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Building resilient Oregon coastal communities: Reimagining critical facilities through Latinx sense of place

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ABSTRACT

Disaster risk reduction requires the identification and assessment of critical infrastructure that may be impacted during a disaster event and taking proactive steps to mitigate these impacts. Yet little consideration is given towards how systemic marginalization of certain populations may inhibit their access to critical infrastructure. Understanding and expanding our understanding of what is considered “critical” in a community could help build greater adaptive capacity and reduce vulnerability, particularly for marginalized or underrepresented populations. In this case study, we examine how Latinx coastal community residents in Oregon (USA) perceive current critical facilities and their values associated with these places, as well as the identification of new locations that are valued as critical to their community and seen as places they would go to in times of need. Our analysis reveals that hazard resilience planning efforts that focused only protecting current critical facilities without including marginalized community members’ perspective, run the risk of creating inequitable access and utilization of these spaces during emergencies. Our results point to the need to broaden the types of facilities that are considered “critical” and incorporating inclusionary policies within existing critical facilities in order to increase communities’ capacity to respond and recover from natural hazards. The aim of this research is to identify systemic issues in resilience planning efforts, not to catalog cultural differences.

1. Introduction

Disaster risk reduction requires the identification and assessment of critical infrastructure that may be impacted during a disaster event and taking proactive steps to mitigate these impacts [1]. The United Nations Office for Disaster Risk Reduction defines critical infrastructure as “the physical structures, facilities, networks, and other assets which provide services that are essential to the social and economic function of the community or society” [2]. Similarly, National Institute of Standards and Technology (NIST) defines critical infrastructure as “essential services and related assets that underpin American society and serve as the backbone of the nation’s economy, security, and health” [3]. Decision makers across cities, states, and nations are left to interpret these broad definitions and determine exactly what is deemed essential to the community and what is not. Typically, critical infrastructures encompass several sectors such as transportation, healthcare, energy, and governance [2]; for example, the United States Federal Emergency Management Agency (FEMA) states that “typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities” [4]. Yet how—and who—decides what facilities and infrastructure are marked as “critical” and therefore presumably

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protected, is rarely considered, particularly regarding social vulnerability, equity, and place attachment. Through this case study based in coastal communities in Oregon, we examine how marginalized perceptions of essential services and facilities differ from official community plans and policies.

2. Literature review

The concept of “vulnerability” is relative in the sense that some communities can experience a disaster to a debilitating degree, while others may experience the same event as a mild disruption in their life due to their own profile of vulnerability [5]. Beginning in the 1980s, vulnerability has been perceived as the conditions present in communities that include both exposure to hazards (e.g., environmental factors) and individual and community inability to mitigate or adapt to those hazards in ways that prevent negative outcomes, including death, infrastructure damage, and social dysfunction (e.g., social factors) [6]. Identifying and mitigating impacts of key critical facilities or infrastructure is seen as a keyway to reduce overall community vulnerability [1].

The concept of *social* vulnerability is both temporally and geographically dynamic and complex due to differences of the preexisting ability to respond to, cope with, and recover from a natural disaster [7]. However, the term social vulnerability should be used with caution and respect to those who are identified as so. The use of this term is often perceived as a description of someone with less agency or capability, which is not the intent of this paper. Those who may be vulnerable in one aspect, can be considered less vulnerable in others. Social determinants of health are often used to describe social vulnerability to hazards are predicated upon systemic racism and historic conditions that have led to a current system of haves and have nots [8]. Determinants include but are not limited to, socioeconomic background, immigration status, limited language proficiency, residential location, and stigma/marginalization [9].

Socially vulnerable populations that are sensitive to hazard exposure must increase their adaptive capacity such as to respond to these hazard risks via individual, family, and institutional mechanisms [10]. Increasing individual and institutional adaptive capacity to respond to hazards increases the community resilience as a whole after a disaster event [11,12]. However, determining community critical facilities and prioritizing plans and funding to increase their ability to withstand disaster events rarely include considerations such as proximity to socially vulnerable areas, or marginalized populations rely on such facilities. Communities must consider what returning to “normal” conditions means for different populations [13].

Engineers and hazard mitigation/adaptation planners often utilize the “resilience triangle” concept to depict resilience metrics in structural settings [14]. The larger the impact on a structure or system such as water or transportation networks, the longer it would be expected to return to pre-disaster levels. The faster the return to pre-event conditions, the more resilient the system. . As with social resilience, the focus of structural recuperation as quickly as possible can inherently disregard the reason disasters strike in the first place. “If resilience is the ability of a community or society to bounce back, then have we forgotten that disasters are produced through human practices?” [15, p.32]. In other words, the existing systemic social arrangements (e.g., poverty, access to education, services) that exists for marginalized populations in many communities are not improved when the community decision-makers focus on a return to pre-disaster conditions of critical infrastructure and facilities without careful consideration of who in the community has access to and utilizes critical infrastructure and facilities [16].

Determining and prioritizing critical infrastructure and facilities for hazard protection through mitigation projects such as retrofits, relocation/rebuilding touch upon concepts of procedural (e.g., how decisions are made) and distributive (e.g., how risks, benefits, and resources are distributed) equity [17]. Identifying and prioritizing critical infrastructure and facilities is most often seen as a socio-technological issues and left to the engineers, planners, and other experts to decide [18]. Community voices, particularly marginalized voices are often left out of “the room where it happens” leading to an overemphasis of some facilities and infrastructure while other places that provide essential community goods and services are not recognized.

Key to understanding what places may be seen as essential to community residents, is an understanding of place itself. Place, opposed to location “attends to how we, as humans, are-in-the-world, how we relate to our environment and make it into place” [19, p. 113]. The theory of place attachment focuses on how people *internally* affiliate and attach themselves to current places as a *sense*, rather than the historical focus of how people externally seek out and adapt to new situations through instability, migration, and change, as an *action*. Low and Altman [20] discuss how sense of place intersects with community sentiment in the context of place attachment to form a cohesive understanding of community perspective and feeling. Williams [21] refers to sense of place as shaped by two forces “place as a locus of attachment” and place as a “center of meaning” [22, p. 2]. By understanding place attachment through these two forces, it is clear that places can have profound effects on communities when the physical attachment and/or the meaning of the place are disrupted by natural disasters [23,24]. Furthermore, dominate worldviews can dictate what place attachments matter and protected in communities [25]. If a wide range of *locations* (physical without relation) and *places* (location with relation) are not considered for marginalized and underrepresented populations when determining critical facilities, then hazard mitigation plans and policies can run the risk of uneven assertions of what places are important for protection.

The aim of this paper is to understand perceptions of sense of place as it relates to hazard mitigation and adaptation planning, particularly the identification and protection of critical facilities. The specific research questions are as follows.

- What locations are perceived as ‘critical facilities’ by Latinx coastal community members?
- What values do these places hold for Latinx coastal residents?
- How do the characteristics and values of these participant-identified critical facilities compare with the current critical facilities determined by state and local emergency management agencies?

3. Case study

We employed a case study approach to answer the above research questions. This case study is in northern Oregon (USA) coastal communities (Fig. 1). This region is dominated by both climate-driven and plate tectonic geohazards [26]. The Cascadia Subduction Zone (CSZ), which runs up the North American west coast from Northern California to Southern Canada, has experienced a magnitude 9.0 earthquake approximately every 526 years, as well as magnitude 8.0 earthquakes approximately every 234 years; it has been over 300 years since the last earthquake [27,28]. There is approximately a 33% chance that the CSZ will experience an 8.0 magnitude earthquake within the next 30 years and 7–12% chance of a 9.0 magnitude earthquake [29]. A 9.0 magnitude earthquake would subsequently result in a tsunami reaching in excess of 10 m onto coastal landscapes [30].

The impact of the CSZ on coastal communities will undoubtedly be life changing for many coastal residents. These impacts will vary



Fig. 1. Map of Northern Oregon USA coastline with the XXL Tsunami scenario [31] and case study cities: Newport (Lincoln County), Seaside, and Astoria (Clatsop County).

depending on individual circumstances at various levels with catastrophic impacts for those who live or work within the inundation zone (Fig. 1) or who have less access to resources. In order to help communities to prepare for “The Big One”, the State of Oregon released the Oregon Resilience Plan (ORP) in 2013 that assessed the impacts of a CSZ event to coastal and inland infrastructure and called for the protection of the following critical facilities: emergency operation centers, police and fire stations, healthcare facilities, primary and secondary schools (K-12, College, and University), government administration/services facilities, emergency shelters, residential housing, community retail stores, financial/banking and vulnerable buildings [32]. Because Oregon has designated specific critical facilities in plans and policies, investigating community perspectives of Latinx (e.g., a person of Latin American origin or descent) coastal residents regarding critical facilities is an ideal choice.

Latinx populations along the Oregon coast are the fastest growing with an increase of 32.7% in Lincoln County and 35.6% in Clatsop County [33], the two counties where this study takes place and therefore important to include Latinx perspectives regarding critical community facilities. Including these voices is particularly important given that the majority of Latinx coastal residents are employed in low-wage place-based industries (e.g., fisheries/fish processing and service sector) primarily located in high tsunami risk areas (e.g., along beaches and bay fronts) [34]. The purpose of this study was not to create a universal definition or create an expanded list of critical facilities, but rather to exemplify the importance of using tailored approaches to identify inclusive hazard mitigation and adaptation strategies and that meet the needs of community members. Furthermore, *Latinx* is not a term that encompasses the diversity of the community members that participated in this research but is simply a singular descriptive commonality. *Latinx* is not considered a favored gender-neutral term for *Latino* in comparison to *Latine* or *Latina* but was found to be most frequently used in academic writing. *Latinx* is not a commonly used word in the Spanish language.

4. Methods

Qualitative data was collected through semi-structured focus groups and individual interviews from June to November 2019. A focus group is a data collection method consisting of gatherings with multiple people to discuss a topic determined by a researcher [35]. This method of interviewing is ideal for getting as many participants as possible within a limited timeframe and because it is believed that gathering participants with similar positionalities can create comfort to enrich an open and honest discussion [36]. The focus groups followed a semi-structured interview guide that allowed for flexibility in clarification of questions, order, and direction. Flexibility in interviewing is necessary when attempting to understand perceptions, especially when using both English and Spanish. The focus groups were held mostly in Spanish, but required interpretation assistance from the two community contact partners. The interview guide (Appendix A) centered on the intersection of sense of place and perceptions of critical facilities by asking participants the following questions: 1) “What places in your community would you go to/rely on/or wish to have protected in times of need?”; and 2) “Why did you or what characteristics made you choose those locations?”

We solicited members of Oregon Latinx communities who live on the Oregon coast, specifically in Newport city (Lincoln County) and within Clatsop County (cities of Seaside, Warrenton, and Astoria) (Fig. 1) to participate in this study. Participants were identified through purposive snowball sampling methods among social networks within local Latinx resource nonprofits and university extension services (see Appendix A for more information regarding recruitment strategies). Thirty-four Latinx coastal community members to participate in focus groups and interviews (Table 1). In Newport, focus groups and individual interviews with a total of fifteen participants were held at a church where the offices of a Latinx resource center were located or at a university extension building when the church was not available, both locations had hosted the participants for other activities prior to the meetings. Clatsop County focus

Table 1
Participant demographics.

Participant Demographics	City of Newport	Clatsop County (Astoria, Seaside, & Warrenton)
	N = 15	N = 19
Gender		
Female	73% (11)	47% (9)
Male	13% (2)	32% (6)
No Response	13% (2)	21% (4)
Age		
18–40	33% (5)	26% (5)
40–69	60% (9)	52% (10)
No Response	7% (1)	21% (4)
Education		
K-12th	73% (11)	42% (8)
>12th grade	20% (3)	37% (7)
No Response	7% (1)	21% (4)
Income		
<25 K	47% (7)	16% (3)
25–75 K	20% (3)	56% (11)
>75 K	7% (1)	–
No Response	27% (4)	26% (5)
Hospitality Industry Worker		
Yes	67% (10)	32% (6)
No	27% (4)	58% (11)
No Response	7% (1)	11% (2)

groups included a total of nineteen participants and were held at a Latinx resource center location in Astoria, Oregon and participants were regular clients and comfortable and familiar with that location. On average, approximately four people attended each Newport focus group and ten people attended each Clatsop County focus group. This difference in attendance was most likely due to the difference of partnership between community contacts. In Newport, focus group interviews took place before community-led cooking classes for Latinx residents. The class teaches basic nutritional information, provides a cooking demonstration, and ends with a sharing a meal together (Fig. 2). The Astoria interviews were organized with a community-based organization who required pre-registration and participants came specifically for the focus groups and the provided meal. The majority of participants identified as middle-age and low-income women with Clatsop participants having slightly higher incomes and education levels with less overall employment in the hospitality sector (Table 1).

5. Analysis

Transcriptions, recordings, and field notes of the interviews and focus groups were analyzed using inductive coding and grounded theory to identify key themes related to critical facilities and resilience. Inductive coding utilized a two-tiered coding scheme in which the structural code represented the location, and the thematic coding represented key value characteristics being described [37,38]. The authors then analyzed intersections and gaps between the thematic value associations with locations identified by participants. Inductive codes and analysis were checked and validated by two external reviewers who were familiar with the study but did not assist in the code development. Inconsistencies in the coding were discussed between the external reviewers and the authors and resolved when there was unanimous agreement. The results of coding and theme analysis were sent to community contacts and community participants that shared their contact information for code validation. The community contact from Newport reviewed and approved the coding; however, no feedback was received from the Clatsop County. Community contacts were also invited to presentations of the initial results and offered further feedback. All results reflect the feedback received from community contacts and study participants.

6. Findings

6.1. Critical facilities identified

In order to understand what locations are deemed critical to Latinx residents, participants were asked “*what places in your community would you go to in times of need?*” Responses to this question were grouped into two key categories (Fig. 3) based on whether the location is included in the list of current critical facilities identified in the Oregon Resilience Plan (i.e., emergency operations, police stations, fire stations, health care facilities, K-12 facilities, and emergency shelters) [32] labeled “current critical facilities.” All other locations were categorized as “participant-identified critical facilities.” Within these two groups, locations were further classified by location type: Recreational, Nonprofit and Sustenance locations within participant-identified critical facilities and Emergency Services, Government Administration, Schools, and Medical Services under current critical facilities.

Within the Participant-identified critical facilities, twelve specific locations identified by participants and eight locations were mentioned in relation to current critical facilities (Fig. 3). These results indicate that while participants mentioned current facilities as being important places during times of need, they also mentioned additional locations, particularly recreational locations which are not currently considered as critical facilities.

6.2. Value associations

In order to identify the values associated with places identified, Latinx participants were asked: *Why did you or what characteristics*



Fig. 2. Cooking class after focus group session, Newport Oregon.

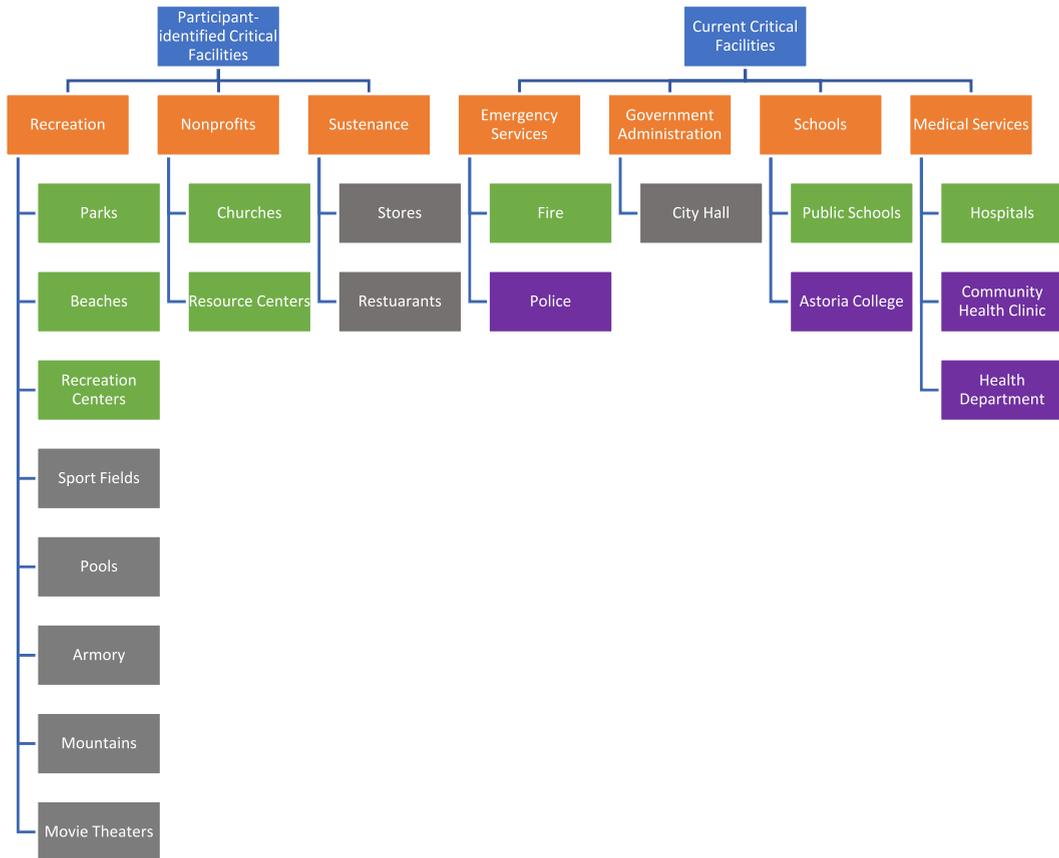


Fig. 3. Locations identified by focus group participants from the city of Newport, Oregon and Clatsop County, Oregon. Blue boxes represent locations under currently identified critical facilities in the Oregon Resilience Plan [32] (i.e., Current Critical Facilities) or locations identified by participants (i.e., Participant-identified Critical Facilities). Orange boxes represent the major location categories used for analysis. Green boxes represent individual locations mentioned by both Newport and Clatsop participants. Grey boxes represent locations only mentioned only by Clatsop participants; and purple boxes represent locations only mentioned by Newport participants.

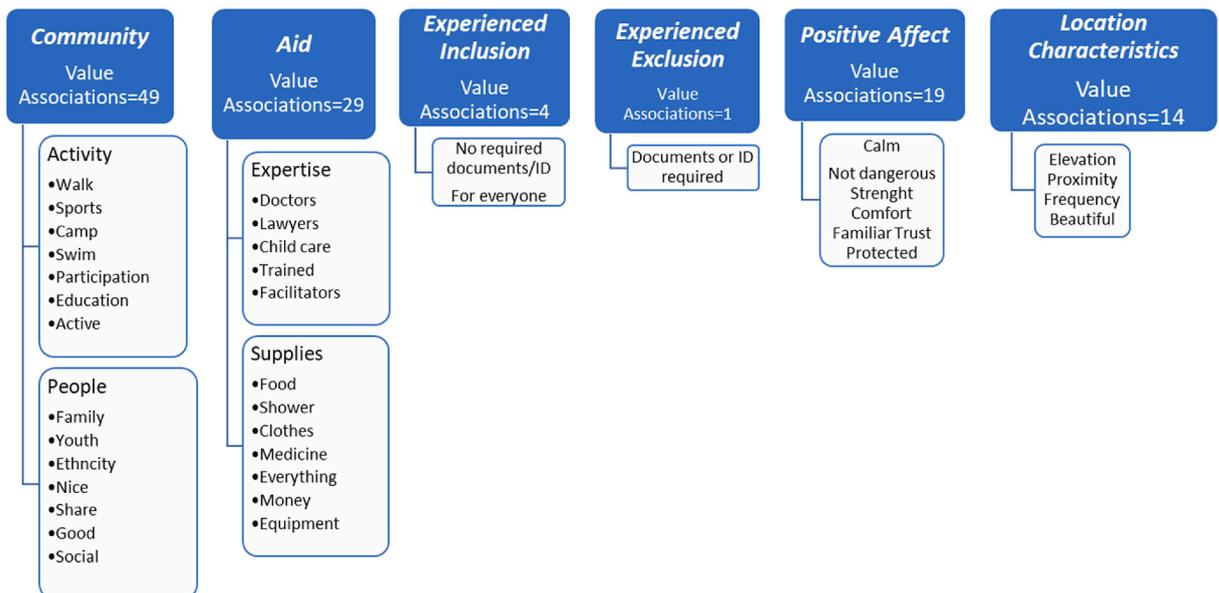


Fig. 4. Place value characteristics.

made you choose those locations? Responses were coded into major themes (blue boxes): *Community, Aid, Experienced Inclusion/Exclusion, Positive Feelings, and Location Characteristics*. The major theme of *Aid* includes subthemes (white boxes) of *Expertise and Supplies* and the major theme of *Community* includes subthemes of *Activity and People* (Fig. 4).

Participants perceived the value of *Community* as being fostered by engaging in different activities and by building relationships and mentioned this value in relation to locations more than any other value (Fig. 4). The major theme of *Community* includes subthemes of *Activity and People* to highlight how the value of community was discussed with participants. The sub-theme of *activity*, includes specific activities that fostered the idea of community and the sub-theme of *people* highlighted the types or characteristics of individuals that were perceived to promote a sense of community. The importance of community aligns with observational fieldnotes that frequently referenced the apparent courtesy and care that all participants showed for one another as a community. For example, at the Newport nutrition and cooking classes, children were always fed first, almost everyone would help cook and clean together and consciously make sure there was enough food for others, including bagging of leftovers to take home. One participant even offered her entire meal to a homeless veteran who wandered into the church after a focus group session and was invited to join us for dinner. Understanding this nuanced context and meaning of *community* to Latinx coastal residents exemplifies the importance of focusing on instilling a sense of community in locations that are critical to community disaster response and recovery in order to be more inclusive and accessible. The theme of community was most often mentioned in relationship to Recreational spaces for Network and Clatsop participants (Fig. 5). For example, a Newport participant noted that they enjoy camping at a specific location where they know other Hispanic families that are friendly.

The parks ... keep us active. We go camping in summer ... it's a very beautiful place, this place is very calm and I like that the people are very friendly. We practically know all the Hispanic families and greet each other.

Another man from Newport stressed the importance of keeping his son active and involved in the community.

The Rec Center, because they go to do sports, especially my son who participates.

The importance of recreational sites for fostering community among Latinx residents was stated in many different ways, including the need for them as trauma response, explained by a Clatsop resident.

When there is an earthquake and you can't work because everything is in chaos, what are we doing to exercise our body, our mind? Things like that [recreation] can distract us, as they say, its entertainment, when you go through a disaster its very traumatic.

The theme of *community* was associated next most with nonprofit locations for both Newport and Clatsop participants. Ethnicity is a notable value identified in the *Community-People* theme. Participants mentioned the importance of trustworthy Latinxs that have reliable information. For example a woman from Clatsop County discussed that a local Latinx focused resource center provides open communication and available information that would be needed in a state of emergency.

I feel that as a council, as a group, we could communicate with each other, and information as well.

Churches were also mentioned in this context:

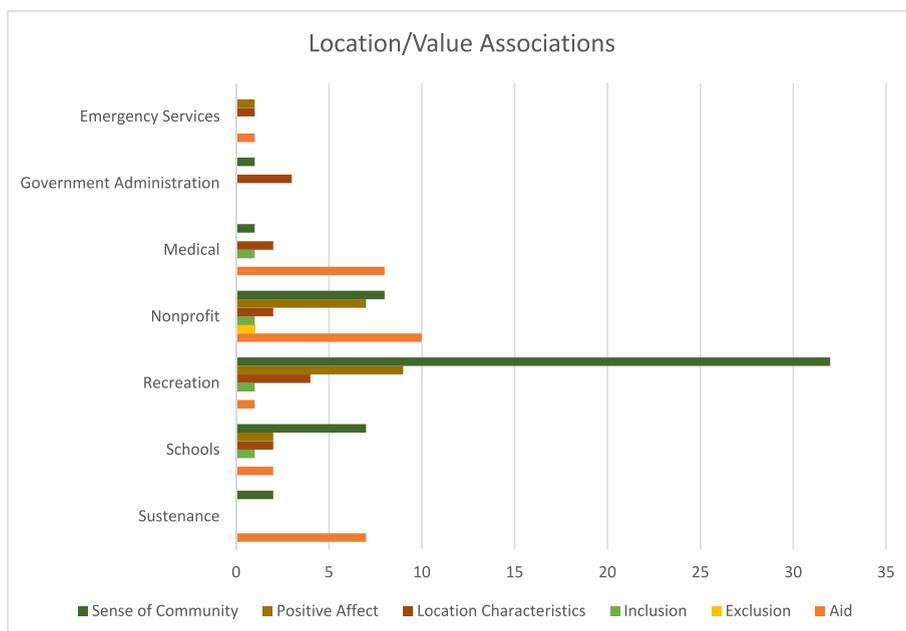


Fig. 5. Values associated with location types.

One of the reasons [why they consider churches as a critical facility], is that there are lots of Latinos in the church who are trustworthy.

In regards to current critical facilities, Schools were most associated with the theme value of community:

For me a school is a place where I think they are a little more able to reach people in case of a disaster and I think they aren't going to see if you're Hispanic or American, I think it's one of those places that supports everyone.

The next theme value associated the most with locations mentioned by participants was the theme of Aid. This theme included a sub-theme related to people providing aid "Expertise" and the tangible aid "Supplies." Latinx participants associated Nonprofit locations with the theme value of Aid. The Oregon Mass Care and Mass Displacement after a Cascadia Subduction Zone Earthquake report acknowledges that while nonprofits are not currently considered critical facilities, Oregon does consider them as a "critical part of emergency response and recovery since they provide a range of social services that are essential to the livelihood of some of our most vulnerable community members" [39, p. 5]. Without nonprofits ready to assist currently and in the future, many people will be at a large disadvantage and lost without the organizations they depend on. This sentiment is reflected in participant's responses for the theme Aid, with the sub-theme "Expertise":

For me, the most important place is this place [nonprofit location], because this is where you [in reference to nonprofit employee] are and where I always find information because I never really go to the hospital.

Tangible aid supplies were also mentioned in relationship to Nonprofit locations. One participant noted available aid with supplies at a church.

With respect to our communities is the church because it's a big building and they have water, bathrooms, food, kitchen there, they have space for people if you have an emergency, they are welcoming.

The value theme of Positive Affect was comprised of descriptors that describe the locale in a positive light and included terms such "calm" "strength" "familiar" and "protected" (see Fig. 4 for a complete list). The value theme of Positive Affect was most commonly associated with Recreation locations for Clatsop residents and Nonprofit locations for Newport residents, such as churches where a participant expressed feeling stronger.

My wife participates in church, and I believe that sometimes we find a little strength there.

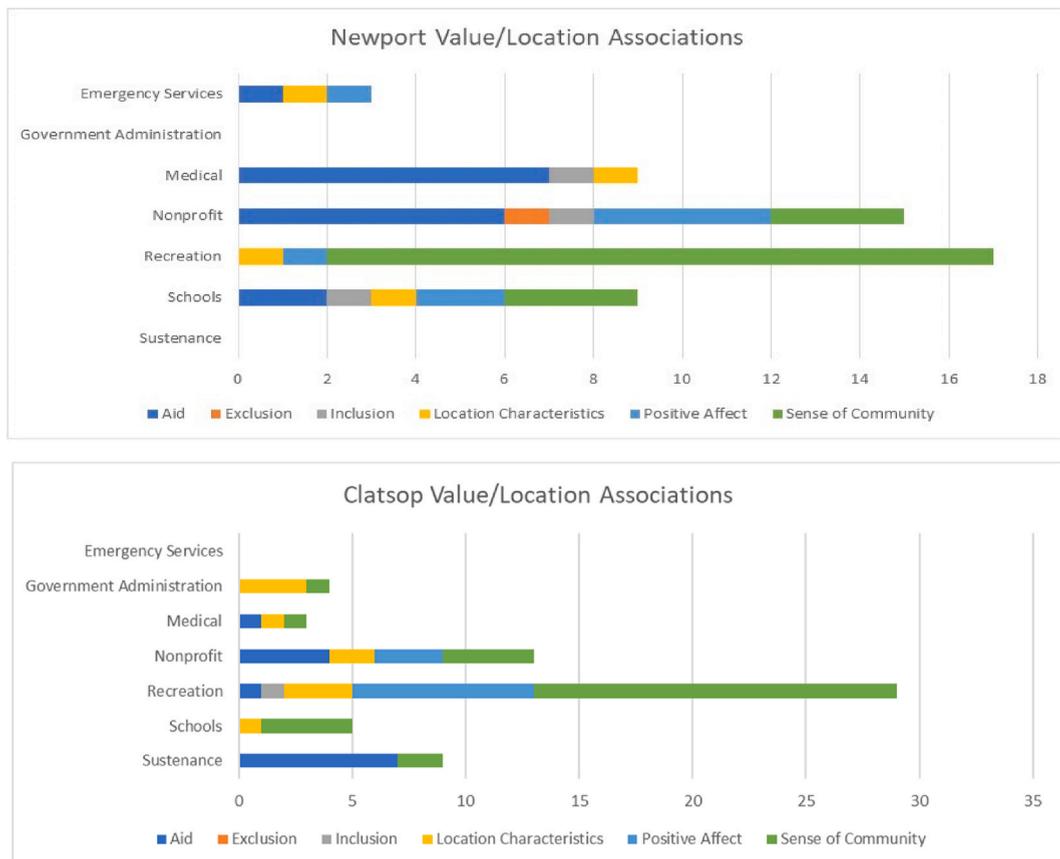


Fig. 6. Location/value associations for city of Newport and Clatsop County, Oregon.

The *Location Characteristic* theme included values that describe the locality of places such as: “the most high spot”, or “proximity to home.” Many of the descriptors were related to the approximate location or characteristics that provided a sense of safety.

Close by my house you know is the church and fire department.

The highest point is the soccer fields. That's our security point, soccer fields are our safe point in a disaster.

The theme of *Experienced Inclusion* refers to values associated with the feeling of belonging in a particular location. For example, one woman discussed a no discrimination policy at a recreation space which she values for her children. While there were not many locations associated with the theme of exclusion, inclusive values were associated with nonprofits, medical, and school locations for Newport participants, and with recreation locations for Clatsop participants.

For me the parks and recreation is important because, like the armory, people are going to skate, whichever people. They have a policy of no discrimination and free of bullying and are firm with this. I think our kids are learning good values there and also, it's a good place.

In a church is another place that doesn't ask if you have this paper, if you're from here or from there.

In contrast to the theme of *Experienced Inclusion*, the theme of *Experienced Exclusion* refers to the feeling that one does not belong or is not welcome in a particular location. While there was only one reference to this value associated with a place, the relevance of theme is particularly important when considering populations feeling welcome when seeking out help, particularly during a crisis such as a natural disaster.

One time an American woman was hungry, and it gave me so much sadness. She was desperate and told them it was raining, but they said “No” she was desperate and screaming, but they [a nonprofit] told her to leave, the woman went crazy and started beating and they took her out.

6.3. Key differences between Newport City and Clatsop County Latinx residents

Fig. 6 shows key differences in the value associated with locations between Newport City and Clatsop County Latinx residents. First and foremost, government administrative locations (e.g. city hall, libraries) were not mentioned by Newport residents and Clatsop residents did not mention emergency services (e.g. police and fire stations). This is quite a striking finding given that both of these location types are currently considered current critical facilities that warrant protection from impacts of earthquake/tsunami [32] yet Latinx residents did not consider them as places they would go in times of need.

In addition, Clatsop County participants identified additional facilities: sustenance (e.g. grocery stores, restaurants). Given that Clatsop County participants included a wider range of locations, it is no surprise that there are more values associated with these places than for Newport Latinx residents. For example, Clatsop County participants associated Government Administration locations with *Community* and *Location Characteristics*:

City hall is in the middle of the town. I'm driving around and I pass the city hall several times, more than three times during the day, and if there's any issue or disaster or not disaster, you always know there are people around it. If you have trouble, you can go there, find some help or information also.

Clatsop County participants associated Sustenance locations (e.g., stores and restaurants) with *Aid* and *Community* values, particularly in reference to a personal experience when a storm hit and the only place with electricity and warm food was a restaurant where everyone ended up eating:

Restaurants, yes, that's good because if there's a disaster and the lights go out in your house or something, you have to go and see where there's food. Because the time when there was the disastrous storm in 2006 or 2008, because it was the only place where there was hot food, in the Chinese restaurant.

For locations mentioned by both communities, Clatsop County Latinx participants perceived recreation spaces, particularly natural spaces, as also providing *Aid* with one participant noting the importance of relying on “Mother Nature” for what is needed when there is nothing else.

Many times, Mother Nature is the one who gives us the things we need. If we have nothing, one can learn what is there at that time. Finding oneself in a situation where they bring nothing and lose everything. You have to look first for the one who gives it, water, a roof. If there is wood or trees, leaves, as the Indigenous people did, one has to find a way to weave branches.

Whereas Medical, Emergency Services, and Schools, were all associated with the theme of *Aid* for Newport residents.

Hospitals, because there they have all the medicines and doctors.

Only one association was found between the theme of *Aid* and government pre-determined locations (Medical) for Clatsop participants. Overall, both groups had the most total value associations with Recreation places. However, Newport participants had the most diverse set of values associated with Nonprofits (*Aid, Exclusion, Inclusion, Positive Affect, and Sense of Community*) and Schools (*Aid, Inclusion, Location Characteristics, Sense of Community*), while Clatsop participants most diverse set of values was associated with Recreation places (*Aid, Inclusion, Location Characteristics, Positive Affect, Sense of Community*).

6.4. Overlaps and gaps between place values & locations

When examining the value associations between current critical facilities (e.g., emergency & medical services, government administration, and schools) and identified by Latinx study participants, we found that participant-identified locations (e.g., nonprofits, sustenance, and recreation) were associated with more values in each value category except location characteristics (Fig. 7). Quite notably, study participants perceived the value of *Aid*, to be *more* associated with locations that are *not* identified as current critical facilities in hazard mitigation policies and planning documents [32]. Study participants perceived these locations, such as nonprofits and churches, as having *more* resources and supporting services than current critical facilities. Furthermore, the value of *Sense of Community* was mentioned the most frequently by both Newport and Clatsop participants even though the majority of current facilities were perceived by participants as lacking this value and thus could limit utilization of current critical facilities during emergencies.

Nonprofit locations and other participant-identified critical facilities were associated most with the *Positive Affect* values and were seen as trustworthy and familiar locations while most current critical facilities, except schools, were not associated with *Positive Affect* values. Interestingly, the negative value of exclusion was *not* associated with any current critical facility (the only reference of exclusion was in association with a nonprofit) while the value of inclusion was associated with *both* current critical facilities and participant-identified critical facilities. The lack of reference to in/exclusion within all other locations does not necessarily mean they are inclusive or exclusionary, it simply means it was not mentioned within the discussions.

Lastly, *Location Characteristics* was the only value associated more with current critical facilities than participant-identified locations. Current critical facility locations have been prioritized for relocation to safer areas outside of tsunami inundation areas and hazard awareness and preparedness materials often reference schools and other critical facilities as safe areas to evacuate to because they are outside the inundation zone [32].

7. Discussion

This study found little association between key values of *Community and Aid* and locations that have been deemed “critical” by local and state emergency agencies for community resilience. Sense of Place Theory provides clear contextual insights to explore this finding. Sense of Place theory embodies two concepts: 1) place attachment—the emotional bonds between a person and a locale [20, 40] and 2) place meaning—the symbolic meaning that people ascribe to a place [41,42]. These two interlinked concepts exemplify the need to consider places as not only geographic coordinates and structures, but where relationships are developed and fostered between people and place. In this study, we found that Latinx residents ascribed some *meaning* to current facilities such as they were located in safe areas outside of the inundation zone. Yet the emotional connections—or the place attachment—particularly *Sense of Community*—to these locations was lacking.

Furthermore, trusting relationships and feelings of belonging are tied to place attachment and in this study, were mentioned most often in reference to churches, nonprofits and other places often utilized by Latinx residents. One explanation of why current critical facilities did not elicit strong place attachment and meaning may be due to the control of access of these places. Critical facilities identified by participants allow a high level of self-governance in access and utilization by community members, while current critical facilities, such as medical, emergency services, government administration and public-school locations do not allow this level of individual control of when and how to access or utilize them. These facilities require individuals to adhere to government protocols and policies to access and utilize. We also see evidence of this lack of control and access leading to feelings of exclusion in nonprofit

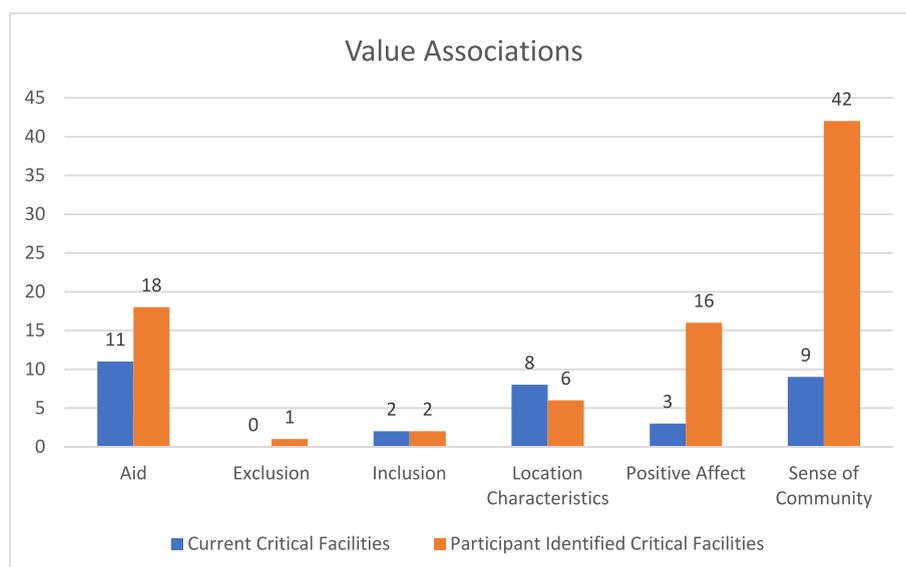


Fig. 7. Value associations for current critical facilities and participant-identified critical facilities.

locations that require documentation to access services. Extrapolating this to emergency management and disaster response, if sanctioned “safe” locations such as schools, police, or fire stations are perceived by marginalized community members as having heavily controlled access that may not include them, these community members may seek out alternative locations which are perceived as more welcoming, even if they are more vulnerable to hazards. For example, community members may opt to seek out their church or trusted nonprofit that may be in the inundation zone or lacks building retrofits to adequately withstand a strong earthquake, rather than going to government facilities due to fears around access or needing proper documentation.

This increased vulnerability lowers overall community resilience, or the ability of a community to “bounce back” after a disaster. While “resilience” is often seen by hazard mitigation planners, engineers and other practitioners as value-neutral, it is laden with the allocation of burdens and benefits among groups [13,43] and begs the question of “resilience from what, for what, and for whom?” [13, p. 479]. Berkes and Ross [44] answer this call by focusing on people-place connections, values and beliefs, social networks and the development of other community strengths. However, providing an equity lens to hazard mitigation planning, such as the determination of facilities that are prioritized for protection to offset hazard impacts, requires a systematic change in procedural justice in how decisions are made regarding what locations are deemed “critical” and needing protection and by whom. By focusing on equitable resilience, communities must consider issues of social vulnerability and differentiated access to power, knowledge, and resources [45, p. 218]. For example, by consciously striving to include Latinx perceptions of locations that are “safe” and where they “belong” within hazard mitigation planning processes and policies, decision-makers can work against the systematic and structural racism within institutions to change the historical practices of excluding marginalized communities from decisions that impact them directly and work towards equitable resilience. We offer below a few planning policy recommendations based on our findings. However, it should be noted that these recommendations should not be implemented without consultation with local community members, particularly those from underrepresented and marginalized groups.

7.1. Equitable resilience planning recommendations

In order to increase equitable resilience, emergency management can create more inclusive and comprehensive list of critical facilities by using the values and locations identified by participants as a guide to where and how to focus and share resources. First and foremost, emergency planners should respectfully engage with underrepresented and marginalized groups in their community and ask for recommendations about how current critical facilities could become more inclusive and increase a sense of belonging. For example, medical facilities and emergency services can improve sense of community within them by hosting public events, such as open houses, with the activities (sports, education, parties, etc.) and people (family, youth, ethnicity) identified by participants in partnership with the locations such as nonprofits that are already perceived to hold these values.

Targeted outreach and engagement efforts can be in partnership with the nonprofits who are already perceived to have these values in order to bridge the gap and provide a sense of security to community members. Additionally, these events can provide important information such as the types of emergency supplies and resources that are available at these locations and clarify how and who can access the facilities. Current critical facilities should clearly communicate, post and advertise their antidiscrimination policies. Additional signals of “belonging” in current critical facilities can be created by: increasing the racial and gender diversity of emergency management staff; recruiting diverse volunteers and staff; translation of all emergency response and management materials; and creating spaces that accommodate extended family networks. Lastly, and perhaps most importantly, when locations are identified as places where marginalized and underrepresented populations would seek out in times of emergency, work with the staff operating these to provide emergency training resources and supplies.

7.2. Study limitations

In-depth qualitative case studies are limited in their ability to reach all targeted population members. In this study, we were unable to hear the perspectives of all Latinx coastal residents and this study is not meant to be representative of all Latinx voices. However, key Latinx coastal resident stakeholders confirmed our study findings. Additionally, through continued involvement with these coastal communities and the Latinx community, we have heard similar locations mentioned and themes. Because the identification of critical facilities is an essential component of disaster risk reduction [1], we recommend that researchers modify and utilize the interview protocol and approach offered in this study (Appendix A) to explore and identify potential inequities in disaster risk reduction planning. In addition, future research would benefit from the development of large-scale survey instrument to quantify and validate how underrepresented and marginalized voices perceive and utilize critical facilities and other community assets.

8. Conclusion

This study sought to understand the locations Latinx coastal residents in the City of Newport and throughout Clatsop County, Oregon would seek out in times of emergency and why. Through our analysis of focus groups and individual interviews we identified both current critical facilities (e.g., emergency & medical services, schools, and government administration) and new participant-identified critical facilities (e.g., nonprofits, places to receive sustenance, and recreation facilities) that these residents would seek out. While current critical facilities are prioritized for protection in local and state hazard mitigation plans, Latinx community members perceived a greater number and diversity of values associated with other facilities they identified. Values, particularly those related to sense of community and belonging were not associated with current critical facilities and may result in an under-utilization of these resources during emergencies. This research is meant to illustrate how critical facilities could be reimagined as more inclusive and equitable locations. Further work with similar methods should be done with a diverse set of populations in order to ensure all voices are amplified in equitable resilience planning.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijdr.2023.103600>.

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