THANK YOU
FOR THE OPPORTUNITY

We have shared a lot over the years.
Bel Marquez – New Mexico
Larry Larson - ASFPM
Doug Plascensia – Arizona
Al Goodman – Mississippi
Paul Osman - Illinois

+ Others….VARIOUS TOPICS BY EACH
OTHER ASFPM COLLEAGUES IN AUSTRALIA …

Mark Forrest
ASFPM
ATLANTA 2015

GOLF SPONSORSHIP
Today we’ll talk about:-

- How Floodplain Management works in Australia
- Mark’s questions
- About our Aussie FMA

So let’s get started............
AUSTRALIAN HISTORY

- Same British heritage as USA ….EXCEPT…
  - Established as a convict colony 1788
  - No coins when first established so Rum was unit of currency (now progressed to beer!)
  - Haven’t yet fought for independence so probably still a convict colony
  - Language easy to learn – just say “mate” at the end of each sentence
  - USA saved us in WW2 (Darwin like Pearl Harbour except more bombs!)
  - Today we share much in common with USA
AUS = USA

Area = 3m sq miles
6th Largest in World
6 states + 2 territories

Area = 3.5m sq miles
4th Largest in World
50 states + territories
AUS = USA

Miami

Gold Coast
AUS = USA

San Francisco Bay

Sydney Harbour
AUS = USA

USA television

AUS Television
Jarryd Hayne !!!
AUS=USA

51st STATE???
SO WHAT’S THE DIFFERENCE?

Mark’s Questions!!

Differences in regulatory frameworks between US and Australia
Differences in insurance costs, availability and how the insurance companies assess risk.
The Australian Rainfall Runoff criteria development process and what motivated the development of a national standard.
How 2D models are used in Australia for land use planning, insurance risk and emergency response
Emergency response being done at the state level by the SES compared to the US, where response is done at the city and county level and is less coordinated. Are there advantages and disadvantages to the SES approach?
How similar or how different are the types of flood hazards in Australia? What types of rainfall events produce flooding in Australia?
Does Australia have arid regions flooding issues similar to the US where flooding is due to short duration intense thunderstorms that produce flashy runoff events that can carry large amounts of sediment and debris?
Hydrologic data collection in Australia – does Australia have an agency similar to the USGS? Length of available records, challenges due to limited data, etc.
Differences in regulatory frameworks between US and Australia?
State vs Local
(proof our states can’t agree)
How does FM work in AUS

3 Levels of Government involved:

- Federal – “EMA” Attorney General’s Dept (mainly funding+research+best practice)
- State Agencies – (Policy+Guidelines+funding+advice)
- Local Councils – 559 in Australia
  - 152 in NSW
  - 80+ are in FMA
COUNCILS - NSW and QLD

- Flood studies (govt grant assistance)
- Land use planning
- Approve development with conditions such as floor levels
- Certify compliant (eg; s149 Certificates)
- Mitigation measures, levees (Govt grant assistance)
Differences in insurance costs, availability and how the insurance companies assess risk?

- No NFIP
- Private insurance since 2007/2008
- Premiums = $X,000’s
- Risk assessed by existing maps plus newer modelling by larger insurance companies
- Smaller companies assume worst or don’t offer
The Australian Rainfall Runoff criteria development process and what motivated the development of a national standard?

- Major floods in 1950’s
- Originally developed as a guide in 1958 due to no mapping/modelling
- Updated 1977, 1987 and being updated again as we speak
- Still a guide using updated rainfall intensity, Rational Method, etc
How 2D models are used in Australia for land use planning, insurance risk and emergency response?

- Land use planning and Development approvals - flood levels, avoid floodways (VxD)
- Insurance premiums based on risk (using results of 2D and 1D Modelling)
- Emergency services planning from sequence of inundation etc.
- Mark Forrest can add to this issue
Emergency response being done at the state level by the SES compared to the US, where response is done at the city and county level and is less coordinated. Are there advantages and disadvantages to the SES approach?

- Different in states (eg; NSW different to QLD)
- NSW state based - less volunteer “ownership” + more “military” like but some Council involvement in pre-planning (LEMC + part funding + data sharing)
- QLD more local Council based and similar to USA
How similar or how different are the types of flood hazards in Australia? What types of rainfall events produce flooding in Australia?
FLOOD RISK IN AUSTRALIA

Types of flood mechanisms in Australia...

- Mainstream Flooding from widespread catchment event/prolonged rainfall
- Localised flash flooding from storm event
- Tropical Cyclones in Northern Australia generate high rainfall/flooding/storm surge
- Groundwater flooding (Northern Territory)
- Potentially from infrastructure failure (levees/dams)
- No “snow melt” flooding
Does Australia have arid regions flooding issues similar to the US where flooding is due to short duration intense thunderstorms that produce flashy runoff events that can carry large amounts of sediment and debris?

ANSWER = YES - BOTH
THE DRIEST CONTINENT
WHAT HAZARDS?

AUSTRALIA!
Darling River – Mississippi?
Darling River Catchment – Feb 2012
Darling River “Normal”
QLD FLOODS 2011

“Flash Flooding” QLD 2011
Toowoomba/Grantham 2011
Floods are Killers!
More deaths than any other Natural Disaster!
QLD FLOODS 2011

People Died
QLD FLOODS 2011

Danger
QLD FLOODS 2011

EMBARRASSING !!!!
COFFS HARBOUR NSW 2009

- STEEP COASTAL ESCARPMENT
- FLASH FLOODS (2HRS)
Waterfall Way 2010

Escarpment east side of great dividing range upstream of Coffs Harbour
First McDonalds – Chicago 1955
First “Elevated” McDonalds!

IMPORTANT floodplain management !!!!!!!
The first purpose built elevated McDonalds for floodproofing
Hydrologic data collection in Australia – does Australia have an agency similar to the USGS? Length of available records, challenges due to limited data, etc.
YES?

- BOM weather/flood warnings and data
- Geoscience Australia – NFRAG, earth quake monitoring, climate change, etc,etc
HISTORY OF FMA

Floodplain Management Association
Evolution.
Started with a conference in May 1961 !!!!
(3 FM Councils plus Hunter Valley Trust)

Conference grew in numbers each year so FMA was formed with rotating Chairman

Nowadays we have an elected President
FMA

What do we do?

1. Conference each year!
2. Lobby Govt Ministers re; funding, planning, etc
3. Provide a network
4. Facilitate workshops on FM issues
5. Perhaps similar but smaller Scale to your ASFPM
Apart from providing advice on technical issues - one of my tasks has been to initiate a floodplain management education program to sustain the knowledge into the future,

As Chair of the project committee I have conscripted volunteers and formed a partnership with the University of Technology in Sydney and the NSW Department of Environment Climate Change and Water.

Do some of the lecturing
FMA EDUCATION PROGRAM

WHERE DID WE GET THE IDEA FROM??

* ASFPM Conference St Louis 2003

Visit the FMA or UTS websites for information
www.floods.org.au
WHAT ELSE DO WE DO THAT’S NEW?

THE CLARENCE FLOODPLAIN PROJECT

!!!!!
We’ve all seen the benefits of levees, drains and floodgates.

BUT

In the eastern states of Australia we have also seen the downside
- Blocked fish passage for breeding
- Poor water quality
- Degraded wetlands
- Knock on effects (Bird life etc)
WORST OF ALL
ACID SULFATE SOILS!

You Have them too!
Virginia/Maryland/California/etc
ASS were an unknown phenomenon to Australians back in the 1950’s 60’s and 70’s

Digging flood mitigation drains/channels exposed these soils (iron sulphides or “pyrites”) to the atmosphere allowing them to oxidise and produce H2SO4

Fish don’t do so well in Sulphuric Acid!
ASS produced acid runoff after rain events and "Red Spot" disease became evident in fish stocks.
CFP

- Winches installed to open gates
- Tidally operated floodgates also invented
- Fish stocks have improved
- Water quality improved
- Significant reduction in Acid discharge to waterways
- Wetlands rehabilitated = 2000Ha+
- Practice has been copied elsewhere in Australia
- Maybe would work in California???
SIMPLE METHODS
THE RESULTS....
A.S.S. REMEDIATION

BEFORE

AFTER

Little Broadwater
CYCLONES
2011 Cyclone Yasi
CYCLONE YASI

<table>
<thead>
<tr>
<th>CATEGORY: 5</th>
<th>CATEGORY: 5</th>
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<tbody>
<tr>
<td>LANDFALL: Expected to hit between Innisfail and Cardwell between 10pm and midnight</td>
<td>LANDFALL: Lousiana, Mississippi, Florida</td>
</tr>
<tr>
<td>SIZE: 500km wide</td>
<td>SIZE: 640km wide</td>
</tr>
<tr>
<td>EYE: 100km wide</td>
<td>EYE: 51km wide</td>
</tr>
<tr>
<td>WIND GUSTS: 320km/h expected</td>
<td>WIND GUSTS: 280km/h</td>
</tr>
<tr>
<td>STORM SURGE: Highest point 6.5 - 9m</td>
<td>STORM SURGE: Up to 8.2m</td>
</tr>
<tr>
<td>RAINFALL: An estimated 1000mm</td>
<td>RAINFALL: Lousiana 380mm; Florida 350mm; Mississippi 250mm</td>
</tr>
<tr>
<td>DAMAGE: Potentially devastating to buildings</td>
<td>DAMAGE: Approx. $91 billion in damage</td>
</tr>
<tr>
<td>DEATH TOLL: No deaths recorded</td>
<td>DEATH TOLL: 1836 people dead</td>
</tr>
</tbody>
</table>

posted in: TheAustralianPost.com
YASI SUPERIMPOSED OVER USA
CYCLONE YASI - PREPARATION

AUSSIE HUMOUR.....I THOUGHT
CYCLONE YASI - PREPARATION

BUT….PROBABLY ONE OF Y’ALL
CLARENCE
Poor evacuation response!

MAY 2009
EVACUATION - PUBLIC EDUCATION

Eg; Radio ads+talkback/Shopping Centre displays/Brochures/schools

Is that Mark on the bar stool?
EVACUATION

TAKE VALUABLES WITH YOU
CLIMATE CHANGE!!!!

Prime water front property for sale - bargain price
NSW GOVERNMENT GUIDELINE

- DECCW Guideline 2007 recommends modelling to assess impact of “High Impact” climate change scenario
- SLR of 0.91m by 2100
- 30% - 40% increase in rainfall intensity
1838 Pre-paid postage - Colonial Postmaster-General of New South Wales, James Raymond introduced the world's first pre-paid postal system.

1843 Grain stripper - John Ridley and John Bull of South Australia developed the world's first grain stripper that cut the crop then removed and placed the grain into bins.

1856 Refrigerator - Using the principal of vapour compression, James Harrison produced the world's first practical refrigerator. He was commissioned by a brewery to build a machine that cooled beer.

1858 Football - In 1858 Tom Will and Henry Harrison wrote the first ten rules of Football, thus becoming the first people in the world to codify a kicking-ball game. These rules predate those of Rugby, Soccer and Gridiron. Football may have been inspired by the Aboriginal jumping/kicking game of Marn Grook.

1876 Stump jump plough - Robert and Clarence Bowyer Smith developed a plough which could jump over stumps and stones, enabling newly-cleared land to be cultivated.

1889 Electric Drill - Arthur James Arnot, patented the world's first electric drill on 20 August 1889 while he was an employee of the Union Electric Company in Melbourne. He designed it primarily to drill rock and to dig coal.

1897 Differential gears - David Shearer of South Australia built a steam car with a differential inside left rear wheel hub.

1902 Notepad - For 500 years, paper had been supplied in loose sheets. J A Birchall decided that it would be a good idea to cut the sheets into half, back them with cardboard and glue them together at the top.

1906 Feature film - The world's first feature length film, The Story of the Kelly Gang, was a little over an hour long.

1906 Surf life saving reel - The first surf life-saving reel in the world was demonstrated at Bondi Beach on 23 December 1906 by its designer Lester Ormsby.

1912 The tank - A South Australian named Lance de Mole submitted a proposal, to the British War Office, for a 'chain-rail vehicle which could be easily steered and carry heavy loads over rough ground and trenches'. The British war office liked the idea but then developed the tank themselves without paying royalties.

1917 Aspro - A pain reliever based on aspirin was developed in Melbourne by George Nicholas. By 1940 it had become the world's most widely used headache and pain treatment.
More Aussie Inventions

1922 Vegemite - One of the world's richest sources of vitamin B, vegemite was invented by Dr. Cyril P. Callister. It is made by the autolysis of expired brewer's yeast: a process where the yeast's own enzymes break it down.

1924 Car radio - The first car radio was fitted to an Australian car built by Kellys Motors in New South Wales.

1927 Speedo - In 1927 Speedo launched the revolutionary 'racer-back' style, which reduced fabric drag. In 1955, Speedo introduced the use of nylon for their racing swimwear. At the 1968, 1972 and 1976 Olympics, more than 70 per cent of all swimming medals were won by competitors wearing Speedo.

1934 Ute - The utility vehicle, with a front like a car and a rear like a truck was designed by Lewis Brandt at the Ford Motor Company in Geelong, Victoria.

1940 Zinc Cream - This white sun block made from zinc oxide was developed by the Fauldings pharmaceutical company.

1942 Transverse folding stroller - Designed by Harold Cornish, the sturdy, lightweight design of his Stoway Strollers made life easier for many parents using public transport as it could be folded and placed under a tram seat.

1944 Antibiotic penicillin - Produced by Howard Florey with help from a Pome named Ernst Chain.

1945 The Hills Hoist - A rotary clothes line with a winding mechanism allowing the frame to be lowered and raised with ease. Invented by Lance Hill.

1952 Victor mower - by Mervyn Victor Richardson, the two-stroke petrol lawn mower with rotary blades revolutionised mowing world wide. * 1957 Trousers with a permeant crease - The process for producing permanently creased fabric was invented by Dr Arthur Farnworth of the CSIRO.

1958 Black box flight recorder - The 'black box' voice and instrument data recorder was invented by Dr David Warren in Melbourne. David Robinson and George Kossoff's work at the Australian Department of Health, resulted in the first commercially practical water path ultrasonic scanner in 1961.

1965 Inflatable escape slide - The inflatable aircraft escape slide which doubles as a raft was invented by Jack Grant of Qantas.

1965 Wine cask - Invented by Thomas Angrove, the wine cask is a cardboard box housing a plastic container which collapses as the wine is drawn off, thus preventing contact with air.

1970 Variable rack and pinion steering - The variable ratio rack and pinion steering in motor vehicles was invented by Australian engineer, Arthur Bishop.

1972 Orbital internal combustion engine - The orbital combustion process engine was invented by engineer Ralph Sarich of Perth, Western Australia.

1979 Race-cam - Race Cam was developed by Geoff Healey, an engineer with Australian Television Network Seven in Sydney. The tiny lightweight camera is used in sports broadcasts and provides viewers with spectacular views of events such as motor racing, which are impossible with conventional cameras.

1979 Bionic ear - The cochlear implant was invented by Professor Graeme Clark of the University of Melbourne.

1983 Winged Keel - Ben Lexen designed a winged keel that helped Australia II end the American's 132 ownership of the America's cup. The keel gave the yacht better steering and manoeuvrability in heavy winds.

1992 Multi-focal contact lens - The world's first multi-focal contact lens was invented by optical research scientist, Stephen Newman in Queensland.
OTHER CHEAP STRATEGIES

WSUD and On-site Detention
What's my name?
WATER FLOW
CORIOLIS EFFECT

SOUTHERN HEMISPHERE SINK
clockwise?
2016 CONFERENCE

WE’D LOVE TO SEE YOU THERE
THANK YOU

Ian Dinham
FMA President
Director Engineering – Moree Plains Shire Council

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SEE YOU IN MAY 2016!

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