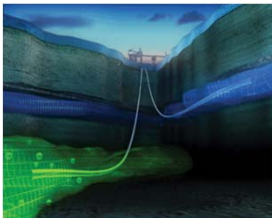
## WIND FARMS

CARBONSIMPLICITY



## CARBON SEQUESTRATION EASEMENTS?

(Energy Tribune 18/03/2008 / FutureGen)



## SOLAR FARMS

ENVIRALMENT



## SUSTAINABILITY ISSUES

ACT Govt



## DEAKIN – CANBERRA

ACTMAPi



## PROPERTY RIGHTS

www.cartoonstock.com



\*These hotshot business types think they own the sky

## DEAKIN

ACTMAPi





**"THE ACT GOVERNMENT IS PLANNING FOR CLIMATE CHANGE"**  
ACT GOVERNMENT 2010 STATEMENT OF PLANNING INTENT

"The Government's intent is to: ....

- develop and implement statutory arrangements for protecting **solar rights**
- ... to ensure better tools for measuring the energy gain and strengthening the rules around passive solar orientation of stand alone blocks in new subdivisions
- ... further enhance stormwater harvesting in new estates

## DUE DILIGENCE??

National Real Estate Investor - Denise Kalette

- "To date, real estate due diligence has focused on revealing risks associated with purchasing, selling or converting property assets. But the expanding view of environmental due diligence now includes the potentially beneficial effects of tax credits and the use of carbon credits, as well as savings in the financing process and possible higher valuations for energy-conserving structures, among other issues."

## DUE DILIGENCE REPORT

RICS

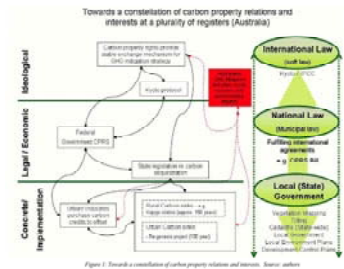
Lead Document	4	<b>7. MATTERS FOR THE LEGAL ADVISER'S ATTENTION</b>	18
4.4 Engagement Directly by the Client	6	7.1 Title and Tenure	19
<b>5. MAIN COMPONENTS OF THE TECHNICAL DUE DILIGENCE REPORT</b>	<b>7</b>	7.2 Boundaries	19
5.1 General Property Description	7	7.3 Guarantees and Warranties	19
5.2 Access	7	7.4 Leases	19
5.3 Structure	8	<b>8. INSURANCE</b>	20
5.4 Building Fabric	8	<b>9. ANNEXURE A</b>	21
5.5 External Areas	8	Confirmation of Scope of Services	21
5.6 Ducting Services	9	<b>10. ANNEXURE B</b>	22
5.7 Environmental Issues	10	Report Limitations	22
5.8 Sustainability	11		
5.9 Town Planning	11		
5.10 Statutory Compliance Review	12		
5.11 Heritage Significance Assessment	13		
5.12 Floor Space Ratio, Car Parking Ratio and Efficiency	13		
5.13 Identification Surveys	14		

## OTHER RIGHTS

- CARBON RIGHTS
- WATER RIGHTS
- ECO RIGHTS
- SOLAR RIGHTS
- RIGHTS TRADING
- RIGHTS ASSOCIATED WITH CADASTRE

## CARBON TITLE AND JURISDICTION

Boydell, Sheehan, Prior & Hendy



## CARBON ACCOUNTING

- NGER (National Greenhouse and Energy Reporting Act 2007)
- CPRS (Carbon Pollution Reduction Scheme)
- EEO (Energy Efficiency Opportunities Program)
- Greenhouse Challenge Plus
- State Government programs

## ISSUES RELATING TO CARBON MEASUREMENT

- JURISDICTION: COMMONWEALTH OR STATE
- LAND OWNERSHIP VS RIGHT TO USE STORAGE SITE
- NATIVE TITLE AND CULTURAL HERITAGE SITES
- ENVIRONMENTAL AND PLANNING LAWS
- WATER ISSUES
- TAX CONSIDERATIONS
- THIRD PARTY ACCESS – TRADE PRACTICES ACT
- ACCOUNTING REQUIRING MEASUREMENT
- THE NATIONAL GREENHOUSE AND ENERGY REPORTING ACT

## CANBERRA ARBORETUM



## ACCOUNTING REQUIRING MEASUREMENT

- Tree Sizes
- Areas
- Floor Areas
- Structure sizes
- Accuracy
- Surveyors or others?

## FLOOR AREA ISSUES

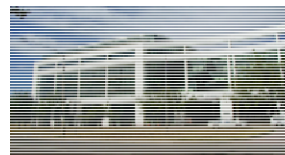
[Fusionopolis - Sustainable Development](#) [JTC Corporation](#)



## FLOOR AREA ISSUES

- DEFINITIONS
- INTERPRETATION
- PURPOSES
- MINIMISE OR MAXIMISE
- MEASUREMENT
- EXCLUSIONS AND INCLUSIONS

## FLOOR AREAS CANBERRA



## WATER RIGHTS - FARM DAMS



## Greenhouse Development Rights

ECOEQUITY

- *The Greenhouse Development Rights framework is designed to support an emergency climate stabilization program while, at the same time, preserving the right of all people to reach a dignified level of sustainable human development free of the privations of poverty.*

## ECO RIGHTS ?

The Ecological Rights Foundation

- The Ecological Rights Foundation is devoted to furthering the rights of all people to a clean, healthful, and biologically diverse environment. It is essential that industries afford protection to workers, consumers, communities, and our ecosystems, the foundations of our local economies. Through education and the enforcement of environmental laws, we seek to protect the public and our environment from injurious business practices.

## BIO RIGHTS

[www.bio-rights.org](http://www.bio-rights.org)

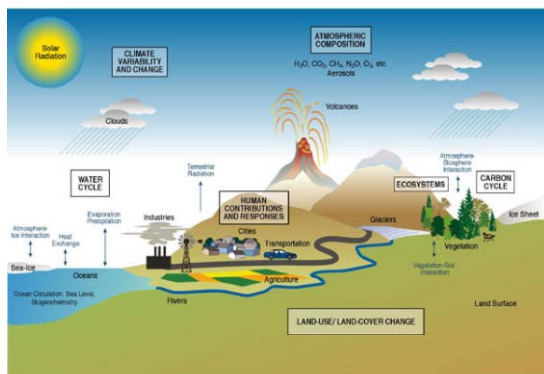
- **Bio-rights is an innovative financing mechanism which provides micro-credits for sustainable development to poor communities in return for their active involvement in the protection of the natural environment.**

Successful community involvement leads to conversion of micro-credits into definite payments, enabling sustainable development and environmental conservation to go hand in hand.



## ADVOCACY


- NEW IDEAS
- INVOLVEMENT
- CONSEQUENCES



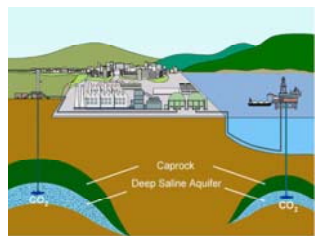
The ACT Government is planning for climate change.

The Government's intent is to:

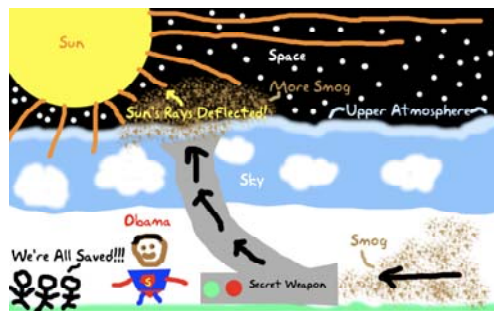
- drive change to planning policy through the Sustainable Future program in support of the Government's climate change strategy Redesigning the Change. This will drive changes to regulation and design standards in the Territory Plan including those relating to solar orientation and solar access.
- recalibrate the Canberra Spatial Plan to ensure that it is responsive to and can deliver on the key principles that are contained within it
- develop and implement statutory arrangements for protecting solar rights
- consult with industry to alter the current solar access rules in the Territory Plan to ensure better tools for measuring energy gain and strengthening the rules around passive solar orientation of stand alone blocks in new subdivisions
- work with the community and industry to implement, over the next ten years, carbon targets for prime estates
- implement more comprehensive measures to increase residential density in and around town and group centres, and along transport corridors
- develop world best practice sustainable development demonstration projects such as the East Lake development
- further enhance solar collector harvesting in new estates
- establish new approaches to water re-use in the Molonglo Valley development
- continue to drive energy efficiencies in new and existing homes by phasing out electric storage hot water heaters for solar 1 and 2 buildings, consistent with the COAG National Strategy on Energy Efficiency



### BACTERIAL TRANSFORMATION OF CO<sub>2</sub> - JAPAN



### ALTERNATIVE IDEAS






## 3-D CITY FARMS



## SSSI SUBMISSION – SUSTAINABLE CANBERRA FRANK BLANCHFIELD



Sustainable future workshop findings report submission  
CPD3 Doc 0001  
Canberra, 2010

### A Sustainable Future and the Spatial Sciences

The Surveying and Spatial Sciences Institute (SSSI) Report, written in response to the ACT Planning and Land Authority (PALA) call for proposals to conduct the workshop and produce the report. While sustainable development is primarily a matter of government action, SSSI in the case of Canberra also requires Australian government and community commitment. It is widely appreciated that the findings arising directly shape the form of Canberra.

#### 1. The Surveying and Spatial Sciences Institute

The SSSI is the professional institute which represents the surveying and spatial science professions in Australia. The institute has 2,700 members working in both public and private practice throughout Australia and New Zealand. While in Canberra we have approximately 100 members, about one-third are professional and academic. Many of these comprise work in the ACT and Australian governments but the majority work in other industries, including health, education, engineering, architecture, planning, and industry. As such, members are both interested in a sustainable future and influential in the land development process.

Our non-Australian members have in Canberra work in Geographic Information Systems (GIS), remote sensing and topography and many are professionally involved at the cutting edge of climate change science and environmental management.

#### 2. Feedback on the Workshop Findings

## SKY FARM



PROPOSAL FOR THE SKY FARM

PROPOSAL FOR THE SKY FARM

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PROPOSAL FOR THE SKY FARM

PROPOSAL FOR THE SKY FARM

**Julia Melnikova, School #13, St. Petersburg, Russia**

I don't want emissions to stay in the air,  
To fill our lungs and to spread everywhere,  
To cause global warming, submerging the land!  
To stop all this mess **we** should lend our hand!

ARE SURVEYORS INVOLVED?

