Evidence-based risk communication: An industry - academy research collaboration that enhanced dam release messages

Sophie Walker, Seqwater
Associate Professor Amisha Mehta, QUT Business School
What we do

- Produce drinking water for 3.1 million people
- Provide irrigation water to 1200 farmers
- Provide essential flood mitigation services to SEQ communities
- Manage recreation areas visited by 2.6 million people last year
Where we operate

- One of Australia’s largest water businesses
- Most geographically spread and diverse asset base of any Australian capital city water authority
- $11B in assets
  - 26 dams, 51 weirs, 2 bore fields
  - 37 water treatment plants
  - 22 pump stations
  - 18 reservoirs
  - 600km pipeline network
  - recycled water scheme
  - desalination plant
Evolution of Seqwater dam notifications

• Qld Floods Commission of Inquiry report – opt-in notification service from Jan 2012
• Service further developed in subsequent years
• Short severe weather event 1 May 2015
• IGEM Review of Seqwater and SunWater Warnings Communications
• App developed for 16/17 summer
IGEM Review recommendation on messaging

• Focus immediate attention and action on issues of collaboration with local disaster management groups, addressing information sharing, messaging responsibilities, terminology and timing

• Seek community feedback on their understanding of these messages
Research objectives and design

Evidence-based modifications to Seqwater’s existing message suite

Phase 1: Six focus groups
- Two each downstream of Hinze Dam, Wivenhoe Dam and North Pine Dam
- 33 community members participated

Phase 2: 30 Online surveys
- Tested effectiveness of existing and modified messages for gated and ungated dams
- 1334 community members
Community knowledge

1. General understanding of the multiple functions of dams: water storage, recreational use, flood mitigation and flood management

2. Dam operators sometimes confused with utility companies

3. Some participants couldn’t identify if they lived downstream of a gated or ungated dam

4. Lack of knowledge about operational differences between gated and ungated dams
   
   I imagine **there’s a valve or something that’s controllable** so I guess they could choose to not spill water from a dam, I assume. (Hinze)

5. Lack of geographical awareness of position in relation to dam and dam catchment areas
<table>
<thead>
<tr>
<th>Specificity</th>
<th>Calls-to-action/guidance</th>
<th>Comprehension</th>
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<tbody>
<tr>
<td>“Are we talking now or are we talking in the next few hours or the next few days? So that’s pretty critical in terms of even an estimation of when that could happen, you know, would be pretty important I would think.”</td>
<td>“I reckon that’s just dumb. Like I’d rather have something like, “avoid low lying...” or “avoid…”, just something where you know that okay, that generally does go under. You know what I mean? I think take extra care, well I don’t know.”</td>
<td>“But this needs to aim at everybody who can understand it, from all ages, level of education, and that needs to be more simple. So ...even that first sentence [from the Seqwater FOC Stand Up activation notification], that something has been mobilised, they’re going to go, huh? So I think it needs to be a little bit more simple.”</td>
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Consistency and trust

• “It doesn’t matter if they’re all giving the same information. There might be bits of information that are not included on other websites that are on some. People look at lots of different websites. But I think the key thing is that they all work together.”
### Perceptions of message effectiveness of existing and modified messages

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing Message</th>
<th>Modified Message</th>
<th>Effectiveness</th>
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<tbody>
<tr>
<td><strong>Hinze Dam (ungated)</strong></td>
<td>‘spilling commenced’ (M=4.93, SD=1.08)</td>
<td>‘spilling commenced’ (M=4.93, SD=1.08)</td>
<td>Perceived to be significantly more effective</td>
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<td></td>
<td>‘dam spilling’ (M=4.45, SD=1.03)</td>
<td>‘dam spilling and downstream hazard’ (M=4.29, SD=1.51)</td>
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<td></td>
<td>‘spilling stopped’ (M=4.82, SD=1.00)</td>
<td>‘spilling stopped’ (M=4.04, SD=1.32)</td>
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<tr>
<td><strong>North Pine Dam (gated)</strong></td>
<td>‘dam release possible’ (M=4.94, SD=0.94)</td>
<td>‘dam release possible’ (M=4.94, SD=0.94)</td>
<td>Perceived to be significantly more effective</td>
</tr>
<tr>
<td></td>
<td>‘alert’ (M=4.33, SD=1.14)</td>
<td>‘stand up’ (M=4.35, SD=1.41)</td>
<td></td>
</tr>
<tr>
<td><strong>Wivenhoe Dam (gated)</strong></td>
<td>‘dam release possible’ (M=5.02, SD=1.03)</td>
<td>‘lean forward’ (M=4.40, SD=1.17)</td>
<td>Perceived to be significantly more effective</td>
</tr>
</tbody>
</table>
Recommendations

- Adopt modified messages
- Consider reduced number of messages
- Distribute messages through multiple channels
- Pursue opportunities for consistent messaging
- Invest in continued community education
- Continue to systematically review messages
Applying research into operations

• All the modified messages were adopted in Seqwater’s communication procedure for dam operations

• Opportunity to discuss research and the modified messages with local Councils ahead of 16/17 summer

• Specific notifications agreed with Mid-Brisbane River irrigators downstream of Wivenhoe Dam

• Link to Flood Warnings issued by the Bureau of Meteorology
Tested during ex-TC Debbie

- 15 of 23 un-gated dams spilling
- No gated dam operations at Wivenhoe, Somerset, North Pine
- Hinze Dam, Little Nerang Dam reach flood of record levels
Tested during ex-TC Debbie

- 38 dam notifications
- 2,000 new subscribers
- More than 90,000 website visitors
- Social media, media interviews
Basis for ongoing engagement

- Targeted approach to engaging and educating downstream communities on dam operations
- Specific fact sheets and dam tours for immediate Population at Risk
Further information

- Sophie Walker (sophie.walker@seqwater.com.au)
- Associate Professor Amisha Mehta (a.mehta@qut.edu.au)