

# The River is Talking, But Who is Listening

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# Outline of Talk



- 
- Introductory comments
  - Common misunderstandings about the floods
  - Protection of Moreton Bay
  - Protection of Brisbane Homes
  - Protection of Rural Homes
  - Lessons from Toowoomba
  - Conclusions

# A World Drowning in Too Many Adjectives



- Things are no longer just “**big**”
- Now they are “**huge-big**”

**A huge, big wall of water!**

**or**

**Huge, big, heavy metal problems**

# A World Drowning in Too Many Adjectives



- Everything today needs to be somehow bigger, better or worse than it was before
- An event that would have been described as a **'flash flood'** last year now needs to be described as an **'inland tsunami'**
- Also, why do we want so much to believe that every storm and every flood is a once in 100 year event!

# A World Drowning in Too Many Adjectives



- How can we be expected to learn appropriate lessons when the language we use is based on the premiss that:
  - everything ‘**good**’ needs to be **better** than it was before, and
  - everything ‘**bad**’ needs to be **worse** than it was before

# 1st Lesson



- 
- Avoid overstating the facts
  - As professionals we should not become caught up in this push to make things always appear bigger, better or worse than they were before!

# Something Very Wrong



- Something is very wrong when the community is more willing to learn about the risk of flooding from **real estate agents** and **TV reporters**, than from trained professionals!
- We now face the real risk that people will return to their homes with the firm belief that another flood will be avoided by simply changing the operation of Wivenhoe Dam

# 2nd Lesson



- As professionals, it is not good enough to just be 'correct'
- We must also *appear* to be correct
- This can only be done if the public are guided down the same path of leaning
- We cannot afford for the community's understanding of environmental and flooding issues to drift away from known trues

# Not Exactly True!



At best Wivenhoe dam has the potential to reduce flood levels in Brisbane by about 1m

← This was **not** designed to stop this! ↓



# Not Exactly True!



← The water that flowed through Toowoomba did **not** pass down the escarpment and flow through the Lockyer valley! ↓



East Ck and West Ck flow towards the Darling River and Adelaide!



# Not Exactly True!

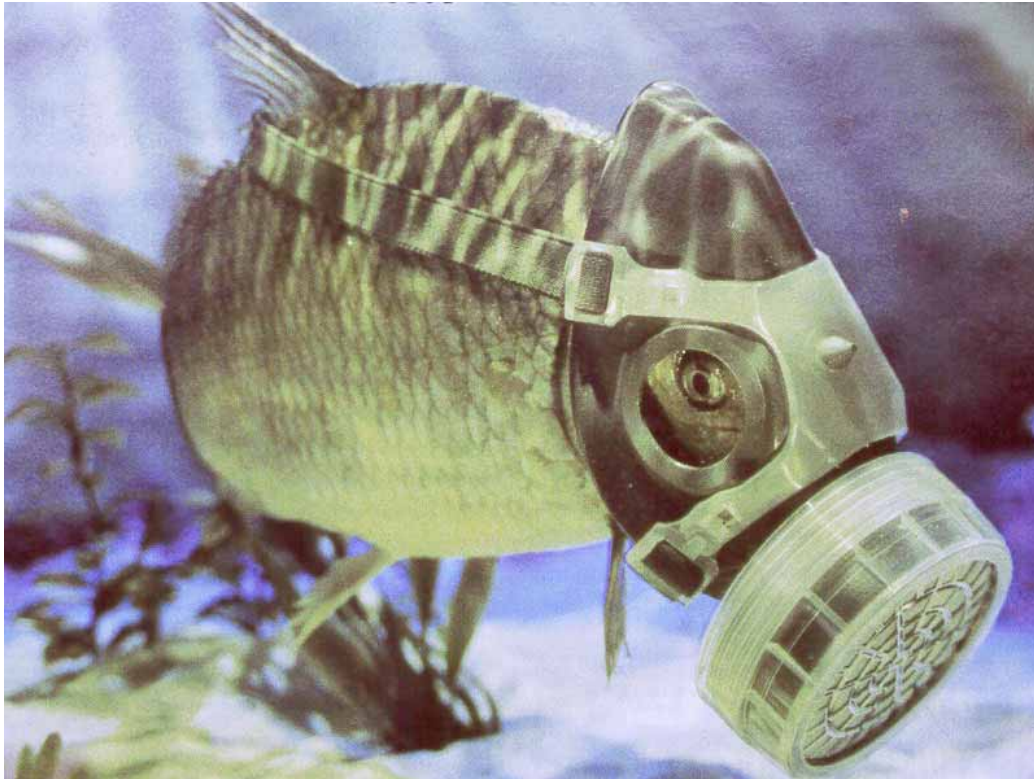


← Not all of this 'muck' was functioning as topsoil across the greater Brisbane valley prior to the flood!

A significant portion was sitting on the bed of the Brisbane and Bremer Rivers →



# Not Exactly True!



The settled 'muck' contains bed silts mixed with anaerobically digested organic matter

← The smell was **not** necessarily caused by sewer overflows and the overflow of sewers and sewerage treatment plants! ↓



# Not Exactly True!



← The washing away of this does **not** necessarily result in more of this ↓

Because the 'muck' primarily consists of silts, it will readily settle to the bed of the river to form part of the bed load



# Clay, Silt & Sand



Sediment  
is not  
made up  
of a  
single  
material



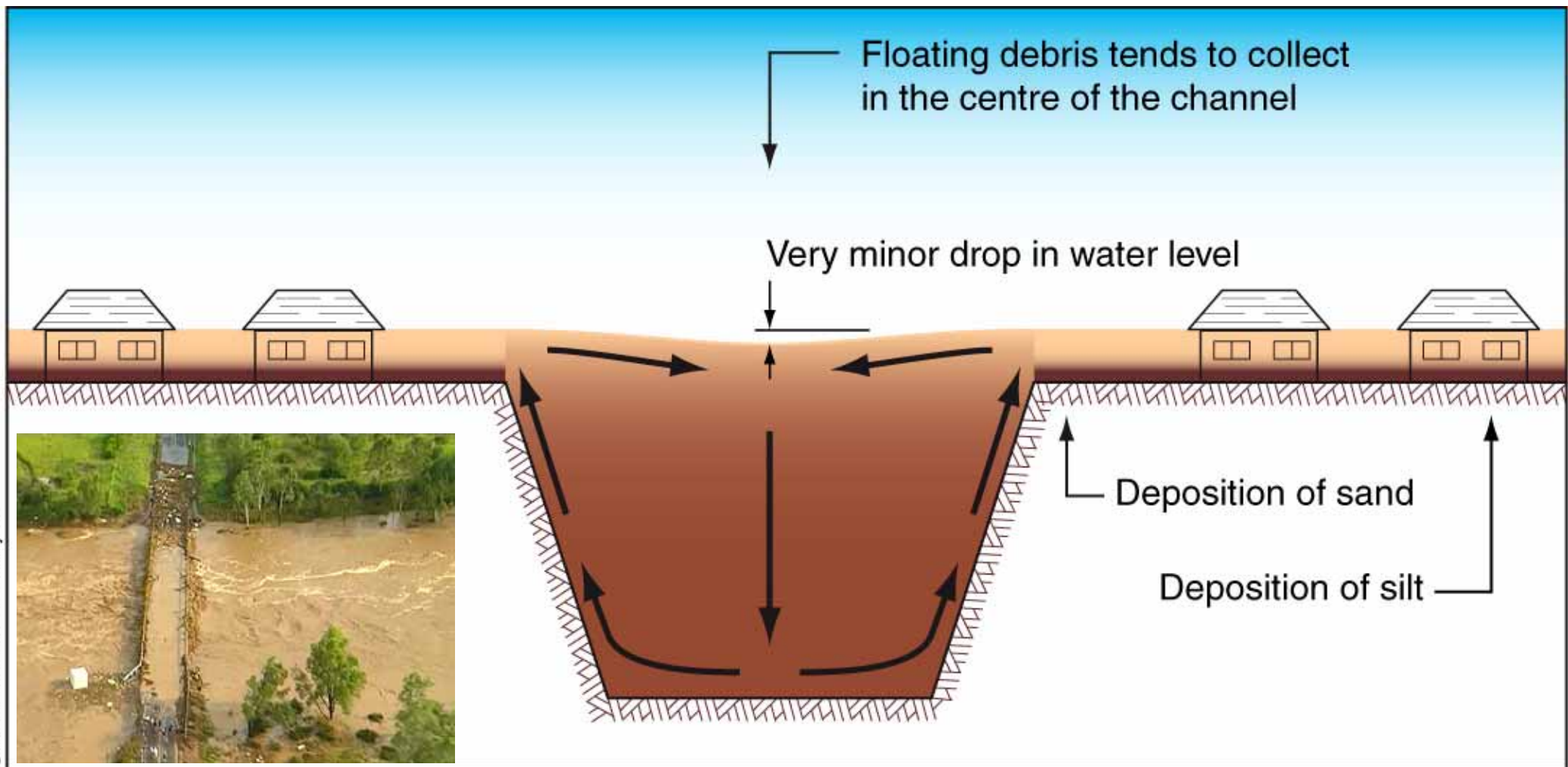
# The Colour of Floodwater



# The Colour of Floodwater



## Sedimentation within the river and floodplains



# Protection of Moreton Bay



The key is the control of clay-sized particles

- Management options should focus on:
  - covering exposed subsoils (urban & rural)
  - rehabilitation of those lands with little or no topsoil
  - stabilisation of gully erosion within sodic soil areas
  - stabilisation of general gully and stream erosion

# 3rd Lesson



- You will not minimise the environmental harm caused to Moreton Bay by sediment, by focusing on sediment control practices
- We need to chase the primary source of clay
- Our priority should always be ‘erosion control’
- We can use ‘sediment control’ to protect creeks and wetlands

# 4th Lesson



The key 'actions' required in the management of Moreton Bay are different from those key actions required to manage our creeks and rivers

- For creeks → focus on clay, silt & sand
- For rivers → focus on clay & silt
- For the bay → focus on clay

# Sources of Clay, Silt & Sand



The task is to chase the source of key pollutants

| Type of erosion     | Clay            | Silt            | Sand |
|---------------------|-----------------|-----------------|------|
| Splash erosion      | Yes             | (steep slopes)  |      |
| Sheet erosion       | Exposed subsoil | Exposed topsoil |      |
| Rill erosion        | Yes             | Yes             | Yes  |
| Gully erosion       | Yes             | Yes             | Yes  |
| Tunnel erosion      | Yes             | Yes             | Yes  |
| Mass movement       | Yes             | Yes             | Yes  |
| Watercourse erosion | Some            | Yes             | Yes  |
| Coastal erosion     |                 |                 | Yes  |
| Wind erosion        | Yes             | Some            |      |

# Protection of Brisbane Homes



Key issues may be considered to be:

- the muck
- the smell
- health risks
- emotional impacts
- physical damage
- financial cost

# Protection of Brisbane Homes



Management options should focus on:

- the muck (focus on silt-sized particles)
- the smell (focus on nutrients and sewer overflows)
- health risks (very difficult to control)
- emotional impacts (information & education)
- physical damage (town planning & education)
- financial cost (town planning & post flood response)

# Dredging?



Dredging  
the river can  
help to  
reduce the  
silt load, but  
there are  
problems!!!

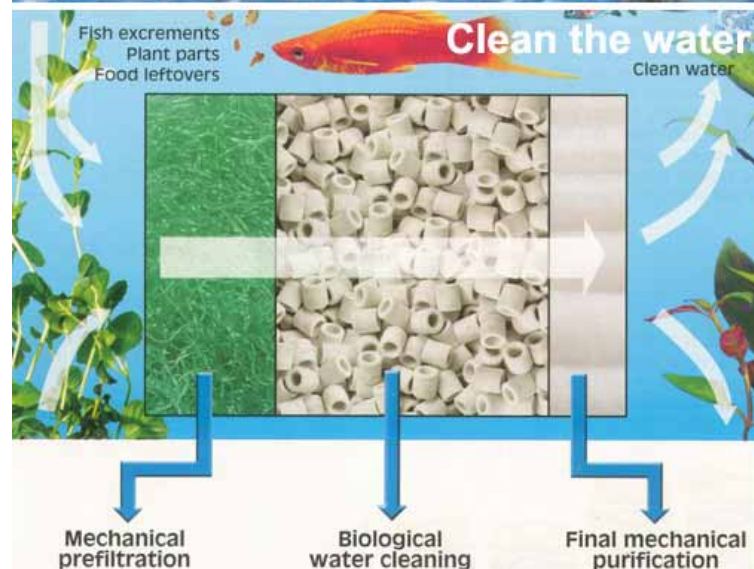
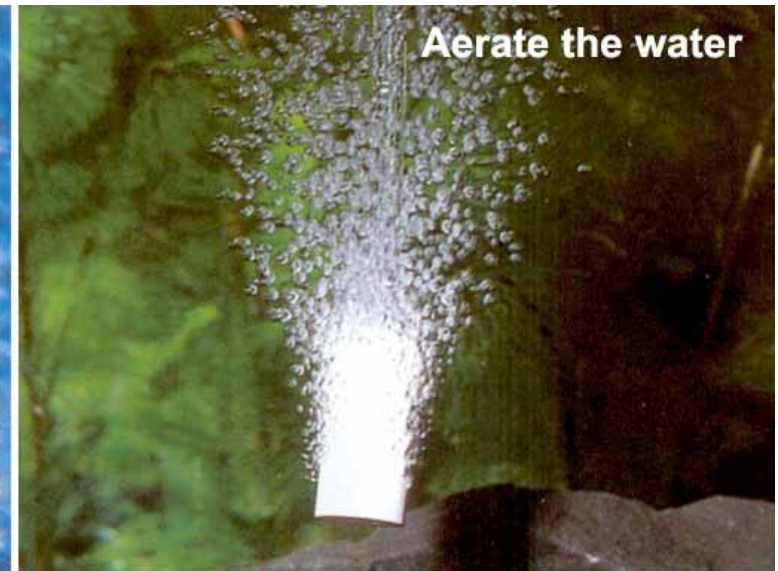


# Fish Tank Management



Fish tanks require:

- food control
- water aeration
- water cleaning
- tank cleaning



# Urban Lake Management



Urban lakes  
require:

- nutrient inflow control
- water aeration
- water cleaning
- lake cleaning



# River Management



## Urban rivers require:

- nutrient inflow control
- water aeration / movement ?
- clean inflows
- bed cleaning?





# Protection of Rural Homes

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Key issues may be considered to be:

- safety of humans
- structural damage
- safety of stock animals
- damage to crops
- emotional stress
- safety of wildlife
- gully erosion

# Protection of Rural Homes



Management options should focus on:

- safety of humans (flow velocity & flood planning)
- structural damage (flow velocity & town planning)
- safety of stock animals (safety islands & fencing)
- damage to crops (very difficult to control)
- emotional stress (information & education)
- safety of wildlife (rehab corridors & riparian zones)
- gully erosion (revegetate hills and slopes)

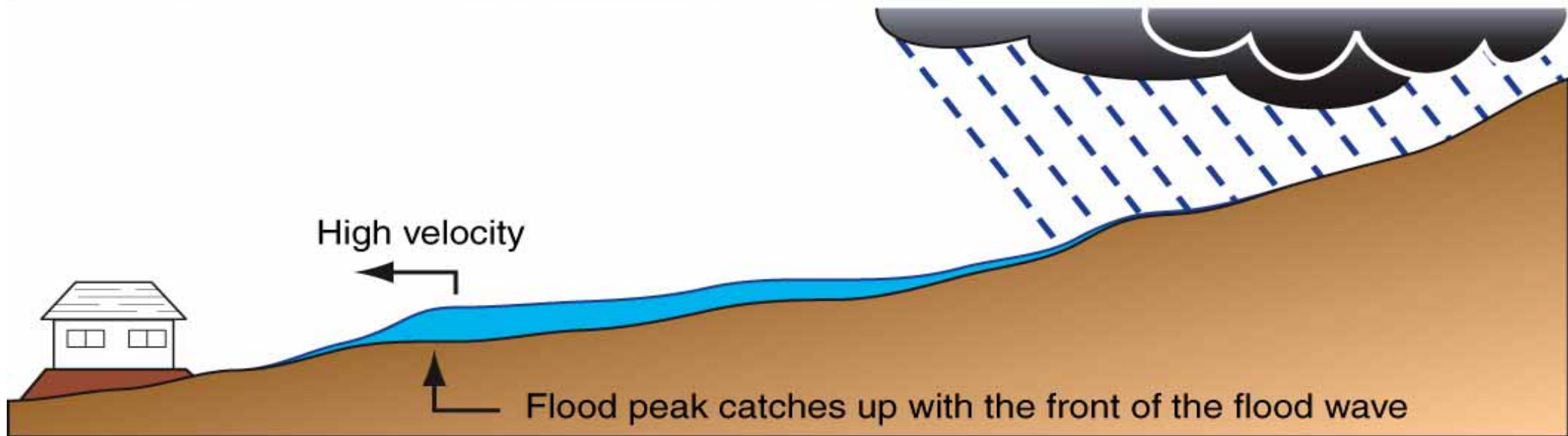
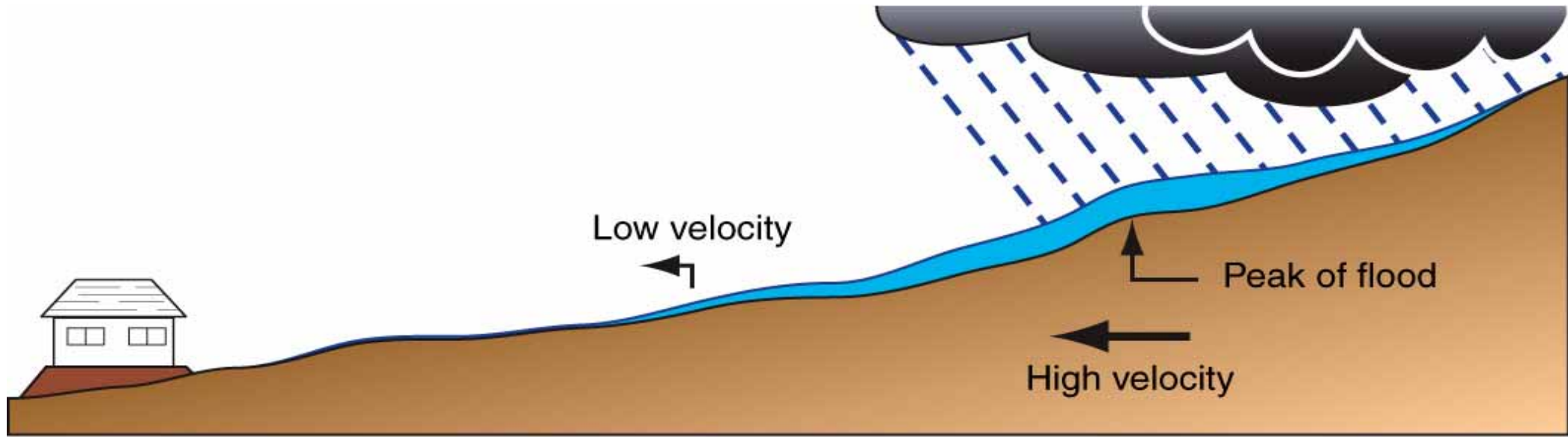
# Flash Floods



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*“A sudden, destructive rush of water down a narrow gully or over a sloping surface in desert regions, due to heavy rains in the mountains or foothills.”* – Macquarie dictionary (2006)

# Flash Floods



# Flash Floods



The effects of flash flooding are amplified by:

- steep catchments
- confined gullies/waterways with minimal floodplains
- reduced riparian vegetation density
- collapsing vegetation within floodways
- high-intensity thunder storms on saturated catchments
- storm fronts that move down the waterway

# The Problem



← The Toowoomba escarpment increases the risk of flash flooding

Clearing of the riparian zone and understorey vegetation for fire control also increases the risk of flash flooding →



# The Problem



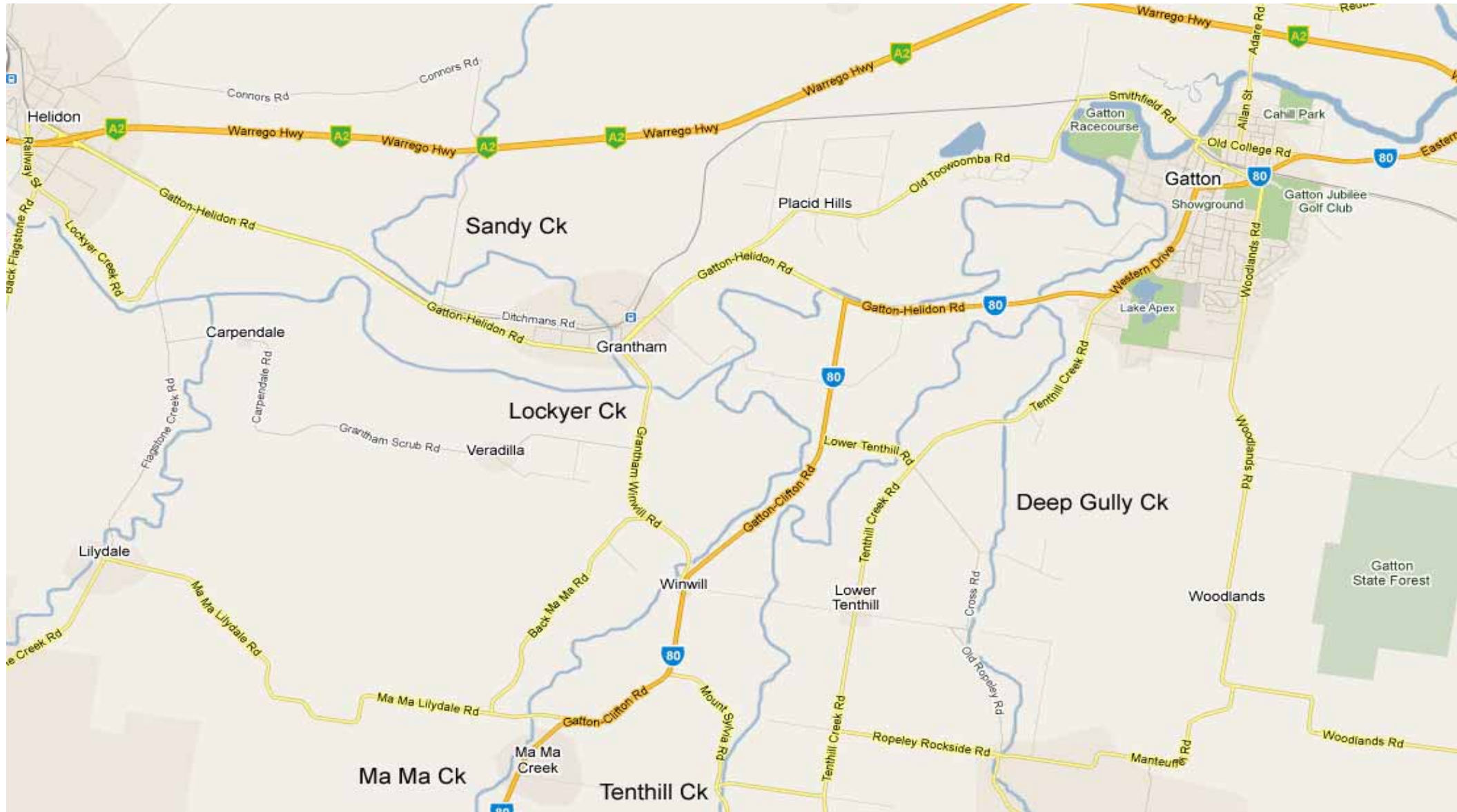
← Lots of this, causes more of this ↓



But less of this →



# Lockyer Valley



# Blackfellow Creek



# Blackfellow Creek



# Natural Vegetation Management



← This is an example of a tree growing in the wrong location

Nature controls vegetation along waterways by removing selected vegetation during severe floods →



# Riparian Vegetation



# Riparian Vegetation



# Toowoomba



← Upstream of this, is this ↓

West Creek is a steep, open trapezoidal channel with little vegetation and a series of stormwater detention basins



# Toowoomba



# Toowoomba



- Would the flooding in Toowoomba have been measurably changed if the creeks had significant riparian cover and/or more extensive in-channel detention storage?

**Answer: Probably not, but possibly the next flood**

- Would an early warning system have reduced the degree of damage and loss of life

**Answer: Unlikely**

# 5th Lesson



**We don't have a river with a flood problem**

**So why change the river!**

**The river does not mind the flooding**

**The flooding does not mind the river**

**We do have a city with a flood problem**

**So does that mean we need to change the city?**

# Failed Actions



- The provision of flood warnings and flood maps
- Compulsory flood searches for new buildings and property sales
- Reliance on the acquisition of flood insurance to control the value of flood-prone properties
- The public marking of historic flood levels
- Setting minimum habitable floor levels
- Releasing predicted city stage flood levels

# 6th Lesson



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- The Queensland Urban Drainage Manual (QUDM) does not address flood management
  - Queensland needs a *Floodplain Management Policy* and guideline

# Five Zones of Flooding



- Zone 1** Riparian zone (open space)
- Zone 2** Non residential – based on flow velocity
- Zone 3** High risk residential – compulsory owner's building and resident's contents flood insurance
- Zone 4** Medium risk residential – compulsory resident's contents flood insurance
- Zone 5** Low risk residential – Q100 to PMF

# Grant's 1st Law of Flooding



“The degree of flood damage is **inversely** proportional to the flood frequency.

Therefore, a reduction in the risk of flooding results in a corresponding increase in the degree of flood damage caused by a flood”

# Grant's 2nd Law of Flooding



“Intense flood information and warnings only results in flood-prone areas being inhabited by those people least likely to heed such warnings”


# Final Word

Street names  
that tell a  
story!



Remember  
to save the  
important  
things!



The background of the slide is an aerial photograph of a wide, shallow river or estuary. The water is a light blue-grey color, and the banks are sandy and light-colored. In the distance, there are low hills or mountains under a clear sky.

# The River is Talking, But Who is Listening

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