

# Building Resilient Oregon Coastal Communities: Reimagining Critical Facilities through Latinx Sense of Place

## 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.

**Keywords:** Vulnerability; Natural Hazards; Latinx; Coastal Communities; Sense of Place; Critical Facilities

24 **Introduction**

25           Disaster risk reduction requires the identification and assessment of critical  
26 infrastructure that may be impacted during a disaster event and taking proactive steps to  
27 mitigate these impacts [1]. The United Nations Office for Disaster Risk Reduction defines  
28 critical infrastructure as “the physical structures, facilities, networks, and other assets which  
29 provide services that are essential to the social and economic function of the community or  
30 society” [2]. Similarly, National Institute of Standards and Technology (NIST) defines critical  
31 infrastructure as “essential services and related assets that underpin American society and  
32 serve as the backbone of the nation’s economy, security, and health” [3]. Decision makers  
33 across cities, states, and nations are left to interpret these broad definitions and determine  
34 exactly what is deemed essential to the community and what is not. Typically, critical  
35 infrastructures encompass several sectors such as transportation, healthcare, energy, and  
36 governance [2]; for example, the United States Federal Emergency Management Agency  
37 (FEMA) states that “typical critical facilities include hospitals, fire stations, police stations,  
38 storage of critical records, and similar facilities” [4]. Yet how—and who—decides what facilities  
39 and infrastructure are marked as “critical” and therefore presumably protected, is rarely  
40 considered, particularly regarding social vulnerability, equity, and place attachment. Through  
41 this case study based in coastal communities in Oregon, we examine how marginalized  
42 perceptions of essential services and facilities differ from official community plans and policies.

43 **Literature Review**

44           The concept of “vulnerability” is relative in the sense that some communities can  
45 experience a disaster to a debilitating degree, while others may experience the same event as a

46 mild disruption in their life due to their own profile of vulnerability [5]. Beginning in the 1980s,  
47 vulnerability has been perceived as the conditions present in communities that include both  
48 exposure to hazards (e.g., environmental factors) and individual and community inability to  
49 mitigate or adapt to those hazards in ways that prevent negative outcomes, including death,  
50 infrastructure damage, and social dysfunction (e.g., social factors) [6]. Identifying and  
51 mitigating impacts of key critical facilities or infrastructure is seen as a keyway to reduce overall  
52 community vulnerability [1].

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

64         Socially vulnerable populations that are sensitive to hazard exposure must increase their  
65 adaptive capacity such as to respond to these hazard risks via individual, family, and  
66 institutional mechanisms [10]. Increasing individual and institutional adaptive capacity to  
67 respond to hazards increases the community resilience as a whole after a disaster event [11,

68 12], yet hazard mitigation planning, particularly regarding determining community critical  
69 facilities and prioritizing plans and funding to increase their ability to withstand disaster events  
70 rarely include considerations such as proximity to socially vulnerable areas or if  
71 underrepresented or marginalized populations rely on such facilities. Communities must  
72 consider what returning to “normal” conditions means for different populations [13].

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

85         Determining and prioritizing critical infrastructure and facilities for hazard protection  
86 through mitigation projects such as retrofits, relocation/rebuilding touch upon concepts of  
87 procedural (e.g., how decisions are made) and distributive (e.g., how risks, benefits, and  
88 resources are distributed) equity [17]. Identifying and prioritizing critical infrastructure and  
89 facilities is most often seen as a socio-technological issues and left to the engineers, planners,

90 and other experts to decide [18]. Community voices, particularly marginalized voices are often  
91 left out of “the room where it happens” leading to an overemphasis of some facilities and  
92 infrastructure while other places that provide essential community goods and services are not  
93 recognized.

94 Key to understanding what places may be seen as essential to community residents, is  
95 an understanding of place itself. Place, opposed to location “attends to how we, as humans,  
96 are-in-the-world - how we relate to our environment and make it into place” [19, p. 113]. The  
97 theory of place attachment focuses on how people *internally* affiliate and attach themselves to  
98 current places as a *sense*, rather than the historical focus of how people externally seek out and  
99 adapt to new situations through instability, migration, and change, as an *action*. Low and  
100 Altman [20] discuss how sense of place intersects with community sentiment in the context of  
101 place attachment to form a cohesive understanding of community perspective and feeling.  
102 Williams [21] refers to sense of place as shaped by two forces “place as a locus of attachment”  
103 and place as a “center of meaning” [22, p. 2]. By understanding place attachment through  
104 these two forces, it is clear that places can have profound effects on communities when the  
105 physical attachment and/or the meaning of the place are disrupted by natural disasters [23,  
106 24]. Furthermore, dominate worldviews can dictate what place attachments matter and  
107 protected in communities [25]. If a wide range of *locations* (physical without relation) and  
108 *places* (location with relation) are not considered for marginalized and underrepresented  
109 populations when determining critical facilities, then hazard mitigation plans and policies can  
110 run the risk of uneven assertions of what places are important for protection.

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

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

## 120 **Case Study**

121 We employed a case study approach to answer the above research questions. This case  
122 study is in northern Oregon (USA) coastal communities (Figure 1). This region is dominated by  
123 both climate-driven and plate tectonic geohazards [26]. The Cascadia Subduction Zone (CSZ),  
124 which runs up the North American west coast from Northern California to Southern Canada,  
125 has experienced a magnitude 9.0 earthquake approximately every 526 years, as well as  
126 magnitude 8.0 earthquakes approximately every 234 years; it has been over 300 years since the  
127 last earthquake [27,28]. There is approximately a 33% chance that the CSZ will experience an  
128 8.0 magnitude earthquake within the next 30 years and 7-12% chance of a 9.0 magnitude  
129 earthquake [29]. A 9.0 magnitude earthquake would subsequently result in a tsunami reaching  
130 in excess of 10 meters onto coastal landscapes [30].

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*Figure 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)*

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

149           Latinx populations along the Oregon coast are the fastest growing with an increase of  
150 32.7% in Lincoln County and 35.6% in Clatsop County [33], the two counties where this study  
151 takes place and therefore important to include Latinx perspectives regarding critical community  
152 facilities. Including these voices is particularly important given that the majority of Latinx  
153 coastal residents are employed in low-wage place-based industries (e.g., fisheries/fish  
154 processing and service sector) primarily located in high tsunami risk areas (e.g., along beaches  
155 and bay fronts) [34]. The purpose of this study was not to create a universal definition or  
156 create an expanded list of critical facilities, but rather to exemplify the importance of using  
157 tailored approaches to identify inclusive hazard mitigation and adaptation strategies and that



158 meet the needs of community members. Furthermore, *Latinx* is not a term that encompasses  
159 the diversity of the community members that participated in this research but is simply a  
160 singular descriptive commonality. *Latinx* is not considered a favored gender-neutral term for  
161 *Latino* in comparison to Latine or Latina but was found to be most frequently used in academic  
162 writing. *Latinx* is not a commonly used word in the Spanish language.

### 163 **Methods**

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

178 We solicited members of Oregon Latinx communities who live on the Oregon coast,  
179 specifically in Newport city (Lincoln County) and within Clatsop County (cities of Seaside,

180 Warrenton, and Astoria) (Figure 1) to participate in this study. Participants were identified  
181 through purposive snowball sampling methods among social networks within local Latinx  
182 resource nonprofits and university extension services (see Appendix A for more information  
183 regarding recruitment strategies). Thirty-four Latinx coastal community members to participate  
184 in focus groups and interviews (Table 1). In Newport, focus groups and individual interviews  
185 with a total of fifteen participants were held at a church where the offices of a Latinx resource  
186 center were located or at a university extension building when the church was not available,  
187 both locations had hosted the participants for other activities prior to the meetings. Clatsop  
188 County focus groups included a total of nineteen participants and were held at a Latinx  
189 resource center location in Astoria, Oregon and participants were regular clients and  
190 comfortable and familiar with that location. On average, approximately four people attended  
191 each Newport focus group and ten people attended each Clatsop County focus group. This  
192 difference in attendance was most likely due to the difference of partnership between  
193 community contacts. In Newport, focus group interviews took place before community-led  
194 cooking classes for Latinx residents. The class teaches basic nutritional information, provides a  
195 cooking demonstration, and ends with a sharing a meal together (Figure 2). The Astoria  
196 interviews were organized with a community-based organization who required pre-registration  
197 and participants came specifically for the focus groups and the provided meal. The majority of  
198 participants identified as middle-age and low-income women with Clatsop participants having  
199 slightly higher incomes and education levels with less overall employment in the hospitality  
200 sector (Table 1).

201

**Table 1: Participant Demographics**

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



204  
205 *Figure 2: Cooking Class after Focus Group Session, Newport Oregon*  
206

207 **Analysis**

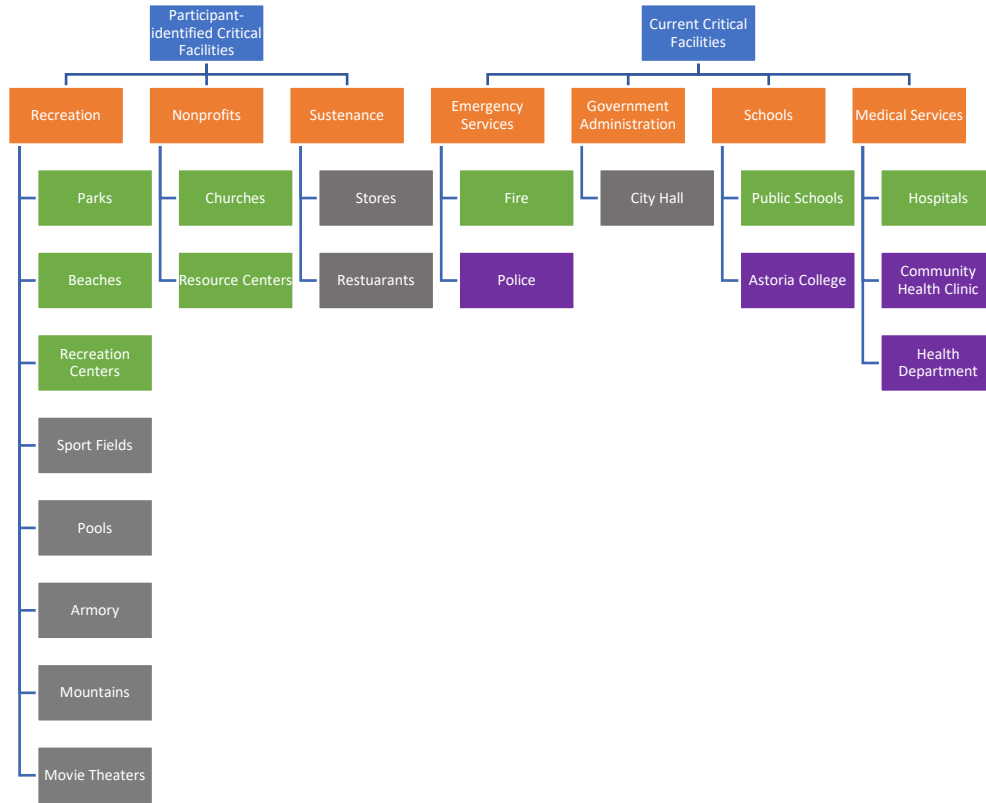
208 Transcriptions, recordings, and field notes of the interviews and focus groups were  
209 analyzed using inductive coding and grounded theory to identify key themes related to critical  
210 facilities and resilience. Inductive coding utilized a two-tiered coding scheme in which the  
211 structural code represented the location, and the thematic coding represented key value  
212 characteristics being described [37,38]. The authors then analyzed intersections and gaps  
213 between the thematic value associations with locations identified by participants. Inductive  
214 codes and analysis were checked and validated by two external reviewers who were familiar

215 with the study but did not assist in the code development. Inconsistencies in the coding were  
216 discussed between the external reviewers and the authors and resolved when there was  
217 unanimous agreement. The results of coding and theme analysis were sent to community  
218 contacts and community participants that shared their contact information for code validation.  
219 The community contact from Newport reviewed and approved the coding; however, no  
220 feedback was received from the Clatsop County. Community contacts were also invited to  
221 presentations of the initial results and offered further feedback. All results reflect the feedback  
222 received from community contacts and study participants.

## 223 **Findings**

### 224 *Critical Facilities Identified*

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



235

236 *Figure 3: Locations Identified by Focus Group Participants from the City of Newport, Oregon and*  
 237 *Clatsop County, Oregon*

238 Blue boxes represent locations under currently identified critical facilities in the Oregon Resilience Plan [32] (i.e.,  
 239 Current Critical Facilities) or locations identified by participants (i.e., Participant-identified Critical Facilities).  
 240 Orange boxes represent the major location categories used for analysis. Green boxes represent individual locations  
 241 mentioned by both Newport and Clatsop participants. Grey boxes represent locations only mentioned only by  
 242 Clatsop participants; and purple boxes represent locations only mentioned by Newport participants.

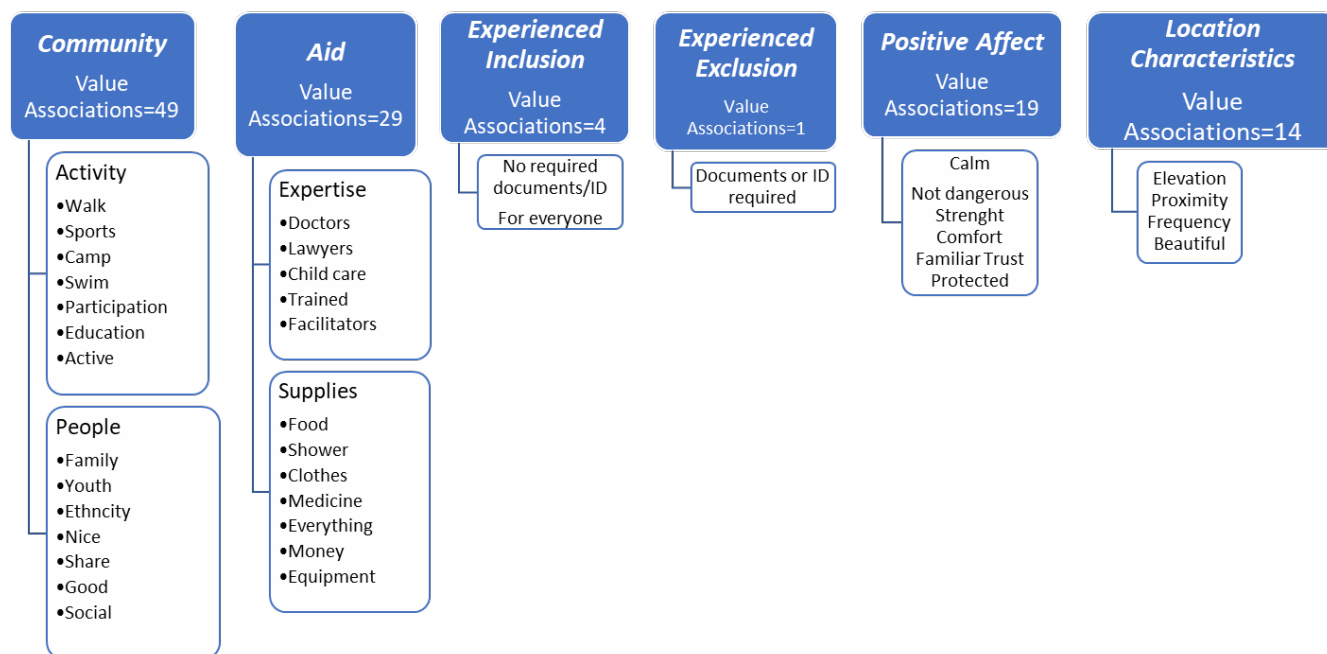
243

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

249 *Value Associations*

250 In order to identify the values associated with places identified, Latinx participants were  
 251 asked: *Why did you or what characteristics made you choose those locations?* Responses were

252 coded into major themes (blue boxes): *Community, Aid, Experienced Inclusion/Exclusion,*  
 253 *Positive Feelings, and Location Characteristics.* The major theme of *Aid* includes subthemes  
 254 (white boxes) of *Expertise* and *Supplies* and the major theme of *Community* includes subthemes  
 255 of *Activity* and *People* (Figure 4).



256  
 257 *Figure 4: Place Value Characteristics*  
 258

259 Participants perceived the value of *Community* as being fostered by engaging in  
 260 different activities and by building relationships and mentioned this value in relation to  
 261 locations more than any other value (Figure 4 ). The major theme of *Community* includes  
 262 subthemes of *Activity and People* to highlight how the value of community was discussed with  
 263 participants. The sub-theme of *activity*, includes specific activities that fostered the idea of  
 264 community and the sub-theme of *people* highlighted the types or characteristics of individuals  
 265 that were perceived to promote a sense of community. The importance of community aligns  
 266 with observational fieldnotes that frequently referenced the apparent courtesy and care that all

267 participants showed for one another as a community. For example, at the Newport nutrition  
268 and cooking classes, children were always fed first, almost everyone would help cook and clean  
269 together and consciously make sure there was enough food for others, including bagging of  
270 leftovers to take home. One participant even offered her entire meal to a homeless veteran  
271 who wandered into the church after a focus group session and was invited to join us for dinner.  
272 Understanding this nuanced context and meaning of *community* to Latinx coastal residents  
273 exemplifies the importance of focusing on instilling a sense of community in locations that are  
274 critical to community disaster response and recovery in order to be more inclusive and  
275 accessible. The theme of community was most often mentioned in relationship to Recreational  
276 spaces for Network and Clatsop participants (Figure 5 ). For example, a Newport participant  
277 noted that they enjoy camping at a specific location where they know other Hispanic families  
278 that are friendly.

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

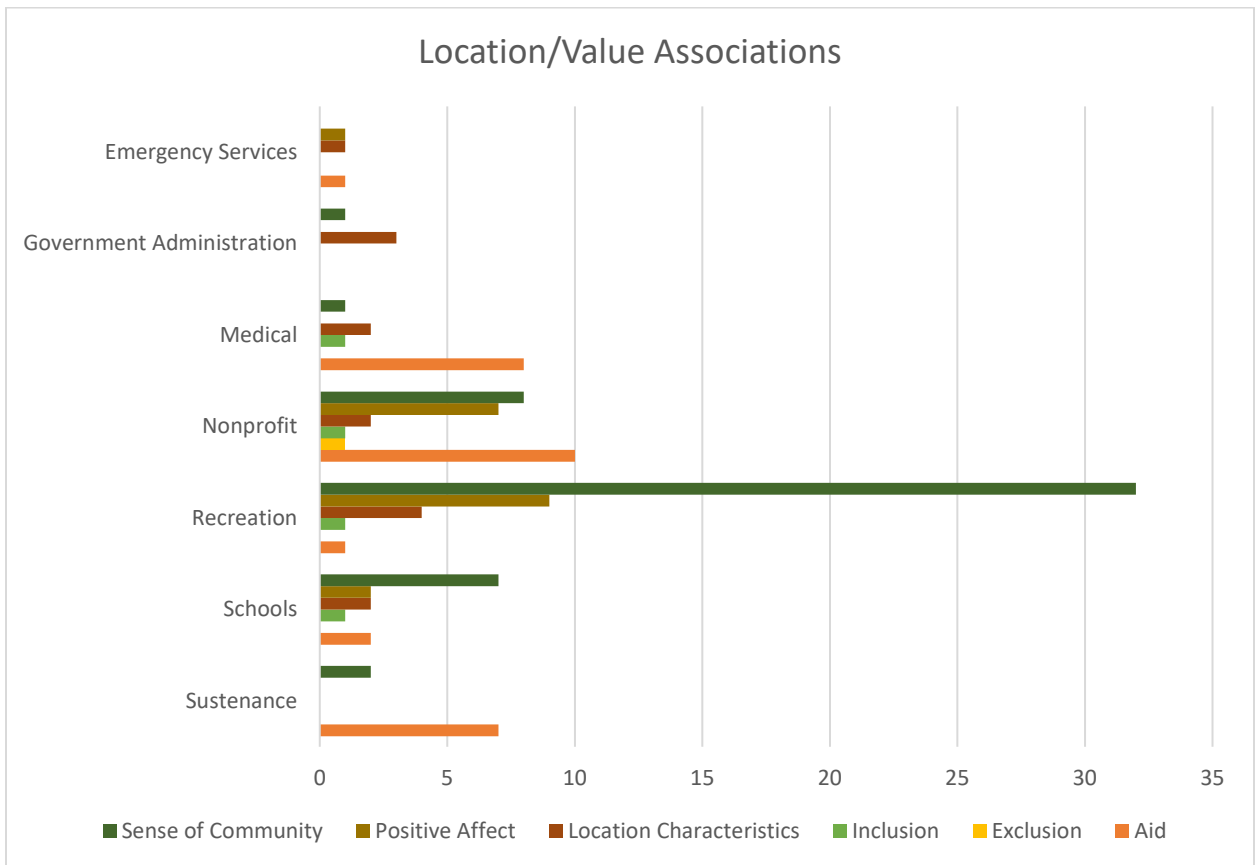
282 Another man from Newport stressed the importance of keeping his son active and  
283 involved in the community.

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

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



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



292  
 293                    *Figure 5: Values Associated with Location Types*

294  
 295                    The theme of *community* was associated next most with nonprofit locations for both  
 296                    Newport and Clatsop participants. Ethnicity is a notable value identified in the *Community-*  
 297                    *People* theme. Participants mentioned the importance of trustworthy Latinxs that have reliable  
 298                    information. For example a woman from Clatsop County discussed that a local Latinx focused  
 299                    resource center, the Lower Columbia Hispanic Council (LCHC, renamed as Consejo Hispano),

300 provides open communication and available information that would be needed in a state of  
301 emergency.

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

304 Churches were also mentioned in this context:

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

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

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

312 The next theme value associated the most with locations mentioned by participants was  
313 the theme of *Aid*. This theme included a sub-theme related to people providing aid “Expertise”  
314 and the tangible aid “Supplies.” Latinx participants associated Nonprofit locations with the  
315 theme value of *Aid*. The *Oregon Mass Care and Mass Displacement after a Cascadia Subduction*  
316 *Zone Earthquake* report acknowledges that while nonprofits are not currently considered  
317 critical facilities, Oregon does consider them as a “critical part of emergency response and  
318 recovery since they provide a range of social services that are essential to the livelihood of  
319 some of our most vulnerable community members” [39, p. 5]. Without nonprofits ready to  
320 assist currently and in the future, many people will be at a large disadvantage and lost without

321 the organizations they depend on. This sentiment is reflected in participant’s responses for the  
322 theme Aid, with the sub-theme “Expertise”:

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

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

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

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

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

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

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

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

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

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

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

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

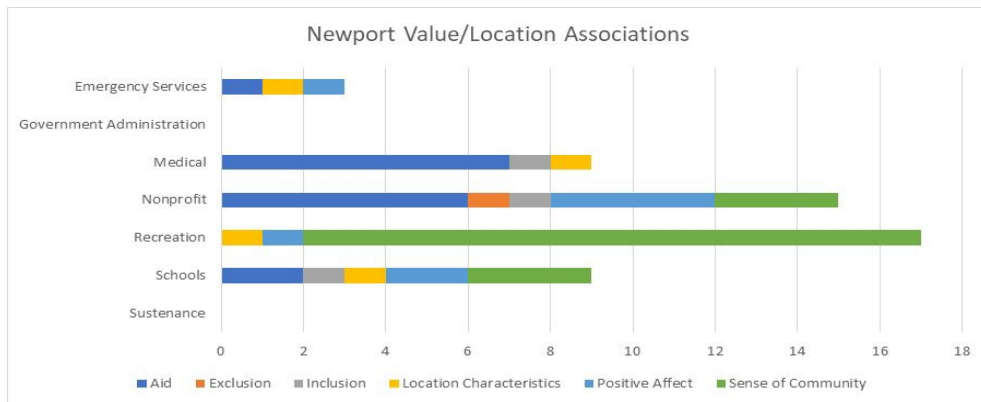
361                    *One time an American woman was hungry, and it gave me so much sadness. She*  
362                    *was desperate and told them it was raining, but they said "No" she was*

363 *desperate and screaming, but they [a nonprofit] told her to leave, the woman*  
 364 *went crazy and started beating and they took her out.*

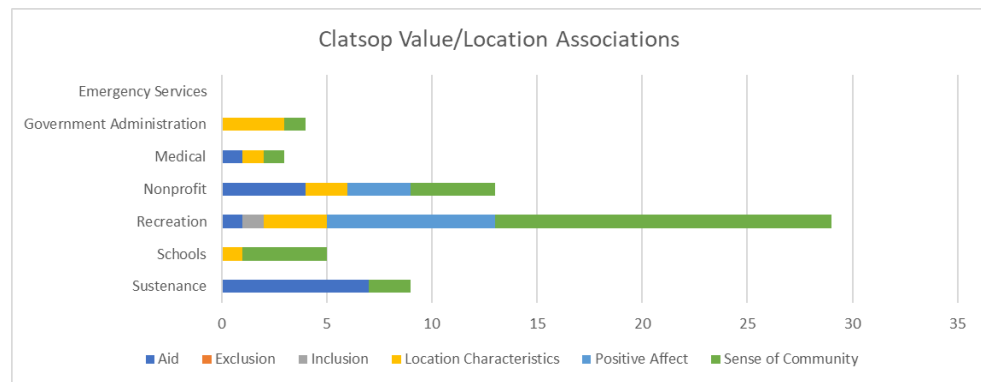
365 *Key Differences between Newport City and Clatsop County Latinx Residents*

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

373



374



375 *Figure 6: Location/Value Associations for City of Newport and Clatsop County, Oregon*

376

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

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

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

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

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

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

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

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

406 Only one association was found between the theme of *Aid* and government pre-  
407 determined locations (Medical) for Clatsop participants.

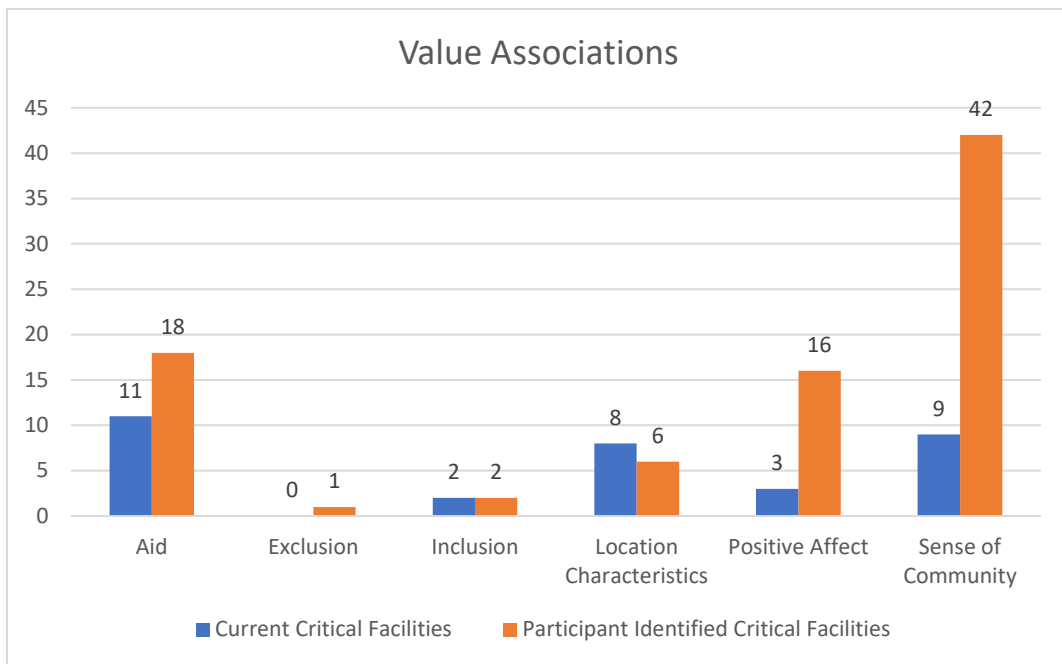
408 Overall, both groups had the most total value associations with Recreation places.

409 However, Newport participants had the most diverse set of values associated with Nonprofits  
410 (*Aid, Exclusion, Inclusion, Positive Affect, and Sense of Community*) and Schools (*Aid, Inclusion,*  
411 *Location Characteristics, Sense of Community*), while Clatsop participants most diverse set of  
412 values was associated with Recreation places (*Aid, Inclusion, Location Characteristics, Positive*  
413 *Affect, Sense of Community*).

#### 414 *Overlaps and Gaps between Place Values & Locations*

415 When examining the value associations between current critical facilities (e.g.,  
416 emergency & medical services, government administration, and schools) and identified by  
417 Latinx study participants, we found that participant-identified locations (e.g., nonprofits,  
418 sustenance, and recreation) were associated with more values in each value category except  
419 location characteristics (Figure 7). Quite notable study participants perceived the value of *Aid*,

420 to be *more* associated with locations that are *not* identified as current critical facilities in hazard  
 421 mitigation policies and planning documents [32]. Study participants perceived these locations,  
 422 such as nonprofits and churches, as having *more* resources and supporting services than  
 423 current critical facilities. Furthermore, the value of *Sense of Community* was mentioned the  
 424 most frequently by both Newport and Clatsop participants even though the majority of current  
 425 facilities were perceived by participants as lacking this value and thus could limit utilization of  
 426 current critical facilities during emergencies.



427  
 428 *Figure 7: Value Associations for Current Critical Facilities and Participant-identified Critical*  
 429 *Facilities*

430 Nonprofit locations and other participant-identified critical facilities were associated  
 431 most with the *Positive Affect* values and were seen as trustworthy and familiar locations while  
 432 most current critical facilities, except schools, were not associated with *Positive Affect* values.  
 433 Interestingly, the negative value of exclusion was *not* associated with any current critical facility  
 434 (the only reference of exclusion was in association with a nonprofit) while the value of inclusion



435 was associated with *both* current critical facilities and participant-identified critical facilities.  
436 The lack of reference to in/exclusion within all other locations does not necessarily mean they  
437 are inclusive or exclusionary, it simply means it was not mentioned within the discussions.

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

#### 443 **Discussion**

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

455 Furthermore, trusting relationships and feelings of belonging are tied to place  
456 attachment and in this study, were mentioned most often in reference to churches, nonprofits

457 and other places often utilized by Latinx residents. One explanation of why current critical  
458 facilities did not elicit strong place attachment and meaning may be due to the control of access  
459 of these places. Critical facilities identified by participants allow a high level of self-governance  
460 in access and utilization by community members, while current critical facilities, such as  
461 medical, emergency services, government administration and public-school locations do not  
462 allow this level of individual control of when and how to access or utilize them. These facilities  
463 require individuals to adhere to government protocols and policies to access and utilize. We  
464 also see evidence of this lack of control and access leading to feelings of exclusion in nonprofit  
465 locations that require documentation to access services. Extrapolating this to emergency  
466 management and disaster response, if sanctioned “safe” locations such as schools, police, or  
467 fire stations are perceived by marginalized community members as having heavily controlled  
468 access that may not include them, these community members may seek out alternative  
469 locations which are perceived as more welcoming, even if they are more vulnerable to hazards.  
470 For example, community members may opt to seek out their church or trusted nonprofit that  
471 may be in the inundation zone or lacks building retrofits to adequately withstand a strong  
472 earthquake, rather than going to government facilities due to fears around access or needing  
473 proper documentation.

474         This increased vulnerability lowers overall community resilience, or the ability of a  
475 community to “bounce back” after a disaster. While “resilience” is often seen by hazard  
476 mitigation planners, engineers and other practitioners as value-neutral, it is laden with the  
477 allocation of burdens and benefits among groups [43, 13] and begs the question of “resilience  
478 from what, for what, and for whom?” [13, p. 479]. Berkes and Ross [44] answer this call by

479 focusing on people-place connections, values and beliefs, social networks and the development  
480 of other community strengths. However, providing an equity lens to hazard mitigation  
481 planning, such as the determination of facilities that are prioritized for protection to offset  
482 hazard impacts, requires a systematic change in procedural justice in how decisions are made  
483 regarding what locations are deemed “critical” and needing protection and by whom. By  
484 focusing on equitable resilience, communities must consider issues of social vulnerability and  
485 differentiated access to power, knowledge, and resources [45, p. 218]. For example, by  
486 consciously striving to include Latinx perceptions of locations that are “safe” and where they  
487 “belong” within hazard mitigation planning processes and policies, decision-makers can work  
488 against the systematic and structural racism within institutions to change the historical  
489 practices of excluding marginalized communities from decisions that impact them directly and  
490 work towards equitable resilience. We offer below a few planning policy recommendations  
491 based on our findings. However, it should be noted that these recommendations should not be  
492 implemented without consultation with local community members, particularly those from  
493 underrepresented and marginalized groups.

#### 494 *Equitable Resilience Planning Recommendations*

495 In order to increase equitable resilience, emergency management can create more  
496 inclusive and comprehensive list of critical facilities by using the values and locations identified  
497 by participants as a guide to where and how to focus and share resources. First and foremost,  
498 emergency planners should respectfully engage with underrepresented and marginalized  
499 groups in their community and ask for recommendations about how current critical facilities  
500 could become more inclusive and increase a sense of belonging. For example, medical facilities

501 and emergency services can improve sense of community within them by hosting public events,  
502 such as open houses, with the activities (sports, education, parties, etc.) and people (family,  
503 youth, ethnicity) identified by participants in partnership with the locations such as nonprofits  
504 that are already perceived to hold these values.

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

### 518 **Study Limitations**

519 In-depth qualitative case studies are limited in their ability to reach all targeted  
520 population members. In this study, we were unable to hear the perspectives of all Latinx  
521 coastal residents and is not meant to be representative of all Latinx voices. However, key Latinx  
522 stakeholders that have a long history of belonging and engaging in these coastal communities

523 confirmed our results. Additionally, through continued involvement with these coastal  
524 communities and the Latinx community, we have heard similar locations mentioned and  
525 themes. Because the identification of critical facilities is an essential component of disaster risk  
526 reduction [1], we recommend that researchers modify and utilize the interview protocol and  
527 approach offered in this study to explore and identify potential inequities in disaster risk  
528 reduction planning. In addition, future research would benefit from the development of large-  
529 scale survey instrument to quantify and validate how underrepresented and marginalized  
530 voices perceive and utilize critical facilities and other community assets.

### 531 **Conclusion**

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

544 should be done with a diverse set of populations in order to ensure all voices are amplified in  
545 equitable resilience planning.

546

547

548

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556 Silte, Yaquina, Alsea, Coquille, Umpqua, Siuslaw, Kalawatset, Hanis Tribes and all other original  
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558

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