SUPPORTING STATEMENT
U.S. Department of Commerce
National Oceanic & Atmospheric Administration
**Data Collections to Support Comprehensive Economic and Socio-Economic Evaluations of
the Fisheries in Regions of the United States Affected by Catastrophic Events**
OMB Control No. 0648-0767

**1.   Describe (including a numerical estimate) the potential respondent universe and any
sampling or other respondent selection method to be used. Data on the number of
entities (e.g., establishments, State and local government units, households, or
persons) in the universe covered by the collection and in the corresponding sample
are to be provided in tabular form for the universe as a whole and for each of the
strata in the proposed sample. Indicate expected response rates for the collection as
a whole. If the collection had been conducted previously, include the actual response
rate achieved during the last collection.**

<u>Potential Respondent Universe</u>

The potential respondent universe for the collections NMFS will conduct for each specific
catastrophic event consists of two sets of individuals in the potentially affected area for that
event. They are those who own or operate a commercial or recreational (for-hire) fishing vessel
and those who own or manage a fishing related business, such as a seafood dealer, seafood
processor, bait and tackle shop, and, where appropriate, aquaculture facility. Providing a
numerical estimate of the respondent universe for each collection is challenging for two reasons.
First, we will not know the potentially affected area until the event occurs. Second, there is not a
single source of information, which NMFS can use to assemble a potential respondent universe.
Therefore, we used information from previous collections for the evaluations of two types of
catastrophic events to estimate the population universe and other collection variables for the
proposed regional and national information collections.

Since 2018, NMFS has conducted 11 regional collections to support evaluations of the impacts
of and recoveries from five hurricanes. Six of those collections were for fishing operations and
five were for other fishing related businesses. In addition, it has conducted two collections,
which contributed to a national evaluation of the impacts of the COVID-19 pandemic. We used
information from the 11 previous regional collections to estimate the population universe,
sample size, number of responses, and response rates for the proposed regional collections.
Similarly, we used information from the COVID-19 collections to make estimates for the
proposed national collections.

On average, we expect to conduct four regional collections per year for fishing operations and another four for other fishing related businesses. Population universe, sample size, and response rate data for the previous regional collections are in Table B1 and the resulting average annual estimates for eight regional collections are in Table B2.

Population universe, sample size, number of responses, and response rate data for the previous COVID-19 collections are in Table B3. To expand to a national collection from the collections that covered Atlantic and Gulf of Mexico coastal states, Puerto Rico and the United States Virgin Islands (USVI), we increased the totals in Table B3 by 50 percent to account for the additional fishing operations and other fishing related businesses in the Alaska, West Coast and Pacific Islands Regions and to allow the inclusion of bait and tackles shops in all regions. In addition, we used an estimate of two collection per year for fishing operations and another two for other fishing related businesses to generate the average annual estimates for four national collections in Table B4.

Table B1. Population Universe, Sample Size and Response Rate Data for 11 Previous Regional Collections Used in Evaluating the Impacts of and Recoveries from Five Hurricanes.

Collection	Population Size	Sample Size	Responses	Response Rate
Hurricane Irma Following Year Collection (Florida)				
Fishing Operations	4,024	1,700	391	23.0%
Commercial Only	2,416	1,029	220	21.4%
For-Hire Only	1,437	603	155	25.7%
Commercial and For-Hire	171	68	16	23.5%
Fishing Related Businesses	3,202	1,350	147	10.9%
Total	**7,226**	**3,050**	**538**	**17.6%**
Hurricane Harvey Following Year Collection (Texas)				
Fishing Operations	2,332	2,332	292	12.5%
Commercial	1,491	1,491	139	9.3%
For-Hire	842	842	153	18.2%
Fishing Related Businesses	243	213	27	12.7%
Total	**2,575**	**2,545**	**319**	**12.5%**
Hurricane Florence Rapid Response Collection (North Carolina)				
Fishermen	6,715	1,784	628	35.2%
Commercial	5,881	1,229	389	31.7%
For-Hire	834	520	239	46.0%
Fishing Related Businesses (1)	35	35	9	25.7%
Total	**6,750**	**1,819**	**637**	**35.0%**
Hurricane Michael Rapid Response Collection (Florida)				
Fishing Operations	598	598	179	29.9%
Fishing Related Businesses	245	245	78	31.8%
Total	**843**	**843**	**257**	**30.5%**
Hurricanes Irma and Maria Following Year Collection (Puerto Rico)				
Fishing Operations	866	866	687	79.3%
Commercial Fishermen	815	815	664	81.5%
For-Hire Fishermen	51	51	23	45.1%
Dealers/processors	48	48	41	85.4%
Total	**914**	**914**	**728**	**79.6%**
Hurricanes Irma and Maria Following Year Collection (USVI)				
Commercial and For-Hire Fishing Operations				
St. Thomas	64	64	58	90.6%
St. Croix	88	88	55	62.5%
Total	**152**	**152**	**113**	**74.3%**

(1) These were only bait and tackle shops. The state did the dealer/processor surveys.

Table B1. Continued.

Totals for All the Collections for the Five Hurricanes	Population Size	Sample Size	Responses	Response Rate
Six Collections for Fishing Operations	14,687	7,432	2,290	30.8%
Five Collections for Fishing Related Businesses	3,773	1,891	302	16.0%

Table B2. Estimates for Four Annual Regional Collections from Fishing Operations and another Four Collections from Fishing Related Businesses.

Type of Operation	Population Size	Sample Size	Responses	Response Rate
Estimates Per Collection				
Fishing Operations	2,448	1,239	382	30.8%
Fishing Related Businesses	755	378	60	15.9%
Total	3,203	1,617	442	27.3%
Totals for four collections for each type of operation				
Fishing Operations	9,792	4,956	1,528	30.8%
Fishing Related Businesses	3,020	1,512	240	15.9%
Total	12,812	6,468	1,768	27.3%

Table B3. Population Universe, Sample Size, Number of Responses, and Response Rate Data for Two Previous Surveys Used in Evaluating the Impacts of and Recovery from the COVID-19 Pandemic.

New England - Gulf of Mexico: Commercial Fishing Operations				
Region/State	**Population Size**	**Sample Size**	**Responses**	**Response Rate**
New England				
ME	7,248	979	23	2.4%
NH	239	239	16	6.7%
MA	4,106	695	34	4.9%
RI	130	130	22	16.9%
CT	127	127	7	5.5%
Subtotal	11,850	2,170	102	4.7%
Mid-Atlantic				
NY	709	210	18	8.6%
NJ	306	240	23	9.6%
PA	0	0	0	0.0%
DE	2	2	1	50.0%
MD	2,994	888	65	7.3%
VA	1,385	411	55	13.4%
Subtotal	5,396	1,751	162	9.3%
South Atlantic				
NC	1,928	1,187	110	9.3%
SC	456	281	24	8.5%
GA	215	215	25	11.6%
Subtotal	2,599	1,683	159	9.4%
Gulf Of Mexico				
FL	4,241	1,094	121	11.1%
AL	519	270	11	4.1%
MS	91	91	11	12.1%
LA	5,281	1,094	63	5.8%
TX	1,750	636	23	3.6%
Subtotal	11,882	3,185	229	7.2%
Totals	**31,727**	**8,788**	**652**	**7.4%**

Table B3 Continued.

Region/State	Population Size	Sample Size	Responses	Response Rate
New England - Gulf of Mexico: For-Hire Fishing Operations				
New England				
ME	194	194	30	15.5%
NH	118	118	17	14.4%
MA	932	932	114	12.2%
RI	146	146	21	14.4%
CT	140	140	20	14.3%
Subtotal	1,530	1,530	202	13.2%
Mid-Atlantic				
NY	356	356	52	14.6%
NJ	414	414	51	12.3%
PA	77	77	4	5.2%
DE	90	90	8	8.9%
MD	587	587	57	9.7%
VA	143	143	29	20.3%
Subtotal	1,667	1,667	201	12.1%
South Atlantic				
NC	761	761	94	12.4%
SC	552	552	75	13.6%
GA	201	201	32	15.9%
Subtotal	1,514	1,514	201	13.3%
Gulf Of Mexico				
FL	2,426	2,426	296	12.2%
AL	343	343	26	7.6%
MS	67	67	7	10.4%
LA	72	72	11	15.3%
TX	163	163	30	18.4%
Subtotal	3,071	3,071	370	12.0%
Totals	**7,782**	**7,782**	**974**	**12.0%**

Table B3. Continued.

New England - Gulf of Mexico: Dealers/Processors				
Region/State	Population Size	Sample Size	Responses	Response Rate
New England				
ME	376	376	39	10.4%
NH	18	18	2	11.1%
MA	270	270	20	7.4%
RI	45	45	4	8.9%
CT	15	15	2	13.3%
Subtotal	724	724	67	9.3%
Mid-Atlantic				
NY	96	96	11	11.5%
NJ	86	86	12	14.0%
PA	5	5	0	0.0%
DE	11	11	1	9.1%
MD	26	26	5	19.2%
VA	39	39	5	12.8%
Subtotal	263	263	34	12.9%
South Atlantic				
NC	597	597	30	5.0%
SC	198	198	29	14.6%
GA	174	174	13	7.5%
Subtotal	969	969	72	7.4%
Gulf Of Mexico				
FL	1,071	1,071	99	9.2%
AL	126	126	10	7.9%
MS	38	38	2	5.3%
LA	1,076	1,076	63	5.9%
TX	289	289	27	9.3%
Subtotal	2,600	2,600	201	7.7%
Totals	**4,556**	**4,556**	**374**	**8.2%**
Grand Totals (NE - Gulf)	**44,065**	**21,126**	**2,000**	**9.5%**

Table B3. Continued.

Puerto Rico and USVI Commercial Fishing Operations				
Region	Population Size	Sample Size	Responses	Response Rate
West	377	229	87	38%
East	247	145	83	57%
South	231	143	58	41%
North	328	184	88	48%
Total	**1,183**	**701**	**316**	**45%**

Totals for the COVID-19 Collections				
Type of Operation	Population Size	Sample Size	Responses	Response Rate
Fishing Operations	40,692	17,271	1,942	11.2%
Fishing Related Businesses	4,556	4,556	374	8.2%
Totals for the COVID-19 Collections	**45,248**	**21,827**	**2,316**	**10.6%**

Table B4. Estimates for Two National Collections from Fishing Operations and another Two Collections from Fishing Related Businesses.

Type of Operation	Population Size	Sample Size	Responses	Response Rate
Estimates Per Collection				
Fishing Operations	61,038	25,906	2,913	11.2%
Fishing Related Businesses	6,834	6,834	561	8.2%
Total	**67,872**	**32,740**	**3,474**	**10.6%**
Totals for two collections for each type of operation				
Fishing Operations			5,826	
Fishing Related Businesses			1,122	
Total			**6,948**	

Table B5 contains estimates of the number of responses from fishing operations and other fishing related businesses for the proposed eight regional and four national collections. The estimates are from Tables B2 and B4

Table B5. Estimated Number of Responses from fishing operations and other fishing related businesses for the Proposed Eight Regional and Four National Collections.

Type of Collection and Operations	Average Annual Responses
Regional Collections	
Fishing Operations	1,528
Fishing Related Businesses	240
National Collections	
Fishing Operations	5,826
Fishing Related Businesses	1,122
All Collections	
Fishing Operations	7,354
Fishing Related Businesses	1,362
Total	**8,716**

Respondent Selection Methods

We made no changes in the procedures or statistical methodology of the collection since the last approval. The respondent selection methods used previously primarily varied by region and catastrophic event due to differences in the following: 1) the information available to identify the potential respondent universes, 2) the sizes of the populations of interest, 3) the effectiveness of alternative methods of contacting potential respondents, and 4) the expected response rates.

When the population size was sufficiently large and NMFS could identify the sample frame, NMFS used a stratified random sample, where it defined strata by area (e.g., state, territory or county) for each sampled sector (e.g., commercial fishing operations, for-hire fishing operations and other fishing related businesses). NMFS chose stratified random sampling over simple random sampling to: 1) increase precision of the estimates for the entire population (Cochran, 1977), 2) increase precision for the subgroups (Lohr 1999), 3) lower sampling errors and improve coverage of the population (Daniel 2011, McLennan 1999), and 4) allow comparisons across strata and inferences within strata (Daniel 2011, McLennan 1999).

When the population size was not sufficiently large, NMFS attempted to conduct a census and when the potential respondents were difficult to identify or contact, NMFS used opportunistic and site-intercept sampling strategies. Below, we describe the sample selection and collection methods used in previous collections. NMFS plans to use similar situation-appropriate methods for the proposed collections.

1. **Hurricane Florence: A rapid response collection from North Carolina fishermen and fishing related businesses**

NMFS, working with a contractor, the North Carolina Division of Marine Fisheries, and North Carolina Sea Grant, conducted a rapid appraisal of damage from Hurricane Florence through field, online and phone surveys throughout the state's coast. NMFS used a contractor to conduct phone interviews of commercial and for hire fishing operations and bait and tackle shops to assess damages from Hurricane Florence. The State of North Carolina collected similar data from seafood dealers and processors. The purpose of this collection was to assess damages to commercial and for hire fishing operations and fishing related businesses (seafood dealers, seafood processors and bait and tackle shops); determine insurance coverage for those who sustained damages; and better understand revenue losses related to this storm.

For each of five types of businesses (commercial fishing operations, for-hire fishing operations, seafood dealers, seafood processors, and bait and tackle shops) NMFS compiled the sampling frame and drew random samples for each coastal county. Using the samples provided by NMFS, the contractor and the State attempted to contact owners or representatives of these operations to conduct interviews regarding the status of their businesses after the hurricane and losses suffered to date. This collection included an additional set of questions for dealers who were vessel owners. The sample files included all license information or business ID numbers so that the phone interviewer knew to ask about multiple vessels or multiple gear types when applicable. Interviews only asked about multiple vessels if more than one vessel owned by the same individual was included in the sample provided by NMFS.

2. **Hurricane Michael: A rapid response collection from Florida fishermen and fishing related businesses**

In partnership with the Florida Fisheries & Wildlife Commission (FWC), NMFS used a contractor to conduct phone interviews of fishery participants in the Florida Panhandle and Big Bend area to assess damages from Hurricane Michael. The collection involved a census of all commercial and for hire vessel owners. For other fishing related businesses, NMFS compiled the sampling frames and drew random samples for each strata defined by three types of businesses (seafood dealers, processors and bait and tackle shops) and county. Using the contact information for all commercial fishermen and for-hire fishermen, as well as contact information for the sample of fishing related businesses provided by NMFS, the contractor attempted to contact owners or representatives of these operations to conduct interviews regarding the status of their businesses after the hurricane and losses suffered to date.

3. **Hurricane Irma: A follow year collection from Florida fishermen and fishing related businesses**

NMFS used a contractor to conduct a phone survey with fishermen and fishing related businesses in Florida. NMFS provided the contractor with sample frames it had compiled of commercial fishermen, for-hire fishermen and fishing related businesses. The contractor stratified each of the three sample frames by county, drew a random sample for each strata and made up to five attempts to contact each person in the samples.

4. **Hurricane Harvey: A following one year collection from Texas fishermen and fishing related businesses**

For Hurricane Harvey in Texas, NMFS used the same methods described above for Hurricane Irma in Florida.

5. **Hurricanes Irma and Maria: A following year collection from Puerto Rico fishermen**

For the following year collection in Puerto Rico, the population and sample sizes were the total number of fishermen who showed up in fisheries statistics in Puerto Rico after Maria. Due to field conditions, they were sampled opportunistically not using a random sample.[1] NMFS used sampling methods similar to those employed earlier in the Puerto Rico Department of Natural and Environmental Resources (DNER) censuses of active commercial fishermen, which date back to 1988 (Matos-Caraballo and Torres Rosado 1989; Matos-Caraballo 1998; Matos-Caraballo, Cartagena-Haddock, and Pena-Alvarado 2005, Matos-Caraballo and Agar 2011). The sampling protocol required data collectors to visit fishing centers, private fish stores (known as pescaderias), marinas, and fishing communities several times a month for a year to identify and interview active fishermen. This field intensive sampling protocol was favored over one that solely relied on DNER fishing license (or landings) frames because of the considerable turnover following Marıa, and also because many respondents had expired fishing licenses (but had an established fishing history). Another consideration was fishermen's occupational multiplicity livelihood strategies, which combine year-round or seasonal fishing with other wage labor opportunities, including some that take place in the United State mainland.

An interdisciplinary team of social scientists and DNER biologists designed and implemented the data collection. Port agents from the DNER's Fisheries Research Laboratory and contracted field assistants, mainly university graduates, conducted the in-person interviews, which were in Spanish when appropriate.

Surveyors worked closely with heads of fishing centers, fish store owners, marina managers, and other fishery leaders to identify active fishermen, including those loosely affiliated with their facilities.

6. **Hurricanes Irma and Maria: A following year collection from USVI fishermen and fishing related businesses**

The following year collection in the USVI was intended to approximate a census.[2] The survey was administered utilizing opportunistic and site-intercept sampling strategies. The site sampling was done at the annual commercial fisheries registration on both St. Thomas and St. Croix and has proven to be an effective strategy for sampling a large number of fishermen in a limited period (Crosson and Hibbert 2017).

---

[1] This summary is from Agar et al. 2020.

[2] This summary is from Stoffle et al. 2020.

7. COVI-19: A rapid response collection from New England through Gulf of Mexico fishermen and fishing related businesses

NMFS used a contractor to conduct a mail survey with a follow-up phone survey of fishermen and fishing related businesses from New England through the Gulf of Mexico. The plan was to obtain 200 responses from each of three sectors in each of four regions for a total of 2,400 responses. The sectors were commercial fishermen, for-hire (party/charter) fishermen and dealers/processors. The four regions were New England, Mid-Atlantic, South Atlantic, and Gulf of Mexico. NMFS stratified each region by state and based the target number of responses for a state by sector on its share of the population of the sector within its region. The sample size for commercial fishermen within each state was set equal to the product of its target number of responses and the inverse of the expected response rate for commercial fishermen. Due to the small numbers of for-hire fishermen and dealers/processors, the sample size for each state was set equal to its population. The commercial fishermen were randomly selected from a list of fishermen NMFS maintains. NMFS expected the resulting sample means to have approximately a margin of error of 5% of the population means with a 95% confidence interval for each sector.

8. COVID-19: Collections from Puerto Rico and USVI fishermen and fishing related businesses in 2020

Six Month Puerto Rico Survey: The phone survey used contact information for approximately 1,000 potential respondents in Puerto Rico, who included mostly active commercial fishermen, as well as dealer processors and charter/for hire operators. Approximately 25 percent of the commercial fishermen were sampled and a census was conducted of the charter/for-hire and dealer/processor sectors since these groups are small and only include approximately 90 potential respondents.

The sampling protocol for commercial fishermen required interviewers to reach out to a stratified, random sample of captains over the phone. The sample was stratified by coastal region (i.e., east, north, south and west) to capture the impact of the pandemic on a wide range of fisheries. To satisfy the requirements of the sampling protocol, interviewers were instructed to draw a replacement fisherman only if the randomly selected fisherman a) refused to participate; b) was unavailable due to illness, travel, or death; or c) could not be contacted after three separate attempts.

Six Month USVI Survey: NMFS obtained a list of all fishermen with commercial permits that landed at least one pound of fish in 2019. Due to the relatively small number of individuals, we called everyone on the list. We conducted web research to identify charter/for hire operators in USVI, compiled a list of approximately 30 operators and attempted to contact each one. NMFS did this with an internal phone bank manned by SEFSC staff and contractors.

Expected Response Rate

Table B6 contains sample size, numbers of contacts and responses and response rate data for 11 previous regional collections. For fishing operations, the response rates ranged from 13 to 78 percent and averaged 31 percent, where the response rate is the percent of the sample that

responded and we calculated each average using the totals of the sample sizes and responses. The response rates defined in terms of the percent of the contacted sample that responded were much higher. They ranged from 53 to 100 percent and averaged 70 percent. Therefore, the difficulty in contacting the fishing operations included in the sample substantially reduced the response rates for fishing operations. The same was true for the response rates for other fishing related businesses. In terms of sample size, those response rates ranged from 11 to 85 percent and averaged 16 percent. In terms of the number contacted, the response rates ranged from 29 to 91 percent and averaged 40 percent.

NMFS will attempt to improve the contact information for fishing operations and other fishing related businesses. However, the estimated response rates for the proposed collections, which are about 31 and 16 percent, respectively, for fishing operations and other fishing related businesses in the regional collections compared to about 11 and 8 percent for the national collections, equal the response rates for the previous collections (see Tables B1 - B4).

Table B6. Sample Size, Numbers of Contacts and Responses and Response Rate Data for 11 Previous Regional Collections Used in Evaluating the Impacts of and Recoveries from Five Hurricanes.-

Collections	Sample	Contacts	Responses	Responses/ Sample	Responses/ Contacts
Hurricane Irma Following Year Collection (Florida)					
Fishing Operations	1,700	622	391	23%	63%
Fishing Related Businesses	1,350	474	147	11%	31%
Hurricane Harvey Following Year Collection (Texas)					
Fishing Operations	2,332	552	292	13%	53%
Fishing Related Businesses	213	94	27	13%	29%
Hurricane Florence Rapid Response Collection (North Carolina)					
Fishing Operations	1,784	890	628	35%	71%
Fishing Related Businesses	35	16	9	26%	56%
Hurricane Michael Rapid Response Collection (Florida)					
Fishing Operations	598	235	179	30%	76%
Fishing Related Businesses	245	118	78	32%	66%
Hurricanes Irma and Maria Following Year Collection (Puerto Rico)					
Fishing Operations	848	848	664	78%	78%
Fishing Related Businesses	48	45	41	85%	91%
Hurricanes Irma and Maria Following Year Collection (USVI)					
Fishing Operations	152	113	113	74%	100%
Totals for Fishing Operations	**7,414**	**3,260**	**2,267**	**31%**	**70%**
Totals for Fishing Related Businesses	**1,891**	**747**	**302**	**16%**	**40%**
Grand Totals	**9,305**	**4,007**	**2,569**	**28%**	**64%**

2. **Describe the procedures for the collection of information including:**

- Statistical methodology for stratification and sample selection,

- Estimation procedure,

- Degree of accuracy needed for the purpose described in the justification,

- Unusual problems requiring specialized sampling procedures, and

- Any use of periodic (less frequent than annual) data collection cycles to reduce burden.

Fielding, stratification, and sample selection

To determine the most effective method of data collection for each catastrophic event, NMFS will consider the following:

1. Regional differences in cultural preferences for alternative methods of providing information;
2. Regional differences in the ability to identify and contact potential respondents;
3. The extent and type of damage to infrastructure, such as phone lines, electrical power and cell towers, caused by the event and the extent to which the damage has been repaired at the time of the collection; and
4. The time available to conduct the collection.

Generally, NMFS will obtain information on the vessel owner's name, mailing address, and telephone number from federal and/or state/territory permit and vessel registration files; and it will obtain similar information on other fishing related businesses from government, association and commercial sources. NMFS or its contractor will select stratified random samples, if a census is not used, and field the survey. Among other things, the response to Question 1 describes the sampling methods NMFS will use.

NMFS will provide the two OMB approved questionnaires (one each for fishing operations and other fishing related businesses) to a contractor. The contractor will turn those questionnaires into whichever of the following is/are appropriate for a specific collection: 1) telephone scripts and computer-assisted telephone interviewing (CATI) instruments appropriate for a specific phone survey, 2) mail surveys, 3) online surveys, and 4) in-person interview scripts. NMFS will review these contractor products with the contractor to ensure an appropriate alignment with the questionnaires and project information needs. Neither NMFS nor the contractor can do this before they know the potentially affected area, type of catastrophic event and type of collection (i.e., immediate response or follow-up collection).

The contractor will conduct the collections primarily in English, but will have interviewers who speak the appropriate language(s) (e.g., Spanish and Vietnamese) available for callbacks as needed. In addition, the contractors will, as needed, translate collection documents (e.g., mail correspondence, telephone scripts and survey instruments) into the appropriate language(s).

NMFS and/or its contractor will provide local media and fishing/business associations with information that introduces the collection, explains how NMFS will use the data and the

importance of the collection, identifies the types of data to be collected, and provides contact information for those who want more information about the collection.

The following descriptions of alternative fielding strategies cover the situation-specific methods NMFS expects to use.

Telephone Surveys

NMFS will attempt to use contractors that are familiar with the areas, fisheries and businesses for a collection and that will use interviewers with similar familiarities.

NMFS or its contractor will send an initial mailing with a personalized cover letter, a personalized copy of the questionnaire, and an explanation of how NMFS will use the data collected by the survey. This will provide survey recipients with an opportunity to see first-hand the data to be collected by the survey. Survey recipients will receive a self-addressed stamped envelope for responding to the survey by mail, as well as instructions for responding later by telephone or online if they prefer.

The contractors will provide the options to submit the requested information by phone at a later time, by mail or online and will provide the potential respondents with the information necessary to use their preferred option (e.g., a call-in number or website and password). In addition, the contractors will circulate the call-in number in the major fishing communities, for use by individuals who have questions or need assistance with obtaining or completing the survey.

About one week after the initial mailing, attempts to contact all potential respondents via telephone will begin. If telephone numbers are not available for some fishermen or businesses or if the contractor cannot contact them with the phone numbers it has, the contractor will use a telephone number matching service to match their names and addresses with their telephone numbers. We anticipate that at the time these calls begin, most survey recipients will not have responded to the survey. The contractor will contact survey recipients to encourage participation, answer questions about the survey, and help determine the most suitable response method (mail, telephone, online or in-person interview). For those choosing an in-person interview, an interview time and location will be scheduled. This fielding approach was followed for a variety of the previous collections. Because of the success of these previous collections using the same methods, changes to the procedures or statistical methodology seemed inappropriate.

The contractor will make up to five attempts to contact each person in the samples and enter one of the following interview disposition codes for each potential respondent:

1. Partial or complete interview
2. Already completed mail or online form
3. Prefer to complete a mail or online form
4. Refused
5. Language barrier
6. No contact
7. No contact - answering machine

8. No contact –wrong phone number / phone number does not work

If during the last successful call, a potential respondent indicates a lack of interest in completing the full survey, the interviewer will ask no more than five questions about their reluctance to complete the survey.

Mail Surveys

The potential respondents will receive a personalized initial mailing that includes a letter describing the survey and its purpose and importance. The initial mailing will also include a copy of a personalized questionnaire and a self-addressed stamped envelope for returning the questionnaire. The personalized cover letter will provide a contact telephone number for those wishing to complete the survey in-person, by phone, or online or to speak to someone about the survey. About two weeks after the initial mailing, we will send a reminder letter to all non-respondents. The contractor will send a reminder postcard or a second reminder letter to non-respondents about three and four weeks after the initial mailing. The contractor will include a copy of the questionnaire with each reminder letter. About a week after the final mailing, the contractor will attempt to contact non-respondents by telephone to encourage them to provide the requested information. If a potential respondent indicates a lack of interest in completing the full survey, the interviewer will ask no more than five questions about their reluctance to complete the survey.

Online Surveys

The contractor will send a personalized letter inviting the potential respondents to participate in the online survey. That letter will: 1) explain how NMFS will use the data collected by the survey and the importance of the collection; 2) provide the password and website the person can use to respond online; 3) provide a call-in number they can use if they need technical support, have questions about the survey or prefer to provide the requested information by phone; and 4) a personalized copy of the questionnaire and a self-addressed stamped envelope for responding to the survey by mail, if they prefer to do that. The contractor will use reminder mailings and, if possible, phone calls to encourage responses. In a final effort to obtain some information about non-respondents, the contractor will send a post card with no more than five questions about their reluctance to complete the survey.

Estimation Procedure

Initial estimation procedures will consist of producing summary statistics (e.g. mean and standard deviation) within strata for the data collected. We will use these values to characterize the impacts of and recovery from a specific catastrophic event. NMFS expects to use the statistical tests similar to those used in Colburn et al. 2015 NOAA Tech Memo. For example, the Mann-Whitney U statistic was used for all mean value comparisons between two independent groups involving total value of physical damages/losses and percent of revenue lost. NMFS made comparisons involving multiple groups using Kruskal-Wallis one-way analysis of variance. NMFS chose non-parametric tests in order to account for non-normality of data distribution and the presence of outliers. In addition, where appropriate, NMFS will report the

total and average value of impacts by sector.

<u>Degree of Accuracy Needed for Intended Purpose</u>

We will use the data collected through this survey for statistical inference of population values from respondents. Neither economic theory nor legislative mandates establish the degree of accuracy needed for these intended uses. All else being equal, we prefer more accurate data; however, we expect this survey will provide sufficiently accurate and useful data for these intended uses and we will strive to make the correct choices with respect to the tradeoff between data accuracy and data collection costs.

The formula for the standard error of the sample mean computed from a sample of size n randomly selected from a finite population of size N with a population standard deviation of σ is $\sigma\sqrt{\dfrac{N-n}{n(N-1)}}$. Therefore, the percentage reduction from the population standard deviation σ to the standard error of the sample mean is approximately[3] $1-\sqrt{\dfrac{N-n}{n(N-1)}}$.

Table B7 presents the expected average population, sample size and response rate and the resulting estimate of the percentage reduction from the population standard deviation to the standard error of the sample mean for each of the four types of collections NMFS will conduct.

Table B7. Expected Average Population and Sample Sizes and the Resulting Estimate of the Percentage Reduction from the Population Standard Deviation to the Standard Error of the Sample Mean for Each of the Four Types of Collections.

Type of Collection/ Operation	Population Size (N)	Sample Size (n)	Responses	Percentage Reduction[4]
Regional Collections				
Fishing Operations	2,448	1,239	382	95.3%
Fishing Related Businesses	755	378	60	87.6%
National Collections				
Fishing Operations	61,038	25,906	2,913	98.2%
Fishing Related Businesses	6,834	6,834	561	96.0%

---

[3] This calculation assumes the same variance within strata. It is approximate in case variances across strata are different.

[4] As noted above, the percentage reduction from the population standard deviation σ to the standard error of the sample mean is approximately $1-\sqrt{\dfrac{N-n}{n(N-1)}}$.

Unusual problems requiring specialized sampling procedures

NMFS does not expect any unusual problems; therefore, specialized sampling procedures will generally not be needed. An exception might be if a disaster involves a particularly large population (with substantially different damage profiles in different areas). In that case, we might stratify the population further based on expected disaster impact (e.g., high impact, category 5 storm impact areas vs. lower impact, category 4 impact areas). This will allow us to adjust our sampling intensity by impact-strata to stay in budget while still achieving adequate coverage of the high impact areas.

Periodic Data Collection Cycle to Reduce Burden

These are as-needed data collections intended to capture information regarding the impacts of and recoveries from catastrophic events shortly and/or one year after the event. In the case of an ongoing event (e.g., a pandemic or red tide) that lingers for many months in the same region(s), NMFS may conduct collections quarterly and/or semi-annually as needed to evaluate an ongoing event.

3.   Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.

Methods Used To Maximize Response Rates

NMFS will take or has taken the following steps to maximize response rates.

1. It will work with state agencies to coordinate press releases notifying the public of the survey, its purpose and importance, and the different ways it will administer the survey.

2. NMFS designed the survey instrument carefully to ensure that questions are in simple and straightforward language and are as brief as possible without compromising the quality of information obtained.

3. This study will make use of four methods for data collection: telephone, fillable-online, mail, and intercept, face-to-face surveys. While response rates for internet-based surveys tend to be lower than other modes (Cook et al., 2000; Couper, 2000), Dillman et al. (2009) found that a mixed-mode strategy of one data collection followed by another could substantially increase response rates. For example, they found that web-based surveys followed up with a telephone survey could improve response rates by 35%. Dillman et al. (2009) also found that mail surveys followed by telephone contact yielded a total response rate of 82%. The intercept method used previously by the investigators to reach fishermen in a study on job satisfaction and well-being in fishing communities in the Mid-Atlantic elicited an 85% response rate (Pollnac et al. 2014).

4. In cover letters and prior to the implementation of a telephone or in-person interview, it will be explained that NMFS will protect the confidentiality of the survey data, participation is voluntary, participants can skip questions they do not want to answer, and that the interview can be stopped at any point.

5. NMFS will compile the name, address and phone number of potential respondents from existing sources including federal and state agencies, fishing businesses, and fishing organization membership lists.

6. If useful telephone numbers are not at first available, the contractor will use a telephone number matching service to match names and addresses with telephone numbers.

7. For the collections to support immediate evaluations, the telephone will be used as the primary way to survey the selected potential respondents with a telephone number. An online survey will be made available to potential respondents who do not want to complete the survey over the telephone. In-person interviews will be conducted in conjunction with site visits when telephone service is not available, or to specifically target respondents who are not responding to the other methods of contact.

8. For follow-up collections, NMFS typically will use telephone in conjunction with mail surveys for the selected potential respondents with an address and phone number. NMFS will use a mixed mode survey approach for these collections because there is evidence that response rates will increase if a respondent who did not complete a survey with one mode is offered a different mode (de Leeuw 2005: 233-255).

9. For the telephone interview, each potential respondent will be called up to five times before being recorded as a no contact, non-respondent.

10. Following the Pew Research Center's approach, the calls will be staggered over times of day and days of the week (including at least one daytime call) and spread as evenly as possible across the survey period to maximize the chances of making contact with a potential respondent.

11. The number of calls where contact was made, a survey was successfully completed, and refusals will be recorded (Pew Research Center 2013).

12. Telephone respondents will also have the opportunity to complete the survey online or by mail rather than over the phone if they prefer.

13. We made contact with key members of NMFS, academia, and industry to better understand the study universe.

Strategy to Address Non-Response

The previous sections describe the methods NMFS will use to maximize the response rates, In the face of an unexpected and significant frequency of nonresponse that could lead to potentially

biased results, the data in-hand on respondents and non-respondents will be compared to investigate differences that could indicate biased results. If bias is suspected, demographic and other relevant information about the specific target sectors, available prior to contact and obtained through the surveys, will be used to adjust weights for non-response. This approach has been extensively used to address non-response bias (Carlson and Williams 2001, Little and Vartivarian 2003). The type and extent of information that is readily available on the target populations as well as information that NMFS will obtain during the data collections are considered appropriate to adjust the weights of respondents presenting similar characteristics to non-respondents if that is necessary. If NMFS suspects a strong non-response bias, it will conduct a brief non-response telephone or post card survey to roughly quantify the source and effects of the bias.

Adequacy of Accuracy and Reliability of Information for Intended Uses

Among other things, the response to the previous question (Question 2) describes the degree of accuracy needed for the purpose described in the response to Part A, Question 2. That response describes the specific uses the agency plans for the data collected. NMFS expects the proposed collections to yield reliable data that can be generalized to the universe studied.

4. **Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.**

The statistical procedure used to select the sample is provided above in the response to Question 2. The survey questions: 1) reflect input from constituents on what information is relevant to the fishery and available; 2) are based on standard survey methodology used throughout NMFS; and 3) represent a minimal set of questions necessary to meet the requirements of the intended analysis.

A review of the study description, the study methodology, and the survey instrument has been undertaken. NMFS personnel at the six Fisheries Science Centers have reviewed the survey tool and provided comments on both the survey tool and the study.

NMFS based the survey questions for the proposed collections on the survey questions approved by OMB in 2018 under OMB Control No. 0648-0767 and tested in the previous collections discussed above. Those questions were based on the Hurricane Sandy following year assessment (under OMB Control No. 0648-0686), which was tested and implemented in 2013-2014. The results of the Hurricane Sandy assessment (Colburn et al. 2015 NOAA Tech Memo; Clay, Colburn, & Seara 2016; Seara, Clay, & Colburn 2016) were used to improve the clarity of questions for the proposed collections.

5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

The internal NMFS design, development, review, and statistical analysis team includes Dr. Mathew McPherson (Southeast Fisheries Science Center; 646-289-2235), Dr. Michael Jepson (Southeast Regional Office; 727-551-5756), Dr. Lisa L. Colburn (Office of Science and Technology; 401-782-3252), Dr. Rita Curtis (Office of Science and Technology; 301-427-8122), and Dr. Stephen Stohs (Southwest Fisheries Science Center; 858-546-7084).

The primary individuals expected to collect the data for each catastrophic event will be contractors who have experience with the fisheries and communities affected by that event.

REFERENCES

Agar, J, Manoj Shivlani & Daniel Matos-Caraballo (2020) The Aftermath of Hurricane María on Puerto Rican Small-Scale Fisheries, Coastal Management, 48:5, 378-397, DOI: 10.1080/08920753.2020.1795967 https://doi.org/10.1080/08920753.2020.1795967

Carlson, B. L. and S. Williams (2001). "A comparison of two methods to adjust weights for non-response: propensity modeling and weighting class adjustments". In *Proceedings of the Annual Meeting of the American Statistical Association*, August 5-9, 2001. https://www.amstat.org/sections/srms/Proceedings/y2001/Proceed/00111.pdf.

Clay, P.M., L.L. Colburn, & T. Seara (2016). "Social bonds and recovery: An analysis of Hurricane Sandy in the first year after landfall." *Marine Policy*: Volume 74, December 2016, Pages 334-340.

Cochran W. 1977. Sampling Techniques. New York: Wiley.

Colburn, L.L., P.M. Clay, T. Seara, C. Weng, & A. Silva (2015). "Social and economic impacts of Hurricane/Post Cyclone Sandy on the commercial and recreational fishing industries: New York and New Jersey one year later." U.S. Department of Commerce, *NOAA Technical Memorandum NMFS-F/SPO-157*, 68p., August 2015.

Cook, C., F. Heath, & R.L. Thompson (2000). "A meta-analysis of response rates in web- or Internet-based surveys." *Educational and Psychological Measurement* 60: 821-826.

Couper, M.P. (2000). "Web surveys: A review of issues and approaches." *Public Opinion Quarterly* 64: 464-494.

Crosson, S and L. Hibbert. 2017. Integrating Commercial Fisheries Registration, Education and Social Science in the U.S. Virgin Islands. North American Journal of Fisheries Management, 37:2, 349-352, DOI: 10.1080/02755947.2016.1264505.

de Leeuw E.D. (2005). "To mix or not to mix data collection modes in surveys". *Journal of Official Statistics* 21(2):233–255.

Daniel J. 2011. Sampling Essentials: Practical Guidelines for Making Sampling Choices. SAGE Publications, Inc. https://dx.doi.org/10.4135/9781452272047

Dillman, D.A., G. Phelps, R. Tortora, K. Swift, J. Kohrell, J. Berck, & B.L. Messer (2009). "Response rate and measurement differences in mixed-mode surveys using mail, telephone, interactive voice response IVR) and the Internet." *Social Science Research* 38: 1-18.

Little, R. J. and S. Vartivarian (2003). "On weighting the rates in non-response weights". *Statistics in Medicine* 22: 1589-1599.

Lohr S. 1999. Sampling: Design and Analysis. Duxbury Press. https://drive.uqu.edu.sa/_/maatia/files/Sampling.pdf

Matos-Caraballo, D., and Z. Torres-Rosado. 1989. Comprehensive census of the fishery of Puerto Rico, 1988. CODREMAR Technical Report 1 (3):1–55.

Matos-Caraballo, D. 1998. Puerto Rico fishery census. Proceedings of the Gulf and Caribbean Fisheries Institute 51:258–270.

Matos-Caraballo, D., M. Cartagena-Haddock, and N. Pena-Alvarado. 2005. Comprehensive census of the marine fishery of Puerto Rico in 2002. Proceedings of the Gulf and Caribbean Fisheries Institute 56:97–110.

Matos-Caraballo, D., and J. Agar. 2011. Census of active fishers in Puerto Rico (2008). Marine Fisheries Review 73 (1):13–27.

McLennan W. 1999. An Introduction to Sample Surveys. A.B.S. Publications, Canberra.

PEW Research Center. "Our Survey Methodology in Detail." Available at http://www.people-press.org/methodology/our-survey-methodology-in-detail/. Accessed on October 2013.

Pollnac, R.B., T. Seara, & L.L. Colburn (2014). "Aspects of Fishery Management, Job Satisfaction, and Well-Being among Commercial Fishermen in the Northeast Region of the United States." *Society and Natural Resources* 01:1-18.

Seara, T., P.M. Clay, & L.L. Colburn (2016). "Perceived adaptive capacity and natural disasters: A fisheries case study." *Global Environmental Change* 38: 49-57.

Stoffle, B., R. Stoffle, and K. Van Vlack. 2020. Sustainable Use of the Littoral by Traditional People of Barbados and Bahamas. Sustainability, 12, 4764.