

1 **Fisheries allocations for socioeconomic development: lessons learned from the Western**
2 **Alaska Community Development Quota (CDQ) Program**

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46 **Fisheries allocations for socioeconomic development: lessons learned from the Western**
47 **Alaska Community Development Quota (CDQ) Program**
48 **- A Research Paper for submission to Ocean and Coastal Management**
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51 **1. Introduction**
52

53 The Community Development Quota (CDQ) Program was established in 1992 as a fisheries and
54 economic development program for Western Alaska communities. The Program was conceived
55 in the mid-1980s in response to the juxtaposition of the highly developed industrial pollock
56 fishery to highly undeveloped and economically impoverished Western Alaska communities.
57 “It’s unconscionable to leave the people that have been there for 8,000 years on the beach while
58 someone else gets the fish,” said Clem Tillion, who advocated for the creation of the program at
59 the time as a fisheries liaison for the Governor of Alaska (Clem Tillion, pers. comm., July 31,
60 2015).
61

62 The CDQ Program is similar to other fisheries allocation and access authorities for indigenous
63 peoples, such as the Boldt Decision in Washington State, the Maori Fisheries Act in New
64 Zealand, and the Marshall Decision in Canada. The access and/or allocation rights that resulted
65 from these settlements afforded the representative indigenous groups with capital to provide
66 employment, training, and scholarship opportunities for their people, and in some cases to re-
67 invest revenue into purchasing more fishing assets (Knuston, 1989; Day, 2004; Wiber and
68 Milley, 2007). The program is unique in the U.S. however for the volume and value of the
69 allocations and thereby the extent of the potential benefits that it can confer onto communities,
70 with the most recent available estimates of the groups’ net assets totaling \$900.7 million in 2013
71 (APICDA, 2015; BBEDC, 2015; CBSFA, 2015; CVRF, 2015; NSEDC, 2015; YDFDA, 2015).
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73 Despite the uniqueness of the CDQ Program, there has been limited research on it or on the
74 groups themselves (Ginter, 1995; Haynie, 2014; NMFS, 2017; NRC, 1999). This paper addresses
75 this knowledge gap and provides an institutional analysis of the Western Alaska CDQ Program
76 and a framework for how a CDQ-type program could be implemented in Arctic Alaska or
77 elsewhere.¹ This research is based on fieldwork in Western Alaska CDQ communities and
78 extensive discussions with CDQ Program representatives and stakeholders.
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80 Discussions over the development of a CDQ-type program in the north Pacific Ocean took place
81 over the course of a decade beginning in the 1980s. The North Pacific Fishery Management
82 Council (NPFMC), which manages fisheries in the U.S. North Pacific, considered the
83 development of a CDQ Program as part of the discussions and negotiations over the split of the
84 Bering Sea and Aleutian Islands (BSAI) pollock quota between inshore harvesting operations
85 (those making landings at shore-based processors) and those offshore (i.e. catcher processors)
86 and as a component of the proposed individual fishing quota program (IFQ) for the halibut and

¹ Throughout this paper, we refer to Western Alaska communities as those communities within the existent CDQ Program and Arctic Alaska communities as those coastal communities adjacent to Arctic Alaska federal waters, as described in NPFMC (2009). The literature on Western and Arctic Alaska communities described below may have utilized slightly different designations for these communities.

87 sablefish fisheries (NRC, 1999; NPFMC/NMFS, 2016). Because the inshore/offshore pollock
 88 allocation issue was advancing faster in the NPFMC process than the halibut and sablefish IFQ
 89 Program, the CDQ Program first developed as a component of the pollock allocations
 90 (NPFMC/NMFS, 2016). The CDQ programmatic structure of defined eligible communities and
 91 geographically designated CDQ groups adopted under the BSAI pollock fishery then became the
 92 default structure for considerations of community allocations under the IFQ Program; this
 93 represented a substantial refinement of community allocation considerations under the IFQ
 94 Program that had at different times included communities from Oregon to Alaska
 95 (NPFMC/NMFS, 2016). The CDQ Program itself was made permanent with the reauthorization
 96 of the Magnuson-Stevens Act (MSA) in 1996, providing the potential for future allocations into
 97 other BSAI fisheries and phased-in allocations of BSAI crab fisheries, which were approved by
 98 the NPFMC in 1995 (NRC, 1999).

100 The CDQ Program thus began initially with pollock allocations but quickly expanded to include
 101 allocations in all other federally managed Bering Sea and Aleutian Islands (BSAI) fisheries
 102 (Table 1). Each of the CDQ groups may harvest their allocation themselves or lease out the
 103 harvest of their allocations to non-CDQ entities or individuals. The CDQ Program received
 104 allocations under each of the rationalization or catch share programs in the BSAI, including
 105 within the nine BSAI rationalized crab fisheries, which are designated as either harvester or
 106 processor quota shares. The 2006 reauthorization of the MSA cemented the CDQ allocations of
 107 most directed BSAI fisheries at about 10% of the total allowable catch (TAC) (except that the
 108 allocations are gear and area-specific for halibut and sablefish) and provided for such an
 109 allocation in any commercial BSAI fishery established after the MSA enactment.

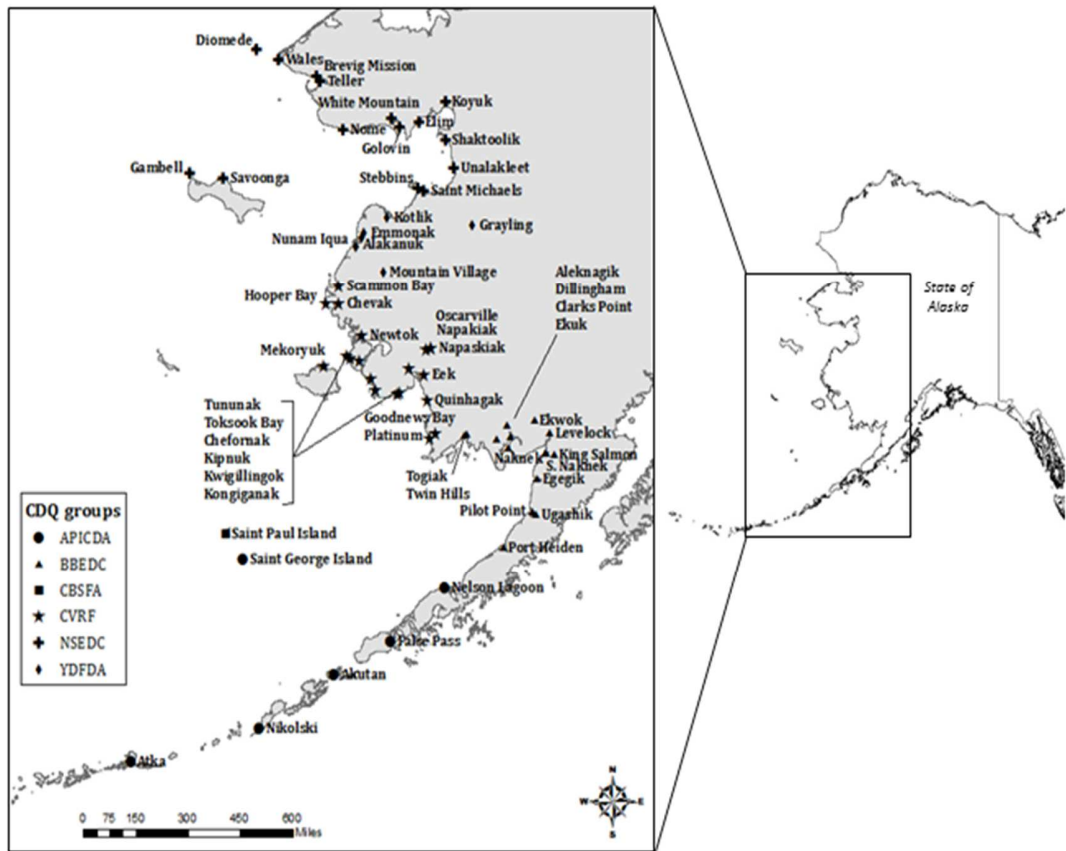
111 Table 1. CDQ programmatic allocations for each federally managed fishery.

Fishery	Management Program (Implementation Date)	CDQ Programmatic Allocation (percent of TAC)
Halibut	Halibut and sablefish IFQ (1995)	20% of Area 4B 50% of Area 4C 30% of Area 4D 100% of Area 4E
Sablefish	Halibut and sablefish IFQ (1995)	20% of BSAI sablefish fixed gear fishery 7.5% of BSAI trawl gear fishery
BSAI pollock	American Fisheries Act (1998)	10% of Bering Sea subarea 10% of Aleutian Islands and Bogoslof District
Other/non-pollock groundfish	Amendment 80 (2007)	10.7% of each groundfish species managed under Amendment 80
BSAI crab	Crab rationalization program (2005)	10.7% of each rationalized BSAI crab fishery

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113 Eligibility to participate in the CDQ Program was limited to communities that were a) within 50
114 miles of the BSAI, b) without previously developed fish harvesting or processing capacity, c)
115 recognized as a Native Village under the Alaska Native Claims Settlement Act of 1971, and d)
116 composed of residents who conducted 50% of their commercial or subsistence fishing in the
117 waters of the Bering Sea (Ginter, 1995). (It should be noted that although CDQ communities
118 were designated in part on the basis of recognition as a Native Village, CDQ benefits
119 (scholarships, employment, etc.) are not limited to Native residents of those communities). The
120 CDQ Program was established with geographic boundaries that excluded Arctic Alaska
121 communities north and east of the Bering Strait. Originally, the program included 56
122 communities, but by 1999 nine additional communities were determined to be eligible for
123 participation in the program by the National Marine Fisheries Service (NMFS, 2006).
124 Ultimately, these 65 CDQ-eligible communities were identified in a Congressional statute passed
125 in 2005 (NMFS, 2006). The goals of the CDQ Program are to 1) provide eligible western Alaska
126 communities with the opportunity to participate and invest in fisheries in the BSAI Management
127 Area, 2) support economic development in western Alaska, 3) alleviate poverty and provide
128 economic and social benefits for residents of western Alaska, and 4) achieve sustainable and
129 diversified local economies in western Alaska (MSA, 2006).

130
131 In 1992, each of the eligible communities held meetings at which fishermen were selected to
132 represent the community (NRC, 1999). Subsequently, six CDQ groups emerged aligned largely
133 on the basis of geographical proximity and cultural boundaries (NRC, 1999); although, as
134 discussed below, there continues to be some internal strife within the groups. These six
135 geographically designated CDQ groups are the Aleutian and Pribilof Island Community
136 Development Association (APICDA), the Bristol Bay Economic Development Corporation
137 (BBEDC), the Central Bering Sea Fishermen's Association (CBSFA), the Coastal Villages
138 Region Fund (CVRF), the Norton Sound Economic Development Association (NSEDCA), and the
139 Yukon Delta Fisheries Development Association (YDFDA) – (hereafter referred to as the CDQ
140 groups) that manage the CDQ fisheries allocations (Ginter, 1995) (Figure 1).
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Figure 1. Map of the CDQ Program’s eligible communities by CDQ group.

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As a historical military base, the community of Adak – the westernmost civilian occupied island on the Aleutian Chain – was not eligible to be included in the CDQ Program. The community, however, successfully advocated for its own fishing allocations in both the Aleutian Islands pollock (managed by the Aleut Corporation) and the western Aleutian Islands golden king crab (WAG) federal fisheries (managed by the Adak Community Development Corporation - ACDC). These allocations were intended to provide seafood harvesting and processing and economic development opportunities to the community of Adak (Consolidated Appropriations Act of 2004; NPFMC, 2004). Since this pollock allocation could not be fished for many years due to area closures for Stellar Sea Lion protections, the Aleut Corporation has not undertaken any associated development efforts in Adak, according to Corporation representatives. Following the model of the CDQ groups, ACDC collects royalties from the harvest of its WAG crab allocation, and the group has a mandate that its crab allocation be landed in Adak, as long as the processor is operational.

Under some current versions of MSA reauthorization, an equivalent program may be proposed in the future for Alaska’s northern communities if commercial fisheries are developed in U.S.

162 federal Arctic waters.² Currently, there are a few small-scale commercial fisheries that are
163 prosecuted in State waters (out to three nautical miles) in the U.S. Arctic including chum salmon,
164 herring sac roe, herring for crab bait, crab, shellfish, and whitefish (NPFMC, 2009). However,
165 there is a general prohibition on commercial fishing in U.S. federal Arctic waters due to a lack of
166 sufficient information on stock abundance, ecosystem interactions, and potential impacts of
167 climate change in the region (NPFMC, 2009). Scientific efforts are currently underway to
168 address these gaps (NPFMC, 2009; Wilson and Ormseth, 2009; NPRB, 2015).

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170 The paper is organized as follows: In the next section, we provide a brief overview of the socio-
171 economic challenges facing Western and Arctic Alaska communities and a review of other
172 fisheries allocations for economic development programs or regimes. We then present our field
173 work methods and an institutional analysis of the CDQ Program with respect to 1) the structure
174 of the groups, 2) participation of community residents in CDQ group activities, 3) reporting
175 requirements and oversight, 4) fisheries assets, 5) in-region fisheries development efforts, and 6)
176 broader socioeconomic development efforts. This is followed by a series of lessons learned from
177 the Western Alaska CDQ Program experience and conclusions. Many of the lessons learned
178 about managing assets for economic development purposes in Native and remote Alaska
179 communities are either similar between the CDQ groups and ACDC, or are contextualized in the
180 differences between them. Furthermore, earnings from fisheries allocations for Arctic CDQ
181 groups would likely fall closer to those of ACDC than to the Western Alaska CDQ groups due to
182 limited commercial fisheries resources in the Arctic. Therefore, the experiences of ACDC are
183 woven throughout the lessons learned section as well.

184 185 **2. Socioeconomic Challenges Facing Western and Arctic Alaska communities**

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187 Western and Arctic Alaska communities face many of the same socio-economic challenges.
188 Most of these communities are located in areas with access to rich natural resources and are
189 suitable for subsistence economies, but their locations (rugged, isolated, and remote) are not
190 compatible with private sector development (Smiddy, 2005). Employment is often limited to the
191 public sector and most residents in these communities rely on a mixture of commercial, wage,
192 subsistence, and transfer economies (Ginter, 1995; Himes-Cornell et al., 2013; Himes-Cornell
193 and Kasperski, 2015; Smiddy, 2005). The isolation and remoteness of Western and Arctic Alaska
194 communities translates into high living costs, unemployment rates, and poverty rates and these
195 communities struggle with other social problems including high rates of alcohol abuse, teenage
196 pregnancy, and suicide (Ginter, 1995; Howe, 2009; Huskey et al., 2004, Huskey, 2009; Lowe,
197 2015; Martin, 2009; Robards and Greenberg, 2007; Smiddy, 2005). Many of these communities
198 have had significant declines in population over the last several decades as their residents have
199 migrated to urban centers, which have affected school enrollment and retention (Department of
200 Commerce, Community and Economic Development, 2009; Himes-Cornell and Hoelting, 2015).

² Herein, U.S. federal Arctic waters are defined in accordance with the North Pacific Fishery Management Council's Arctic Fisheries Management Plan definition as all marine waters in the U.S. Exclusive Economic Zone of the Chukchi and Beaufort Seas from 3 nautical miles (nmi) offshore the coast of Alaska or its baseline to 200 nmi offshore, north of Bering Strait (from Cape Prince of Wales to Cape Dezhneva) and westward to the 1990 United States/Russia maritime boundary line and eastward to the United States/Canada maritime boundary (NPFMC, 2009). Definitions of the Arctic Alaska vary across U.S. and international agencies.

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3. Material and Methods

We collected both quantitative and qualitative information about the CDQ program and CDQ group participation in Alaska's federal fisheries. In the first phase of this study, we gathered historical and contextual information about the development of the CDQ program over time and the fisheries that the CDQ groups participate in. We gathered data from several existing data sources, including the CDQ groups' annual reports, websites, and Decennial Reviews (DCCED, 2013; APICDA, 2015; BBEDC, 2015; CBSFA, 2015; CVRF, 2015; NSEDC, 2015; YDFDA, 2015). To analyze the extent of fisheries participation by CDQ community and Adak residents, we compiled data on vessel registrations and State-limited entry permits from the State of Alaska's Commercial Fisheries Entry Commission (CFEC). We compiled data on CDQ group quota shareholdings from the National Marine Fisheries Service (2015; 2017) and publicly available reports (Garber-Yonts and Lee, 2016).

In the second phase of this study, we conducted interviews with representatives of the CDQ groups and their member communities. Interview topics generally included the needs of the respondent's community, the evolution of the CDQ Program and their group, the organizational structure of their group, their fisheries and other economic development programs, their outreach efforts, future challenges to the CDQ groups, and overall fisheries participation of their region's residents. The specific discussion topics covered in the interviews are provided in the Supplementary Materials. We surveyed between one and three representatives from five of the six CDQ groups. No representative from the sixth group was available for an interview; however, this group provided input through written correspondence. In total, we conducted semi-structured interviews with 10 CDQ group representatives. We initially made contact with the CEO of each group and allowed the group to identify the appropriate person for us to interview. In some cases, we interviewed the CEO directly. In others, we interviewed the vice president, the fishing operations and quota manager, or key long-term consultants that advise a CDQ group on fishing policy issues. Where possible, interviews were conducted in person. If this was not possible, interviews were conducted on the telephone. We also conducted semi-structured interviews with three representatives from Adak's ACDC and one person from the Aleut Corporation.

We conducted field site visits to select CDQ communities and Adak between April and August of 2015. We organized field visits to an annual meeting held in Anchorage, Alaska by APICDA (attended by staff and representatives from each of its communities) and to BBEDC's communities of Dillingham, Aleknagik, and Togiak. Additional field visits were not possible due to funding and time constraints. During these field visits, researchers attended fishing related community meetings and conducted semi-structured key informant interviews with 6 APICDA community residents, 8 Adak community residents, 18 residents of BBEDC communities, the BBEDC and ACDC representatives and staff. The selected key informants were chosen on the basis of their expertise about their community needs and the work of the CDQ groups in their community, and included city managers and administrators, tribal representatives, and village public safety officers. The key informants did not provide consent to

245 be recorded, therefore information from the interviews was captured through handwritten notes
246 taken by the interviewer.

247
248 We undertook a qualitative analysis of the information compiled from the
249 individual interviews, community meetings, and the presentations given at the APICDA annual
250 meeting. Using a grounded theory approach, we did a content analysis by comparing and
251 contrasting the answers from the key informant interviews and wrote a narrative summary of the
252 information we collected for each CDQ group (Glaser and Strauss
253 1967). We organized the narratives into the following themes: CDQ group structure,
254 CDQ resident input into the CDQ groups, reporting requirements and oversight, fisheries assets,
255 in-region fisheries development efforts, broader socio-economic development efforts, and
256 lessons learned from the history of the CDQ program. To complement the qualitative narratives,
257 we used the quantitative fisheries data to analyze historical trends in fishery permit, commercial
258 fisheries vessel ownership, and quota shareholdings by the CDQ groups. Finally, we did a
259 thorough literature review of NPFMC documentation and the scientific literature that has been
260 published on the CDQ program to summarize the history of the CDQ program
261 and to give context to the quantitative and qualitative results of this study.

262 263 **4. Institutional analysis of the CDQ Program**

264
265 Here, we present an institutional analysis of the CDQ Program by focusing on the groups'
266 operational directive under the CDQ Program. We describe the structures of the groups, the tools
267 that they have utilized to integrate input from their residents into their decision-making, the
268 evolution of the CDQ Program itself and its reporting requirements. We also examine the
269 fisheries and socioeconomic development programs that the groups have employed and how
270 those have been informed by local fisheries accessibility and socioeconomic realities. This
271 section provides the context for the lessons learned section that follows.

272 273 *4.1 CDQ group structure*

274
275 One of the drivers of the distribution of benefits from fisheries allocations is the organizational
276 structure of the recipient entity. The CDQ groups and ACDC have organized themselves as non-
277 profit organizations, with for-profit subsidiaries that manage the groups' fishing assets and
278 investments. As non-profit organizations, the groups may allocate funds to non-profitable
279 initiatives without having to account to shareholders. Furthermore, they distribute benefits to
280 their stakeholders through development programs rather than dividend payments.

281
282 Each of the CDQ groups has an executive body, comprised of a CEO, financial advisor,
283 accountant, and programmatic staff that, informed by the Board of Directors, makes decisions
284 about how to invest capital, utilize fishing allocations and assets, and implement development
285 programs. These executive bodies are staffed by professionals, often with decades of experience
286 in their fields, and are located in Anchorage and Juneau. Increasingly CDQ groups are staffed by
287 CDQ residents, some of who have benefited from higher education support offered by the
288 groups. The CDQ groups have been able to recruit qualified candidates because of the highly
289 remunerative fisheries allocations that they have received since the onset of the program. The

290 groups have needed to have such people on staff especially as their assets, in-region programs,
291 and fisheries allocations have become more complex. In contrast, the ACDC only has an
292 allocation of crab to manage and one staff person.

293

294 *4.2 CDQ resident input into the CDQ groups*

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296 The structure of the CDQ group can have implications for how CDQ community residents
297 interact with the group. The CDQ groups are mandated by legislation to have a Board of
298 Directors, at least 75% of which must be comprised of resident fishermen from the group's
299 communities (MSA, 2006). As such, residents of their communities directly inform the groups'
300 investments, policies, and programs. Under the CDQ structure, the members of the organizations
301 are the communities rather than individuals. This has driven the election process for the Board of
302 Directors to be part of municipal or similar types of elections (in contrast to elections that are
303 held at meetings of corporate shareholders) (NRC, 1999). Similarly, ACDC has a Board of
304 Directors, whose members are elected for three-year terms in municipal elections in Adak.

305

306 The groups also interact with their residents through their regional offices and meetings in the
307 communities. Only two of the groups have their headquarters in one of their member
308 communities. This is likely to be an artifact of previous reporting requirements and associated
309 planning and monitoring necessities, described below. Representatives for these two groups
310 indicated that having an in-region presence is critical for understanding the needs of their
311 communities and for effectively providing services to their residents. All of the groups also
312 regularly either have meetings within their communities or they provide funding for residents to
313 attend out-of-region meetings with CDQ staff. These gatherings provide a venue for residents to
314 hear about their group's programs and funding opportunities and for staff to hear about residents'
315 needs and progress on projects. The CDQ groups also communicate with their respective
316 residents through their community liaisons, annual reports, and newsletters.

317

318 *4.3 Reporting requirements and oversight*

319

320 When the CDQ Program was established, there was a competitive bidding process among the six
321 groups for portions of the CDQ programmatic harvesting allocations. The groups were evaluated
322 on the basis of their community development plans, which had to include three types of
323 information – community development information, business information, and a statement of the
324 managing entity's qualifications. The information required under these headings was substantial
325 and for some areas highly detailed. For example, community development information included
326 project description, allocation requested, project schedule, employment and educational
327 programs, existing infrastructure, capital uses, and short- and long-term benefits; within the
328 employment rubric itself the CDQ group had to provide information on the number of
329 individuals to be employed, the nature of the work provided, the number of employee-hours
330 anticipated per year, and the availability of labor from local communities (NRC, 1999). These
331 plans were evaluated by the State of Alaska on the basis of how they addressed development of a
332 self-sustaining local fisheries economy, local employment, and community development, and the
333 State made recommendations for allocations, which were reviewed by the NPFMC and NMFS
334 (NRC, 1999). Due to the expansion of the CDQ Program into various BSAI federally managed

335 fisheries in the first several years of the program, by 1999, the groups had been subject to five
336 planning and review cycles (NRC, 1999).

337
338 This initial oversight process proved to be controversial and onerous. Over the first several years
339 of the CDQ Program, redistributions of programmatic harvesting allocations were about 1% to
340 3% for pollock and upwards of 14% for some of the groundfish species.³ The pollock
341 reallocations between the groups represented shifts of millions of dollars without specific reasons
342 being given for the reallocations (NRC, 1999). The State had a set of 16 criteria that it used to
343 evaluate the groups, with a complex scoring system and opaque threshold levels for quota
344 reallocations (NRC, 1999). In addition, the review and planning process was a huge effort for the
345 CDQ groups with substantial administrative and overhead costs for hiring consultants,
346 developing annual plans, complying with regulatory mandates, exercising fiscal control, and
347 tracking programmatic successes (NRC, 1999).

348
349 The 2006 reauthorization of the MSA cemented the distribution of the programmatic allocations
350 to each of the CDQ groups at the March 1, 2006 level. It also removed the mandate for State
351 approval of the community development plans, replacing the previous review process with a
352 decennial review. The decennial review process, which can result in up to a 10% reallocation for
353 each species, is based on self-reporting by the groups with respect to four criteria: 1) socio-
354 economic conditions in the group's member communities, 2) overall financial performance of
355 the group, 3) workforce development in the group's member communities, and 4) achievement
356 of the goals of the group's community development plans. Under the new reporting requirement,
357 the groups have complete autonomy in weighting the four criteria.⁴

358 359 *4.4 Fisheries assets*

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361 Since their nascence, all of the CDQ groups have partnered with experienced BSAI commercial
362 fishing companies to harvest or lease their allocations using revenue sharing or royalty fee
363 arrangements. Although most of the groups continue in these types of harvesting arrangements,
364 they have also since invested in subsidiaries and in their own vessels, with ownership stakes
365 ranging from 9% to 100%, see Table 5 in NMFS (2017) for a full breakdown of CDQ vessel
366 ownership. These investments have allowed the groups to increase the revenues that they
367 generate from their CDQ allocations and in some cases increased quota allocations in BSAI
368 fisheries (NMFS, 2017). CVRF is the only group that established itself as a fully vertically
369 integrated company, with 100% ownership of its fishing vessels. Since 2004, revenue from
370 investments has exceeded royalty income for all CDQ groups (NMFS, 2017).

371
372 CDQ representatives noted that they have applied a diversified investment strategy in BSAI
373 fishing assets to minimize their risk in an industry prone to high variability. Each of the groups
374 has invested in quota shareholdings in the Pacific halibut and sablefish IFQ fisheries (with CDQ
375 ownership of close to 1% of the total shares in each fishery), with greater overall holdings in the

³ The CDQ annual matrices are available at the link below. Change the reference year at the end of link for the desired year. <https://alaskafisheries.noaa.gov/sites/default/files/reports/annualmatrix1997.pdf>

⁴ The first round of the Decennial Reviews took place in 2013, see: <https://www.commerce.alaska.gov/web/dbs/CDQInformation.aspx>

376 sablefish fishery (NMFS, 2015). CDQ representatives noted that limited investments in quota
377 shares in the halibut IFQ fishery reflect concerns about decreasing TACs. Relative to the halibut
378 and sablefish IFQ fisheries, the CDQ groups have made substantially larger investments in, and
379 hold larger percentages of, the overall quota shares in the BSAI rationalized crab fisheries. Total
380 quota shareholdings owned by CDQ groups range across the BSAI crab fisheries from 14% to
381 59% for harvester shares and from 12% to 30% for processor shares (Garber-Yonts and Lee,
382 2016). However, the groups have made substantially different investments in these fisheries,
383 with some of the groups near or at the allowable limit for CDQ group ownership of harvester
384 shares (according to CDQ representatives), while others have invested in processor quota shares
385 instead of harvester shares (Garber-Yonts and Lee, 2016). Returns from pollock harvests have
386 historically (NMFS, 2017) and continue to (according to CDQ representatives) dominate CDQ
387 portfolio returns.

388

389 *4.5 In-region fisheries development efforts*

390

391 The CDQ Program is largely a fisheries development program. The CDQ groups are constrained
392 to spend most revenue earned from their allocation on operating costs, and fisheries related
393 capital, training, education, jobs and infrastructure development, although they may spend up to
394 20% of their annual revenue on non-fisheries related in-region economic development projects
395 (MSA, 2006).

396

397 Although generally limited, prior to the implementation of the CDQ Program, there was some
398 variability in historical participation of CDQ community residents in commercial fisheries. The
399 degree of pre-CDQ commercial fisheries participation was determined by a combination of
400 economic factors including access to productive fishing grounds and markets (buyers) for fish, as
401 well as cultural factors, such as European influence during the 1800s and 1900s and the cohesion
402 of commercial and subsistence fishing traditions (NRC, 1999). For example, the Aleuts (the
403 Native people of the Aleutian Islands) were heavily influenced by the commercial drive of
404 Russian traders and settlers and had access to local salmon fisheries as far west as False Pass.
405 This led to the adoption of a commercial fishing identity by some Aleut communities and local
406 participation in the salmon and to a much lesser extent the BSAI crab fisheries (NRC, 1999). The
407 Athabaskans of Bristol Bay also had a history of fishing in their area - on drift gillnet boats
408 owned by salmon canneries and on setnet sites largely run by women (ibid.). On the other hand,
409 the Aleuts of the Pribilof Islands and the Yup'ik and Inupiaq of the Yukon and Kuskokwim
410 River deltas and the Norton Sound area had limited access to markets for their fish, which
411 limited their participation in commercial fisheries (ibid.).

412

413 The CDQ groups have sought to increase fisheries participation in their communities within an
414 overall context of general consolidation in Alaska's fisheries. Over the last several decades, most
415 of Alaska's State and federal fisheries have transitioned to management under a catch share or
416 limited entry program. In some cases, these management shifts have resulted in massive
417 consolidation and the migration of fishing privileges out of rural Alaska communities and
418 sometimes Alaska altogether, concurrent with increasing entry costs (Knapp 2011; Carothers,
419 Lew, and Sepez, 2011; Szymkowiak and Himes-Cornell, 2015).

420

421 One of the most significant ways through which the CDQ groups promote fisheries participation
422 in their communities is by subsidizing regional processing capacity. Amongst the groups, only
423 BBEDC's communities have historically had processing capacity for fish species that could be
424 harvested by residents. The processors that existed in the other CDQ communities processed
425 species that are generally not harvested by locals, including pollock and crab. All of the groups
426 have established processing capacity in some of their communities for resident-caught fish. CDQ
427 representatives noted that the groups' revenues from their BSAI fishing operations subsidize
428 these in-region processors, many of which operate at a substantial annual loss – upwards of
429 several millions of dollars. Several of the CDQ groups' representatives noted concerns about
430 their capacity to sustain such losses in the long run. As an example, CVRF closed its Platinum
431 salmon processing plant in 2016 as a result (Demer, 2016). Some of these processing operations
432 are staffed almost exclusively by regional residents, while others are staffed primarily by non-
433 residents due (according to CDQ representatives) to a lack of interest from residents in working
434 in the facilities. According to its representatives, ACDC has similarly spent several hundred
435 thousand dollars over the years in stopgap processing capacity, but lacks sufficient capital to be
436 able to subsidize a permanent large-scale processor in Adak, which many Adak residents noted
437 was the key to the long-term viability of their community. The CDQ groups' efforts at creating
438 processing capacity in their communities are within a context of an overall decline in shoreside
439 processors in Alaska over the last several decades (Fissel et al., 2015; NPFMC/NMFS 2016).

440
441 The CDQ groups have funded various fisheries-related infrastructure projects in their
442 communities and most of the groups have a low-interest loan or subsidy program for residents to
443 be able to purchase fishing vessels, gear, and/or permits. In Alaska, local municipalities
444 generally maintain harbors with limited funding from the State (ASCE 2016), and CDQ money
445 can be used to leverage additional grants for various marine infrastructures by matching funds.
446 For example, NSEDC offers grants to their communities for constructing or renovating fisheries-
447 related infrastructure, such as fish processing facilities, docks, and harbors. CVRF built
448 community service centers in each of its communities, which serve as facilities to maintain,
449 repair, and service boats and gear. The largest variety of subsidy and loan programs for fishing-
450 related purchases is offered by BBEDC, which targets an array of potential financial needs with
451 various funding levels and interest subsidies, down payment grants, equity assistance and
452 financial training (BBEDC, 2015).

453
454 The CDQ groups have also sought to create fishing opportunities for their residents by
455 developing specialized markets for CDQ-resident fish products, by advocating before fisheries
456 management bodies, and by providing funding to research entities conducting stock assessments.
457 Several of the groups have established their own subsidiaries or relationships with existent
458 seafood vendors to market the quality as well as the unique cultural and economic development
459 aspects of their residents' seafood products. The CDQ groups have also successfully advocated
460 for fisheries allocations and fishing opportunities for their residents to the NPFMC. Perhaps the
461 greatest example of this, the groups helped to realize an expansion of CDQ allocations to
462 groundfish species and crab when these programs went under a license limitation program, years
463 prior to transferable allocations being given to anyone else for these fisheries. The CDQ groups
464 have also benefited from regionalization of crab quota shares, flexibility in where halibut quota
465 shares may be landed, and lifting of a mandate for a limited license permit for small boat

466 fishermen in the CDQ Pacific cod fishery. The ACDC has similarly adopted an advocacy role to
467 the NPFMC, most recently successfully appealing for a shoreside landing requirement in the
468 federal Aleutian Islands cod fishery, which takes place near Adak (NPFMC, 2015). Several of
469 the CDQ groups also have research arms or provide funding to research entities intended to
470 improve fisheries management and opportunities for their residents (APICDA, 2015; BBEDC,
471 2015; CBSFA, 2015; CVRF, 2015; NSEDC, 2015; YDFDA, 2015).

472
473 The CDQ halibut fishery represents the only CDQ programmatic allocation that is harvested by
474 CDQ residents due to its relative accessibility in nearshore waters. For four out of the six CDQ
475 groups, the vast majority of CDQ halibut is harvested by CDQ residents, and according to CDQ
476 representatives, the groups do not charge their residents a lease fee for harvesting their CDQ
477 allocations. The other two groups utilize a harvesting partner or their own CDQ-owned vessels to
478 harvest the allocation, because the resource is too far offshore to be accessible to the (generally)
479 small resident-owned vessels according to CDQ representatives. Because most CDQ residents
480 were not participating in the commercial halibut fishery prior to the implementation of the CDQ
481 Program, the harvest of CDQ halibut represents a wholly new fishing opportunity. The other
482 species allocated to the CDQ groups are in offshore, deep waters that are not easily accessible to
483 CDQ residents. Due to capital constraints, most CDQ resident fishermen fish from small (16 to
484 30 foot), open skiffs, which limit their geographic range for fishing and the species that they can
485 target. In addition to some investments in halibut quota shares, the CDQ groups recently
486 successfully advocated for the privilege in low halibut stock abundance years to lease halibut
487 IFQ (which is generally prohibited in the Pacific Halibut and Sablefish IFQ Program and can
488 then be harvested by CDQ residents) in order to provide their residents with more of these
489 harvesting opportunities (NPFMC, 2017). Similarly, through its for-profit subsidiary, ACDC
490 purchased halibut and sablefish quota shares, for harvest by Adak residents.

491 492 *4.6 Broader socio-economic development efforts*

493
494 The CDQ groups have adopted a variety of mechanisms and programs to support overall socio-
495 economic development in Western Alaska. All of the groups have an annual community grant
496 that may be used for a variety of development projects by the CDQ communities, with funding
497 levels varying substantially across the CDQ groups, from \$10,000 to \$500,000. The CDQ groups
498 also have a variety of funding programs that target educational and personal development, with
499 higher education scholarship totaling just over \$2 million across all of the groups in recent years
500 (see the groups' annual reports). CDQ representatives and residents noted that many of their
501 communities lack the type of employment that would incentivize scholarship recipients returning
502 to their communities; however, CDQ representatives also commented that there has been an
503 increase in employment of its residents within the CDQ management body itself due to these
504 increasing skillsets. Furthermore, there is often a flow of remittances back to the communities
505 from these non-residents, and this monetary income is a critical component of maintaining
506 subsistence traditions as residents increasingly rely on technological improvements for
507 subsistence practices (Kruse, 1986; Langdon, 1991; NRC, 1999; Wolfe, 1986). The groups also
508 coordinate in-region vocational trainings and fund daycare programs, summer camps,
509 internships, as well as substance abuse prevention and treatment programs.

510

511 The CDQ groups' non-fisheries socioeconomic development programs have evolved in response
512 to the changing needs of CDQ residents and the utility of the programs themselves. The
513 infrastructure and community grants and personal development funds are important resources for
514 residents who are not fishermen and for the communities themselves. However, CDQ
515 representatives and residents noted that not all of the communities are equally adept at ensuring
516 that community grants are well spent. Furthermore, the CDQ groups have applied different
517 mechanisms for distributing community grants with some providing funding levels based on
518 community population while others allocate equal funding to all communities.

519

520 Many of the CDQ groups also provide direct subsidies to their community residents to mitigate
521 rising fuel costs (DCCED, 2016), which were noted by representatives and residents as a
522 particular area of concern for the future of CDQ communities. CDQ representatives remarked
523 that as some of their communities' populations grow, these subsidies are spread over fewer
524 people and in general, the rising price of fuel results in less disposable income, which has
525 negative implications for the local economies.

526

527 **5. Lessons learned for the implementation of a CDQ-type Program in Arctic Alaska**

528

529 Over the 25 years since the implementation of the CDQ Program, the CDQ groups have
530 continuously transformed how they approach fisheries and socio-economic development in their
531 communities. The following section condenses this wealth of institutional knowledge into a few
532 key lessons for the development of CDQ-type program in Arctic Alaska. Although this section is
533 tailored towards the institution of a CDQ program in Arctic Alaska, these lessons can be applied
534 to other regions as well.

535

536 *5.1 The organizational structure of the groups is critical.*

537

538 The CDQ groups have organized themselves as non-profit corporations with membership
539 comprised of geographic communities rather than individuals. Many CDQ residents interviewed
540 for this study compared this non-profit structure to the for-profit structure of ANCSA
541 corporations, noting that the former provides longer-term benefits locally through direct
542 investments in the community. ANCSA corporations distribute their financial resources largely
543 through dividend payments to individual shareholders who may or may not actually reside in the
544 community. (It should be noted that some ANCSA corporations have made direct investments in
545 projects within their communities). In addition, the CDQ membership structure may mitigate
546 potential intergenerational inequities in program benefits because membership is not fixed to a
547 group of individuals. This also prevents what can be complicated inheritance structures or the
548 issuance of new stock for new shareholders, an issue with which some of the ANCSA
549 corporations have struggled (Blair, 2016).

550

551 *5.2 Community residents should have meaningful input into CDQ group evolution.*

552

553 The CDQ groups have employed a variety of mechanisms to ensure communication between
554 CDQ staff and residents, including holding in-region meetings, employing community liaisons
555 and in-region staff, and developing regular newsletters and annual reports. Both CDQ

556 representatives and residents interviewed for this study indicated that these various avenues
557 foster good communication between the two. However, CDQ group representatives noted that
558 the groups may need to be more effective at communicating that CDQ funding is accessible to all
559 CDQ community residents, not just Native Alaskans. That is, although eligibility to participate in
560 the program was initially limited to predominantly Native Alaska communities, eligibility to
561 receive benefits from the CDQ groups is based on residency and not ethnicity. This
562 misunderstanding of CDQ benefits has been an issue since the start of the program (NRC, 1999)
563 and may in part be attributed to several factors, including that the CDQ groups often allocate
564 community grants to Tribal entities and that they have Boards largely or solely comprised of
565 Tribal members.

566
567 One of the persistent themes that we heard in our interviews with CDQ representatives and
568 residents was that the Board of Directors provides a critical link between the groups and their
569 residents. CDQ representatives and residents alike noted that these Boards drive fisheries and
570 socio-economic development policies for the CDQ groups. Furthermore, because these Boards
571 are comprised of regional residents, they are arguably informed about local needs and directly
572 affected by the success of CDQ programs.

573
574 Another lesson specific to the Board of Directors is that internal cultural differences unless
575 somehow addressed may stymie progress and the degree to which a CDQ group can effectively
576 confer benefits onto its residents. Some of the groups include communities that have historically
577 identified themselves as separate people utilizing different language groups (NRC, 1999).
578 Furthermore, CDQ representatives recounted that historical conflicts between communities and
579 tribes in Western Alaska (documented in Funk, 2010; Maschner and Reedy-Maschner, 1997),
580 continue to underlie interactions on some of their Boards of Directors and limit the capacity of
581 communities to coordinate applications in order to maximize the utility of community grants.
582 Internal conflicts over indigenous fisheries allocations or access rights have been documented in
583 numerous other instances (Clark, 1985; Knuston, 1989; Day, 2004; Wiber and Milley, 2007;
584 Capistrano and Charles, 2012). For one CDQ group that was experiencing this kind of conflict, it
585 noted that equalizing the communities on the Board of Directors and with respect to the annual
586 community grant (each community has one representative on the Board and an equal amount of
587 potential grant funding irrespective of its population) helped to assuage these internal conflicts.

588
589 *5.3 Allocations amongst CDQ groups should be stable, transparent and equitable.*

590
591 In the first several years of the CDQ Program, there was fundamental uncertainty about the
592 longevity of the program itself and the allocations between the groups. As a result, some of the
593 groups made investments intended to yield the quickest economic returns rather than the most
594 sustainable, which in some cases meant ignoring the programmatic desires of CDQ residents
595 (NRC, 1999). According to CDQ representatives, uncertainty over inter-group allocations also
596 shaped development decisions that may not have been efficient or effective and caused the
597 groups to allocate substantial financial and human capital resources to developing community
598 development plans rather than implementing programs that affected positive change in their
599 communities. Shifting allocations on the basis of poor performance is in effect punishment for
600 residents encompassed in a CDQ group that is mismanaging its assets and already providing

601 mediocre services to its residents. Instead, as described in more detail below, it may be more
602 effective for CDQ groups to be afforded stable allocations and to be subject to an evolutionary
603 review process that provides substantial oversight during the nascent stage when the groups are
604 the most likely to need it.

605
606 The multi-million dollar quota reallocations between the CDQ groups by the State of Alaska
607 over the first decade and a half of the Program were based on a process that was not necessarily
608 transparent to CDQ representatives or residents. According to CDQ representatives, this meant
609 that they were not necessarily making the best investment or programmatic choices for their
610 residents. Therefore, not only should allocations amongst the CDQ groups be stable, but the
611 process leading to those allocations should be transparent as well.

612
613 Over the last several years, relations between some of the CDQ groups have been fraught due to
614 concerns about the inequities of inter-group allocations, which have at least in part grown out of
615 the historical instability and ambiguity of the State's reallocation process. This conflict has
616 resulted in what one CDQ representative called the "virtual dissolution" of the Western Alaska
617 Community Development Association, the trade association comprised of six representatives
618 from each of the CDQ groups that was established under authority of the reauthorized MSA in
619 2006. Previously, through this association, the groups had been coordinating efforts to bulk
620 purchase fuel for their communities in order to provide cheaper energy to their residents and to
621 develop unified substance abuse treatment efforts, according to CDQ representatives. CDQ
622 representatives noted that the continued conflict over allocations has sidelined these concerted
623 efforts and limited the groups' capacity to have a unified front before the NPFMC, although
624 some of the groups continue to work together on fishery policy advocacy, coordinating fish
625 buyers in their communities, and even partnering on acquisitions.

626
627 *5.4 The need for oversight and reporting should evolve.*

628
629 The most effective reporting requirement for CDQ groups may also be one that is evolutionary,
630 with more oversight at the onset of a new management program, by a diversified panel of
631 reviewers, as emergent entities are learning how to manage their allocations. The review panel
632 should be comprised of an independent group of State, Federal, and Western Alaska CDQ
633 managers, as well as fisheries and (potentially) other business representatives, who can evaluate
634 any new CDQ-type groups and provide pragmatic advice for improving performance. There has
635 been evidence of mismanagement of allocations and the need for external oversight especially
636 during the onset of new programs intended to provide socio-economic development benefits
637 through natural resource allocations (Anders and Anders, 1986; Colt, 2001; Smiddy, 2005).
638 Similarly, there were some growing pains with respect to poor investments and mismanagement
639 for both CDQ groups and ACDC. For example, the original group that managed the CDQ
640 allocations for the 20 communities now represented by CVRF had to dissolve in the late 1990s
641 after a failed partnership in a catcher-processor vessel, which underwent foreclosure proceedings
642 (NRC, 1999). According to ACDC representatives, in its beginnings, the group spent several
643 hundred thousand dollars on "Band-Aid processing capacity" that was ultimately not utilized. A
644 CDQ representative noted that there was some necessity for personnel evolution as well, because
645 some staff had insufficient experience for their positions.

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However, initial requirements for oversight and reporting should respond to the changing needs of the program and the capacity of the groups to manage their allocations effectively. Furthermore, representatives of the Western Alaska CDQ groups noted that their programs are constantly evolving to meet the changing realities and needs of their residents and to address potential flaws in their existent programs. During their nascent stage, the groups may not be able to cover the resource requirements for implementing new programs in their communities. As such, any snapshot of a group’s fisheries and socio-economic development efforts, especially in this initial stage, may not provide an adequate picture of the group’s potential in this arena. The review panel may also evolve in response to the potentially changing expertise needed and desired by the groups.

5.5 Performance metrics and evaluations should account for programmatic tradeoffs, local perceptions of sustainability, and broader social trends.

When programs have multiple and at least somewhat conflicting objectives, there is an inherent trade-off between optimizing objectives. For example, maximizing revenues from halibut CDQ allocations can provide revenue for community-level investments, but this may be at odds with providing direct fishing and earning opportunities to CDQ residents. Thus, CDQ groups should be explicit about their trade-off decisions and account for the desires of their residents in the objectives that they optimize. Although Board of Directors’ programmatic and investment decisions should reflect these desires, one CDQ resident expressed concerns about nepotistic choices by their representative Board member. Therefore, community residents should vote at CDQ implementation and on a regular basis afterwards on community-specific and group-wide objectives, which would serve as a check on Board member votes and group decisions.

CDQ performance metrics should broadly reflect local notions about what defines community sustainability, as these may be fundamentally different from conventional Western ideas derived from a focus on wage economies. For example, when asked to define community sustainability in the face of potential climate change impacts, members of Arctic Alaskan and Canadian communities identified five common goals, which centered on control over and continued use of local lands and resources, education, a thriving culture, and a compatible cash economy (Kruse et al., 2004). This aligns with a holistic understanding of development “as a process that enhances the effective freedom of the people involved to pursue whatever they have reason to value” (WCCD, 1995). Communities could similarly identify broader social objectives for an Arctic CDQ Program that converged with the realities of their existence and value system. Associated measurable response variables could then be identified, which, like Kruse et al. (2004), could span a comprehensive notion of well-being including subsistence use patterns (target species and harvest quantities), traditional language usage, and traditional and Western educational attainment. Other metrics of community sustainability and health could also supplement group evaluations (e.g., life expectancy, infant mortality, substance abuse rates, crime rates, unemployment, population, and median income).

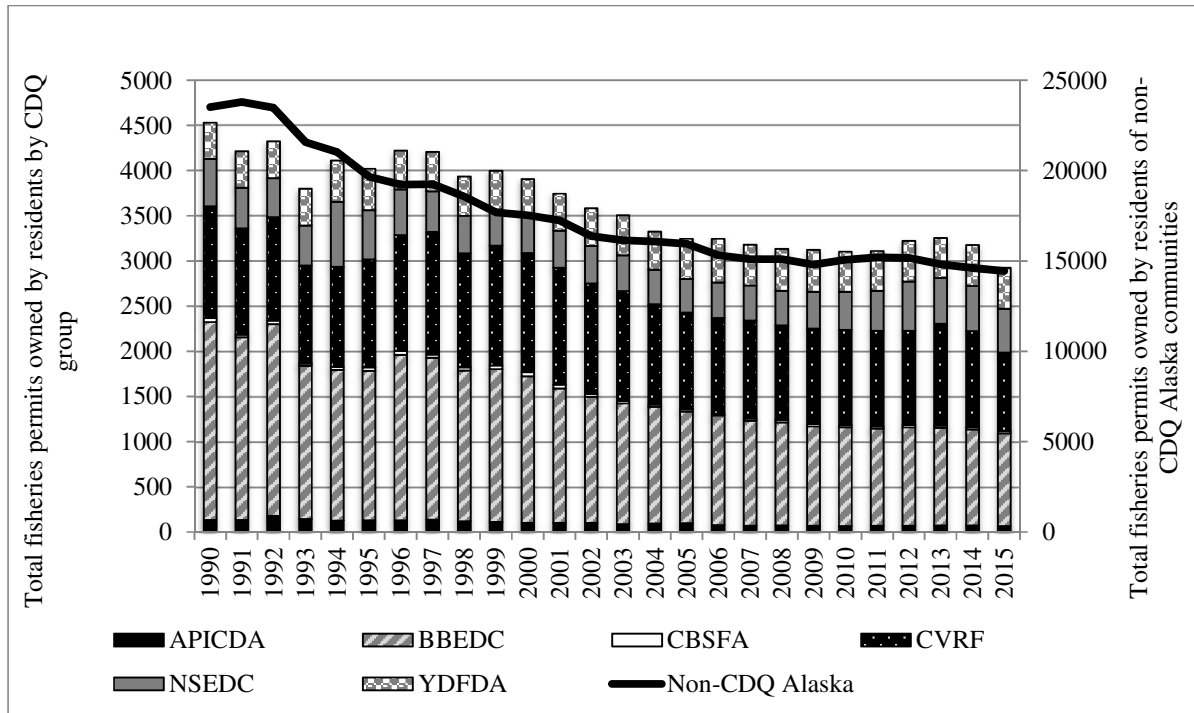
Any evaluation of the CDQ groups that simply provides trends in community sustainability or health indicators will be inherently limited by a lack of an appropriate counterfactual of

691 community conditions in the absence of these groups. Many factors beyond the control of any
692 one socio-economic development program affect community health and sustainability.
693 Ultimately, most of the Western Alaska CDQ, Adak, and any future Arctic Alaska CDQ
694 communities are in remote and isolated areas, where robust and diversified economies may be
695 unrealistic and long-term subsidization of these communities is likely necessary. Therefore, the
696 formation of CDQ Program objectives in Arctic Alaska should reflect these inherent limitations
697 and broader notions of community well-being.

698
699 *5.6 Expectations about resident participation in fisheries may need to be contextualized within*
700 *overall fisheries participation trends and regional realities.*

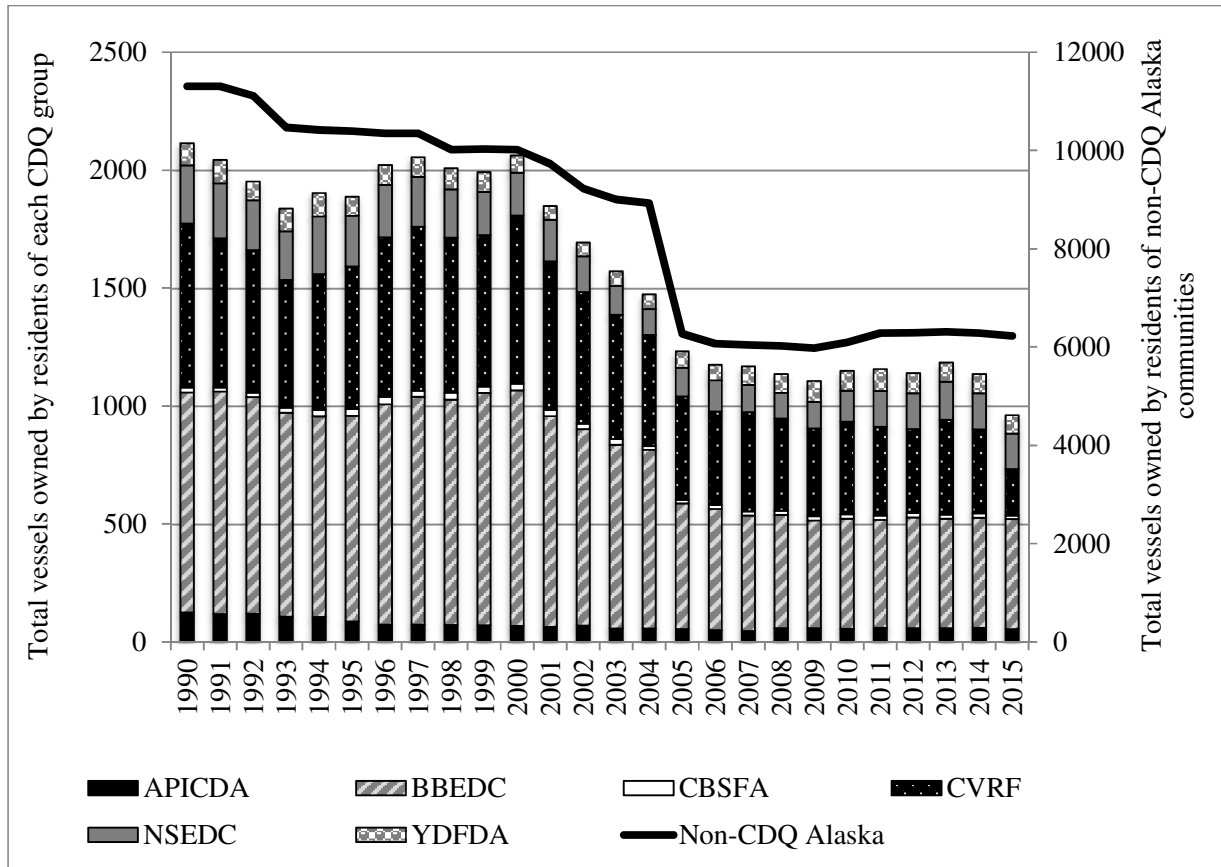
701
702 The impacts of the CDQ groups with respect to fisheries participation of Western Alaskan
703 residents should be contextualized within the overall trends of consolidation in Alaska's
704 fisheries. Figures 2 and 3 show trends in fishery permit and commercial fisheries vessel
705 ownership, respectively, for residents of the six CDQ groups and all of non-CDQ Alaska from
706 1990 to 2015. Residency is based on the mailing address provided by the permit and vessel
707 owner, respectively. The fishery permit ownership information is for Alaska State fisheries,
708 which are closer to shore, require smaller vessels and less gear, and are, therefore, generally
709 more accessible to those with less access to capital. For both of these participation metrics,
710 trends for the CDQ communities are generally aligned with overall trends across non-CDQ
711 Alaskan communities of decreasing fishery permit and vessel ownership. The one outlier to this
712 overall trend is YDFDA, which has had an increase in permit ownership since CDQ
713 implementation. For APICDA, BBEDC, and CBSFA, decreasing permit and vessel ownership
714 are aligned with overall population declines since the early 1990s. However, for CVRF, NSEDC,
715 and YDFDA reductions in vessel ownership, and reductions in permit ownership for CVRF and
716 NSEDC have been concurrent with population increases.

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Figure 2. Alaska State fisheries permit ownership by CDQ and non-CDQ Alaska residents, 1990 to 2015



724
725 Figure 3. Commercial fisheries vessels ownership by CDQ and non-CDQ Alaska residents, 1990
726 to 2015

727
728 CDQ representatives noted that the groups' fisheries development efforts may be chiefly
729 mitigating what would have otherwise been an even steeper decline in fisheries participation.
730 Similarly, ACDC's efforts in Adak have largely centered around providing halibut and sablefish
731 fishing opportunities and a buyer for this fish, while stable large-scale processing capacity,
732 which Adak residents and officials identified as the anchor for the community's long-term
733 stability, depends on fisheries that are out of the purview of ACDC (Summer, 2017). Any
734 expectations about the impacts of a CDQ program in Arctic Alaska at increasing fisheries
735 participation by residents would have to be similarly contextualized.

736
737 Allocations to the Western Alaska CDQ groups have not, with the exception of halibut, resulted
738 in direct fishing opportunities for CDQ residents because of limitations on the availability of
739 local species and the constraints on their participation in offshore fisheries, primarily capital. If
740 Arctic Alaska fishing opportunities were also primarily offshore, CDQ-type allocations to
741 communities there would also likely produce limited direct harvesting opportunities for
742 residents. In fact, opportunities for increasing participation in fisheries would likely be more
743 constrained in Arctic Alaska than they are in Western Alaska due to fewer locally available
744 species and shorter fishing seasons (NPFMC, 2009; Perovich et al., 2015). CDQ-type groups in

745 Arctic Alaska may have to rely more on employing residents on offshore fishing vessels as a way
746 of generating fishing opportunities.

747

748 **6. Conclusions**

749

750 Since the inception of the CDQ Program nearly two and a half decades ago, the CDQ groups
751 have undergone a substantial evolution, from fledgling companies to powerful players in
752 Alaskan fisheries. This study examines this evolution and provides a series of lessons that can be
753 applied by future CDQ-type groups in Arctic Alaska and elsewhere. Future extensions of this
754 research should seek to examine CDQ group effects on fisheries participation and socioeconomic
755 conditions utilizing appropriate counterfactuals, or statistical techniques in lieu of, and socio-
756 economic development indicators that account for a broad understanding of community well-
757 being.

758

759

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761

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769

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