

**Annual Report to NOAA Marine Debris Program  
for Research Projects<sup>1</sup>**

Please send the completed report by email attachment to the NOAA Marine Debris Program point of contact ([sherry.lippiatt@noaa.gov](mailto:sherry.lippiatt@noaa.gov)) and [Courtney.Arthur@noaa.gov](mailto:Courtney.Arthur@noaa.gov).

**Submitted by:**

**Date Prepared:**

**Reporting period covered:**

**Is this the final project report?**

**Contact Name:**       **Contact Email:**

**Contact Phone Number:**

**Project Title:**

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<sup>1</sup> This form is meant for projects that do not have traditional reporting through the Grants.gov website. For example, projects funded within NOAA and with Cooperative Institutes.

## Part I: Project Summary.

1. Summarize the activities during this reporting period, including methods used, locations visited and timing. (If this is the final report, please summarize activities since the beginning of the project.)

Greater Farallones National Marine Sanctuary's (GFNMS) four year participation in the Marine Debris – Monitoring and Assessment Project (MD-MAP) pilot program, beginning in June 2012, engages citizen-scientists in collection of baseline information on the occurrence of marine debris within GFNMS. National NOAA Marine Debris Program monitoring protocols were used to select the first four beach sites based on minimal likelihood of shore-sourced debris, including remoteness from outflow sources such as drainage pipes and rivers or streams, and in areas away from recreational users. Three beach sites are located in the Point Reyes National Seashore (Drakes Beach, Limantour Beach, and South Beach) and one in Año Nuevo State Park (North Point Beach). Standing stock surveys are conducted at these sites, recording but not removing marine debris, and providing information on debris abundance and composition. In year four of the program GFNMS received additional funding to establish two new beach sites for conducting accumulation surveys from June, 2015 – July, 2016. The two new sites are located at Drakes Beach within Point Reyes National Seashore, roughly 1 mile west of the existing standing stock beach site, and at Ocean Beach within the Golden Gate National Recreation Area. (See Appendix A) Selection of these two new sites considered proximity to standing stock survey locations to avoid impact on those sites and data collected but did not require that sites be removed from recreational use and outflow locations. Accumulation survey sites record and remove debris, providing clean-up efforts that protect habitat and species health.

Surveys at all six sites provide important baseline information about the type, location, and abundance of marine debris. Data gathered through standing stock surveys use random sampling of marine debris from only 20% of each survey site and do not remove debris, while accumulation surveys categorize debris deposited in the entire plot and remove all debris items. Comparing data between standing stock and accumulation surveys will provide a more complete picture of debris deposition on local beaches and may inform changes to future marine debris programs and survey protocol. For this reporting year July, 2014 through June, 2015 a total of 47 standing stock surveys and two accumulation surveys were conducted. All surveys are conducted every 28 days with a +/- three day window.

Each of the six beach sites comprises a permanent one-hundred meter long rectangular plot. Standing stock plots are surveyed in a stratified random sample pattern so that 20% of the plot is assessed at each survey, while the entire 100 m plot is monitored during accumulation surveys. Surveyors follow NOAA Marine Debris Program monitoring protocols observing and tallying all debris over 2.5cm, within seven different categories: plastic, wood, glass, cloth/fabric, metal, and rubber, and unclassified or other, accompanied by photos and global positioning locations. Debris items captured as unclassified or other consist of items containing materials from two or more categories, for example a plastic fishing rod with wooden covering or a plastic and metal derelict crab pot. Weather, time, and season are also recorded as well as details about large debris items (>1ft), and notes on items of interest or observation. Citizen-scientists also note additional debris items >5 mm to <2.5 cm, changes in

beach topography, and presence of wildlife outside their designated plots. Information and photos collected at each survey are entered into the online MD-MAP database by either the GFNMS Marine Debris Project coordinator (coordinator) or trained citizen science volunteers who conduct the surveys. Hard copy records are sent to the coordinator to be reviewed and archived. Debris items recorded between the >5 mm to <2.5 cm size are noted on the hard copy survey sheets but *not* entered into the online NOAA database. Instead, the coordinator analyzes this data and keeps records in-house at the GFNMS offices.

Eight trained citizen scientists conduct monthly surveys at each of the four standing stock survey sites, with two volunteers conducting one survey per site. Each accumulation survey is performed by a combination of volunteers, local organizations, businesses, school groups, and GFNMS staff, with coordinator assistance and training. Accumulation survey groups are recruited through advertisement, existing sanctuary partner organizations, and through local schools. For example, established partnerships between school groups and the sanctuary's Limpets education program are likely to participate in accumulation surveys during the 2015/2016 school year. Additionally, existing partnerships with groups such as Starbucks, Autodesk, and Bold Earth that have previously volunteered with the sanctuary's Bolinas Lagoon restoration efforts will also likely be participating in accumulation surveys throughout the upcoming reporting year July, 2015 – June, 2016. Recruited groups have the option of participating in one or more accumulation surveys at either of the two survey sites. Groups recruited for each accumulation survey are accompanied by the coordinator who performs educational presentations about marine debris issues, provides on-site equipment and survey protocol training, and assists groups during survey procedures. The accumulation program will provide unique benefits for education and outreach to new user groups regarding the severity of the marine debris problem and importance of the National Marine Sanctuary system for providing protection to our oceans and shores as well as and stewardship building through beach clean-ups.

In addition to survey methodology, standardized protocols are established for contacting appropriate authorities and beach managers should toxic/hazardous materials or debris with potential invasive species occur at beach sites. Similar procedures have also been outlined for contacting staff and reporting debris items thought to be originating from the March, 2011 Japanese tsunami. From July, 2014 – June, 2015 no debris items were considered to be toxic or hazardous and no survey items through this program were reported as potential Japanese tsunami debris. However, through Beach Watch, another volunteer-lead shoreline monitoring project that partners with GFNMS and MD-MAP, one item was discovered on North Beach in Point Reyes National Seashore and reported to the [DisasterDebris@NOAA.gov](mailto:DisasterDebris@NOAA.gov) site.

2. Describe the project results or progress to date. Please include quantitative measures of success, such as metric tons removed and length of shoreline covered, and describe how these results affect the research objective and/or hypothesis.

Preliminary findings from the 144 total surveys conducted in years 1 (July, 2012 through June, 2013), 2 (July, 2013 through June, 2014), and 3 (July 2014 through June, 2015) of this ongoing pilot program have recorded 5,043 debris items across all seven categories in addition to “other” items. Data from July, 2012 – April, 2015 indicates that hard plastic fragments are the most commonly recorded debris item across all four sites and that Drakes Beach is the highest deposition site (See Appendix B). When further comparing the average number of

debris items recorded per survey through April, 2015, plastic followed by wood remain the most commonly recorded debris categories, and Drakes Beach remains the highest deposition site per survey (See Appendix C). These preliminary findings can lend information toward management or policy implications that may target specific debris items (i.e. plastics) and the timing and location of effective beach clean-up opportunities. Because only two accumulation surveys have been conducted, no data analysis has occurred between the two different survey types.

The GFNMS MD-MAP program has adapted NOAA protocols and continues to utilize survey sheets that were amended and approved by NOAA Marine Debris Program staff in year one and year three of the program. These amended survey sheets, and complimentary online database categories, incorporate two custom debris categories unique to the six GFNMS beach sites that were not originally included in the nationally used NOAA survey sheets: 1) shotgun shells, and; 2) oyster farming debris. Beginning in June, 2015, a separate recording of meso-debris items (5mm - 2.5 cm) was incorporated to the survey sheets. Analysis of this data by the coordinator will help validate debris items recorded within the 2.5 cm and 1 ft. size range and maintain survey uniformity. Additionally, through independent analysis the coordinator manages and compiles this data, which demonstrates variation and quantity of meso-debris items against other debris sizes within and between each of the six beach sites and provides baseline data on the scope of the meso-debris problem along the sanctuary shores. Survey sheet reformation continues to improve the effectiveness and efficiency of the program as volunteers are able to better record and organize information and therefore increase data accuracy.

A total of six survey plots cover 600 m along the GFNMS coast. Recorded debris items and survey observations may provide information applicable to other beach management efforts. Baseline data are submitted to the NOAA Marine Debris Program and used as a centralized marine debris resource for coordinating and managing the issue of marine debris on multiple scales. Locally, site-specific baseline data provides insight into the scope of the marine debris problem within GFNMS by determining the presence and deposition rate of marine debris as well as seasonal patterns of deposition. Data also provides details about debris types, presence/absence and abundance of debris within beach plots, and impacts to beaches over time and seasonally. Site-specific baseline data also helps target better locations and time periods for effective beach cleanup efforts, while minimizing wildlife and habitat disturbance. Regionally, these data will provide site-comparison analysis to better understand the scope of the marine debris impacts along the West Coast, and offer opportunities for state and local partnerships to better manage debris reduction efforts. Nationally, data will help determine the most efficient use of limited funding for prevention and mitigation efforts critical for development of national marine debris policy recommendations.

3. List the work projected for the remainder of the funding period.

Work projected for the remainder of the funding period, year four , July 2015 – June 2016, will continue to execute standing stock and accumulation surveys using the same protocols as in years one through three. Data management will also continue in its current manner with updates to debris findings maps at least one time per year and updates to GFNMS website biannually.

For both continuation of the standing stock and accumulation surveys, annual project reporting will reflect changes made to the survey and/or reporting processes, and a final report after year four, or when funding availability ends, will summarize findings and accomplishments throughout the projects duration. As data compiles and as funding allows, presentations and attendance at conferences or workshops related to marine debris and citizen science will provide information to stakeholders about the development and execution of volunteer lead science programs, educate citizens and land managers about the scope and severity of the marine debris problem, and provide scientific evidence of trends in debris type, location, and frequency.

4. Include any other findings, results, or information you would like to report or comment on, such as status of data in accordance with the data sharing plan, or description of any project photographs. Describe any issues encountered.

Additional information about the project, methodology, and reporting procedures can be found at: <http://farallones.noaa.gov/science/marinedebris.html>  
A map depicting locations of the four GFNMS managed standing stock beach sites can be found at: <http://farallones.noaa.gov/science/pdf/gfnmssurveysites.pdf>  
Any inquiries about program processes or survey data can be directed to the project coordinator Kate Bimrose at [kate.bimrose@noaa.gov](mailto:kate.bimrose@noaa.gov)

## Part II. Budget Information

1. Provide an Itemized Budget Table according to the format below showing expenses incurred (in dollar amounts) *during the reporting period*.

<b>Budget Category</b>	<b>NOAA Funds (\$)</b>	<b>Matching Contributions (\$)</b>	<b>Match Contribution Description:</b> Nature (cash or in-kind) and Source of Match	<b>Total Expense (\$)</b>
Personnel	\$40,404	\$20,330.00	Volunteer time for travel, conducting surveys, and entering data (\$5,114.00); GFNMS staff time (\$15,216.00)	\$60,734
Fringe	\$0	\$0	All costs include benefits, overhead and payroll accounted for in other categories	0
Supplies	\$383.31	\$3,250.00	GFNMS in-kind office space, utilities, supplies, & computer	\$3,633.31
Other direct costs	\$0	\$1,200.00	Personal cell phone use to communicate with volunteers	\$1,200.00
Contractual				0
Travel	\$1100	\$744.80	GFNMS in-kind use of government car/FastTrack	\$1844.80
Indirect costs	\$0	\$0		0
Other	\$0	\$0		
<b>TOTAL</b>	<b>\$41,887.31</b>	<b>\$25,524.80</b>		<b>\$67,412.11</b>

Note: to see updated totals you need to right click on the total, then choose "update field." If you add rows, you will need to update the formulas in each "total" cell. Click in the total cell, go to "Table Tools" on the top toolbar, click the "layout" tab, click "formula", and add the new cell references.

2. Briefly describe the expenditures within each budget category for this reporting period. Include a more detailed description of matching contributions (if applicable).

Personnel costs include hourly fully loaded rates for the project coordinator and project supervisor Kirsten Lindquist. Matching contributions in this category include volunteer time at \$22.50/hr, with roughly two hours of survey time including data and photo reporting, for a total of 98 hours at a total cost of \$2,205.00. Additionally volunteer travel time at \$0.575/mi totals \$2,909.00. Finally, GFNMS staff time, including supervising roles, contracting services, IT time, and oversight totals another 156 hours at a contribution of \$15,216.00.

Supply costs include NOAA funding (\$383.31) and in-kind use of office space (~\$1,000.00), phone and utilities (~\$850.00) computer (\$1,200.00) and office supplies (~\$200.00) equaling another \$3,250.00.

Travel in-kind costs include use of the GFNMS government vehicle and FastTrack for surveys (100mi/survey) approximately 13 times over the course of the year at a rate of \$0.575/mi equaling \$744.80. Additional costs of \$1100 were reimbursed as a portion of NOAA funding allocated for use of personal vehicle to survey sites and one conference when government cars were unavailable.

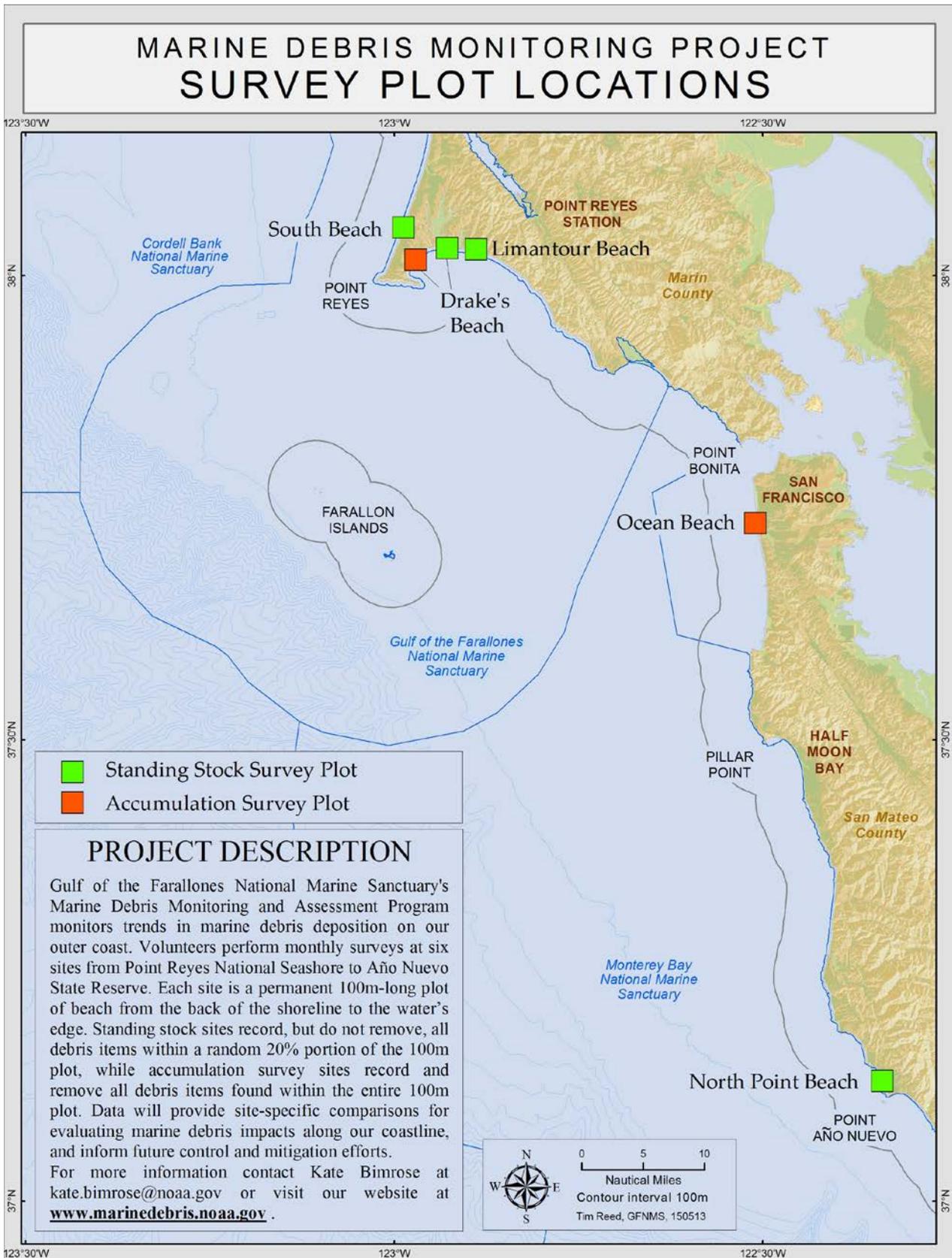
Indirect costs include use of personal cell phone for contacting volunteers, beach managers, and GFNMS staff at \$100.00/month equaling \$1,200.00 for the reporting year.

3. Provide an updated budget table according to the format below showing funding expended throughout the duration of the project.

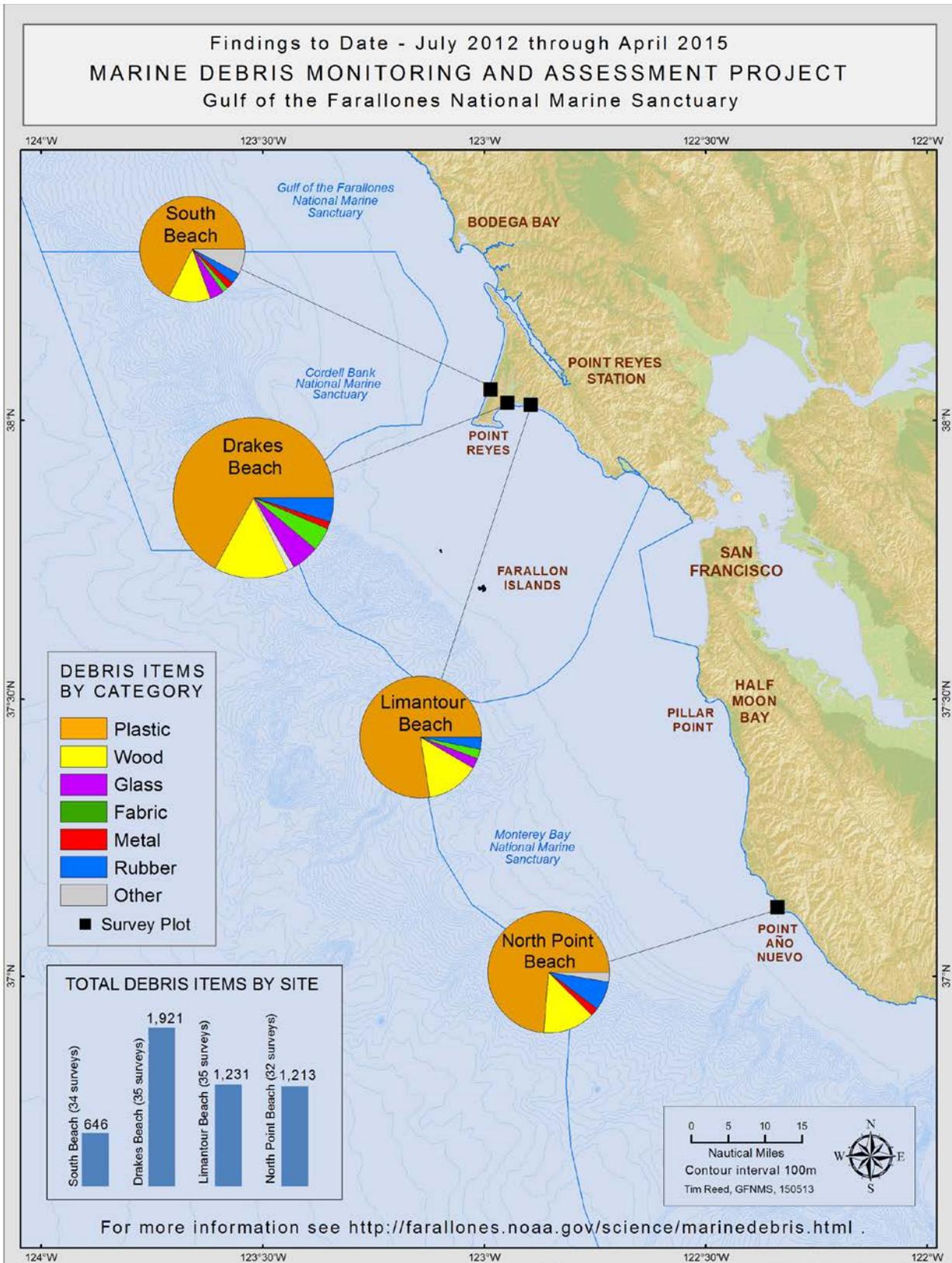
<b>TOTALS</b>	<b>NOAA funds (\$)</b>	<b>Matching contributions (\$)</b>	<b>Total Expense (\$)</b>
TOTAL amount of award	<b>\$110,980.98</b>	<b>\$50,119.00</b>	<b>\$161,099.98</b>
Amount expended during this reporting period	<b>\$41,887.31</b>	<b>\$25,524.80</b>	<b>\$67,412.11</b>
Cumulative amount expended from this award	<b>\$110,980.98</b>		<b>\$110,980.98</b>
Amount of funds awaiting expenditure	<b>\$0.00</b>		<b>\$0.00</b>

Note: to see updated totals you need to right click on the total, then choose "update field." If you add rows, you will need to update the formulas in each "total" cell. Click in the correct cell, go to "Table Tools" on the top toolbar, click the "layout" tab, click "formula", and add the new cell references.

# APPENDIX A - Greater Farallones National Marine Sanctuary Survey Locations



**APPENDIX B**



## APPENDIX C

For each site the average number of debris items recorded per survey (July, 2012 – April, 2015), and debris category (plastic, wood, metal, glass, fabric, rubber, and other).

