

## Nurdle Patrol Year 1 Final Report

PI: Jace Tunnell

### Administration:

#### Contract Activity

- The Nurdle Patrol Expansion, Education, and Outreach was approved for funding on June 1, 2020.
- Tracy Weatherall was hired July 1, 2020, as the Nurdle Patrol Assistant.
- The Subaward Agreement No. UTA20-000902 between The University of Texas at Austin and Texas A&M University Corpus Christi was fully funded for the amount of \$39,984.00 on August 31, 2020, to develop a mobile application for Nurdle Patrol and enhance the NurdlePatrol.org website.
- The contract between the Texas Plastic Pollution Symposium venue (Holiday Inn Beach Resort at South Padre Island) and the University of Texas at Austin was finalized and signed on October 26, 2020.
- Purchase Order issued on November 30, 2020, for \$10,000 to complete a series of nurdle awareness videos by Enlightened Images.
- Purchase Order issued to Augs Services in January 2021 for \$14,122.50 to create and post three billboards across Texas about Nurdle Patrol from February to May 2021 (Figure 1).
- Purchase Order issued to Augs Services in March 2021 for \$4,660 to post a billboard in La Porte, Texas about Nurdle Patrol from March to May 2021.
- Purchase Order for E&F Audio Visual IT Services in March 2021 for \$1,782.33 to provide IT equipment and services to host the Texas Plastic Pollution Symposium.

### Risks and Impacts

Due to COVID-19, The University of Texas at Austin (UT-A) has banned work related travel for all faculty, staff, and students until August 31, 2021. This emergency travel ban has impacted the following:

- Our ability to attend meetings, provide trainings and expand the Nurdle Patrol footprint has been limited to online and/or local endeavors only.
- We were approved by the university to attend the Texas Plastic Pollution Symposium on March 4-5, 2021, on South Padre Island, Texas.

### Project Tasks:

***Hire full-time staff to organize annual meeting, training, travel, manage website and develop promotional materials about Nurdle patrol.***

Tracy Weatherall was hired during the first quarter starting July 1, 2020.

#### ***Host the Texas Plastic Pollution Symposium (TPPS)***

The Symposium was a success! The planning committee met every other week via Zoom during the third quarter to discuss the event logistics. Planning committee members include members from the following organizations: Gulf Guardians, Texas Sea Grant, City of South Padre Island, Texas Parks and Wildlife Department, University of Texas Rio Grande Valley, University of Texas Marine Science Institute, and the Mission-Aransas Reserve. The symposium took place in the city of South Padre Island, TX on March 4-5, 2021, at the Holiday Inn Beach Resort at South Padre Island. Day one (March 4<sup>th</sup>, 2021) included seventeen oral and three poster presentations focusing on research, solutions, and public policy regarding plastic pollution in the state of Texas, and day two (March 5<sup>th</sup>, 2021) included local community workshops, a beach clean-up and additional outreach events. March 4<sup>th</sup> had approximately 40 attendees in person and 120 virtual through Zoom. March 5<sup>th</sup> had around 60 participants in person. Diane Wilson was the invited speaker where she gave a 30 minute “live” through Zoom presentation about her life growing up and her battle with Formosa Plastics. All participants received a “Swag Bag” filled with a TPPS t-shirt, stainless steel

water bottle, face mask and duffel bag (Figure 2). To advertise the event, TPPS promotional posters were created and distributed (Figure 3). The contract between the Holiday Inn Beach Resort at South Padre Island and the University of Texas at Austin was finalized and signed on October 26, 2020. Included in the contract are the event charges for March 4<sup>th</sup>, 2021 (\$7,386.30) included the presentation room (\$1,500.00), three meals (\$1,119.20- Breakfast, \$1,359.20 – Lunch, \$1,359.20 – Dinner) and related service fees and banquet charges. Additional associated costs were IT services by E&F IT Services (\$1,782.33) who supplied the necessary equipment and technical expertise for the Zoom portion of the symposium and swag (\$6,375.74) for 200 people (\$2,588.96 – masks & duffel bags, \$1,407.50 – t-shirts, \$2,379.28 – stainless steel tumblers). On Friday, March 5, 2021, we provided the presentation room (\$500), lunch (\$1,040.00), and associated services fees (\$218.40) which totaled \$1,758.40.

### ***Student Scholarships***

As an incentive to attract students to attend in person and present their research at the Symposium, they were offered a \$500 stipend to cover costs for travel and expenses. A total of six students presented either an oral presentation or a poster presentation. The students applied for the stipend funds through the University of Texas and checks were sent to the students during the fourth quarter.

### ***Create Starter Kits***

Three kits were developed over the past year, a Nurdle Patrol Startup Kit, Teacher Nurdle Kit and Plastic Free Life Starter Kit. The Nurdle Patrol Starter Kit (Figure 4) was created for organizations to startup their own Nurdle Patrol citizen science project or to incorporate nurdle surveys into their existing monitoring program. The kits were designed to supply organizations with resources needed to conduct surveys, talk to their volunteers about nurdles, and provide a foundation for a successful project. To date, 119 partners have received starter kits with more requests coming in from organizations on a regular basis.

In January 2021, we initiated the Plastic Free Life Challenge. This friendly competition was designed as an incentive to encourage our partners and individuals to conduct as many nurdle surveys as possible each month. The group that conducts the most surveys will win a Plastic Free Life starter kit that includes 42 single-use plastic alternatives (Figure 5).

The Teacher Nurdle Kits were developed in February 2021 due to many requests from teachers across the United States that wanted to teach their students about how plastics reach the ocean and what negative impacts plastics have on the environment. These kits include a curriculum about nurdles entering the ocean, what negative impacts there are, and what solutions are out there to prevent nurdles from getting into the waterways. Two hundred and fifty-nine kits were shipped during the fourth quarter totaling 357 kits shipped since February 2021. The impact on the schools around the country is significant because if each teacher has 25 students, then the 357 teachers would be teaching 8,925 students. We know from talking with the teachers that some have up to 125 students since they teach multiple classes per day, so the number of students reached is likely much higher. The interactive teacher kits also include six jars of nurdles, information card about how to conduct a nurdle survey, a presentation all about nurdles, and articles describing the problem (Figure 6).

### ***Meet with organizations about Nurdle Patrol – Outreach***

During the first year we acquired 119 Nurdle Patrol partners (Figures 7-10; Table 1-2). Several virtual presentations and meetings were given during the fourth quarter to promote Nurdle Patrol to new organizations, including:

- July 22, 2020 – TAMUCC Plastics Class
- July 24, 2020 – TAMUCC Nurdle Patrol field day

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June 2020 - May 2021

- July 24, 2020 – Terra Science & Education in New York
- August 4, 2020 – Youth Audubon
- August 19, 2020 – Inland Ocean Coalition – North Texas Chapter
- August 25, 2020 - Texas Sea Grant
- August 26, 2020 – Cimpatco Live TV: <https://youtu.be/2a8NZKeZw1s>
- September 10, 2020 – Rotary of Corpus Christi
- September 16, 2020 – TAMUCC Science Teachers Association
- September 23, 2020 – Waterkeeper Association
- September 23, 2020 – Public Lab
- September 25, 2020 – Gulf Coast Growth Ventures
- September 30, 2020 – CC Montessori School
- October 28, 2020 – Yorkshire Academy
- November 11, 2020 – TAMUCC Islander Green Team
- November 17, 2020 – BlueTech Panel
- November 23, 2020 – University of Pittsburgh
- February 9, 2021 – Texas Master Naturalist Rio Grande Valley
- March 4, 2021 – TX Plastic Pollution Symposium
- March 5, 2021 – South Padre Family Expo
- March 30, 2021 – University of Southern Mississippi Science Cafe
- April 6, 2021 – American Chemical Association Symposium
- April 14, 2021 – Eastern Mennonite University
- April 22, 2021 – South Florida Water Management District
- May 11, 2021 – Microplastics Science Team
- May 14, 2021 – Sisters on the Fly, “Nurdles and Turtles” talk
- May 19, 2021 – Texas Informal Educators Association
- May 19, 2021 – Colombia Microplastics Symposium
- May 21, 2021 – Reserve Advisory Board Meeting

The Nurdle Patrol Facebook group is being utilized as a way to communicate with individual citizen scientists as well as new organizations about new efforts related to Nurdle Patrol. News stories, survey results, and other related material are also shared with the more than 2,600 followers on the closed group Nurdle Patrol Facebook page. Also, the Nurdle Patrol Twitter account (public) was created in August 2020 to educate and inform the general public about plastic pollution and other science related topics. To date there are 241 followers.

### ***Develop Phone App and update website***

A contract was signed with Texas A&M University-Corpus Christi Conrad Blucher Institute (CBI) on August 31, 2020. The work by CBI included the development of a phone app for Nurdle Patrol, as well as updates to the Nurdle Patrol website ([www.NurdlePatrol.org](http://www.NurdlePatrol.org)). Both versions of the phone app, Android and iOS, were released in May 2021. The app is being downloaded and utilized by citizen scientists. No technical glitches have been found to date; however, we would like to add some features in future versions of the app that will be included in the year 2 funding. These improvements include adding a map of all the data from all surveys performed and adding a solutions page.

Website improvements have been occurring monthly, including the bulleted list of items completed below.

- The website was updated on April 22, 2021, with the following:
  - Gulf Nurdle Expedition was added to homepage.
- The website was updated on November 26, 2020, with the following:

- Esri map refactor
  - A legend was added to the map as a widget
  - Nurdle points can now be toggled on and off
  - The Legend is now included when the map is printed
- Solutions Page has new UI design and text
- Overview page
  - New image was added at the top as a banner
  - The publication and YouTube card description texts have been updated
- The website was updated on March 14, 2021, with the following:
  - Popup template on the patrol points can now have a disclaimer if the standardized nurdle count was calculated without the patrol being completed properly (minutes collecting must be 10 minutes or more to be a completed survey). A disclaimer message was added to the 42 patrols that met these criteria.
  - The algorithm for calculating the standardized count has changed slightly. We are now applying the equation to all patrol. However, if **minutes collecting** or **number of volunteers** is 0, the standardized nurdle count will equal 0 because both minutes collecting and number of volunteers is used for division.

### ***Develop promotional videos***

Camera equipment was purchased to obtain footage of nurdles on the beach, nurdle surveys from volunteers, and to have footage for a variety of videos that will be produced both internally at UTMSI for public awareness as well as videos produced by a professional film crew, Enlightened Images. Videos produced have been placed on the YouTube Channel that the Mission-Aransas Reserve maintains, as well as posting to various social media platforms. Below is a list of already produced videos and future contracted videos to be made.

- A short video was completed internally for promoting the Nurdle Patrol startup kits, with the link to the video being found here: <https://youtu.be/wKMaKwXJVP4>
- Enlightened Images produced the following promotional videos:
  - An 18-minute documentary of the Great Nurdle Expedition across the Gulf of Mexico: <https://youtu.be/LcwNITA09ys> . This video was published on Earth Day, April 22<sup>nd</sup>. Enlightened Images has created this video along with two other shorter versions that UT showed on their social media on Earth Day, getting a wide audience of viewers. This video will continue to be used along with some short promotional videos to help promote.
  - The “Purple Nurdle” is a 23 second video to spark the interest of nurdles with the younger generation with the use of an emoji. This video will be used as an advertisement on Facebook and YouTube. <https://youtu.be/mHvvMzITiNMb>
  - The “Nurdles Sea to Shining Sea” is another short promotional video to highlight the types of beautiful scenery we all want, but that nurdles are lurking below. This will be another video used in advertisements. <https://youtu.be/GmbjsHUikpU>
  - A graphics designer helped to produce a simple animated one-minute video about the life cycle of a nurdle. This is an easy way for teachers to show their students the basics about what a nurdle is. <https://youtu.be/4w3T73jizpo>
  - A new training video at the beach was recorded in Spanish and filmed in South Padre Island on May 14<sup>th</sup>. <https://youtu.be/cd8xMRajoMY>
  - A series of short promotional videos were completed in May 2021 to help promote the NurdlePatrol.org webpage.
    - Everything Plastic: <https://youtu.be/LJgrssl6kE>

- Nurdles on the Dark Horizon: <https://youtu.be/9G6qS686Bik>
- Nurdle Road Trip Trailer: <https://youtu.be/-xw1bZT91dl>
- Nurdle Patrol Citizen Scientists for Future Generations: <https://youtu.be/tV3lHFNUlLc>

### ***Make educational material***

In July 2020 we created a Nurdle Patrol flyer that on the front side describes how to conduct a Nurdle Survey and on the back side has more detailed information that includes where to look for nurdles, what nurdles are, and a QR Code link to NurdlePatrol.org where a training video can be found (Figure 11). We have printed 2,500 copies to date and include approximately 25 flyers in each Nurdle Patrol citizen science startup kit. We also distribute the cards in the Teacher Nurdle Kits, during nurdle training events and in person presentations. We plan to print more in the future to distribute at educational events and to new start up Nurdle Patrol organizations as demand comes in. In March 2021 we translated the informational cards to Spanish (Figure 12) and printed 1,000 cards. Many of these are being shipped down the Rio Grande Valley to the Texas Master Naturalists that are in contact with teachers in the Valley. We are also advertising these for communities that are largely Spanish speaking. We are working to translate other educational materials to Spanish, including the Nurdle Patrol sampling methodology publication and the nurdle training video.

### **Summary**

A total of 3,176 surveys were conducted during the first year of the Matagorda Bay Mitigation Trust and 1,243,279 nurdles were removed from the beaches, riverbanks, and lake shorelines of the United States and Mexico. Nurdlepatrol.org acquired 119 new partners and shipped 357 teachers kits to educators in the USA, Mexico, and Spain (Table 3).

### **Obstacles**

Travel restrictions continued to be the biggest obstacle thus far, as this limits face to face contact with new groups; however, virtual technology has been very useful in meeting with large groups and seems to be working out in our favor.

***Nurdle Patrol Progress Report Figures***



**Figure 1.** Nurdle Patrol billboard campaign.



Figure 2. Texas Plastic Pollution Symposium swag.

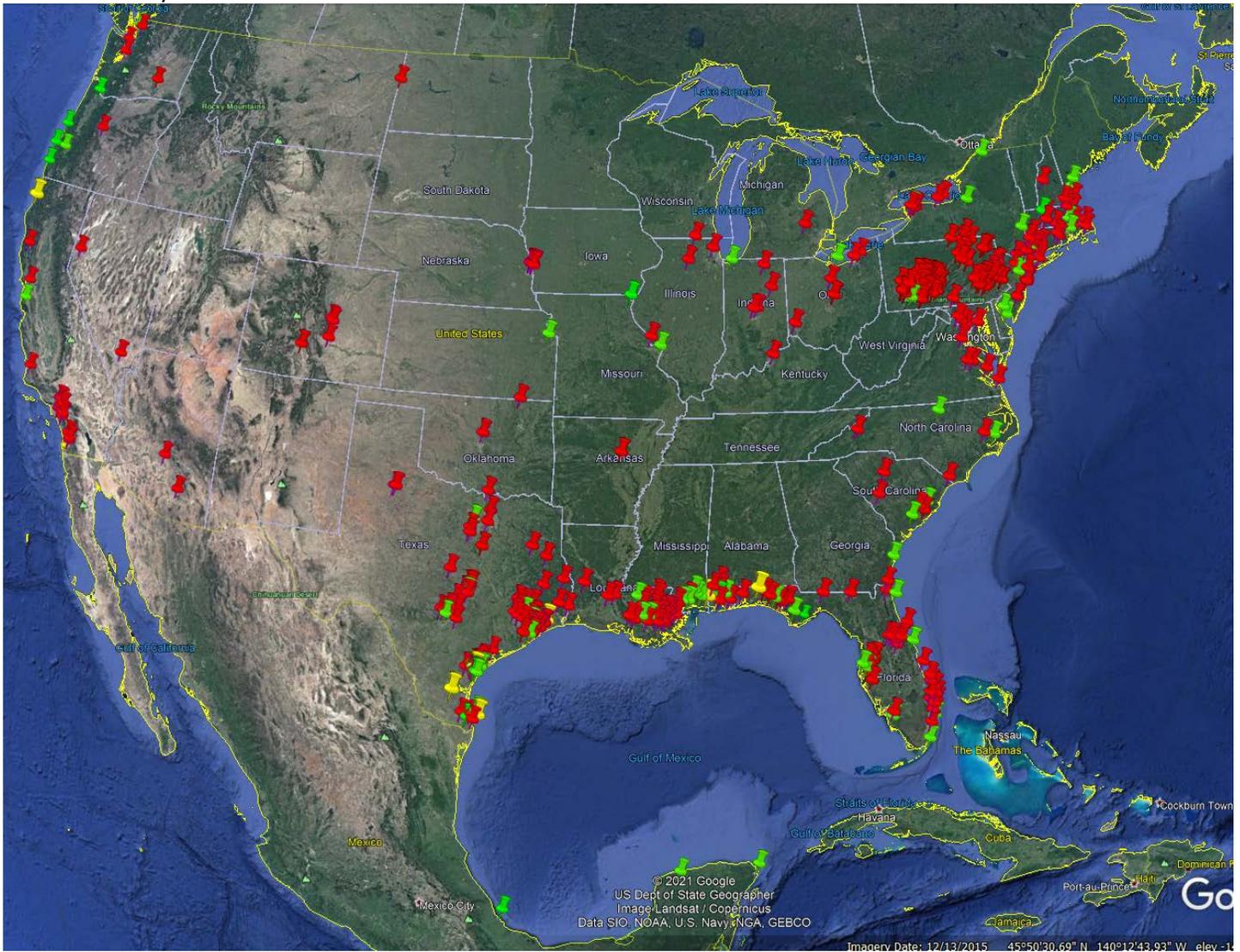


Figure 3. Save the Date and Call for Abstracts & Registration promotional posters.





Figure 6. Teacher kit items.



**Figure 7.** Nurdle Patrol Partners in the continental United States and Mexico. Green markers represent partners who joined previously, and yellow markers represent new partners acquired during the Fourth quarter. Red markers represent Nurdle Patrol Teacher Kits that were sent to educators.

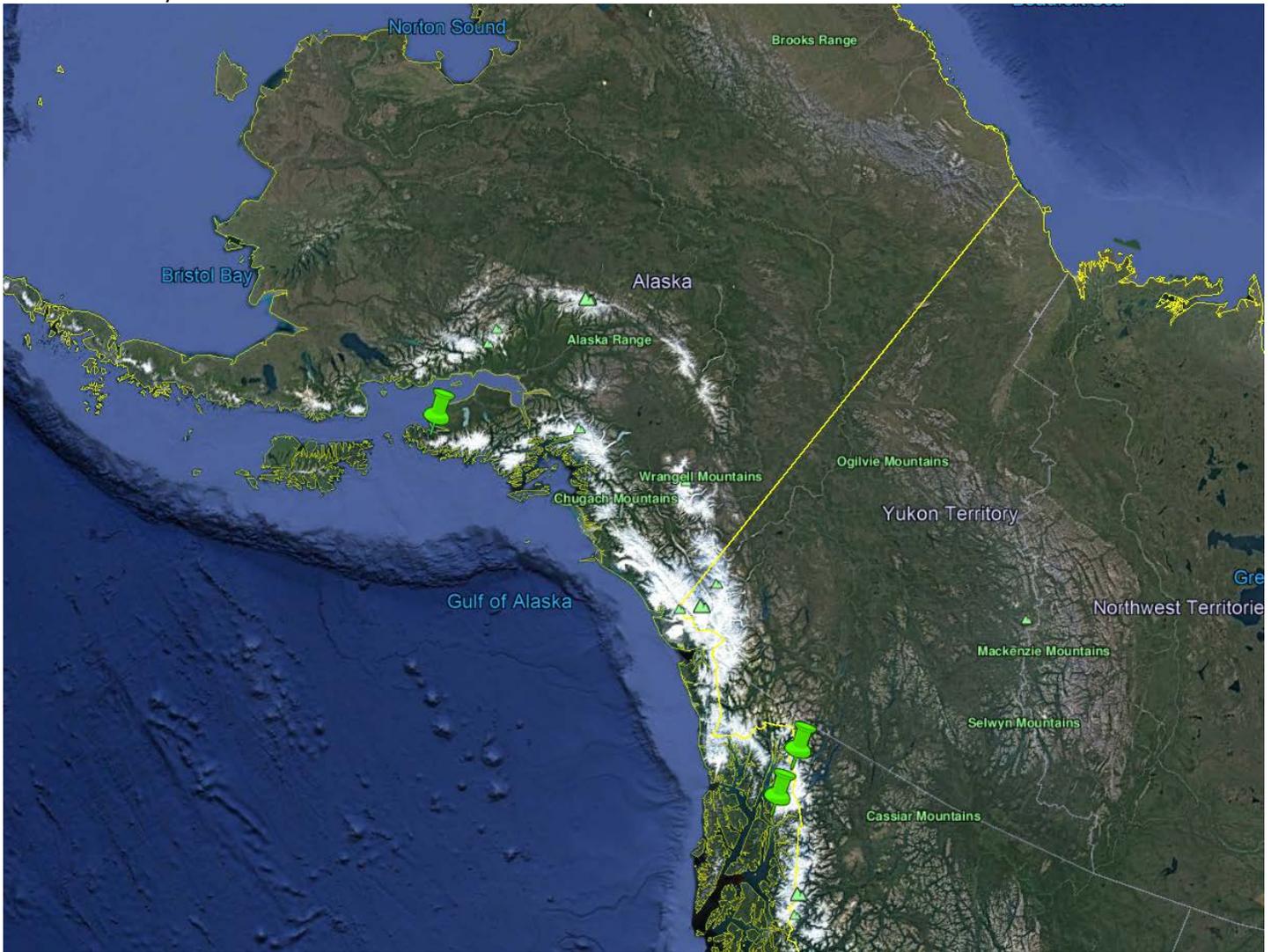


Figure 8. Nurdle Patrol Partners in Alaska.

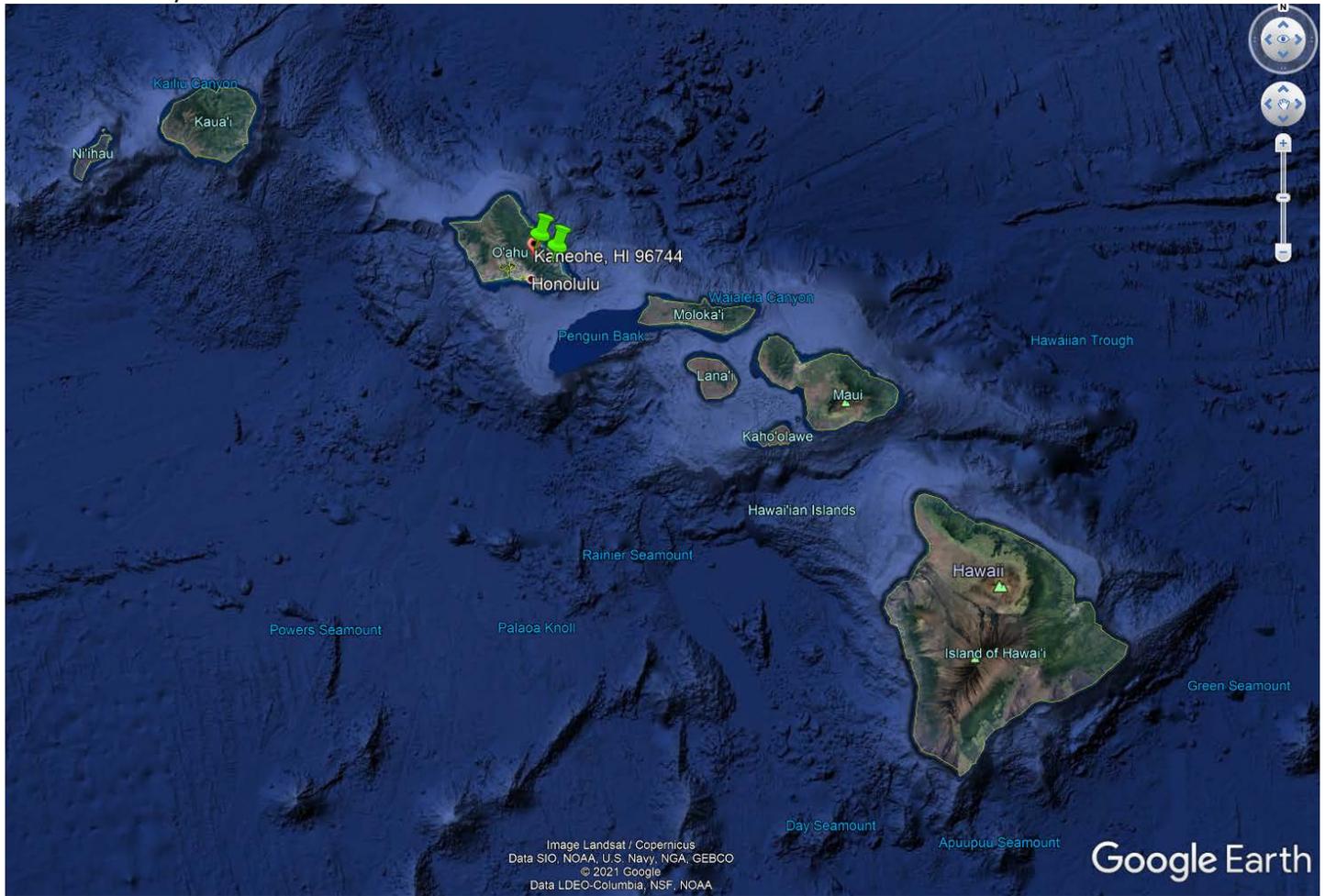


Figure 9. Nurdle Patrol Partners in Hawaii.



Figure 10. Teacher Kit in Spain.

# NURDLE PATROL

**Pick up plastic pellets (nurdles) at your beach for 10 minutes.**

**Send location, date, pics, and number found to [NurdlePatrol.org](http://NurdlePatrol.org)**

**Done!**



## NURDLE PATROL?

More info: [www.NurdlePatrol.org](http://www.NurdlePatrol.org)

Nurdle Patrol is a citizen science project that is looking to gather information about where nurdles are located across the United States, remove the nurdles from the environment, and create awareness about the nurdle issue. Nurdles are small plastic pellets and are the basis of everything plastic. They are small and look like food to animals, and they absorb harmful chemicals in the environment so can be deadly to some animals. Join us to help create change in policies to prevent nurdles from entering the waterways.



Figure 11. Nurdle Patrol outreach flyer front and back.

# Patrulla Nurdle

**Por 10 minutos en tu playa, recoge postas de plástico.**

**Manda la ubicación, fecha, fotos y el número encontrado a [NurdlePatrol.org](http://NurdlePatrol.org).**

**¡Listo!**



## Patrulla Nurdle?

Más información: [www.NurdlePatrol.org](http://www.NurdlePatrol.org)

Patrulla Nurdle, es un proyecto de ciencia ciudadana, que desea recopilar información sobre la ubicación de Nurdles, a lo largo de Estados Unidos, retirarlos del medio ambiente y crear conciencia sobre el tema de los Nurdles. Nurdles son pequeñas postas de plástico, las cuales son la base de todo plástico. Son pequeñas y para los animales asemejan comida, absorben químicos dañinos del medio ambiente que pueden ser mortales para algunos animales. Únete con nosotros, para prevenir que los Nurdles entren a las vías fluviales.



Figure 12. Spanish version of the Nurdle Patrol outreach flyer front and back.

**Nurdle Patrol Progress Report Tables**

Number	Partner	Group Type	State	Number	Partner	Group Type	State
1	Terra Science & Education	School	NY	31	Gulf Guardians	Nonprofit	TX
2	Terra Science & Education	School	NY	32	Sun of a Beach Cleanup	Nonprofit	FL
3	Tampa Bay Estuary Program	NEP	FL	33	Keep Bolivar Beautiful	Nonprofit	TX
4	Coastal Bend Bays & Estuaries Program	NEP	TX	36	Jacques Cousteau NERR	NERR	NJ
5	Weeks Bay NERR	NERR	AL	37	Wells Reserve at Laudholm	NERR	ME
6	Rockport Fulton Middle school Ecology/Environmental Club	School	TX	38	Tijuana River NERR	NERR	CA
7	Island RV Resort	Business	TX	39	Guana Tolomato Matanzas NERR	NERR	FL
8	Southernmost Homeschoolers	Homeschool	FL	40	Defenders of Wildlife	Nonprofit	NC
9	Inland Ocean Coalition North Texas Chapter	Nonprofit	TX	41	Old Women Creek NERR	NERR	OH
10	Choctawhatchee Basin Alliance	Waterkeeper	FL	42	Delaware NERR	NERR	DE
11	National Park Service - Padre Island National Seashore	Federal	TX	43	ACE Basin NERR	NERR	SC
12	Friends of Padre	Nonprofit	TX	44	Angler Action Foundation	Nonprofit	FL
13	Universidad de Veracruzana - Sea & Reef Program	University	MX	45	Hudson River NERR	NERR	NY
14	Rookery Bay NERR	NERR	FL	46	Friends of the Kaw	Nonprofit	KS
15	Surfrider Foundation - Texas Coastal Bend Chapter	Nonprofit	TX	47	Buffalo Niagara Waterkeeper	Waterkeeper	NY
16	Galveston Bay Foundation	Nonprofit	TX	48	Crystal Coast Waterkeeper	Waterkeeper	NC
17	Texas A&M University - Corpus Christi, Conrad Blucher Instit.	University	TX	49	White Oak New Riverkeeper Alliance	Waterkeeper	NC
18	Texas Master Naturalist	Nonprofit	TX	50	Sapelo Island NERR	NERR	GA
19	The University of Texas, Rio Grande Valley	University	TX	51	NY: NJ Baykeeper	Waterkeeper	NY
20	Parley for the Oceans	Nonprofit	MX	52	South Slough NERR	NERR	OR
21	11th Hour Racing	Nonprofit	TX	53	A Rocha USA	Business	FL
22	Monsignor McClancy Memorial HS	School	NY	54	Sustain 2 Remain	Nonprofit	TX
23	Nicholls State University	University	LA	55	Missouri Confluence Waterkeeper	Waterkeeper	MO
24	Texans For Clean Water	Nonprofit	TX	56	Great Bay NERR	NERR	NH
25	Flyaway Paper Straws	Business	FL	57	Sea Grant - Mississippi-Alabama	Sea Grant	MS
26	Our Lady Academy	School	MS	58	Mississippi State University Extension	University	MS
27	Saint Stanislaus	School	MS	59	Flour Bluff ISD	School	TX
28	Shedd Aquarium	Aquarium	IL	60	Corpus Christi Hooks	Business	TX
29	Charleston Waterkeeper	Waterkeeper	SC	61	Padilla Bay NERR	NERR	WA
30	South Padre Island Sessions	Business	TX	62	Kachemak Bay NERR	NERR	AK

**Table 1: Nurdle Patrol Partners who have received startup kits as of May 31, 2021.**

Number	Partner - Continued	Group Type	State	Number	Partner	Group Type	State
63	Bayou City Waterkeeper	Waterkeeper	TX	92	O'ahu Waterkeeper	Waterkeeper	HI
64	Save Our Shores	Nonprofit	CA	93	Plastic Free Grants	Nonprofit	MS
65	Delaware Sea Grant	Sea Grant	DE	94	Chesapeake Bay NERR	NERR	VA
66	Louisiana State University	University	LA	95	Friends of Lake Superior Reserve	NERR	WI
67	Mountain Watershed Association - Youghiogheny Riverkeeper	Nonprofit	PA	96	University of Michigan	University	MI
68	Florida Sea Grant - UF/IFAS Extension Pinellas County	Sea Grant	FL	97	Save Our Seas Mountain Ocean Project	Nonprofit	TX
69	Narragansett Bay NERR	NERR	RI	98	Maryland Coastal Bays Program	Nonprofit	MD
70	Barataria-Terrebonne National Estuary Program	NEP	LA	99	University of Alaska Fairbanks	University	AK
71	Sarasota Bay Estuary Program	Nonprofit	FL	100	University of Oregon's Charleston Marine Life Center	University	OR
72	He'eia National Estuarine Research Reserve	NERR	HI	101	Shoreline Education for Awareness (SEA)	Nonprofit	OR
73	North Carolina Coastal Reserve and NERR	NERR	NC	102	MARYSMA Mar Y Sustentabilidad Para El Medio Ambiente	Eco-tourism	MX
74	North Inlet-Winyah Bay NERR	NERR	SC	103	Apalachicola Nat'l Estuarine Research Reserve & Florida Dept of Environ	NERR	FL
75	Wildlife Club	Nonprofit	FL	104	U.S. Fish and Wildlife Service, Bandon Marsh National Wildlife Refuge	Governmental	OR
76	Tillamook Estuaries Partnership	NEP	OR	105	Mobile Baykeeper	Nonprofit	AL
77	Chesapeake & Coastal Service, CBNERR	NERR	MD	106	Connecticut River Conservancy	Nonprofit	CT
78	Morro Bay National Estuary Program	NEP	CA	107	Dimock and Dimock Photography	Business	OR
79	Waterkeeper Alliance	Nonprofit	TX	108	Costa Cleanups	Nonprofit	TX
80	Healthy Gulf	Nonprofit	LA	109	Elizabeth Kratzig	Eco-tourism	FL
81	Texas Marine Mammal Stranding Network	Nonprofit	TX	110	Zig Travel	Eco-tourism	FL
82	Seaside Sustainability	Nonprofit	MA	111	Rio Grande Chapter of the Texas Master Naturalist	Nonprofit	TX
83	Siera Club, Baton Rouge Group	Nonprofit	LA	112	Mustang Island State Park	Governmental	TX
84	The Gale Academy of Environmental Science and Technology	School	FL	113	Texas Retired Teachers Association	Nonprofit	TX
85	Lake Worth Waterkeepers	Waterkeeper	FL	114	Sea Turtle Inc.	Nonprofit	TX
86	Columbia Waterkeeper	Waterkeeper	OR	115	Choctawhatchee Basin Alliance	Nonprofit	FL
87	Cahaba Riverkeeper	Waterkeeper	AL	116	Turtle Island Restoration Network	Nonprofit	TX
88	MTHS Eco Club	Nonprofit	WA	117	Castal Brigade	Nonprofit	TX
89	USM School of Humanities	University	MS	118	Northcoast Environmental Center	Nonprofit	CA
90	TAMUCC Green Team	University	TX	119	Pascagoula River Audubon Center	Nonprofit	MS
91	Jean Lafitte National Historical Park ad Barataria Preserve	Nonprofit	LA				

**Table 2: Nurdle Patrol Partners who have received startup kits as of May 31, 2021 (continued).**

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MBMT YEAR ONE	June	July	August	September	October	November	December	January	February	March	April	May	Total
Number of Surveys	104	116	324	347	237	173	185	184	323	438	343	402	3,176
Nurdles Removed	2,245	2,762	1,016,385	73,606	59,753	6,847	4,787	8,055	9,517	23,354	21,035	14,933	1,243,279
New Partners	N/A	N/A	75	16	8	3	4	1	5	5	2	0	119
Teacher Kits	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	98	150	104	5	357

**Table 3: Matagorda Bay Mitigation Trust Year 1 Nurdle Patrol Statistics.**