


## What is it Worth? The Value of Floor Level Data

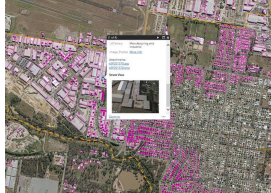
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## Overview

- 3 key inputs into flood damages assessment, each carrying uncertainty
- Floor level survey – certainty costs money
- *What impact does floor level uncertainty have on flood damages?*
- *What is the value of accurate survey?*

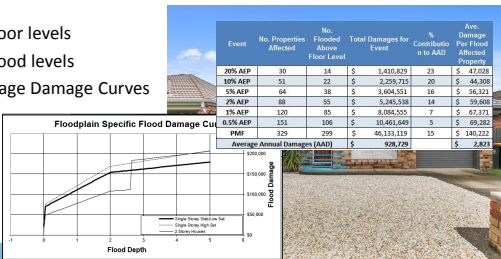


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## Flood Damages Assessment

- Floor levels
- Flood levels
- Stage Damage Curves



Event	No. Properties Affected	No. Flooded Above Floor Level	Total Damages for Event	% Contribution to AAD	Average Damage Per Flooded Property
20% AEP	30	14	\$ 1,410,679	23	\$ 47,028
10% AEP	51	22	\$ 2,225,715	29	\$ 44,388
5% AEP	64	38	\$ 3,604,351	16	\$ 56,321
2% AEP	88	35	\$ 3,285,538	14	\$ 29,668
1% AEP	120	85	\$ 8,084,351	7	\$ 67,371
0.5% AEP	151	106	\$ 10,481,649	5	\$ 69,282
PFDF	829	299	\$ 46,133,119	10	\$ 149,222
Average Annual Damages (AAD)			\$ 808,229		\$ 2,823

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## Sources of Uncertainty

- Flood levels :  $\pm 0.3m$
- Stage Damage Curves: potentially wild
- Floor levels:  $\pm 0.075m - \pm 0.5m$

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### Mitigating Uncertainty



- Flood levels :  $\pm 0.3\text{m}$ 
  - If already using a well calibrated model little more can be done
- Stage Damage Curves: potentially wild
  - Localise the curves through valuations and validation, say \$1500+ per property
- Floor levels:  $\pm 0.075\text{m} - \pm 0.5\text{m}$ 
  - Get (more) accurate survey, \$5 - \$35 per property

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### Floor Level Survey




Range in methods:

- ALS & street view : remote  $\pm 0.5\text{m}$   
: validated  $\pm 0.1\text{m}$
- MLS :  $\pm 0.15\text{m}$
- Field survey:  $\pm 0.075\text{m}$

But at a cost...

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### The Value of Floor Level Survey




Case Study:  
Quantifying the potential impact uncertainty in floor levels could have on damages assessment and options assessment

\*Caveats

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### Impact on AAD – base case



Scenario	AAD	% change from base
Base Case	\$2,595,082	
+ 0.1m	\$1,904,991	- 27%
- 0.1m	\$3,448,932	+ 33%
+ 0.3m	\$965,058	- 63%
- 0.3m	\$2,890,871	+ 11%
+ 0.5 m	\$630,754	- 76%
- 0.5m	\$5,186,434	+ 100%

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### Impact on NPV of benefits



Option	Base NPV of benefits	Range
DM01 (pipes)	\$86,640	\$2,380 - \$86,770
DM04 (pipes)	\$1,810	\$80 - \$2,370
DM05 (pipes)	\$23,590	\$12,330 - \$58,400
DM06 (pipes)	\$83,300	\$10,820 - \$138,110
DM07 (culvert)	\$131,030	\$18,420 - \$131,240
DR01 (dredging)	\$27,820	\$2,410 - \$50,220
DC01 (flowpath)	\$88,950	\$10,900 - \$106,040
LV01 (levee)	\$11,831,170	\$1,564,470 - \$26,030,560

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### Impact on BCR



Option	Base BCR	Range
DM01 (pipes)	0.04	0 - 0.04
DM04 (pipes)	0.01	0 - 0.01
DM05 (pipes)	0.26	0.14 - 0.64
DM06 (pipes)	0.46	0.06 - 0.76
DM07 (culvert)	0.14	0.02 - 0.014
DR01 (dredging)	1.60	0.13 - 2.90
DC01 (flowpath)	0.47	0.06 - 0.56
LV01 (levee)	1.41	0.19 - 3.09

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### Value of Survey



- Obtaining field survey of all 1710 properties = \$9,000 - \$42,500


Option	Survey Cost	Accuracy	BCR bands	% costs	% benefits
DR01	\$9,000	±0.5m	0.13 - 2.90	3.5%	1% - 27%
	\$42,500	±0.1m	1.94 - 1.97	17%	8.4% - 8.5%

Option	Survey Cost	Accuracy	BCR bands	% costs	% benefits
LV01	\$9,000	±0.5m	0.19 - 3.09	0.1%	0.03% - 0.6%
	\$42,500	±0.1m	0.83 - 2.12	0.5%	0.2% - 0.6%

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### So What is It Worth?



- Given current reliance on FDAs it can be critical
  - But we can do more to capture the full benefits
- In catchments where structural options are a real possibility, it can be critical
  - But in some circumstances it makes no difference to the outcome
- It costs money but there are economies of scale and a wide range of methods
  - Are there other beneficiaries to the data?

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