

1 **Reconciling place attachment with catchment-based flood risk management: What can**  
2 **we learn from film?**

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15

16 **Abstract**

17 A catchment-based approach to flood risk management (FRM) is gaining prominence in the  
18 United Kingdom. It is undertaken with wider awareness of multiple stakeholders, as part of a  
19 catchment scale understanding, and, as with other approaches, can visually re-shape place.

20 Land cover and land management change at this scale also has the potential to reconfigure  
21 landscape values and place attachment. Researchers have used qualitative, quantitative and  
22 mapping approaches to understand place attachment. Here we explore secondary data,  
23 specifically, we transcribe and code the stories of five Mytholmroyd, West Yorkshire  
24 residents from the short film, *Calder* about the December 26, 2015 floods. We find place  
25 attachment, identity and social capital are interconnected and feature strongly in the

1 mitigation and prevention phase, post-disaster. Our findings suggest better understanding of  
2 place attachment can support a more catchment scale approach to FRM policy and practice.

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4

## 1. Introduction

5 “First it was the messengers with their tears of mizzle, then a moor gallop and the  
6 sound of a horn. Veins of water cascade from moor to valley where canal and river  
7 are wed. Down it came. It was kelching, hossing, henting, plothering, siling,  
8 teaming, raining. It was raining.” (Opening narration of *Calder*)<sup>1</sup>

9

10 Flooding is a significant threat in the UK and climate change is projected to increase the  
11 intensity and frequency of winter and summer storms increasing the exposure of  
12 communities, farms, businesses and infrastructure to the risk of flooding (Thorne, 2014; HM  
13 Government, 2016; CCC, 2017). A national government response to increased flood risk has  
14 been to foster solutions at the catchment scale which contrasts to targeted single investments  
15 on a river reach and to cross-catchment basin scale management under the European Union’s  
16 Flood Directive 2007/60/EC. The catchment scale is the smallest geographic unit of the  
17 nested scales of Environment Agency river management (River Basin District, Management  
18 Catchment and Operational Catchment).<sup>2</sup>

19

20 In 2013 the Department for Environment, Food & Rural Affairs (DEFRA) launched the  
21 Catchment Based Approach (CaBA) which “embeds collaborative working at a river  
22 catchment scale to deliver cross-cutting improvements to our water environments”.<sup>3</sup> CaBA  
23 necessarily reinforces a focus on people in their catchment and reminds authorities and

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<sup>1</sup> This poem is the opening narration of *Calder*. It is written by and spoken in *Calder* by Paula Sutherland.

<sup>2</sup> See the Environment Agency’s Catchment Data Explorer, <https://environment.data.gov.uk/catchment-planning/>

<sup>3</sup> See the Catchment-Based Approach website, <https://www.catchmentbasedapproach.org/about>

1 researchers of the centrality of place and community, what Carbaugh and Cerulli (2013:5)  
2 describe as their emplacement “somewhere, not just anywhere”, in FRM discussions. It also  
3 highlights a critical role for social capital in disaster recovery and resilience (Cai, 2017)  
4 which Aldrich and Meyer (2015) argue is often neglected by authorities who preferentially  
5 invest in levees and other engineered flood control infrastructure.

6

7 In cases where restoration of natural defences or working with natural processes (WwNP)  
8 shows potential to adapt to environmental change, local communities can hold essential local  
9 knowledge and understandings of interconnections between social, economic and cultural  
10 foundations of the vitality of place(s). In other settings, communities with strong place  
11 attachment have had a central role in new industry development, e.g. coal seam gas, and  
12 environmental change policy, e.g. coastal restoration (McCrea et al., 2016; Burley et al.,  
13 2007). Given a legacy of failed flood defences and lack of confidence in agencies (Cologna et  
14 al., 2017) new approaches to FRM will require new ways of working with flood-prone  
15 communities, that otherwise might resist adopting measures that visually change landscape  
16 and place. In a different context, Davenport and Anderson (2005) found attitudes towards  
17 landscape change in communities in Nebraska were dependent on the type of changes and not  
18 change per se.

19

20 Considering funding is limited and as adaptation to climate change will, in many cases, be  
21 localised to particular places, policy makers and planners need to understand this local scale  
22 in order to support local adaption. In some cases, this may involve supporting processes of  
23 detachment. Agyeman et al. (2009: 509) argue that as climate change disrupts people and  
24 places, and leads in some places ultimately to managed retreat, it is important to understand  
25 not only the “*physical* aspects of relocation....(but also the oft) neglected important

1 *psychological, symbolic, and particular emotional* aspects of ....‘place attachment’”.

2 Understanding how to do this sympathetically and practically is a challenge for FRM policy

3 and practice.

4

5 In arguing for a better understanding of place-based relationships to support environmental

6 planning, Lin and Lockwood (2013) developed a conceptual framework that identifies three

7 core sources, each of which has several dimensions, that together describe sense of place. Of

8 interest for this paper is one of these core sources, sense of place, where emotional

9 attachment is associated with identity, and functional attachment is associated with place

10 dependence, see Table 1. The authors evaluate different research methods and conclude that

11 neither qualitative interviews nor photo elicitation allows a full understanding of sense of

12 place. Therefore alternative methodological approaches or a mixed approach is required.

13

14 **Table 1. Source and dimensions of sense of place (Lin and Lockwood, 2013)**

15

Core sources	Dimensions
1. Place characteristics	a. individual physical features b. locality with multiple features c. associated historic events d. multiple localities with physical features and/or histories in common
2. Responses to place	a. sensory response b. social experience c. cultural association d. biophysical appreciation
3. Sense of place	a. emotional attachment: presence b. emotional attachment: relative strength c. functional attachment: presence d. functional attachment: strength

16

17

18 In this paper, we are interested in reconciling place attachment with catchment-based FRM.

19 The ecosystem services (ES) approach has attracted widespread policy interest as it aims to

20 connect natural ecosystems and the ES flows they support with human wellbeing (MEA,

1 2005; Fisher et al., 2008) of which flood attenuation is a key element. Chan et al. (2012a; 9)  
2 focus on cultural ES (CES) and describe a more active relationship between natural  
3 ecosystems and human wellbeing, where “*services* are the production of *benefits* (where  
4 benefits may take the form of *activities*), which are of *value* to people”. These activities  
5 might be subsistence activities which themselves may be culturally valuable (Chan et al.,  
6 2012a) or activities around collaboration, negotiation and celebration (Bark et al., 2016;  
7 2017). Better understanding of activities and their connection to place attachment, might  
8 suggest ways to engage communities in FRM.

9

10 Bark et al. (2015) used Chan et al.’s (2012a) categories of benefit to identify which cultural  
11 benefits/activities of importance to members of the Ngemba Ngemba Aboriginal community  
12 in New South Wales, Australia, are being met by water plans. Each benefit category was  
13 considered in water planning but the community had aspirations for more co-management,  
14 capacity building and knowledge sharing to achieve each. In a different context, Bark et al.  
15 (2016; 2017) used the categories to track cultural benefits during a 2014 river restoration  
16 event in the Colorado River delta in Mexico. The analysis highlighted the sequencing of  
17 different cultural benefits, pre, during and post restoration.

18

19 Somewhat obscured in the application of the Chan et al. (2012a) benefit categories is the  
20 inherent challenge of finding relevant data. Bark et al. (2015) overcame this data challenge  
21 using a mixed approach with interviews and photo elicitation and data for Bark et al. (2016;  
22 2017) comprised in-person interviews, newspaper articles and blogs. Others have used  
23 informant-directed interviews or questions that explicitly did not follow the ES framework  
24 (Horton et al., 2016; Bieling et al., 2014). Satterfield (2001) writing on different techniques to  
25 elicit stakeholders’ values of nature finds that indirect elicitation tasks provide stakeholders

1 opportunity to articulate a broader range of values. An objective in using the film *Calder*, a  
2 30-minute film<sup>4</sup> shot in 2015 and 2016, by filmmakers Geoff Brokate and Paula Sutherland,  
3 as a secondary data source was the desire to find data on place attachment of flood-prone  
4 communities, where the voices of local people are not framed by the researcher's questions.  
5 As a collection of stories, *Calder* allows those in the film to express their "sources and forms  
6 of sense of place" (Lin and Lockwood, 2013: 1445) "in their own words" (Davenport and  
7 Anderson, 2005; 629).

8

9 In the sections that follow, we describe the data and the adaptation of the Chan et al. (2012a)  
10 framework. We then discuss what insights our case study has for advancing catchment-scale  
11 FRM, concluding that place attachment can support intervention policy and practice at this  
12 scale through CaBA.

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## 2. Method

15 This section is divided into a description of the research process, data and coding protocol.

16

### *Research process*

17  
18 The research reported in this paper was not planned, rather, the first author followed a  
19 research process of exploring unplanned events. Krumboltz's Happenstance Learning Theory  
20 (HLT) developed for career advice, proposes that unplanned events can be planned. Here, the  
21 three steps in HLT were applied to the discovery of an artist-researcher collaboration:

22

1. "Before the unplanned event, you take actions that position you to experience it.

23

2. During the event, you remain alert and sensitive to recognize potential opportunities.

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<sup>4</sup> See *Calder* here, <https://vimeo.com/162076350>

1 3. After the event, you initiate actions that enable you to benefit from it.” Krumboltz,  
2 2009: 144).

3  
4 In research, similar steps of curiosity, receptivity and follow-up apply. Step 1: Walking is  
5 recognised as a method in urban geographical research (Pierce and Lawhon, 2015) and as a  
6 cherished activity in relation to emplacement (Carbaugh and Cerulli, 2013). Curiosity about  
7 place was piqued when the first author walked in the Calder valley, West Yorkshire, prior to  
8 the 2015 floods. After the floods, (June 14 to 20, 2016) the first author walked the long-  
9 distance footpath, The Dales Way, which traverses the Calder catchment.

10  
11 Step 2: Receptivity to the idea of researching cultural benefits in the Calder catchment was  
12 kindled during unstructured, un-noted conversations with other walkers and residents.  
13 Listening during these encounters, in what is a subtle form of elicitation (Satterfield, 2001),  
14 revealed that people openly discussed the benefits they receive, and the values they attach to  
15 the catchment. A question arose about how to collect such information.

16  
17 Step 3: An openness to exploring secondary data, including more novel forms of data, led to a  
18 discussion about artistic expression post-flood with The Chair of the Upper Calder Valley  
19 Renaissance organisation, Mr. Stephen Curry. He recommended *Calder* to the first author  
20 and provided an introduction to Paula Sutherland. A week later, an interview was arranged  
21 (October 15, 2016) at which the making of *Calder* was discussed. In follow-up meetings  
22 Paula Sutherland alone was interested in a possible research collaboration using *Calder* as  
23 data and insights from making the film to explore CES.

24  
25 *Data and coding*

1 In September 2015 the filmmakers were commissioned, and funded by, Mytholmroyd Arts  
2 Festival, to make a film about the *community* of Mytholmroyd. In response to this brief, the  
3 filmmakers asked three questions: *What is community? Where is community? Who is*  
4 *community?* and talked to Mytholmroyd residents to understand place and their stories. The  
5 events of December 26, 2015 led the filmmakers to focus the film on a community that had  
6 lived through a flood. *Calder* features the personal stories of five Mytholmroyd residents who  
7 agreed to share their story.

8

9 PageSix Transcription Services Ltd transcribed *Calder*. This transcript then formed  
10 secondary data. Coding is a qualitative method used to identify themes in a text (Corbin and  
11 Strauss, 2008; Bernard and Ryan, 2010). The first author coded phrases, from words to  
12 sentences, in the transcript and for quality control repeated the entire coding exercise.

13

14 Following Chan et al's (2012a) benefit categories, a coding framework was chosen to  
15 understand *Activity* (Ac), *Aesthetics* (As), *Employment* (Em), *Existence/bequest* (Ex/B),  
16 *Identity* (I), *Inspiration* (Insp), *Knowledge* (K), *Material* (M), *Option* (O), *Place/heritage*  
17 (P/H), *Social capital and cohesion* (SKC) and *Spiritual* (Sp).

18

19 The coding scheme mapped well to the data, however, through observation of the transcript,  
20 we added a new code for *Time* (T) and, following Bark et al. (2015), for *Aspiration* (Asp). To  
21 enable a more nuanced understanding of these benefit categories sub-codes were developed  
22 drawing on three of the five discourse hubs – action, emotion, and relating – of cultural  
23 discourse analysis (Carbaugh and Cerulli, 2013). Examples are *Activity*-thanks and *Spiritual*-  
24 loss, where the latter shows that benefits can be negative. The identity and dwelling discourse  
25 hubs were unused as they are explicit in the *Identity* and *Place/heritage* core codes. No sub-



1 codes were developed for *Aspiration, Existence/bequest, Knowledge, Option* and  
2 *Place/heritage*.

3

4 The individual stories in *Calder* follow a narrative arc with a beginning, middle and end. The  
5 authors divided the transcript into these three phases which mirror phases of a disaster, from  
6 emergency response and recovery, through rehabilitation and reconstruction, and finally to  
7 early considerations around prevention, mitigation and preparedness. The code data by phase  
8 was normalised to account for the length of each phase (16, 6 and 8 minutes of film,  
9 respectively) and the associated number of codes (61%, 15% and 24%, of the total).

10

11

### 3. Results

12 The results consist of counts of core and sub-codes by narrative arc and association between  
13 codes, specifically with *Identity, Place/heritage* and *Social capital and cohesion*. Quotes  
14 from the transcript, coded for a code/sub-code are highlighted in grey.

15

16 The coding framework fit the data with each code used at least once. Sub-codes accounted for  
17 all coding for *Employment* and *Material*, i.e. the sub-code modified the meaning of the core  
18 code, e.g. *Employment-volunteer*, and *Material-loss*:

19

20 “You know, we lost a washing machine, we lost a fridge/freezer, we lost other  
21 things, but it’s the things you can’t replace.”

22

23 Whereas, for the *Activity, Aesthetic, Identity, Inspiration* and *Spiritual* codes the sub-codes  
24 provide greater detail. For example, the *Aesthetic* code had two sub-codes, visual and audio.

25 In some instances, the *Aesthetics*-audio sub-code was positive:

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“And you can, you... There’s been summers that I haven’t eaten inside, I’ll just sit out here every meal. You can just sleep out here. Sound of the river, bats, fantastic.”

and in a number of cases, the absence of sound was also coded with the *Spiritual*-unease sub-code:

“It was deadly quiet, you can imagine, just eerie, an eerie kind of silent outside, but you could hear the water.”

The most coded code, *Activity*, in the first phase was for rescue, clean up and thanks.

“And I was working alongside some housewives from Slough, they’d travelled up from Slough, and some men from Gainsborough, they’d come up. They’d heard about it on the news and they’d come up to have a look that morning, started off at six o’clock. ...because if it hadn’t have been for these people the estate wouldn’t be like it is now.”

As well as those patrolling the town (at night):

“There were all the different biker groups from obviously around West Yorkshire and further that just came and did night patrols, on foot, a lot of them, and it were cold.”

1 Relevant to the final phase of a disaster, the five residents speak of the ‘work’ of memory and  
2 change recognition:

3

4 “But I live right next to the river which some people might think’s not good but  
5 living right next to the river I can see what it’s doing and I’m out the building this  
6 time, you know, like I know exactly when it... Like I’ll see it and I’ll know when it’s  
7 going to flood. It’s just tales of yore that it wouldn’t flood and now we know.”

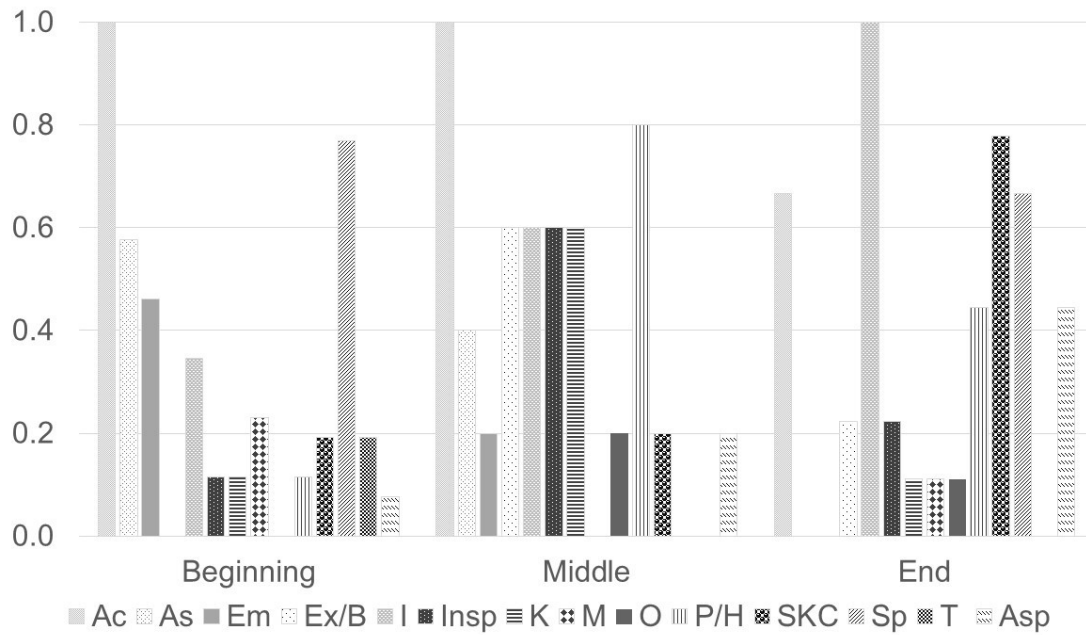
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9 The normalised data displayed in Figure 1 by phase in the narrative arc focuses attention on  
10 different coding combinations and absent codes. The two most coded codes by phase, *Activity*  
11 and *Spiritual*, *Activity* and *Place/heritage*, and *Identity* and *Social capital and cohesion*,  
12 respectively, illustrate the changing nature of benefits as the film proceeds from disaster  
13 response through rehabilitation to prevention. Further, *Time* was only prominent in the first  
14 phase, the telling of the disaster, where it was highly specific, e.g. “it was a quarter to ten in  
15 the morning”. This time specificity is resonant of that portrayed in University of  
16 Manchester’s Professor Stephen Bottom’s one-man storytelling performance, *Too Much of*  
17 *Water*,<sup>5</sup> which is also about the same December 26, 2015 floods, but in Shipley, West  
18 Yorkshire.

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<sup>5</sup> *Too Much of Water* was first performed at the Saltaire Festival, Shipley, West Yorkshire on September 10 and 11, 2016.



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2 **Figure 1. Normalised data showing CES benefit coding by narrative arc. CES, cultural**  
 3 **ecosystem services**

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5 Running through the five stories, are expressions of *Social capital and cohesion*, framed as  
 6 community identity and pride, and of *Inspiration* received from the river and its catchment.

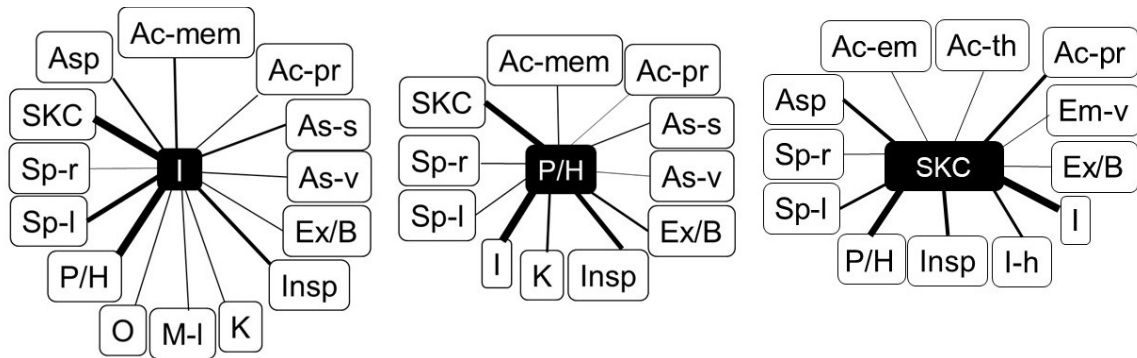
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8 “People pay hundreds, maybe thousands of pounds to come and rent a cottage round  
 9 these places just to do what I can do by just leaving my front door; I feel very proud  
 10 to live in Mytholmroyd.”

11

12 Exploring this further, Figure 2 shows the combinations of codes, including sub-codes, with  
 13 respect to *Place/Heritage*, *Identity*, and *Social capital and cohesion* (P/H, I, SKC). The line  
 14 thickness shows the strength of the association between codes. All three codes are most  
 15 strongly associated with each other and then with *Inspiration*. *Social capital and cohesion* is  
 16 strongly associated with the *Activity* of preparedness and with *Aspiration* for the future.

1



2

3 **Figure 2. Identity, Place/Heritage and Social capital and cohesion interactions with sub**  
 4 **and core codes (width of line shows number of phrases coded)**

5 Bieling (2014) who used stories in CES research about landscape in Germany also found  
 6 Identity is connected to sense of place, inspiration and aesthetic (beauty). However, here by  
 7 examining Figures 1 and 2 we can see how place attachment shifts from focus on actual  
 8 *Place/heritage* to one on *Identity* and *Social capital and cohesion*.

9

#### 10 4. Discussion

11 This section is organised around four themes, place attachment, social capital (and cohesion),  
 12 reconciliation of place attachment with CaBA and film as secondary data.

13

14 *Place attachment:* Amsden et al. (2010: 32) note that “place attachment can serve as a factor  
 15 in the development “of” community, defined as a heightened engagement in collective  
 16 actions that help people meet their day-to-day needs. It could also influence one’s  
 17 development “in” community, directing the behaviors that affect how people both participate  
 18 in communities and seek to change their position within them.” We find evidence from all  
 19 five residents that their place attachment was central to their understanding of their  
 20 development “in” community. Furthermore, for one, it galvanised personal growth and their

1 development “of” community through their new flood warden position, see Figure 2 P/H –I  
2 and p/H –Insp (*pers. comm.* Paula Sutherland).<sup>6</sup>

3

4 “Now, for me, I do believe the floods were the kick-start, that’s what I needed to kick  
5 start my self-confidence going, because I was always ready but not ready and when  
6 the floods came I thought, “Something needs to be done,” and I thought, “Just go  
7 with the flow,” I didn’t even question, “What are you doing?” because whatever  
8 you’re doing’s... “You’re doing alright here, kiddo, just carry on doing.””

9

10 This experience suggests that flood risk managers need to recognise and provide  
11 opportunities for residents to act on this imperative arising from strong place attachment. In  
12 another setting, Hinojosa et al. (2016) find that high-mountain farmers in the French Southern  
13 Alps with strong positive place attachment have lower land abandonment than other  
14 mountain farmers. They suggest that policy could support individuals and community  
15 activities and in so doing support farming permanence in marginal environments for the  
16 betterment of those environments. Analogously grant funding and policy, including flood  
17 insurance policy that supports flood proofing of homes, businesses and infrastructure and  
18 local flood risk reduction activities (Surminski, 2015) could contribute to the longer-term  
19 resiliency of flood-prone communities.

20

21 Surviving and living with hazard can reinforce place attachment (Burley et al., 2007).

22 Mytholmroyd is an at-flood-risk community; it has an extensive history of flooding, with 42

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<sup>6</sup> Flood wardens are the first line of a community’s defence in a flood hazard situation charged with preparing the community, warning the community prior to a flood and coordinating with first responders during a flood incident.

1 flooding incidents recorded in Calderdale by the Environment Agency<sup>7</sup> since 1900. Yet we  
2 find that strong place attachment preceded hazard experience:

3

4 “It’s that sense of community matters, that sense of belonging matters. .... “This is  
5 why we live here”. And that’s a huge part of why people stay and why people move  
6 to this area, because a lot of places don’t have it and we’ve always had it but it’s just  
7 getting better and bigger.”

8

9 Policy makers must understand this distinction for policy development, for instance in  
10 prohibiting floodplain development, accepting that the conditions for strong place attachment  
11 – identity, social capital and cohesion and inspiration – might be absent and without which  
12 such communities are more vulnerable. Equally, policies of managed retreat or abandonment  
13 in communities of belonging may undermine social fabric and support for agencies.

14

15 *Social capital (and cohesion)*: Aldrich and Meyer (2015) describe three types of social  
16 capital. Bonding and bridging social capital describe the connections between homogenous  
17 and heterogeneous groups, respectively. Critical to building or reinforcing relationships for  
18 preparedness is the third type, linking social capital that connects individuals with  
19 government officials and elected leaders. Residents in communities with strong place  
20 attachment are motivated to work for the community and to adapt to future flood risk. In  
21 *Calder* the residents discuss bonding and bridging social capital in the recovery phase of the  
22 disaster, i.e. helping their community (bonding) and in describing the help they received from  
23 outside groups for clear-up and patrolling (bridging), see Figure 2, SKC–EM-v and SKC–I-h.  
24 We also observe that, linking connections between residents and those in power began in the

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<sup>7</sup> See <http://eyeoncalderdale.com/history-of-flooding-in-calderdale>

1 disaster response phase, when residents worked with emergency services personnel to  
2 evacuate vulnerable residents. These positive examples of community-authority working built  
3 trust, later strengthened through engagement with regeneration plans, see Figure 2, SKC–AC-  
4 em, SKC–AC-pr, respectively; which Aldrich and Meyer (2015) propose is another approach  
5 to increase social capital.

6

7 “And the future plans what the councillors and what Royd Regeneration have got  
8 going for Mytholmroyd, it’s going to be a very exciting place to live, *very* exciting, I  
9 feel proud to be part of it, I do.”

10

11 Whereas, the impetus for linking social capital in the literature is often from communities  
12 building ties with authorities, we believe it is also important for authorities to proactively  
13 improve their engagement with flood-prone communities. The Calderdale Council  
14 disseminated community-level information, through the *Flood Recovery Update –*  
15 *Mytholmroyd* (Calderdale Council, March 2016) on: volunteering opportunities; how to  
16 engage with longer-term adaptation through local flood groups, the flood warden programme  
17 and in river stewardship; and how to access local authority administered national Community  
18 Recovery Scheme funds and grants (Priestly, 2016). The objective was to speed up recovery  
19 and to facilitate the return of displaced residents and businesses. Other policy  
20 recommendations to build linking social capital from Aldrich and Meyer (2015) are to  
21 support community efforts around time banking – where time becomes a community  
22 currency that can be exchanged around a shared purpose, e.g. flood recovery – and social  
23 events. Along these lines, the idea of re-opening of the flooded Mytholmroyd Community  
24 Centre was significant to one of the residents:

25



1 “I think the day we reopen will be a good party, definitely. And we’ve still got the  
2 1970s disco ball which is the heart of the centre to be re-hung on the opening day.”

3

4 *Reconciliation with CaBA*: There is a tension between the scale of the personal stories  
5 in *Calder* and the policy shift to catchment-based FRM. Reconciliation of these scales  
6 likely requires new ways of working and engaging with the public(s) as is being trialled  
7 through CaBA partnerships. We suggest consideration of this catchment scale is less of  
8 a cognitive shift after the floods. The floods have demonstrably reminded residents of  
9 the hydrological (and social) connection of ‘their’ river with its catchment. In *Calder*,  
10 there are signs of an appreciation for the need of a new approach to FRM:

11

12 “...my appreciation of the power of water, that’s something I didn’t understand, you  
13 know, just you can’t stop it. It’ll go where it goes, you can’t stop it, and if you try to  
14 stop it... You know, in a battle between us and the river the river will always win,  
15 you know, and that’s not just... You know, however many flood defences you build,  
16 you know, whatever you try to do, however you try to divert it, if the water wants to  
17 go, the water will go, *and we have to find a way of living with it.*” (our emphasis)

18

19 CaBA provides opportunity to embed budding post-flood linking social capital into policy  
20 and practice. The approach encourages communities, interested groups and the authorities, to  
21 engage, partner and collaborate, not only around issues of FRM, but also around other issues  
22 of important to communities, such as biodiversity, recreation, and regeneration. This is where  
23 CES research is valuable in that it emphasises a more active relationship with nature and can  
24 illustrate the types of local activities that can support CaBA. For example, residents can  
25 become involved in *Activity* such as Citizen Science surveillance of river levels and drains for

1 blockages, as well as sharing local *Knowledge* about lessons learned, the antecedents of  
2 previous floods, vulnerable community members, or those temporarily or permanently  
3 displaced by the flood, i.e. to better understand thresholds of displacement. Residents can  
4 also offer their volunteer *Employment* for WwNP initiatives. Supporting such activities and  
5 knowledge transfer with funding, training and partnership working in the periods between  
6 floods could grow linking social capital. Furthermore, such activities could build bridging  
7 social capital with other at-risk communities within a catchment and across catchments, e.g.  
8 with Shipley on the River Aire, enhancing a more coordinated approach to adaptation.

9

10 Putting “what people need”, at the centre of new ways of working was a centrepiece of the  
11 independent and comprehensive review of the lessons learned from the widespread UK  
12 floods in summer 2007 (Pitt Review, 2008: see figure page viii). We believe film can be a  
13 poignant communication medium that can engage authorities in “what people need” and  
14 moreover can provoke emotion and engagement (Burke, no date; Edwards et al., 2016) in the  
15 emotional and psychological aspects (Agyeman et al., 2009) of trauma, recovery and  
16 resilience. Indeed *Calder* was screened at the Fifth International Festival of Public Health,  
17 University of Manchester, July 1, 2016. It can also engage new leaders and researchers in the  
18 emotional aspects of flooding, e.g. at the University of Bradford since 2016/17 it has been a  
19 case study in the BA Peace Studies and International Development and in 2018/19 was added  
20 to the new MA Peace, Resilience and Social Justice.

21

22 *Film as secondary data:* There are many genres of film. *Calder* is an example of community  
23 filmmaking that is sensitive and sympathetic to the subject matter. Trust is an essential  
24 element of the process of community filmmaking. The filmmakers spent time getting to know  
25 people and place. Furthermore, unlike the immediacy of news, which often sensationalises

1 disasters and focuses on blame-gaming (Cologna et al., 2017) and the first phase of a disaster,  
2 residents featured in *Calder* had time to reflect on their and the community's experience of  
3 the flood, its aftermath and future plans and therefore film may provide a more reliable data  
4 source. Further, there is an emergent appreciation of narratives in creating "vivid, compelling  
5 and accessible" science communication for the public and policy makers (Coates, et al., 2014:  
6 37). *Calder's* narrative reveals values that were previously implicit (Kenter et al., 2016: 270),  
7 around humanity, gratitude and the work 'of' and 'in' community, as well as deep  
8 connections to place.

9

10 Film, art and humanities more generally are recognised as approaches important in  
11 understanding community (Coates et al., 2014). Key to this research, *Calder* reveals stories of  
12 place attachment in a disaster-affected community that might otherwise not be forthcoming  
13 through other types of researcher-subject interactions (Cai, 2017). Indeed other CES  
14 researchers have collaborated with artists (Edwards et al., 2016).

15

16 Furthermore, more participatory approaches to CES research are time consuming and costly  
17 (Kenter, 2016) and with film the researcher is another observer and cannot bias the  
18 'collection' of data. Of course, the researcher does choose which film to use as data and the  
19 voice of the filmmakers lies beneath *Calder*, and in this way it is similar to the arts-led  
20 dialogue approach of Edwards et al. (2016: 321) with its own "1) purpose and goals; 2)  
21 representation and audience; 3) format and content, and 4) the processes involved."

22

23 A consequence of using film as secondary data rather than qualitative interviews is that the  
24 underlying process of filmmaking, including editing, is unlikely to be a perfect fit with place  
25 attachment research. Furthermore, the sample size in *Calder* is small and therefore the

1 findings may not be generalisable (Burley et al., 2007; Amsden et al., 2010; Lin and  
2 Lockwood, 2013). However, although *Calder* features just five residents it provides a broad  
3 set of views as of the five, three were not displaced and two were temporarily displaced.

4

5 Since the release of *Calder* in April 2016 two other films have been released that also  
6 represent community responses to the 2015 floods and attitudes to new approaches to FRM.  
7 *Waving, not Drowning* by Jason Elliott and Shanaz Gulzar (December 2016) is a community  
8 film about the 2015 flood in Mytholmroyd and nearby Hebden Bridge.<sup>8</sup> *High Water Common*  
9 *Ground* by Andy Clark (2017) is a series of films, featuring local stakeholders, about WwNP  
10 including initiatives in Calder valley.<sup>9</sup> Both films reflect an interest in representing  
11 community and place as something important for those in decision- and policy-making  
12 positions to understand.

13

14

## 5. Conclusions

15 This artist-researcher collaboration considered place attachment and current approaches to  
16 FRM using a community film as secondary data. Advantages of using a community film are  
17 its independence from the researcher and its reflective nature that covers all three phases of a  
18 disaster. In terms of policy, CaBA is dependent on the strength of communities to co-deliver  
19 it and support from authorities to develop local communities' capability through equipment,  
20 training and local events. Here we find that place attachment was strong before the flood, i.e.  
21 independent of hazard experience and that there is evidence of individuals' development "in"  
22 and "of" community, through CaBA. While linking social capital could be strengthened  
23 through the practice of CaBA, which provides top down, and bottom up engagement between

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<sup>8</sup> See, <https://www.youtube.com/watch?v=JoEZ2p0g2JU>.

<sup>9</sup> See, <http://www.highwaterfilm.co.uk> and <https://www.youtube.com/watch?v=JoEZ2p0g2JU>.

1 authorities and communities on a range of catchment-based issues, place attachment is  
2 independent of it. For FRM policy, agencies need to recognise the importance of place in  
3 discussions around FRM and preparedness activities as well as for retreat and abandonment.

4

5 Chan et al. (2012b: 745) note that “one of the most powerful aspects of an ES approach is  
6 that it focuses decision-making and research specifically on what people care about”. Indeed  
7 the coding of a community film reminds researchers and flood managers of deeply held  
8 values (Kenter, 2016), not only relational values around *Place/heritage*, but transformative  
9 values, around *Inspiration* and *Aspiration* and shared values around *Social capital and*  
10 *cohesion* and *Identity*. Flood-prone communities that exhibit strong place attachment may be  
11 more likely to accept the types of changes, e.g. to the landscape and increased participation  
12 inherent in a CaBA to FRM policy and practice. Researchers could test this in other contexts  
13 including through exploration of new data sources, of which film offers much scope.

14

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24

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