Driving through floodwaters:

What's the point of forecasting?

Fiona Johnson, Ian Cordery

Never Stand Still | Faculty of Engineering | School of Civil and Environmental Engineering

Driving through floodwaters…


ขายยา






The cost of flooding

Globally

- On average 9000 people die each year due to flooding
- In 1990-2000, 1.4 billion people were affected by flooding

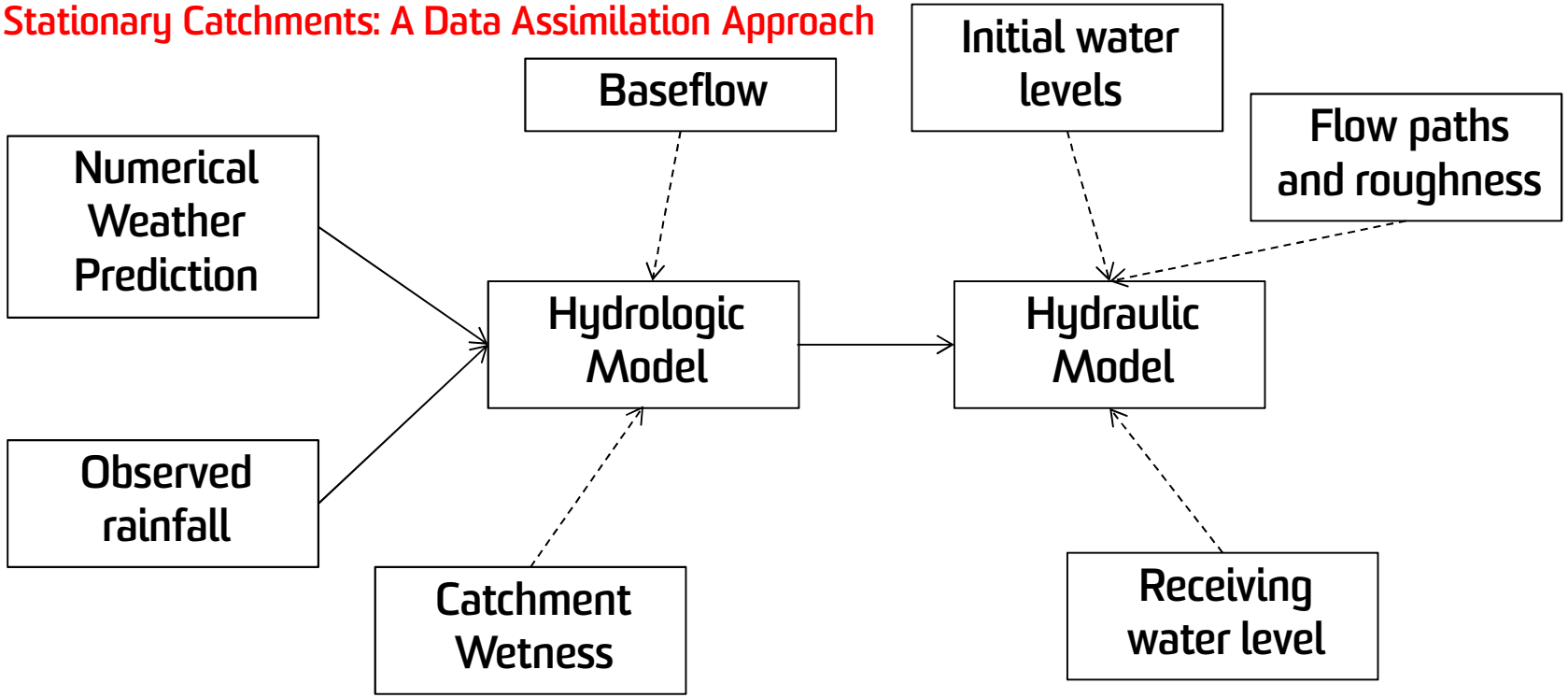
Australia

- Average annual cost $300 million

Jonkman SN. Global perspectives on loss of human life caused by floods (2005). *Nat. Hazards*; 34: 151–75
Elliot, J et al (2005). Recent advances in the development of flood forecasting and warning services in Australia, *International conference on innovation advances and implementation of flood forecasting technology*, October 2005, Norway

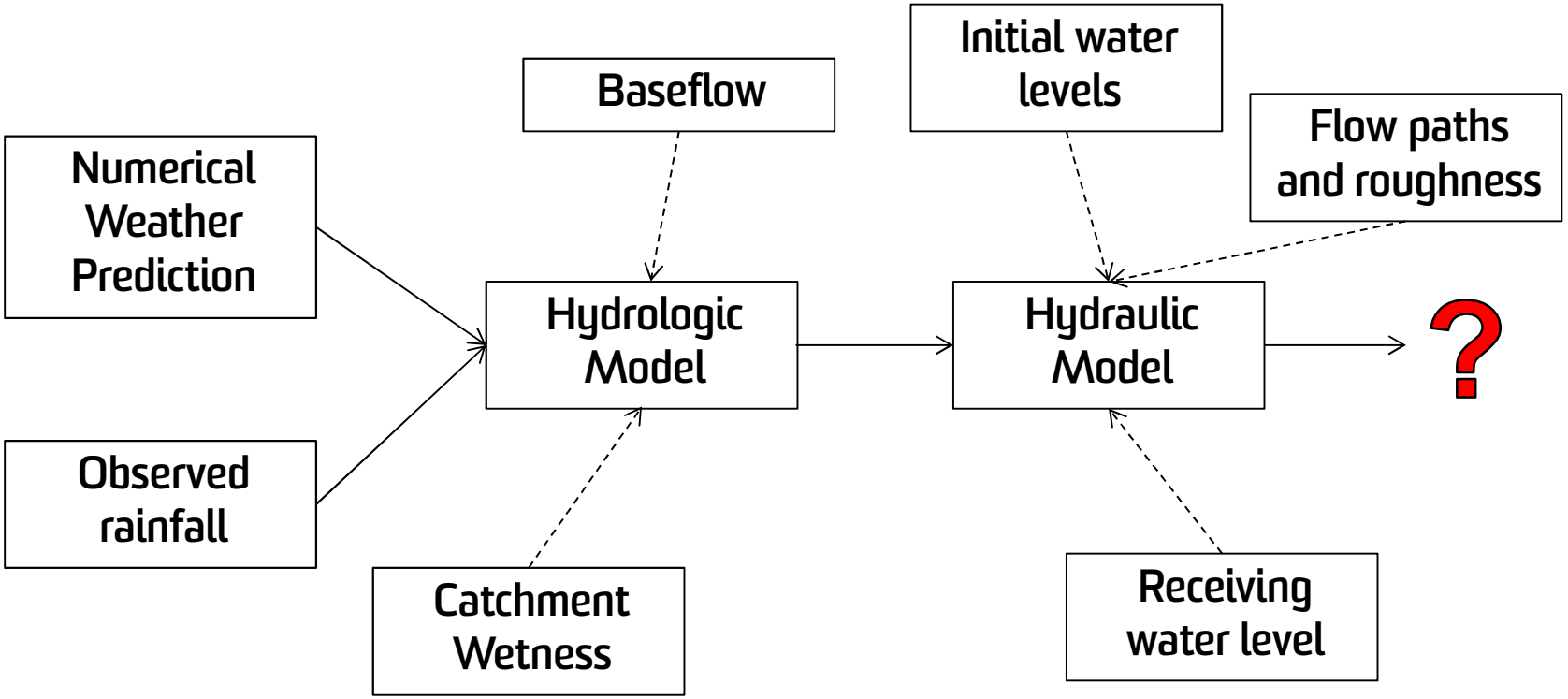
Flood Forecasting

Poster: Pathiraja et al - Hydrologic Modelling in Non-Stationary Catchments: A Data Assimilation Approach



Poster: Kim et al - Improvement of soil moisture dataset combining AMSR2 soil moisture products

Flood Forecasting



What happens to a warning?

Maitland 2007

- 76% evacuation rate

Pasha Bulker storm, June 2007

Grafton 2009

- 24% evacuation rate
- 75% of residents heard about evacuation order

South Grafton, May 2009

Dufty, Taylor and Stevens (2012), Why are people so unkind? Unravelling community responses to floodplain and emergency management, *2012 NSW FMA Conference*

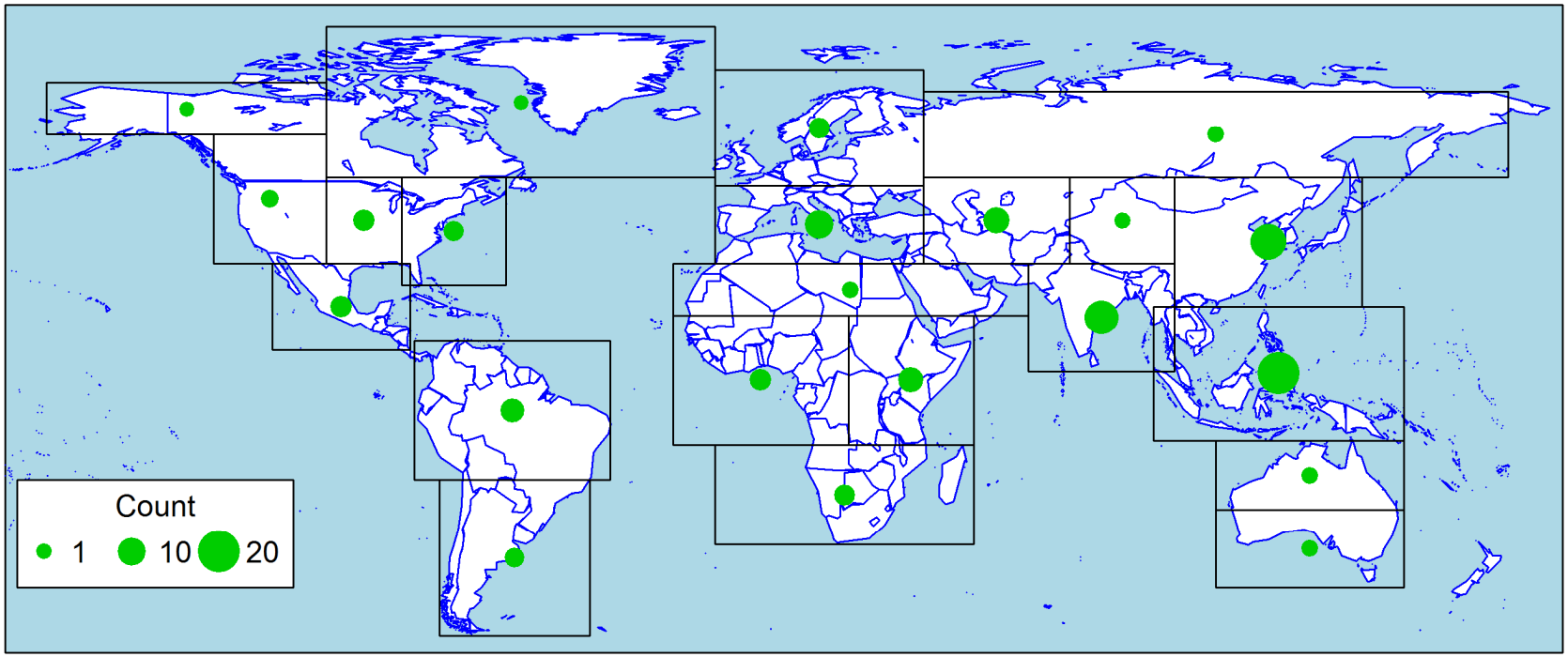
How big is the problem?

- Australian floods 1997-2008
  - 75% of deaths - vehicles or high risk behaviour
- Queensland 2011 floods
  - 33 deaths in total
  - 7 deaths from swimming, kayaking or walking
  - 9 deaths from driving through floodwaters
- Texas
  - 93% of deaths arose from walking or driving through flood waters

FitzGerald, G., W. Du, A. Jamal, M. Clark, and X.-Y. Hou (2010), Flood fatalities in contemporary Australia (1997–2008), *Emergency Medicine Australasia*, 22(2), 180-186.
Queensland Floods Commission of Inquiry (2012), Final Report
Sharif, H., Jackson, T., Hossain, M., and Zane, D. (2014). Analysis of Flood Fatalities in Texas. *Nat. Hazards Rev.*, 10.1061/(ASCE)NH.1527-6996.0000145 , 04014016.

Global distribution of floods

Average number of floods per region per year
(Dartmouth Flood Observatory)

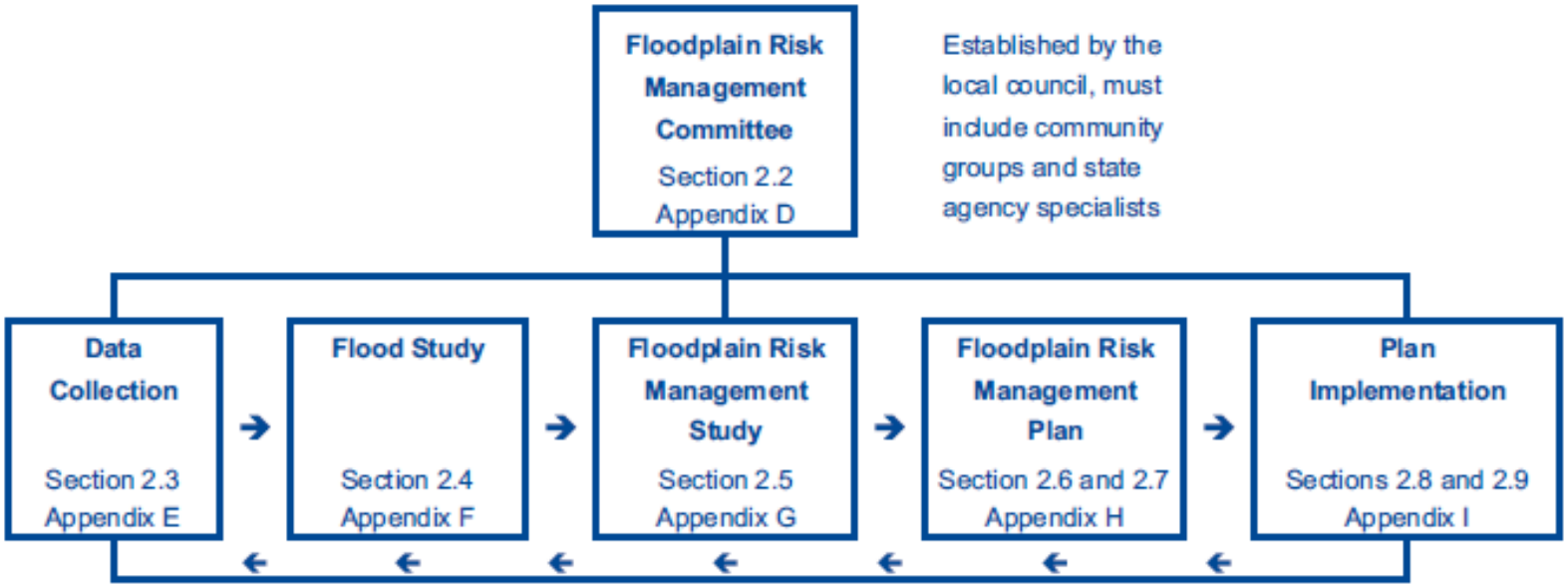


Thanks to Mingyu Feng for the data processing used in this analysis

Other problems

- Unpredictable (?) physical behaviours e.g. blockage
- Human behaviour – "won't happen to me"
- Poor land use planning
- Previous forecast errors
- Forecast uncertainties

Floodplain development



NSW Government (2005), *Floodplain Development Manual: the management of flood liable land,* NSW Government 2005

Is this a research problem?

- Is there value in improving forecasting systems (NWP and/or flood) if current warnings are not correctly interpreted?
- How do floodplain development and planning policies interact with emergency planning?
- How should money be invested?

What do we do about it?

- Quantifying improvements due to forecasts
- Leverage new technologies for dissemination
- Improve (driver) education
- Flash flooding

Driving through floodwaters: What's the point of forecasting?

UNSW AUSTRALIA

Never Stand Still | Faculty of Engineering | School of Civil and Environmental Engineering

Fiona Johnson, Ian Cordery

Email: f.johnson@unsw.edu.au