

APPENDIX A

DEBRIS CHARACTERIZATION FORMS

Shoreline Debris Shoreline Characterization Sheet Complete this form once for each shoreline site.	Organization		Name of organization responsible for collecting the data
	Surveyor Name		Name of person responsible for filling in this sheet.
	Phone Number		Phone contact for surveyor
	Date		Date of this survey

SHORELINE INFORMATION

Shoreline ID		Unique code for the shoreline
Shoreline Name		Name by which the section of shoreline is known
City/State/County		City, County and State where site is located

LAND-USE CHARACTERISTICS

Shoreline Start Coordinates	<u>Lat</u>	<u>Long</u>	Coordinates at northernmost or westernmost extent of shoreline site. Record GPS waypoint or in decimal degrees.
Shoreline End Coordinates	<u>Lat</u>	<u>Long</u>	Coordinates at southernmost or easternmost extent of shoreline site. Record GPS waypoint or in decimal degrees.
Location & major usage	Urban		Select one and indicate major usage (e.g., recreation, boat access, remote)
	Suburban		
	Rural		
Access			Vehicular, pedestrian (you must walk), boat (you must boat)
Nearest Town			Name of nearest town
Nearest town distance			Distance to nearest town
Nearest town direction			Direction to nearest town
Nearest river name			If applicable, name of nearest stream
Nearest river distance			Distance to nearest river/stream
Nearest river direction			Direction to nearest river/stream (cardinal direction)
River/creek input to beach	YES	NO	Whether nearest river/stream has an outlet within shoreline section
Pipe or drain input	YES	NO	If there is a storm drain or channelized outlet with shoreline section
Notes (including description, landmarks, fishing activity, etc.):			

SHORELINE CHARACTERISTICS

Length of Sampling Site (100m if standing stock survey)		Length measured along the midpoint of the shoreline (meters)
Substratum Type		For example, a sandy or gravel beach
Sustrate Uniformity		Percent coverage of the main substrate type
Tidal Range		Use tidal chart
Tidal Distance		Measure on-site
Back of Shoreline		Describe landward limit (e.g., vegetation, rock wall, dunes, cliff)
Aspect		Direction you are facing when you look out at the water

AMENITIES

Amenity	Present?	Amenity	Present?
Parking (cost for 8 hours)		Volleyball Nets	
Restrooms		Fire Pits	
Lifeguard Station		Boardwalk	
Pier		Bike Path	
Showers		Industry Views	
Concessions		Playground	

Shoreline Debris Sampling Site Characterization Sheet Complete this form once per site visit	Organization		Name of Organization Responsible for collecting the data
	Surveyor Name		Name of person responsible for filling in this sheet.
	Phone Number		Phone Contact for Surveyor
	Date		Date of this survey
	# of Survey Staff		Number of survey staff conducting survey

SAMPLING SITE INFORMATION

Shoreline ID			Unique code for the shoreline
Shoreline name			Name for shoreline section (e.g., beach name, park)
Survey type	Accumulation	Standing-Stock	Type of shoreline survey conducted (circle)
Time start/end	<u>Start</u>	<u>End</u>	Time at the beginning and end of the survey (military time)
Width of beach	BACK: FRONT:		Width of beach at time of survey from water's edge to back of shoreline in meters (change of shoreline to dunes, parking lot, etc.)
Season			Spring, summer, fall, winter, tropical, wet, etc.
Date of last survey			Date on which the last survey was conducted
Storm activity			Describe significant storm activity within the previous week (date(s), high winds, etc.)
Current weather			Describe weather on sampling day, including wind speed and % cloud coverage
Large Items	YES	NO	Did you note large items in the debris section (circle one)?
Raking Occurred?	YES	NO	Has the beach recently been raked (do you see evidence of raking, e.g., rake lines in the sand)?

SAMPLING SITE COORDINATES

Coordinates at southeast corner of sampling site	<u>Latitude</u>	<u>Longitude</u>	Record GPS waypoints or coordinates in decimal degrees
Coordinates at southwest corner of sampling site	<u>Latitude</u>	<u>Longitude</u>	Record GPS waypoints or coordinates in decimal degrees
Coordinates at northwest corner of sampling site	<u>Latitude</u>	<u>Longitude</u>	Record GPS waypoints or coordinates in decimal degrees
Coordinates at northeast corner of sampling site	<u>Latitude</u>	<u>Longitude</u>	Record GPS waypoints or coordinates in decimal degrees
Coordinates at start of wrack line	<u>Latitude</u>	<u>Longitude</u>	Record GPS waypoints or coordinates in decimal degrees at start of berm
Coordinates at end of wrack line	<u>Latitude</u>	<u>Longitude</u>	Record GPS waypoints or coordinates in decimal degrees at end of berm

TRANSECT WAYPOINT TABLE (if standing stock survey)

	Transect #	Transect Range	Transect Start	Berm Line	Transect End	Transect Width (m)
Transect 1						
Transect 2						
Transect 3						
Transect 4						

PHOTOS

Photo ID's	Notes

Transect Debris

<i>Shoreline ID:</i>		<i>Date:</i>		<i>Transect ID:</i>	
<i>Shoreline Name:</i>		<i>Surveyor Name:</i>			

Tally (e.g.;III)

Item	Foreshore	Total	Item	Backshore	Total
Plastic					
Plastic fragments- Hard			Plastic fragments- Hard		
Plastic fragments- Foamed			Plastic fragments- Foamed		
Plastic fragments- Film			Plastic fragments- Film		
Food wrappers			Food wrappers		
Beverage bottles			Beverage bottles		
Other jugs or containers			Other jugs or containers		
Bottle or container caps			Bottle or container caps		
Cigar tips			Cigar tips		
Cigarettes			Cigarettes		
Disposable cigarette lighters			Disposable cigarette lighters		
6-pack rings			6-pack rings		
Bags			Bags		
Plastic rope/small net pieces			Plastic rope/small net pieces		
Buoys & floats			Buoys & floats		
Fishing lures & line			Fishing lures & line		
Cups (including foamed plastic)			Cups (including foamed plastic)		
Plastic utensils			Plastic utensils		
Straws			Straws		
Balloons			Balloons		
Personal care products			Personal care products		
Other:			Other:		
Metal					
Aluminum/tin cans			Aluminum/tin cans		
Aerosol cans			Aerosol cans		
Metal fragments			Metal fragments		
Other:			Other:		
Glass					
Beverage bottles			Beverage bottles		
Jars			Jars		
Glass fragments			Glass fragments		
Other:			Other:		
Rubber					
Flip-flops			Flip-flops		
Gloves			Gloves		
Tires			Tires		
Rubber fragments			Rubber fragments		
Other:			Other:		
Processed Lumber					
Cardboard cartons			Cardboard cartons		
Paper and cardboard			Paper and cardboard		
Paper bags			Paper bags		
Lumber/building material			Lumber/building material		
Other:			Other:		
Cloth/Fabric					
Clothing & shoes			Clothing & shoes		
Gloves (non-rubber)			Gloves (non-rubber)		
Towels/rags			Towels/rags		
Rope/net pieces (non-nylon)			Rope/net pieces (non-nylon)		
Fabric pieces			Fabric pieces		
Other			Other		
Other/Unclassifiable					
Food:			Food:		

Large Debris Items (>1 foot or ~0.3m)

Item type (vessel, net, etc.)	Status (sunken, stranded, buried)	Approximate width (m)	Approximate length (m)	Description / photo ID #

Notes on debris items, description of "Other/unclassifiable items, etc:

A-4

Wrack Debris

Shoreline ID:

Date:

Shoreline Name:

Surveyor Name:

Item	Tally (e.g., IIII)			Total
<i>Plastic</i>				
Plastic fragments- Hard				
Plastic fragments- Foamed				
Plastic fragments- Film				
Food wrappers				
Beverage bottles				
Other jugs or containers				
Bottle or container caps				
Cigar tips				
Cigarettes				
Disposable cigarette lighters				
6-pack rings				
Bags				
Plastic rope/small net pieces				
Buoys & floats				
Fishing lures & line				
Cups (including polystyrene/foamed)				
Plastic utensils				
Straws				
Balloons				
Personal care products				
Other:				
<i>Metal</i>				
Aluminum/tin cans				
Aerosol cans				
Metal fragments				
Other:				
<i>Glass</i>				
Beverage bottles				
Jars				
Glass fragments				
Other:				
<i>Rubber</i>				
Flip-flops				
Gloves				
Tires				
Rubber fragments				
Other:				
<i>Processed Lumber</i>				
Cardboard cartons				
Paper and cardboard				
Paper bags				
Lumber/building material				
Other:				
<i>Cloth/Fabric</i>				
Clothing & shoes				
Gloves (non-rubber)				
Towels/rags				
Rope/net pieces (non-nylon)				
Fabric pieces				
Other				
<i>Other/Unclassifiable</i>				
Food				
<i>Large Debris Items (>1 foot or ~0.3m)</i>				
Item type (vessel, net, etc.)	Status (sunken, stranded, buried)	Approximate width (m)	Approximate length (m)	Description / photo ID #

Notes on debris items, description of "Other/unclassifiable items, etc:

APPENDIX B

DEBRIS CHARACTERIZATION HANDBOOK

INTRODUCTION

As part of its pilot study to assess the economic benefit of reductions in marine debris in Orange County California, IEc will collect data on beach characteristics for all significant sandy beaches within a reasonable driving distance of Orange County in the summer of 2013.¹ Data on beach characteristics and marine debris levels will be obtained primarily through on-site observations and measurements. This handbook describes the implementation plan and protocols IEc will use to collect data on marine debris and beach characteristics at the 31 selected beach sites listed below.

SELECTED BEACH SITES (NORTH TO SOUTH)

1. Zuma	17. Huntington City
2. Point Dume	18. Huntington State
3. Topanga	19. Newport
4. Will Rogers	20. Balboa
5. Santa Monica	21. Corona Del Mar
6. Venice	22. Crystal Cove
7. Dockweiler	23. Laguna Beach (Coves)
8. El Segundo	24. Laguna Beach (Main)
9. Manhattan	25. Aliso Beach
10. Hermosa	26. Salt Creek
11. Redondo	27. Doheny State Beach
12. Torrance/Malaga Cove	28. Capistrano
13. Long Beach	29. San Clemente City/Pier
14. Seal Beach	30. Calafia/San Clemente State
15. Sunset/Surfside	31. San Onofre
16. Bolsa Chica	

SCHEDULE

IEc will collect data on marine debris at the 31 selected beach sites in two stages: one in mid-July, from July 9th to July 18th, and one in Mid-August, from August 13th to August 22nd. Data will be collected primarily in the mornings, as close to low tide as possible, and after mechanical raking (which typically occurs between 5am and 10am). None of the assessments will be completed within 72 hours of a significant rainfall event (defined as more than 0.25 inches of rain within 24 hours). The following days have been selected for data collection for both periods.²

¹ Please see IEc's "Study Plan - Assessing the Economic Benefits of Reductions in Marine Debris: A Pilot Study of Beach Recreation in Orange County, California", June 10, 2013 for full details.

² Adjustments to this schedule may need to occur on-site, and will be documented in our final report.

DEBRIS CHARACTERIZATION SCHEDULE

JULY						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
7	8	9 Sunset/Surfside Seal Long Beach	10 Huntington City Huntington State Bolsa Chica	11 Laguna Main Laguna Coves Crystal Cove	12 Corona del Mar Balboa Newport	13 Capistrano Doheny Salt Creek Aliso
14 San Onofre Calafia/San Clemente State San Clemente City	15 Torrance Redondo Hermosa	16 Manhattan El Segundo Dockweiler	17 Venice Santa Monica Will Rogers	18 Topanga Point Dume Zuma	19	20
AUGUST						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
11	12	13 Sunset/Surfside Seal Long Beach	14 Huntington City Huntington State Bolsa Chica	15 Laguna Main Laguna Coves Crystal Cove	16 Corona del Mar Balboa Newport	17 Capistrano Doheny Salt Creek Aliso
18 San Onofre Calafia/San Clemente State San Clemente City	19 Torrance Redondo Hermosa	20 Manhattan El Segundo Dockweiler	21 Venice Santa Monica Will Rogers	22 Topanga Point Dume Zuma	23	24

DEFINITIONS

1. ***Foreshore:*** The area of shore that lies between the limits of the mean high water (MHW) and mean low water (MLLW) and is exposed during low tides.
2. ***Backshore:*** **The part of the beach that lies behind the berm and is reached only by the highest tides. It is usually dry and flat.**
3. ***Berm:*** The nearly horizontal portion of a beach or backshore having an abrupt fall and formed by wave deposition of material and marking the limit of ordinary high tides.
4. ***Wrack line:*** Organic or non-organic material that is deposited onshore, usually at the MHW.
5. ***Shoreline:*** The beach or location selected for the marine debris survey.
6. ***Sampling site:*** For standing stock surveys, the 100 meter stretch of shoreline to be surveyed.
7. ***Length:*** The distance or dimension that runs parallel to the water line.
8. ***Width:*** The distance or dimension that runs perpendicular to the water line.

STAFF RESPONSIBILITIES

During each assessment, field personnel will count and categorize all observed macro debris (debris larger than 2.5cm on the longest dimension) along four randomly selected 5m long transects within a 100m segment of the beach.

This section outlines the protocols that field staff will follow to prepare for and conduct the on-site debris characterization.

FORMS

Fill out all forms completely and legibly. There are five types of forms you will be asked to fill out for every shift:

1. **Shoreline Characterization Sheet:** The elements on this form describe the entire shoreline beach area.
2. **Sampling Site Characterization Sheet:** The elements on this form describe the selected sampling area (100m area) and the conditions on the selected sampling day/time.
3. **Transect Tally – Foreshore:** Use this form to record all observed macro debris in the foreshore section of your four transects.
4. **Transect Tally – Backshore:** Use this form to record all observed macro debris in the backshore section of your four transects.
5. **Wrack Line Tally:** Use this form to record all observed macro debris in the 2m band around the wrack line of your 100m sampling area.

PRIOR TO ARRIVING AT THE SITE

The following steps must be completed before arriving at each beach site:

1. **Select sampling site:** At each beach, the 100m segment of the shoreline will be located so that it is centered on the entrance to the beach from the main parking lot. If the main parking lot has multiple entrances, then the shoreline site will be centered between the outer entrances to the beach. In your handbook, each site has an overview map; on each site, identify the approximate starting location using these guidelines.
2. **Select sampling time:** Using the tide table and raking schedule in your binder, identify the four hour window for collecting data at each site.
3. **Select transects:** Before you arrive at the site, you need to select the four random transects at which you will complete the debris characterization observations. Follow the instructions in the “Transect Random Selection” workbook to randomly select transects for each site, and to find the corresponding meter ranges. This will give you four randomly assigned transect ID numbers (from 1 to 20) and the corresponding five meter range (from 0 to 100 meters) for each site for each survey period. Record the transect IDs and meter range on your Sampling Site Characterization Sheet (in the Transect Waypoint Table).

- 4. *Begin completing Shoreline Characterization Sheet:*** Several elements of the shoreline characterization sheet should be completed before arriving at the site. The elements that can be completed ahead of time are:

Shoreline Information
Land-Use Characteristics

AFTER ARRIVING AT THE SITE

The following steps must be completed upon arrival at each beach site:

- 5. *Complete Shoreline Characterization Sheet:*** Fill in the remaining elements of the Shoreline Characterization Sheet:

Shoreline Characteristics
Amenities

- 6. *Begin completing Sampling Site Characterization Sheet:*** Fill in the “Sampling Site Information” section of the Sampling Site Characterization Sheet.
- 7. *Set up your sampling site and transects:*** At each beach, find the designated starting point for the 100m segment of the shoreline using the area indicated on the maps in your binder. Use the step-by-step instructions in Attachment A to set up your sampling site and transects.
- 8. *Complete Sampling Site Characterization Sheet:*** Fill in the remaining elements of the Sampling Site Characterization Sheet:

Sampling Site Coordinates
Transect Waypoint Table

- 9. *Observe and record debris along the wrack line:*** Follow the step-by-step instructions in Attachment A to observe and record debris along the wrack line, using your Wrack Line Tally Form. Characterize all debris that measures over 2.5cm, (or 1 inch) in the longest dimension that you see using the categories on your form. If any part of the item is within the sample transect, count the item. DO NOT remove any debris from the transect. Record large debris items (anything larger than 1 foot in the longest dimension) in the large debris section of the tally form.
- 10. *Observe and record debris in each transect:*** Follow the step-by-step instructions in Attachment A to observe and record debris in each transect, using your Transect Tally – Foreshore and Transect Tally – Backshore Forms. Characterize all debris that measures over 2.5cm, (or 1 inch) in the longest dimension that you see using the categories on your form. If any part of the item is within the sample transect, count the item. DO NOT remove any debris from the transect. Record large debris items (anything larger than 1 foot in the longest dimension) in the large debris section of the tally form.

11. **Clean up site:** Once all data is collected, make sure you remove all flags and string from the site. Record all photo IDs and make all final notes on site characteristics and debris observed during the survey period. Record the end time on your Sampling Site Characterization Sheet.

POLICIES

ALTERNATE SAMPLING SITE AREA

If the 100 meter area segment centered on your predetermined starting point for a given beach is not available (e.g., the area is covered by visitors), you will proceed either north or south from that location (based on a coin flip) until an adequate 100 meter measurement site has been identified. If there are no adequate measurement sites within 500m of the main parking lot, leave the site and return at an alternative time.

ALTERNATE TRANSECTS

If you are unable to obtain measurements along four transects at the predetermined sampling site (e.g., visitors have entered one or more of your transect areas after the 100 meter sampling site has been established), you will proceed either north or south from that transect (based on a coin flip) until an adequate transect has been identified. If there not four adequate transects within the 100 meter sampling site, identify an alternate sampling site as described above.

DRESS

You will be working outside, so be sure to dress appropriately for the weather. Bring appropriate outerwear for normal temperatures and precipitation throughout the season. Temperatures can range from 50 to 90 degrees in this area at this time of year.

You should dress in a casual but professional manner. Acceptable attire includes pants, casual collared shirts, button-up shirts, knit shirts, and blouses. Your footwear should be comfortable and have a closed toe. Most closed-toe footwear is acceptable, including tennis shoes, hiking boots, and work boots. Do not wear sandals, open-toed shoes, tank tops, shorts, cut-offs, sweats, or workout clothes.

PERSONAL SAFETY

Your safety is our first priority. If you ever perceive an unsafe condition, you should take immediate action to avoid or mitigate the condition. If there is an emergency or you feel threatened, call 9-1-1. You may also call your Field Supervisor, who will assist you in any way possible. If you are unable to complete your assigned duties due to safety concerns, you should contact your Field Supervisor.

QUESTIONS FROM THE PUBLIC

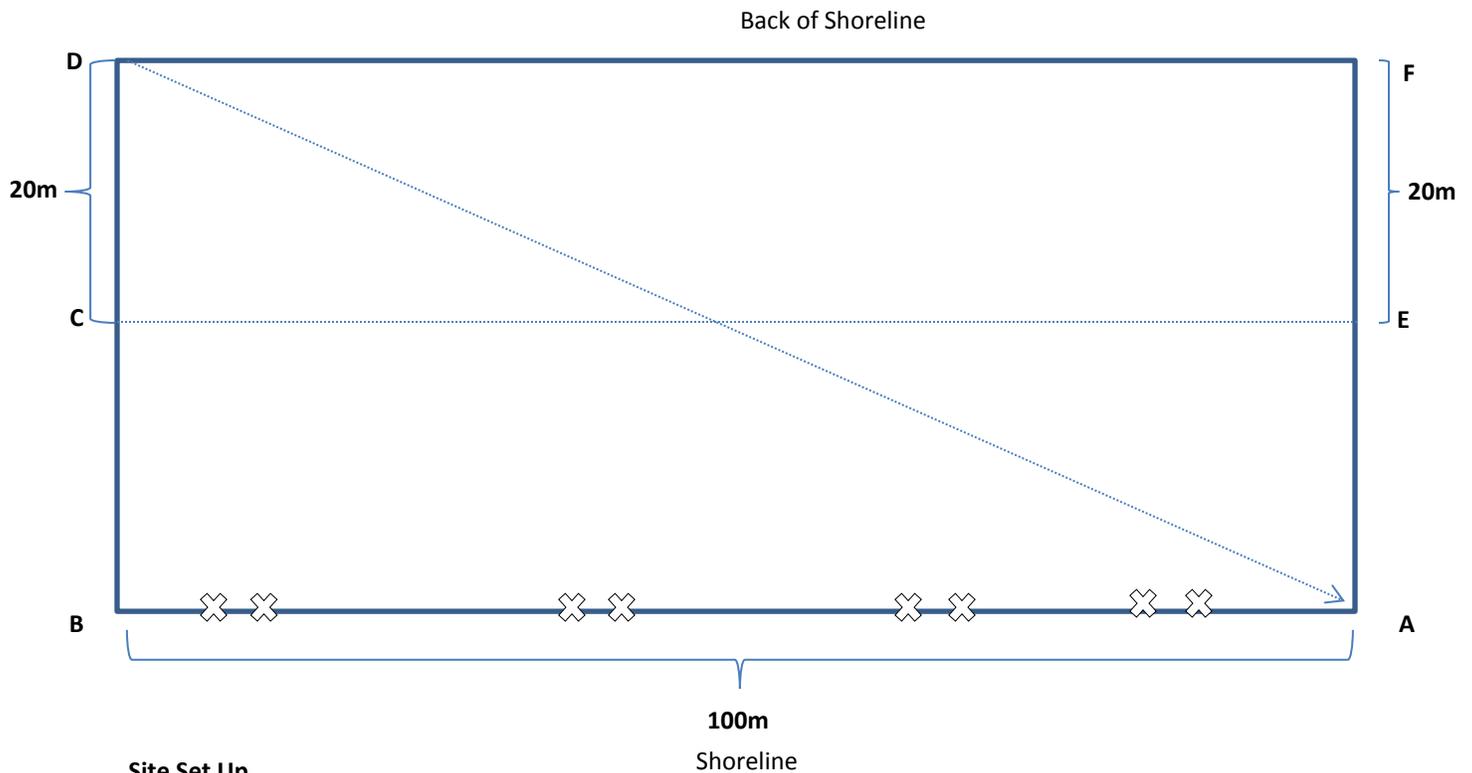
During the study, you may interact with individuals who approach you because they are interested in learning about the study. This handbook provides guidelines for some of the interactions you are likely to have regarding implementation of the study. Attachment B has a list of some common questions that you may encounter and responses to each.

However, we cannot predict every situation that you may encounter. You should always act professionally, courteously, and safely.

MATERIALS / SUPPLIES

Attachment C has a checklist of materials and supplies that all survey staff should bring with them to each of their shifts.

Attachment A: Step-by-Step Instructions

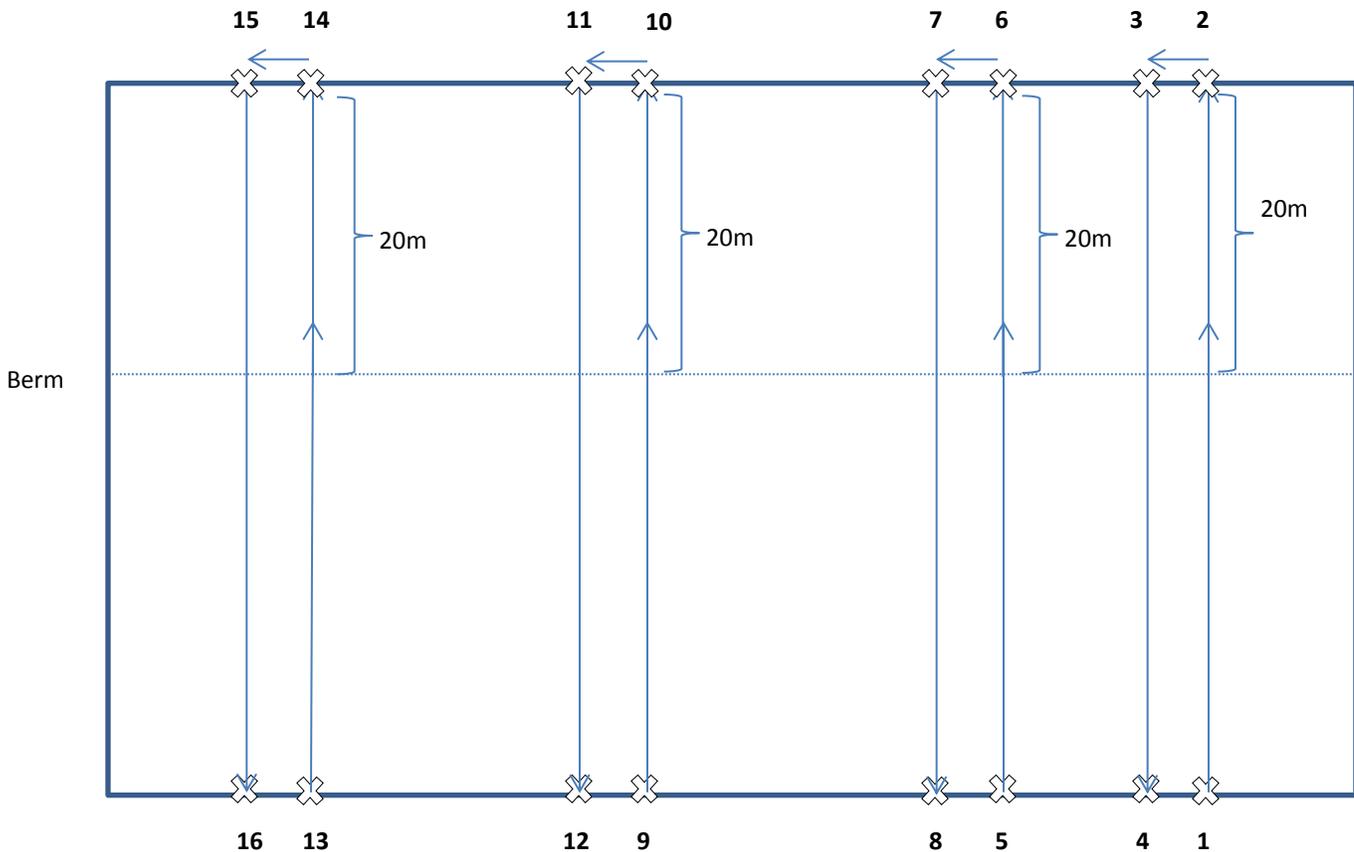


Site Set Up

1. Find your starting point (A), stake a flag and mark coordinates/waypoint on your Sampling Site sheet.
2. Walk parallel to shoreline towards corner (B). As you walk, put down flags down at each transect meter range (from your transect table).
3. When you have walked 100 meters (B), stake a flag and mark coordinates/waypoints on your sheet.
4. Walk straight back towards the back of the shoreline (perpendicular to the shoreline) until you hit the berm (C). Mark berm coordinates/waypoints on your sheet.
5. Continue walking back towards the back of the shoreline until you have walked 20 meters past the berm crest (D). Stake a flag and mark coordinates/waypoints on your sheet.
6. Return to your starting point (A).
7. Walk straight back towards the back of the shoreline (perpendicular to the shoreline) until you hit the berm (E). Mark berm coordinates/waypoints on your sheet.
8. Continue walking back towards the back of the shoreline until you have walked 20 meters past the berm crest (F). Stake a flag and mark coordinates/waypoints on your sheet.

Wrack Line Debris Observation

1. Return to Point E (approximate start of wrack line).
2. Walk along the wrack line (parallel to the shoreline) towards point C.
3. Field Staff 1: Observe all macro debris within a 2 meter band of the wrack line (1 meter on each side of the center of the wrack line) – report all debris to Field Staff 2.
4. Field Staff 2: Follow Field Staff 1 and record all debris reported by Field Staff 1 on your wrack line tally form.



Transect Set-Up

Field Staff 1

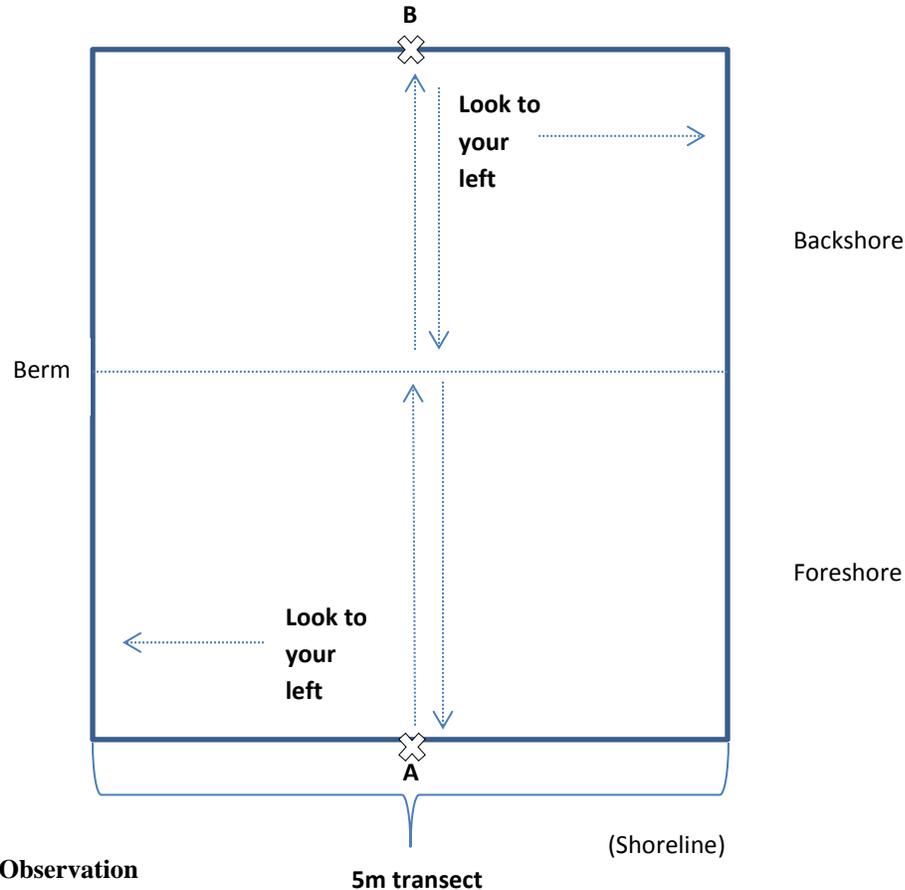
1. Start at Point 1. Reset your surveyor's wheel and walk straight to the back of the shoreline (perpendicular to the shoreline – towards Point 2) until you hit the berm.
2. Walk an additional 20 meters past the berm (to Point 2).
3. Walk 5 meters parallel to the shoreline (to Point 3).
4. Reset your surveyor's wheel and walk straight back to the shoreline (perpendicular to the shoreline – towards Point 4). Report total width to Field Staff 2.

Field Staff 2

1. Start at Point 1. Mark coordinates on your sheet. Attach string to flag 1.
2. Follow Field Staff 1 and drag string behind you until you hit the berm. Mark coordinates on your sheet.
3. Follow Field Staff 1 to back of shoreline. Plant a flag at Point 2, attach string to flag 2. Mark coordinates on your sheet.
4. Follow Field Staff 1 5 meters parallel to the shoreline (to Point 3). Plant a flag at Point 3, attach string to flag 3.
5. Follow Field Staff 1 back to the shoreline (towards Point 4), dragging string behind you. Attach string to flag 4. Record total width on your sheet.

Repeat Steps 1-4 for remaining 3 transects

Repeat Steps 1-5 for remaining 3 transects

**Transect Debris Observation***Field Staff 1*

1. Start at Point A (midpoint of the first transect). Walk straight to the back of the shoreline (perpendicular to the shoreline – towards Point B).
2. Look to your left and report all the macro debris you see between you and the string line to your left (marking the border of the transect) to Field Staff 2.
3. Stop when you get to the berm.
4. Continue walking to the back of the transect (Point B) and report all the macro debris you see between you and the string line to your left.
5. Turn around and walk back towards the shoreline (perpendicular to the shoreline – towards Point A).
6. Look to your left and report all the macro debris you see between you and the string line to your left (marking the border of the transect) to Field Staff 2.
7. Stop when you get to the berm.
8. Continue walking to the back of the transect (Point A) and report all the macro debris you see between you and the string line to your left.

Repeat Steps 1-8 for remaining 3 transects

Field Staff 2

1. Start at Point A. Follow Field Staff 1 and walk straight to the back of the shoreline (perpendicular to the shoreline – towards Point B).
2. Record all macro debris reported by Field Staff 1 on your Transect Tally – Foreshore form.
3. Stop when you get to the berm.
4. Continue walking to the back of the transect (Point B) and record all macro debris reported by Field Staff 1 on your Transect Tally – Backshore form.
5. Turn around and walk back towards the shoreline (perpendicular to the shoreline – towards Point A).
6. Continue recording all macro debris reported by Field Staff 1 on your Transect Tally – Backshore form.
7. Stop when you get to the berm.
8. Continue walking to the back of the transect (Point A) and record all macro debris reported by Field Staff 1 on your Transect Tally – Foreshore form.

Repeat Steps 1-8 for remaining 3 transects

Attachment B: Responses to Frequently Asked Questions

What are you doing?

We are collecting information about marine debris on this beach as part of a study being conducted by the National Oceanic and Atmospheric Administration to estimate the benefits of reductions in marine debris for Orange County residents.

How will the results be used?

The results will be used in a study being conducted by the National Oceanic and Atmospheric Administration to estimate the benefits to Orange County residents of reductions in marine debris on Orange and Los Angeles County beaches.

Who is running the study?

The study is being conducted by Industrial Economics for the National Oceanic and Atmospheric Administration's Marine Debris Division.

How long will this take? How often will you be out here?

It should only take us about an hour to conduct our measurements at this beach. We will conduct measurements at this beach once in July and once in August of this year.

Where is the study being conducted?

The study is being conducted at the major public beaches in Orange and Los Angeles County, from San Onofre to Zuma Beach.

How can I get more information about the study?

You can find out more about the study by contacting Jason Landrum with the U.S. National Oceanic and Atmospheric Administration. His phone number is (301) 713-2989.

Attachment C: Equipment Checklist

- A sufficient number of ALL forms. Be sure to bring all partially completed forms as well. Bring extras! This includes:
 1. Shoreline Characterization Sheet
 2. Sampling Site Characterization Sheet
 3. Transect Tally - Foreshore Form
 4. Transect Tally - Backshore Form
 5. Wrack Line Tally Form
- Debris Characterization Handbook
- Site-Specific Maps
- Driving directions to each beach site
- Surveyor's Wheel
- 100' Fiberglass Measuring Tape
- Flag markers
- Hand Held GPS Unit
- Extra batteries for GPS Unit
- Twine and twine storage reel
- Ruler
- Several pens/pencils. Bring extras!
- Plastic folder to hold your forms
- Clipboard
- Cell Phone
- Digital Camera
- Watch
- Comfortable, closed-toe shoes
- Emergency contact list
- First Aid Kit
- Work Gloves
- Sunblock
- Water
- Hat
- Snacks (recommended)

APPENDIX C

MARINE DEBRIS SURVEY INSTRUMENT

Southern California Beach Survey



To start, we'd like to THANK YOU for taking the time to participate in this VOLUNTARY survey! Your responses will help government officials understand the types of things that people want to see/experience when they visit the beach in the local area.

Throughout the survey, when we ask questions about beaches in the "local area," we are referring to ocean beaches in Los Angeles, Orange, and San Diego counties.

1 Have you ever visited an ocean beach in the local area? (Circle one number.)

- 1 Yes
- 2 No ➡ Skip to Question 11

2 Over the past year, how many day trips would you say you've taken to ocean beaches in the local area? When we say "day trip" we mean any trip to the beach where you left home and returned home within the same day. (Circle one response.)

- | | | | |
|---|-------------------|----|-------------------------|
| 1 | None | 7 | 31 – 40 Day Trips |
| 2 | 1 – 5 Day Trips | 8 | 41 – 50 Day Trips |
| 3 | 6 – 10 Day Trips | 9 | 51 – 75 Day Trips |
| 4 | 11 – 15 Day Trips | 10 | 76 – 100 Day Trips |
| 5 | 16 – 20 Day Trips | 11 | More Than 100 Day Trips |
| 6 | 21 – 30 Day Trips | | |

3 Which of the following activities do you typically participate in when you visit a beach in the local area? (Check all that apply.)

- | | |
|--|--|
| <input type="checkbox"/> Sunbathing | <input type="checkbox"/> Surfing |
| <input type="checkbox"/> Wading | <input type="checkbox"/> Picnicking |
| <input type="checkbox"/> Swimming | <input type="checkbox"/> Fishing |
| <input type="checkbox"/> Bodysurfing | <input type="checkbox"/> Walking/Running |
| <input type="checkbox"/> Volleyball | <input type="checkbox"/> Biking |
| <input type="checkbox"/> Partying/Bonfires | |

Other? _____

4 What type of transportation do you typically use to get to the beach?

- 1 I walk or bike
- 2 I take a bus
- 3 I drive ➡ How many adults and children would typically be in your vehicle?

_____ Adults (18 Or Older)

_____ Children (Under 18)

5 Please tell us how important the following characteristics are to you when you decide which local beach to visit. (Circle one number for each characteristic.)

	NOT IMPORTANT				VERY IMPORTANT
Scenic beauty or view	1	2	3	4	5
Good water quality	1	2	3	4	5
Close to home	1	2	3	4	5
Parking is convenient	1	2	3	4	5
Parking is free or inexpensive	1	2	3	4	5
Good surfing available	1	2	3	4	5
Sandy (rather than rocky)	1	2	3	4	5
Not crowded	1	2	3	4	5
Long enough to go for a walk/run	1	2	3	4	5
Bike path available	1	2	3	4	5
Fishing opportunities available	1	2	3	4	5
No garbage or manmade debris on the sand or in the surf	1	2	3	4	5
No natural debris like kelp or seaweed on the sand or in the surf	1	2	3	4	5

6 Are there any other characteristics that are important to you when deciding which local beach to visit?

- 1 Yes → Please Describe _____
 2 No

7 Which beaches in the local area have you heard of? From the list below, please circle the names of all local beaches that you have heard of.

- | | | |
|--------------|------------------|----------------------|
| Zuma | Torrance/Malaga | Laguna Beach (Main) |
| Point Dume | Long Beach | Laguna Beach (Coves) |
| Topanga | Seal Beach | Aliso Beach |
| Will Rogers | Sunset/Surfside | Salt Creek |
| Santa Monica | Bolsa Chica | Doheny |
| Venice Beach | Huntington City | Capistrano |
| Dockweiler | Huntington State | San Clemente Pier |
| El Segundo | Newport Beach | Calafia/San Clemente |
| Manhattan | Balboa | San Onofre |
| Hermosa | Corona Del Mar | |
| Redondo | Crystal Cove | |

12 How concerned would you be to see the following types of garbage or manmade debris on the sand or in the surf while visiting a local beach? (Circle one number for each item)

	NOT AT ALL CONCERNED				VERY CONCERNED
Plastic items or bottles	1	2	3	4	5
Styrofoam	1	2	3	4	5
Paper products	1	2	3	4	5
Wooden items	1	2	3	4	5
Metal items or cans	1	2	3	4	5
Glass	1	2	3	4	5
Rubber items	1	2	3	4	5
Cloth or clothing	1	2	3	4	5
Cigarette butts	1	2	3	4	5
Fishing gear	1	2	3	4	5
Medical wastes	1	2	3	4	5
Animal wastes	1	2	3	4	5

13 Please look again at the list in Question 12 and circle the types of garbage or manmade debris that you have actually seen on the sand or in the surf at local beaches.

14 Have you noticed any other types of garbage or manmade debris on the sand or in the surf at local beaches?

- 1 Yes
- 2 No → Skip to Question 16

15 What other types of garbage or manmade debris have you noticed?

16 Please look at the beaches in the list below and circle any beaches where you think garbage or manmade debris on the sand or in the surf is a problem.

Zuma	Torrance/Malaga	Laguna Beach (Main)
Point Dume	Long Beach	Laguna Beach (Coves)
Topanga	Seal Beach	Aliso Beach
Will Rogers	Sunset/Surfside	Salt Creek
Santa Monica	Bolsa Chica	Doheny
Venice Beach	Huntington City	Capistrano
Dockweiler	Huntington State	San Clemente Pier
El Segundo	Newport Beach	Calafia/San Clemente
Manhattan	Balboa	San Onofre
Hermosa	Corona Del Mar	
Redondo	Crystal Cove	

17 To the best of your knowledge, what do you think is the largest source of garbage and manmade debris found on the sand or in the surf at local beaches? (Circle one number.)

- 1 Left by beach visitors
- 2 Blown to the beach from nearby areas on land
- 3 Washed ashore from the ocean
- 4 Washed ashore from nearby rivers or storm drains
- 5 Other (please specify) _____

18 Have you participated in any beach cleanups within the last three years?

- 1 Yes
- 2 No

19 Please look at the beaches in the list below and circle any beaches that you think are frequently too crowded.

Zuma	Torrance/Malaga	Laguna Beach (Main)
Point Dume	Long Beach	Laguna Beach (Coves)
Topanga	Seal Beach	Aliso Beach
Will Rogers	Sunset/Surfside	Salt Creek
Santa Monica	Bolsa Chica	Doheny
Venice Beach	Huntington City	Capistrano
Dockweiler	Huntington State	San Clemente Pier
El Segundo	Newport Beach	Calafia/San Clemente
Manhattan	Balboa	San Onofre
Hermosa	Corona Del Mar	
Redondo	Crystal Cove	

Finally, we have just a few questions about you and your household for statistical purposes.

20 How many adults and children live in your household?

_____ Adults (18 or older)

_____ Children (under 18)

21 What is your gender? (Circle one number.)

- 1 Male
- 2 Female

22 What is your age?

_____ Years

23 Are you of Hispanic, Latino or Spanish origin? (Circle one number)

- 1 Yes
- 2 No

24 What is your race? (You may select more than one.)

- 1 American Indian or Alaskan Native
- 2 Asian
- 3 Black or African American
- 4 Native Hawaiian or Other Pacific Islander
- 5 White
- 6 Some other race (please specify) _____

25 What is the highest degree or level of school you have completed? (Circle one number.)

- 1 No schooling
- 2 Some schooling less than grade 12
- 3 High school graduate
- 4 Some college
- 5 Associate's Degree
- 6 Bachelor's Degree
- 7 Master's Degree
- 8 Professional Degree beyond a Bachelor's
- 9 Doctoral Degree

25 Which of the following income categories best describes your household income last year, before taxes? (Circle one number.)

- | | | | |
|---|---------------------|----|-----------------------|
| 1 | \$10,000 or less | 7 | \$60,001 - \$75,000 |
| 2 | \$10,001 - \$20,000 | 8 | \$75,001 - \$100,000 |
| 3 | \$20,001 - \$30,000 | 9 | \$100,001 - \$125,000 |
| 4 | \$30,001 - \$40,000 | 10 | \$125,001 - \$150,000 |
| 5 | \$40,001 - \$50,000 | 11 | \$150,001 or more |
| 6 | \$50,001 - \$60,000 | | |

Thank you for participating!

Please return your survey in the enclosed, self-addressed, stamped envelope.

Paperwork Reduction Act Statement

The National Oceanic and Atmospheric Administration (NOAA) is authorized by 33 U.S.C. 1951 et seq. to conduct this survey. The information collected will be used by NOAA to estimate economic impacts associated with marine debris on beaches.

Public reporting burden for this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other suggestions for reducing this burden to Jason Landrum, NOAA NOS, 1305 East-West Hwy, SSMC4, Room 10239, Silver Spring, MD 20910.

The questionnaire has an identification number for mailing purposes only. Your name and address will be deleted after we receive your completed questionnaire. Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subjected to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

OMB Control Number 0648-0681 | Current Expiration Date: 10/31/2014

APPENDIX D

MARINE DEBRIS NON-RESPONDENT FOLLOW-UP

Please answer the five brief questions below, then return your completed survey in the enclosed self-addressed, stamped envelope.

1 Over the past year, how many day trips would you say you've taken to ocean beaches in the local area? When we say "day trip" we mean any trip to the beach where you left home and returned home within the same day. (Circle one response.)

- | | | | |
|---|-------------------|----|-------------------------|
| 1 | NONE | 7 | 31 – 40 DAY TRIPS |
| 2 | 1 – 5 DAY TRIPS | 8 | 41 – 50 DAY TRIPS |
| 3 | 6 – 10 DAY TRIPS | 9 | 51 – 75 DAY TRIPS |
| 4 | 11 – 15 DAY TRIPS | 10 | 76 – 100 DAY TRIPS |
| 5 | 16 – 20 DAY TRIPS | 11 | MORE THAN 100 DAY TRIPS |
| 6 | 21 – 30 DAY TRIPS | | |

2 Did you take any day trips to ocean beaches in the local area in June, July, or August of 2013?

- 1 YES → How many? _____
2 NO

3 In general, how concerned would you be to see garbage or manmade debris while visiting a local beach? (Circle one number.)

- | | | | | | | | |
|--|-------------------------|---|---|---|--|--|-------------------|
| | NOT AT ALL
CONCERNED | | | | | | VERY
CONCERNED |
| | 1 | 2 | 3 | 4 | | | 5 |

4 Have you participated in any beach cleanups within the last three years?

- 1 YES
2 NO

5 How many adults and children live in your household?

_____ ADULTS (18 or older)

_____ CHILDREN (under 18)

THANK YOU for taking the time to participate!

Paperwork Reduction Act Statement

The National Oceanic and Atmospheric Administration (NOAA) is authorized by 33 U.S.C. 1951 et seq. to conduct this survey. The information collected will be used by NOAA to prioritize and assess efforts to reduce marine debris.

Public reporting burden for this collection of information is estimated to average five minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other suggestions for reducing this burden to Jason Landrum, NOAA NOS, 1305 East-West Hwy, SSMC4, Room 10239, Silver Spring, MD 20910.

The questionnaire has an identification number for mailing purposes only. Your name and address will be deleted after we receive your completed questionnaire. Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subjected to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

OMB Control Number 0648-0681 | Current Expiration Date: 10/31/2014

APPENDIX E

SURVEY SUMMARY STATISTICS

QUESTION 1

Q1: EVER			
VISITED A			
LOCAL			
BEACH?	FREQ.	PERCENT	CUM.
-----+-----			
YES	1,337	97.45	97.45
NO	35	2.55	100.00
-----+-----			
TOTAL	1,372	100.00	

QUESTION 2

Q2: ANNUAL			
DAY TRIPS	FREQ.	PERCENT	CUM.
-----+-----			
NONE	104	7.59	7.59
1-5	490	35.77	43.36
6-10	245	17.88	61.24

11-15		102	7.45	68.69
16-20		86	6.28	74.96
21-30		92	6.72	81.68
31-40		57	4.16	85.84
41-50		41	2.99	88.83
51-75		47	3.43	92.26
76-100		37	2.70	94.96
>100		69	5.04	100.00
-----+				
TOTAL		1,370	100.00	

QUESTION 3

WHICH ACTIVITIES DO YOU PARTICIPATE IN WHEN VISITING LOCAL BEACHES?

+-----+			
ACTIVITY	PERCENT	N	

SUNBATHING	51.20	1373	
WADING	38.24	1373	
SWIMMING	34.16	1373	
BODYSURFING	19.96	1373	
VOLLEYBALL	7.43	1373	

PARTYING/BONFIRES	34.60	1373	

Q3: OTHER ACTIVITIES MENTIONED:

OTHER_ACTIVITY	N
DINING	27
DOG WALKING	24
PLAYING IN SAND	21
SNORKELING/DIVING	16
SITTING/RELAXING	15
WATCHING OCEAN/SUNSET	14
PHOTOGRAPHY	13
SHOPPING	13
KAYAKING	13
PADDLEBOARDING	13
PEOPLE WATCHING	9
SKATEBOARDING/ROLLERBLADING	8
BALL GAMES	8
TIDEPOOLING	8
READING	7
BOATING/SAILING	7
WATCHING WILDLIFE	7
BOOGIE/BODYBOARDING	6
FINDING SHELLS	6
PARTICIPATING IN BEACH CLEANUP	5

ATTENDING FESTIVALS/EVENTS	4
FLYING KITE	3
CRUISING/DRIVING	3
OTHER	38

QUESTION 4

Q4: WHAT TYPE OF TRANSPORTATION DO YOU TYPICALLY USE TO GET TO THE BEACH?

TRAVEL_MODE	PERCENT	N
I WALK OR BIKE	11.64	1375
I TAKE A BUS	1.53	1375
I DRIVE	91.49	1375

NOTE: PERCENTAGES DO NOT SUM TO 100 BECAUSE SOME INDIVIDUALS PROVIDED MULTIPLE RESPONSES

Q4: HOW MANY ADULTS AND CHILDREN WOULD TYPICALLY BE IN YOUR VEHICLE?

Q4: ADULTS	FREQ.	PERCENT	CUM.
1	211	17.15	17.15
2	773	62.85	80.00
3	141	11.46	91.46
4	87	7.07	98.54
5	11	0.89	99.43
6	6	0.49	99.92
8	1	0.08	100.00
TOTAL	1,230	100.00	

Q4:	FREQ.	PERCENT	CUM.
CHILDREN			
0	736	59.84	59.84
1	138	11.22	71.06
2	236	19.19	90.24
3	73	5.93	96.18
4	33	2.68	98.86
5	10	0.81	99.67
6	3	0.24	99.92
20	1	0.08	100.00
TOTAL	1,230	100.00	

QUESTION 5

HOW IMPORTANT ARE THE FOLLOWING BEACH CHARACTERISTICS (1 = NOT IMPORTANT, 5 = VERY IMPORTANT)?

		-----+					
		CHARACTERISTIC	PCT_1	PCT_2	PCT_3	PCT_4	PCT_5
TOTAL	N						

		SCENIC BEAUTY OR VIEW	0.6	1.9	12.6	28.3	56.6
100.0	1338						
		GOOD WATER QUALITY	1.6	2.0	8.7	21.2	66.4
100.0	1341						
		CLOSE TO HOME	3.2	5.5	24.7	27.9	38.6
100.0	1356						
		PARKING IS CONVENIENT	2.6	2.8	13.1	32.3	49.1
100.0	1347						
		PARKING IS FREE OR INEXPENSIVE	5.5	6.1	16.7	27.6	44.1
100.0	1317						

		GOOD SURFING AVAILABLE	55.4	15.0	12.6	7.4	9.6
100.0	1307						
		SANDY (RATHER THAN ROCKY)	6.8	6.4	20.6	33.1	33.1
100.0	1340						
		NOT CROWDED	4.0	5.2	32.9	34.0	23.9
100.0	1332						

	LONG ENOUGH FOR A WALK/RUN	10.1	11.3	26.5	28.2	23.8
100.0	1342					

	BIKE PATH AVAILABLE	28.6	17.4	23.5	15.1	15.4
100.0	1309					

-----|

	FISHING AVAILABLE	56.5	14.8	13.7	6.7	8.4
100.0	1323					

	NO MARINE DEBRIS	2.3	2.6	7.3	21.9	66.0
100.0	1361					

	NO NATURAL DEBRIS	21.1	18.1	30.7	18.3	11.9
100.0	1346					

+-----
-----+

QUESTION 6

Q6: ANY			
OTHER			
CHARACTERIS			
TICS?	FREQ.	PERCENT	CUM.
-----+			
YES	495	39.76	39.76
NO	750	60.24	100.00
-----+			
TOTAL	1,245	100.00	

Q6: OTHER CHARACTERISTICS MENTIONED:

OTHER_CHARACTERISTIC	N
FOOD OPTIONS NEARBY	80
CLEAN/CLOSE RESTROOMS	74
SAFETY/SECURITY	45
FIREPITS AVAILABLE	33
SHOPS AVAILABLE	25
DOGS ALLOWED	25
CLEAN SAND	23
NO RUDE VISITORS	20
LIFEGUARDS AVAILABLE	17
EASY BEACH ACCESS	16
ATTRACTIONS NEARBY	12
SHOWERS AVAILABLE	12
POLICE PRESENCE	12
GOOD WEATHER	11
NO SMOKING	10
SAFE SWIMMING	7
HANDICAP ACCESS	7
CLEAN AIR	6
SEATING/BENCHES	6
WILDLIFE	5

BARS NEARBY	5
NO GANG ACTIVITY	5
NO HOMELESS PEOPLE	5
NO DRUGS/ALCOHOL	4
NO LOUD MUSIC	4

PICNIC AREA	4
NO TRAFFIC	3
PIER NEARBY	3
QUIET	3
FAMILY FRIENDLY	3

OTHER	117
+-----+	

QUESTION 7

WHICH OF THE FOLLOWING BEACHES YOU HAVE HEARD OF?

BEACH	PERCENT	N
ZUMA	49.7	1381
POINT DUME	32.7	1381
TOPANGA	22.0	1381

	WILL RODGERS	39.2	1381	
	SANTA MONICA	86.5	1381	

	VENICE BEACH	87.7	1381	
	DOCKWEILER	27.8	1381	
	EL SEGUNDO	35.6	1381	
	MANHATTAN	74.6	1381	
	HERMOSA	76.2	1381	

	REDONDO	84.0	1381	
	TORRANCE	18.8	1381	
	LONG BEACH	88.5	1381	
	SEAL BEACH	90.4	1381	
	SUNSET	63.0	1381	

	BOLSA CHICA	74.0	1381	
	HUNTINGTON CITY	76.7	1381	
	HUNTINGTON STATE	79.9	1381	
	NEWPORT BEACH	96.7	1381	
	BALBOA	88.4	1381	

	CORONA DEL MAR	84.7	1381	
	CRYSTAL COVE	78.2	1381	
	LAGUNA MAIN	91.2	1381	
	LAGUNA COVES	77.1	1381	
	ALISO	54.2	1381	

	SALT CREEK	48.5	1381	
	DOHENY	68.8	1381	
	CAPISTRANO	67.3	1381	
	SAN CLEMENTE PIER	71.5	1381	

	CALAFIA	41.9	1381	

	SAN ONOFRE	73.6	1381	

Q7: NUMBER			
OF BEACHES			
SELECTED	FREQ.	PERCENT	CUM.
-----	-----	-----	-----
0	52	3.63	3.63
1	10	0.70	4.33
2	13	0.91	5.23
3	14	0.98	6.21
4	15	1.05	7.26
5	19	1.33	8.58
6	16	1.12	9.70
7	18	1.26	10.96
8	12	0.84	11.79
9	24	1.67	13.47
10	22	1.54	15.00
11	31	2.16	17.17
12	35	2.44	19.61
13	27	1.88	21.49
14	36	2.51	24.01
15	38	2.65	26.66
16	38	2.65	29.31
17	57	3.98	33.29
18	55	3.84	37.12

19		62	4.33	41.45
20		60	4.19	45.64
21		64	4.47	50.10
22		89	6.21	56.32
23		77	5.37	61.69
24		78	5.44	67.13
25		78	5.44	72.58
26		68	4.75	77.32
27		74	5.16	82.48
28		71	4.95	87.44
29		48	3.35	90.79
30		53	3.70	94.49
31		79	5.51	100.00

-----+-----

TOTAL		1,433	100.00
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QUESTION 8

WHICH OF THE FOLLOWING BEACHES WOULD YOU NEVER CONSIDER VISITING?

+-----+

	BEACH	PERCENT	N
	ZUMA	9.4	1433
	POINT DUME	9.5	1433

	TOPANGA	9.8	1433	
	WILL RODGERS	10.0	1433	
	SANTA MONICA	8.0	1433	

	VENICE BEACH	9.4	1433	
	DOCKWEILER	11.7	1433	
	EL SEGUNDO	13.6	1433	
	MANHATTAN	8.4	1433	
	HERMOSA	8.2	1433	

	REDONDO	7.2	1433	
	TORRANCE	12.0	1433	
	LONG BEACH	9.5	1433	
	SEAL BEACH	4.1	1433	
	SUNSET	4.6	1433	

	BOLSA CHICA	4.3	1433	
	HUNTINGTON CITY	3.6	1433	
	HUNTINGTON STATE	2.7	1433	
	NEWPORT BEACH	0.8	1433	
	BALBOA	1.5	1433	

	CORONA DEL MAR	1.9	1433	
	CRYSTAL COVE	2.4	1433	
	LAGUNA MAIN	1.4	1433	
	LAGUNA COVES	1.7	1433	
	ALISO	5.5	1433	

	SALT CREEK	5.5	1433	
	DOHENY	5.1	1433	
	CAPISTRANO	4.0	1433	

SAN CLEMENTE PIER	3.8	1433	
CALAFIA	5.2	1433	

SAN ONOFRE	9.9	1433	
+-----+			

Q8: NUMBER			
OF BEACHES			
CROSSED OUT	FREQ.	PERCENT	CUM.
-----+			
0	1,008	70.34	70.34
1	87	6.07	76.41
2	58	4.05	80.46
3	42	2.93	83.39
4	27	1.88	85.28
5	30	2.09	87.37
6	22	1.54	88.90
7	20	1.40	90.30
8	21	1.47	91.77
9	6	0.42	92.18
10	16	1.12	93.30
11	10	0.70	94.00
12	11	0.77	94.77
13	11	0.77	95.53
14	10	0.70	96.23
15	6	0.42	96.65
16	10	0.70	97.35
17	10	0.70	98.05

18		9	0.63	98.67
19		2	0.14	98.81
20		3	0.21	99.02
22		5	0.35	99.37
23		1	0.07	99.44
24		2	0.14	99.58
25		1	0.07	99.65
26		2	0.14	99.79
28		2	0.14	99.93
30		1	0.07	100.00

-----+-----

TOTAL		1,433	100.00	
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QUESTION 9

Q9: ANY |
BEACH TRIPS |
IN |
JUN/JUL/AUG |

?		FREQ.	PERCENT	CUM.
YES		1,070	78.50	78.50
NO		293	21.50	100.00
TOTAL		1,363	100.00	

-----+-----

QUESTION 10

JUN_TRIPS_N	FREQ.	PERCENT	CUM.
NONE	589	41.10	41.10
1-5	534	37.26	78.37
6-10	149	10.40	88.76
11-15	60	4.19	92.95
16-20	27	1.88	94.84
21-30	45	3.14	97.98
31-40	18	1.26	99.23
41-50	5	0.35	99.58
51-75	2	0.14	99.72
76-100	2	0.14	99.86
>100	2	0.14	100.00
TOTAL	1,433	100.00	

JUL_TRIPS_N	FREQ.	PERCENT	CUM.
NONE	529	36.92	36.92

1-5		542	37.82	74.74
6-10		183	12.77	87.51
11-15		68	4.75	92.25
16-20		31	2.16	94.42
21-30		45	3.14	97.56
31-40		18	1.26	98.81
41-50		11	0.77	99.58
51-75		4	0.28	99.86
>100		2	0.14	100.00
-----+-----				
TOTAL		1,433	100.00	

AUG_TRIPS_N		FREQ.	PERCENT	CUM.
-----+-----				
NONE		561	39.15	39.15
1-5		542	37.82	76.97
6-10		144	10.05	87.02
11-15		63	4.40	91.42
16-20		35	2.44	93.86
21-30		53	3.70	97.56
31-40		16	1.12	98.67
41-50		12	0.84	99.51
51-75		4	0.28	99.79
76-100		1	0.07	99.86
>100		2	0.14	100.00
-----+-----				
TOTAL		1,433	100.00	

TOT_TRIPS_N	FREQ.	PERCENT	CUM.
NONE	432	30.15	30.15
1-5	358	24.98	55.13
6-10	187	13.05	68.18
11-15	107	7.47	75.65
16-20	61	4.26	79.90
21-30	114	7.96	87.86
31-40	43	3.00	90.86
41-50	29	2.02	92.88
51-75	48	3.35	96.23
76-100	32	2.23	98.46
>100	22	1.54	100.00
TOTAL	1,433	100.00	

VARIABLE	OBS	MEAN	STD. DEV.	MIN	MAX
JUN_TRIPS	1433	4.337753	9.65966	0	150
JUL_TRIPS	1433	4.909281	10.02045	0	160
AUG_TRIPS	1433	4.877181	10.55282	0	170
TOT_TRIPS	1433	14.12421	29.67588	0	480

QUESTION 11

Q11: HOW			
CONCERNED			
TO SEE			
MARINE			
DEBRIS ON			
SAND/SURF?			
(1=NOT			
CONCERNED..			
.5=VERY	FREQ.	PERCENT	CUM.
-----+-----			
1	18	1.33	1.33
2	38	2.80	4.12
3	153	11.27	15.39
4	306	22.53	37.92
5	843	62.08	100.00
-----+-----			
TOTAL	1,358	100.00	

QUESTION 12

HOW CONCERNED WOULD YOU BE TO SEE THE FOLLOWING TYPES OF DEBRIS (1 = NOT AT ALL, 5 = VERY)?

```

+-----+
-----+
|          DEBRIS_TYPE      PCT_1  PCT_2  PCT_3  PCT_4  PCT_5  TOTAL
N |
|-----|
| PLASTIC ITEMS OR BOTTLES   3.4    4.5   11.9   22.9   57.3   100.0
1404 |
|          STYROFOAM        3.0    4.2   10.3   21.0   61.5   100.0
1401 |
|          PAPER PRODUCTS   3.0    9.6   20.4   27.9   39.1   100.0
1398 |
|          WOODEN ITEMS     5.7   13.6   23.5   24.3   32.9   100.0
1393 |
|          METAL ITEMS OR CANS 2.2    3.1    6.8   21.1   66.9   100.0
1400 |
|-----|
|          GLASS            2.4    2.1    3.3   11.9   80.3   100.0
1406 |
|          RUBBER ITEMS     2.4    4.7   12.8   25.6   54.6   100.0
1395 |
|          CLOTH OR CLOTHING 5.4    9.8   23.4   25.0   36.4   100.0
1391 |
|          CIGARETTE BUTTS  4.1    4.0    9.2   20.4   62.3   100.0
1406 |
|          FISHING GEAR     4.1    7.0   15.8   23.3   49.9   100.0
1392 |
|-----|
|          MEDICAL WASTES   2.2    1.1    1.5    5.1   90.1   100.0
1402 |

```

	ANIMAL WASTES	2.6	3.4	6.7	16.1	71.2	100.0
--	---------------	-----	-----	-----	------	------	-------

1404 |

+-----+
-----+

QUESTION 13

WHICH OF THESE TYPES OF DEBRIS HAVE YOU ACTUALLY SEEN AT LOCAL BEACHES?

DEBRIS_TYPE	PERCENT	N
PLASTIC ITEMS OR BOTTLES	69.4	1433
STYROFOAM	47.1	1433
PAPER PRODUCTS	55.0	1433
WOODEN ITEMS	26.1	1433
METAL ITEMS OR CANS	45.7	1433
GLASS	40.2	1433
RUBBER ITEMS	17.7	1433
CLOTH OR CLOTHING	27.7	1433
CIGARETTE BUTTS	62.3	1433
FISHING GEAR	17.6	1433
MEDICAL WASTES	7.2	1433
ANIMAL WASTES	27.8	1433

```

+-----+
Q13: NUMBER |
OF TYPES OF |
    DEBRIS |
OBSERVED |   FREQ.   PERCENT   CUM.
-----+-----
    0 |       324   22.61   22.61
    1 |        40    2.79   25.40
    2 |        93    6.49   31.89
    3 |       141    9.84   41.73
    4 |       152   10.61   52.34
    5 |       144   10.05   62.39
    6 |       138    9.63   72.02
    7 |       108    7.54   79.55
    8 |        94    6.56   86.11
    9 |        69    4.82   90.93
   10 |        49    3.42   94.35
   11 |        37    2.58   96.93
   12 |         44    3.07  100.00
-----+-----
TOTAL |   1,433  100.00

```


QUESTION 14

BEACHES?	FREQ.	PERCENT	CUM.
Q14:			
NOTICED ANY			
OTHER			
MARINE			
DEBRIS AT			
LOCAL			
-----+-----			
YES	226	16.80	16.80
NO	1,119	83.20	100.00
-----+-----			
TOTAL	1,345	100.00	

QUESTION 15

WHAT OTHER TYPES OF GARBAGE OR MANMADE DEBRIS HAVE YOU NOTICED?

+-----+
OTHER_DEBRIS N

	FOOD WASTE	32	
	DIAPERS	21	
	OIL/GAS	18	
	CANS	13	
	CONDOMS	12	

	BALLOONS	12	
	BEACH TOYS	11	
	PLASTIC BOTTLES	11	
	PLASTIC BAGS	10	
	BOTTLES (GENERAL)	8	

	DEAD ANIMALS	8	
	TAR	7	
	FOOD WRAPPERS	7	
	FEMININE HYGIENE	7	
	SHOES	6	

	FLOWERS/PLANTS	6	
	BOOGIE BOARDS	5	
	GARBAGE	5	
	SURFBOARDS/LEASHES	4	
	SEAWEED	4	

	NEEDLES/SYRINGES	4	
	SHOPPING CART	3	
	WATER BOTTLES	3	
	TENNIS BALLS	3	
	FURNITURE	3	

	GLASS BOTTLES	3	

```

|          CHARCOAL      3 |
|          ROCKS        3 |
|        AUTO PARTS     3 |
|          TIRES        3 |
|-----|
|          OTHER       41 |
+-----+

```

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*****
*****

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QUESTION 16

```

*****
*****

```

AT WHICH OF THE FOLLOWING BEACHES IS MARINE DEBRIS A PROBLEM?

PERC1 = COUNT DIVIDED BY TOTAL RESPONDENTS

PERC2 = COUNT DIVIDED BY TOTAL RESPONDENTS AWARE OF BEACH

```

+-----+
|          BEACH      PERC1   PERC2     N |
|-----|
|          ZUMA        2.9     6.0    1433 |
|        POINT DUME    2.4     7.5    1433 |
|          TOPANGA     2.9    13.8    1433 |
|        WILL RODGERS  3.2     8.5    1433 |
|        SANTA MONICA 15.8    19.0    1433 |
|-----|
|        VENICE BEACH 18.8    22.2    1433 |

```

	DOCKWEILER	5.0	18.8	1433	
	EL SEGUNDO	7.5	21.7	1433	
	MANHATTAN	6.5	9.0	1433	
	HERMOSA	6.4	8.7	1433	

	REDONDO	8.8	10.9	1433	
	TORRANCE	4.5	25.0	1433	
	LONG BEACH	23.4	27.4	1433	
	SEAL BEACH	12.4	14.2	1433	
	SUNSET	5.9	9.8	1433	

	BOLSA CHICA	12.1	17.0	1433	
	HUNTINGTON CITY	20.9	28.3	1433	
	HUNTINGTON STATE	20.0	26.0	1433	
	NEWPORT BEACH	15.8	16.9	1433	
	BALBOA	8.1	9.5	1433	

	CORONA DEL MAR	6.1	7.4	1433	
	CRYSTAL COVE	3.7	4.9	1433	
	LAGUNA MAIN	10.5	11.9	1433	
	LAGUNA COVES	4.3	5.8	1433	
	ALISO	5.0	9.5	1433	

	SALT CREEK	4.7	10.1	1433	
	DOHENY	10.6	16.0	1433	
	CAPISTRANO	4.5	7.0	1433	
	SAN CLEMENTE PIER	6.6	9.6	1433	
	CALAFIA	3.3	8.3	1433	

	SAN ONOFRE	4.8	6.8	1433	

Q16: NUMBER			
OF BEACHES			
SELECTED	FREQ.	PERCENT	CUM.
-----+-----			
0	563	39.29	39.29
1	183	12.77	52.06
2	209	14.58	66.64
3	160	11.17	77.81
4	76	5.30	83.11
5	76	5.30	88.42
6	39	2.72	91.14
7	23	1.61	92.74
8	18	1.26	94.00
9	15	1.05	95.05
10	16	1.12	96.16
11	7	0.49	96.65
12	3	0.21	96.86
13	4	0.28	97.14
14	4	0.28	97.42
15	3	0.21	97.63
16	2	0.14	97.77
17	1	0.07	97.84
20	2	0.14	97.98
24	1	0.07	98.05
25	1	0.07	98.12
28	1	0.07	98.19
29	2	0.14	98.33

31	24	1.67	100.00
-----+-----			
TOTAL	1,433	100.00	

QUESTION 17

Q17: WHAT DO YOU THINK IS THE LARGEST SOURCE OF MARINE DEBRIS?

+-----+-----			
	DEBRIS_SOURCE	PERCENT	N

	LEFT BY BEACH VISITORS	74.71	1392
	BLOWN TO THE BEACH FROM LAND	6.03	1392
	WASHED ASHORE FROM THE OCEAN	9.63	1392
	WASHED ASHORE FROM RIVERS/DRAINS	23.71	1392
	OTHER	3.30	1392
+-----+-----			

NOTE: PERCENTAGES DO NOT SUM TO 100 BECAUSE SOME INDIVIDUALS PROVIDED MULTIPLE RESPONSES

Q17: OTHER SOURCES MENTIONED:

```

+-----+
|          OTHER_SOURCE      N |
|-----|
|          DOGS/BIRDS       4 |
| OVERFILLED TRASH BARRELS   3 |
|          BOATERS          3 |
|          OTHER            27 |
+-----+

```


QUESTION 18


```

Q18: |
PARTICIPATE |
D IN BEACH |
CLEANUP |
WITHIN LAST |
3 YEARS? |      FREQ.      PERCENT      CUM.
-----+-----
YES |           242      17.08      17.08
NO  |          1,175      82.92      100.00
-----+-----
TOTAL |          1,417      100.00

```


QUESTION 19

AT WHICH OF THE FOLLOWING BEACHES IS CROWDING A PROBLEM?

PERC1 = COUNT DIVIDED BY TOTAL RESPONDENTS

PERC2 = COUNT DIVIDED BY TOTAL RESPONDENTS AWARE OF BEACH

BEACH	PERC1	PERC2	N
ZUMA	2.5	5.2	1433
POINT DUME	1.1	3.5	1433
TOPANGA	1.3	6.3	1433
WILL RODGERS	2.3	6.1	1433
SANTA MONICA	24.8	29.7	1433
VENICE BEACH	25.1	29.7	1433
DOCKWEILER	2.1	7.8	1433
EL SEGUNDO	2.2	6.5	1433
MANHATTAN	7.7	10.7	1433
HERMOSA	6.2	8.5	1433
REDONDO	9.1	11.3	1433
TORRANCE	1.6	8.8	1433
LONG BEACH	10.3	12.1	1433
SEAL BEACH	7.7	8.9	1433

SUNSET	2.2	3.7	1433

BOLSA CHICA	7.6	10.7	1433
HUNTINGTON CITY	32.9	44.6	1433
HUNTINGTON STATE	31.3	40.7	1433
NEWPORT BEACH	35.9	38.5	1433
BALBOA	15.6	18.3	1433

CORONA DEL MAR	16.5	20.3	1433
CRYSTAL COVE	3.5	4.6	1433
LAGUNA MAIN	33.5	38.1	1433
LAGUNA COVES	4.9	6.6	1433
ALISO	5.7	10.8	1433

SALT CREEK	6.6	14.0	1433
DOHENY	8.8	13.3	1433
CAPISTRANO	3.0	4.6	1433
SAN CLEMENTE PIER	8.2	12.0	1433
CALAFIA	2.7	6.6	1433

SAN ONOFRE	3.8	5.4	1433
+-----+			

Q19: NUMBER |
OF BEACHES |

SELECTED	FREQ.	PERCENT	CUM.
0	317	22.12	22.12
1	187	13.05	35.17
2	241	16.82	51.99
3	193	13.47	65.46
4	159	11.10	76.55
5	95	6.63	83.18
6	67	4.68	87.86
7	41	2.86	90.72
8	29	2.02	92.74
9	22	1.54	94.28
10	20	1.40	95.67
11	13	0.91	96.58
12	16	1.12	97.70
13	7	0.49	98.19
14	5	0.35	98.53
15	3	0.21	98.74
16	2	0.14	98.88
17	1	0.07	98.95
18	3	0.21	99.16
23	1	0.07	99.23
29	1	0.07	99.30
31	10	0.70	100.00
TOTAL	1,433	100.00	

QUESTION 20

Q20: NUMBER |
OF ADULTS |
IN |
HOUSEHOLD |
(18+) | FREQ. PERCENT CUM.
-----+-----
1 | 216 15.40 15.40
2 | 797 56.81 72.20
3 | 227 16.18 88.38
4 | 118 8.41 96.79
5 | 26 1.85 98.65
6 | 10 0.71 99.36
7 | 8 0.57 99.93
10 | 1 0.07 100.00
-----+-----
TOTAL | 1,403 100.00

Q20: NUMBER |
OF KIDS IN |
HOUSEHOLD |
(<18) | FREQ. PERCENT CUM.
-----+-----
0 | 242 32.88 32.88
1 | 202 27.45 60.33
2 | 217 29.48 89.81

3		48	6.52	96.33
4		15	2.04	98.37
5		6	0.82	99.18
6		5	0.68	99.86
8		1	0.14	100.00

-----+-----

TOTAL		736	100.00	
-------	--	-----	--------	--

QUESTION 21

Q21: GENDER		FREQ.	PERCENT	CUM.
MALE		642	45.82	45.82
FEMALE		759	54.18	100.00

-----+-----

TOTAL		1,401	100.00	
-------	--	-------	--------	--

QUESTION 22

Q22: AGE			
CATEGORY	FREQ.	PERCENT	CUM.
18-29	114	8.23	8.23
30-39	214	15.45	23.68
40-49	261	18.84	42.53
50-59	344	24.84	67.36
60-69	262	18.92	86.28
70-79	133	9.60	95.88
80-89	47	3.39	99.28
90-99	10	0.72	100.00
TOTAL	1,385	100.00	

QUESTION 23

Q23:			
HISPANIC/LA			
TINO	FREQ.	PERCENT	CUM.
YES	211	15.15	15.15
NO	1,182	84.85	100.00
TOTAL	1,393	100.00	

QUESTION 24

Q24: RACE	FREQ.	PERCENT	CUM.
-----+-----			
AMERICAN INDIAN OR ALASKAN NATIVE	14	1.04	1.04
ASIAN	216	16.08	17.13
BLACK OR AFRICAN AMERICAN	19	1.41	18.54
NATIVE HAWAIIAN OR OTHER PACIFIC ISLAND	17	1.27	19.81
WHITE	947	70.51	90.32
SOME OTHER RACE	82	6.11	96.43
MULTIPLE RACES SELECTED	48	3.57	100.00
-----+-----			
TOTAL	1,343	100.00	

QUESTION 25

Q25: HIGHEST DEGREE OR LEVEL OF SCHOOL	FREQ.	PERCENT	CUM.
-----+-----			
NO SCHOOLING	1	0.07	0.07

SOME SCHOOLING LESS THAN GRADE 12	23	1.64	1.71
HIGH SCHOOL GRADUATE	116	8.27	9.99
SOME COLLEGE	318	22.68	32.67
ASSOCIATE'S DEGREE	162	11.55	44.22
BACHELOR'S DEGREE	460	32.81	77.03
MASTER'S DEGREE	169	12.05	89.09
PROFESSIONAL DEGREE BEYOND A BACHELOR'S	78	5.56	94.65
DOCTORAL DEGREE	75	5.35	100.00
-----+-----			
TOTAL	1,402	100.00	

QUESTION 26

Q26: HOUSEHOLD			
INCOME	FREQ.	PERCENT	CUM.
-----+-----			
<= \$10,000	32	2.47	2.47
\$10,001 - \$20,000	60	4.64	7.12
\$20,001 - \$30,000	59	4.56	11.68
\$30,001 - \$40,000	88	6.81	18.48
\$40,001 - \$50,000	93	7.19	25.68
\$50,001 - \$60,000	99	7.66	33.33
\$60,001 - \$75,000	145	11.21	44.55
\$75,001 - \$100,000	171	13.23	57.77
\$100,001 - \$125,000	168	12.99	70.77

IEc

\$125,001 - \$150,000	119	9.20	79.97
> \$150,000	259	20.03	100.00
-----+-----			
TOTAL	1,293	100.00	

APPENDIX F

DEBRIS CHARACTERIZATION SITE MAPS

Zuma Beach



Legend

-  Main Entrance
-  Shoreline Boundary

Month

-  August
-  July

0 190 380 760 Meters

Source: Esri, DigitalGlobe, GeoEye, IGN, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Point Dume



Note: The July and August sampling sites overlap.

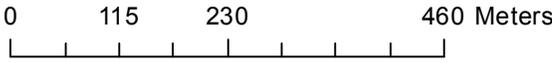
Legend

-  Main Entrance
-  Shoreline Boundary

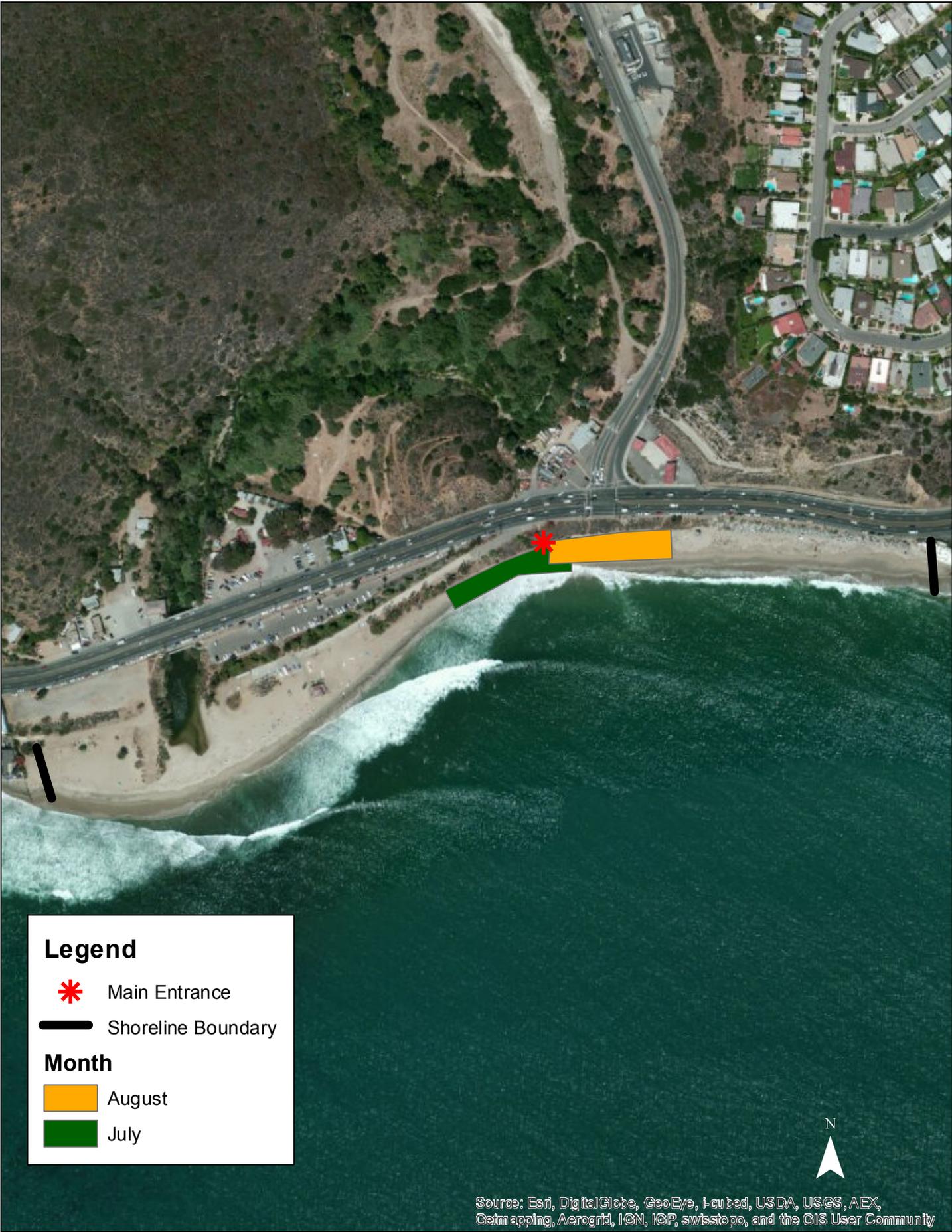
Month

-  August
-  July

Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Topanga



Legend

-  Main Entrance
-  Shoreline Boundary

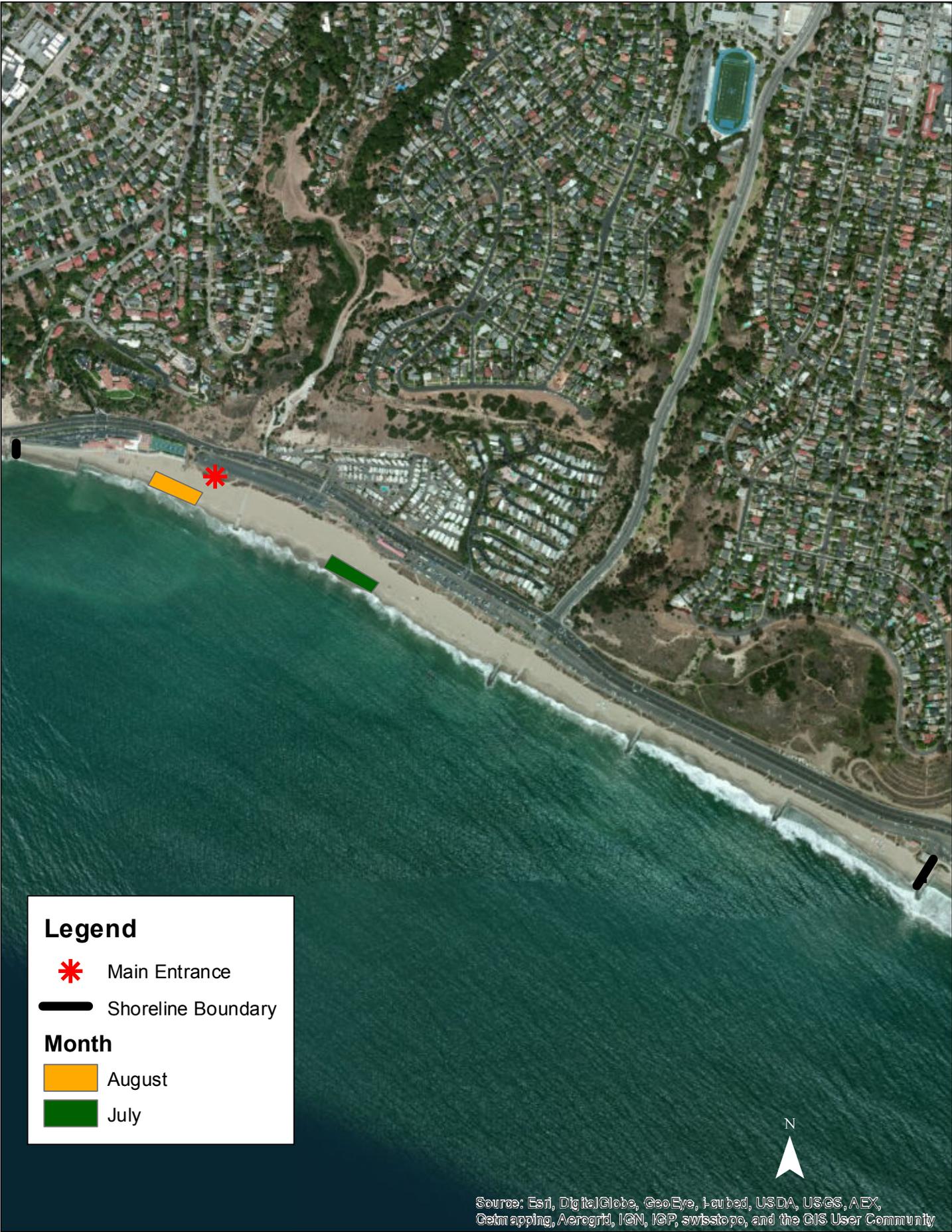
Month

-  August
-  July

Source: Esri, DigitalGlobe, GeoEye, IGN, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 70 140 280 Meters

Will Rogers



Legend

 Main Entrance

 Shoreline Boundary

Month

 August

 July

Source: Esri, DigitalGlobe, GeoEye, IGN, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 185 370 740 Meters

Santa Monica



Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

-  Main Entrance
-  Shoreline Boundary

Month

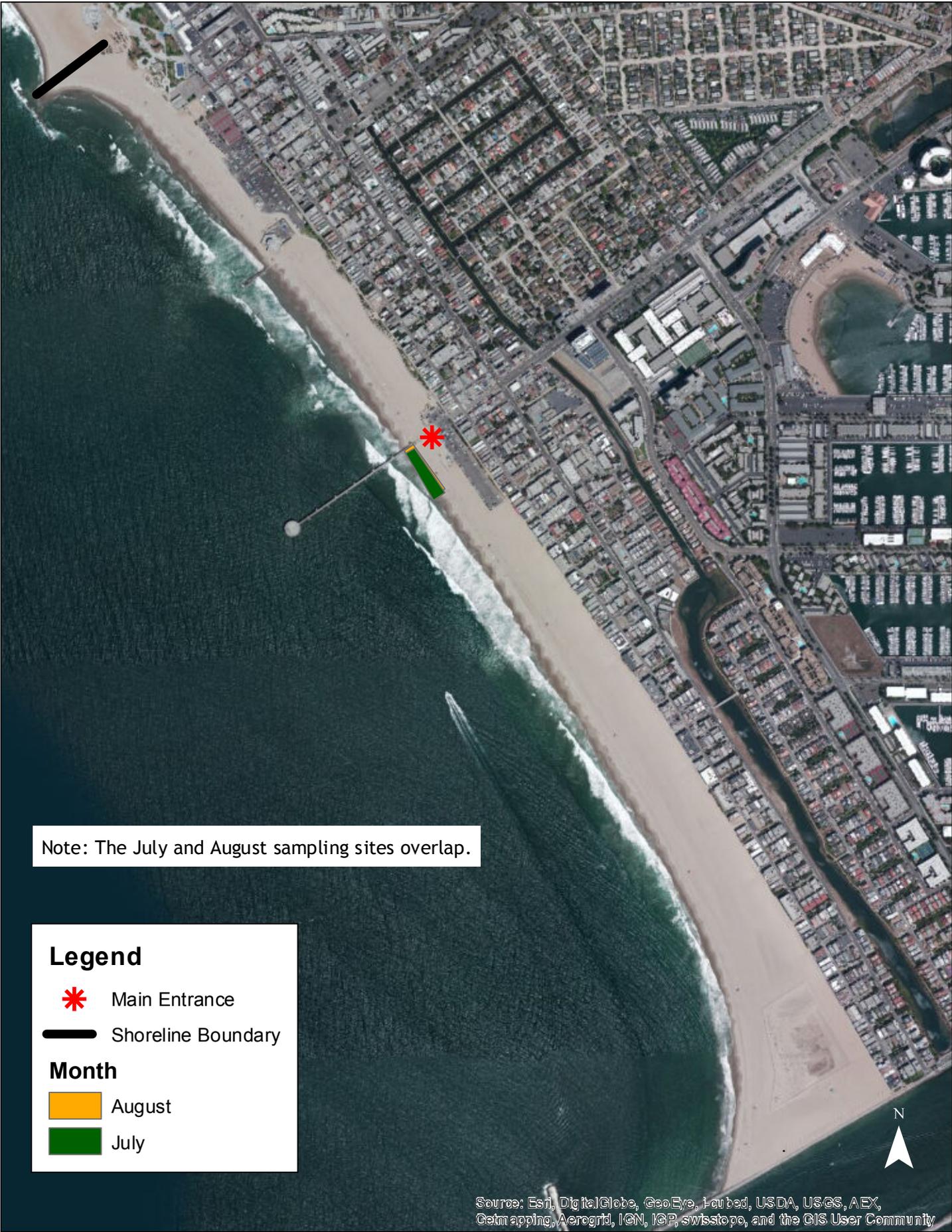
-  August
-  July

0 495 990 1,980 Meters



Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Venice Beach



Note: The July and August sampling sites overlap.

Legend

-  Main Entrance
-  Shoreline Boundary

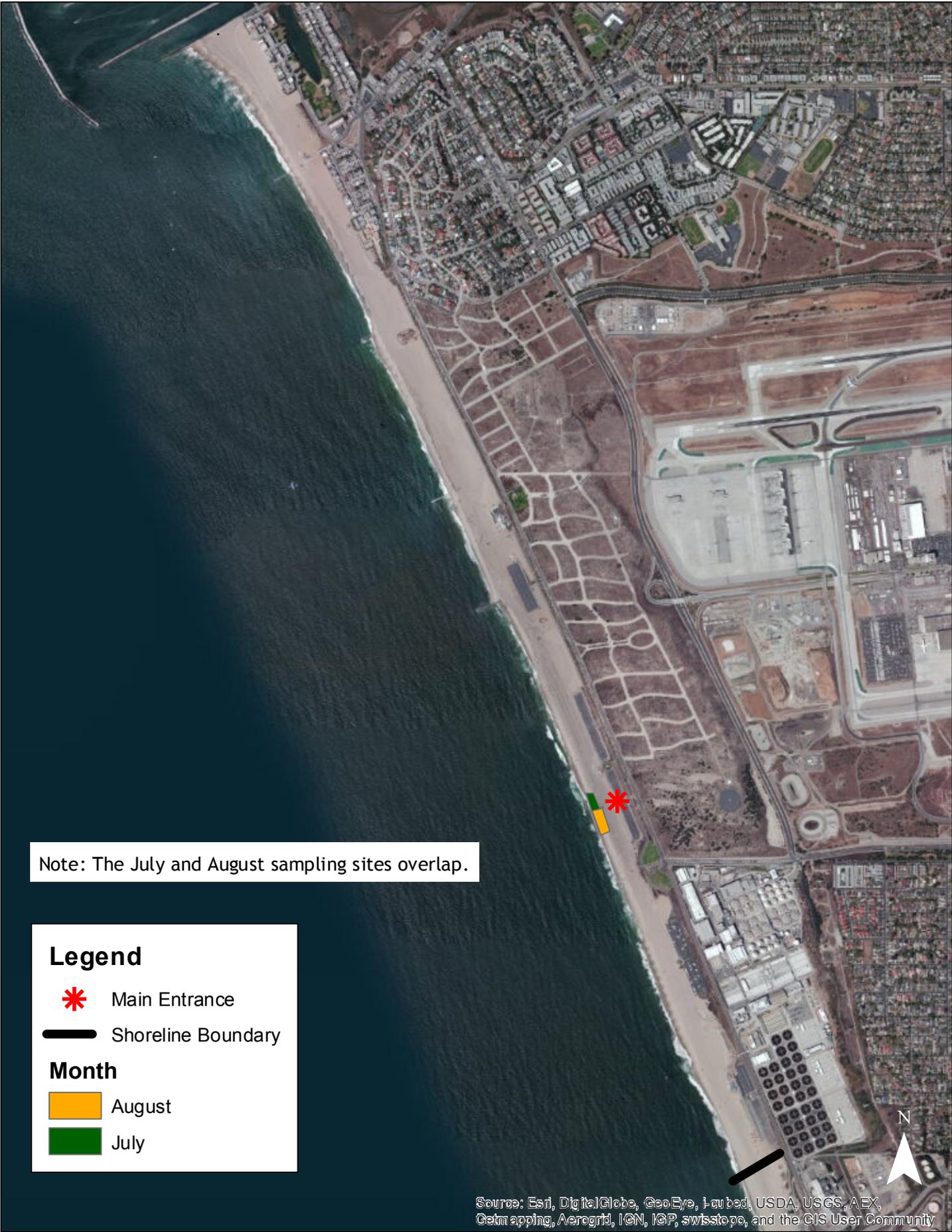
Month

-  August
-  July

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 200 400 800 Meters

Dockweiler State Beach



Note: The July and August sampling sites overlap.

Legend

-  Main Entrance
-  Shoreline Boundary

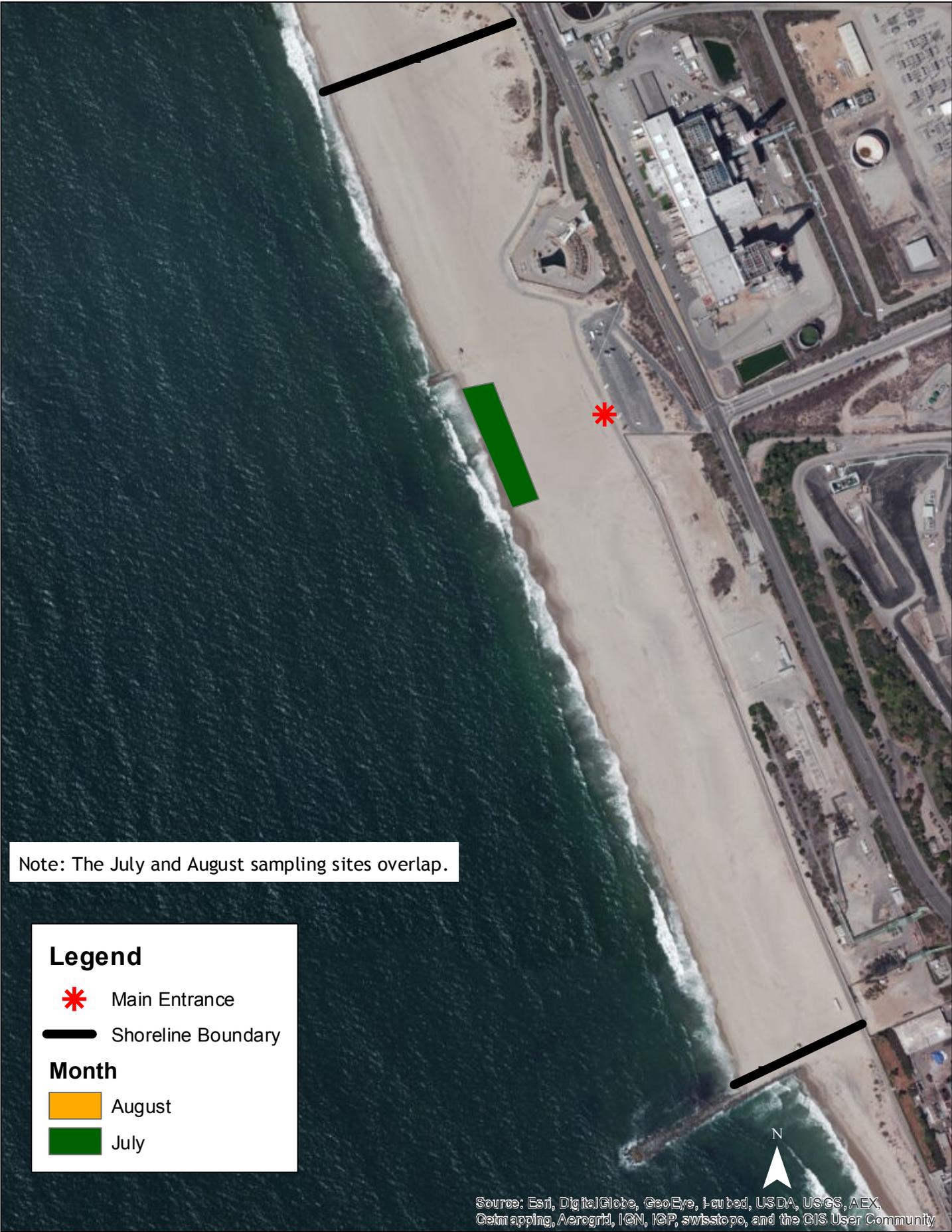
Month

-  August
-  July

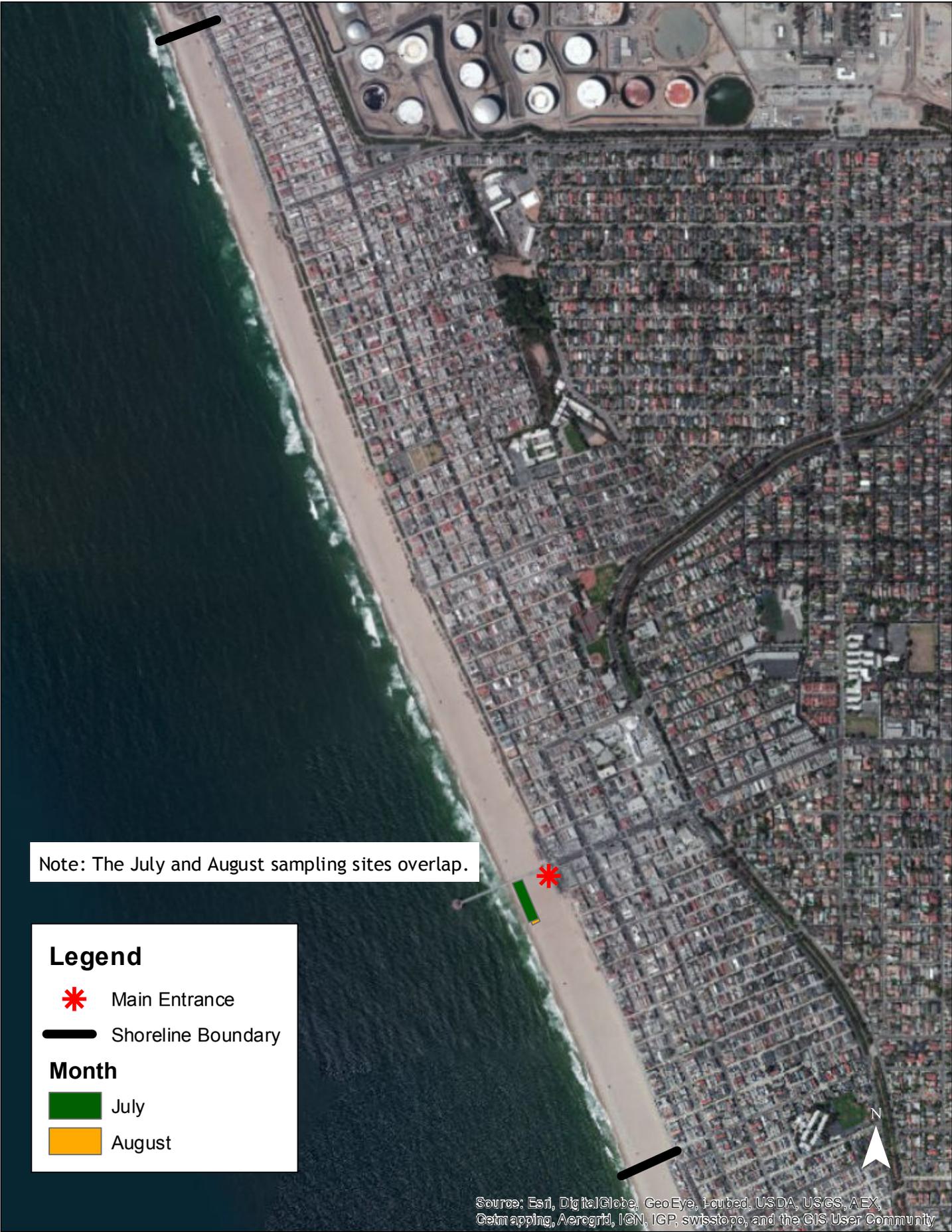


Source: Esri, DigitalGlobe, GeoEye, IGN, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

El Segundo Beach



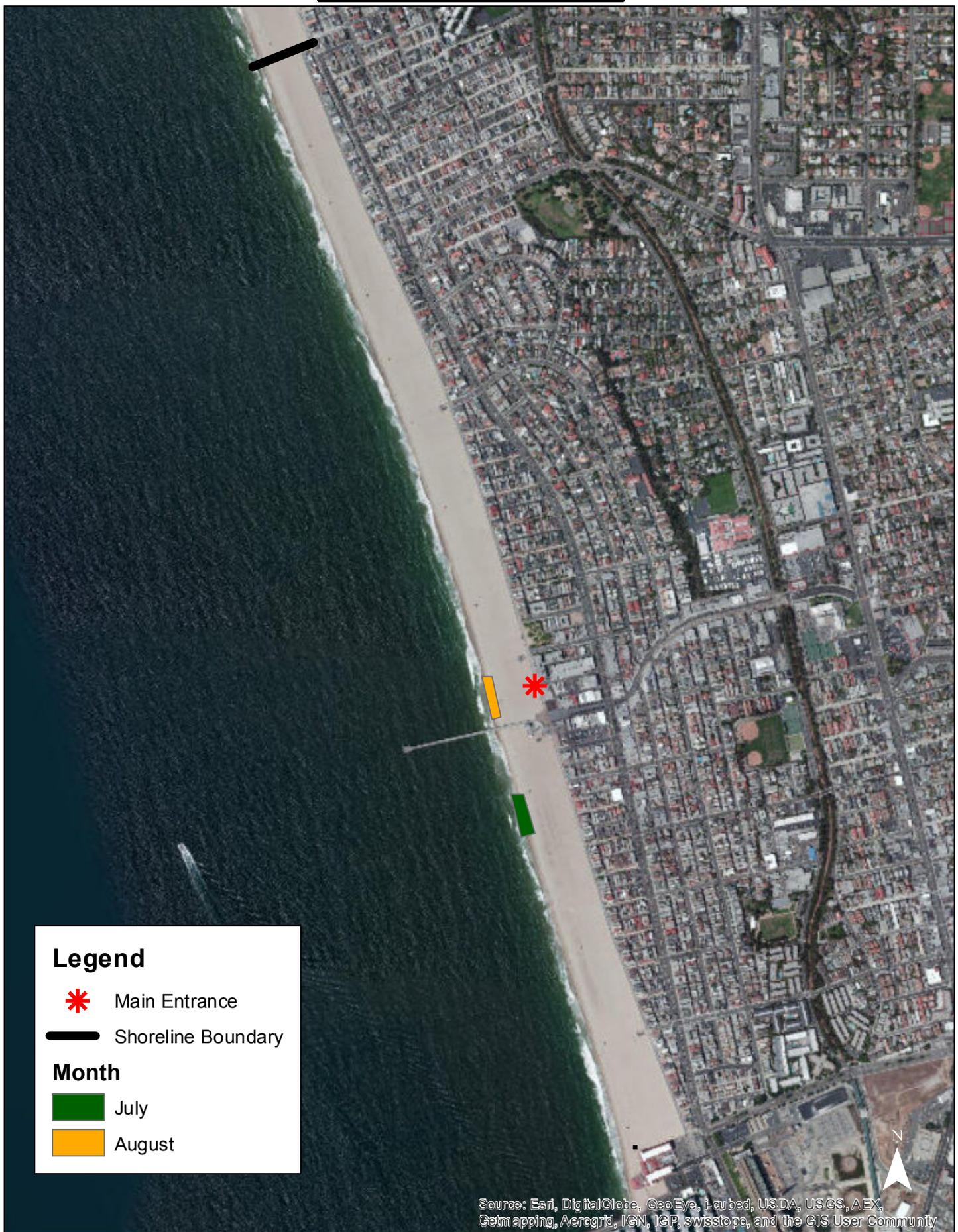
Manhattan Beach



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Hermosa Beach



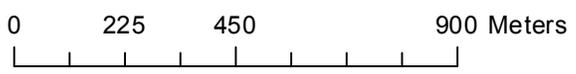
Legend

-  Main Entrance
-  Shoreline Boundary

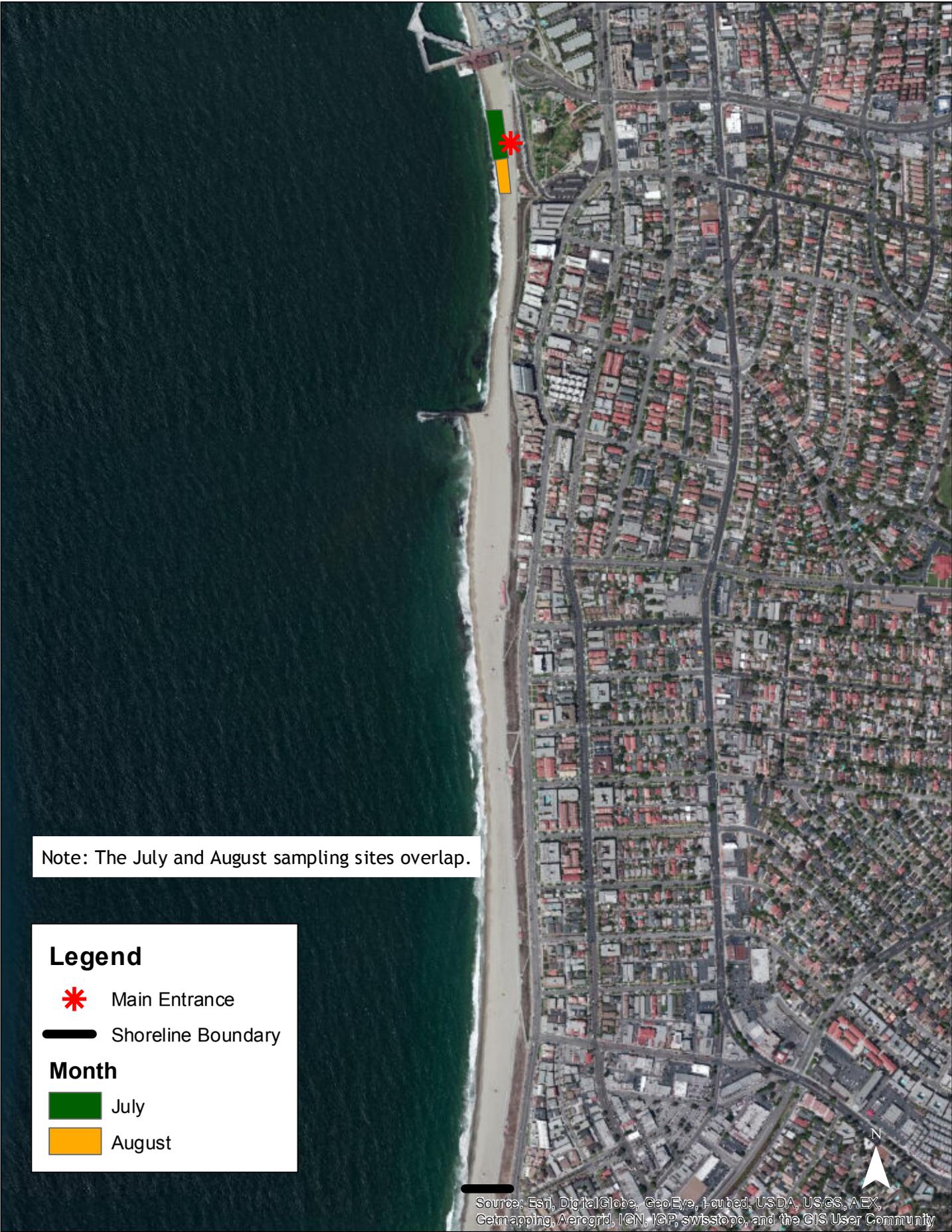
Month

-  July
-  August

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



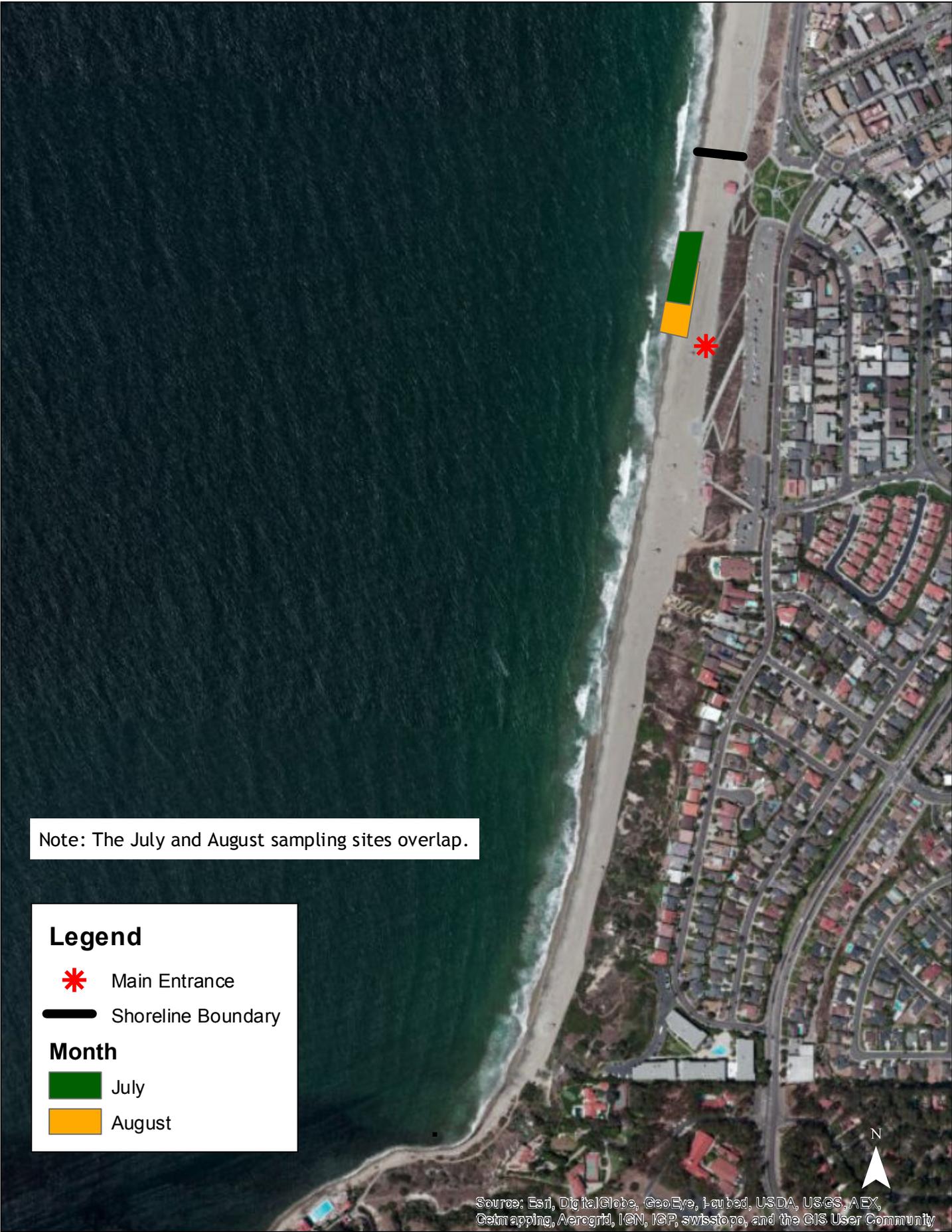
Redondo Beach



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Torrance/Malaga Beach



Note: The July and August sampling sites overlap.

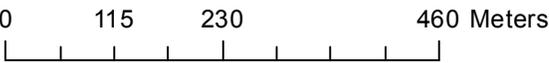
Legend

- Main Entrance
- Shoreline Boundary

Month

- July
- August

Source: Esri, DigitalGlobe, GeoEye, IGN, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Long Beach



Note: The July and August sampling sites overlap.

Legend

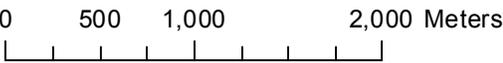
- * Main Entrance

Month

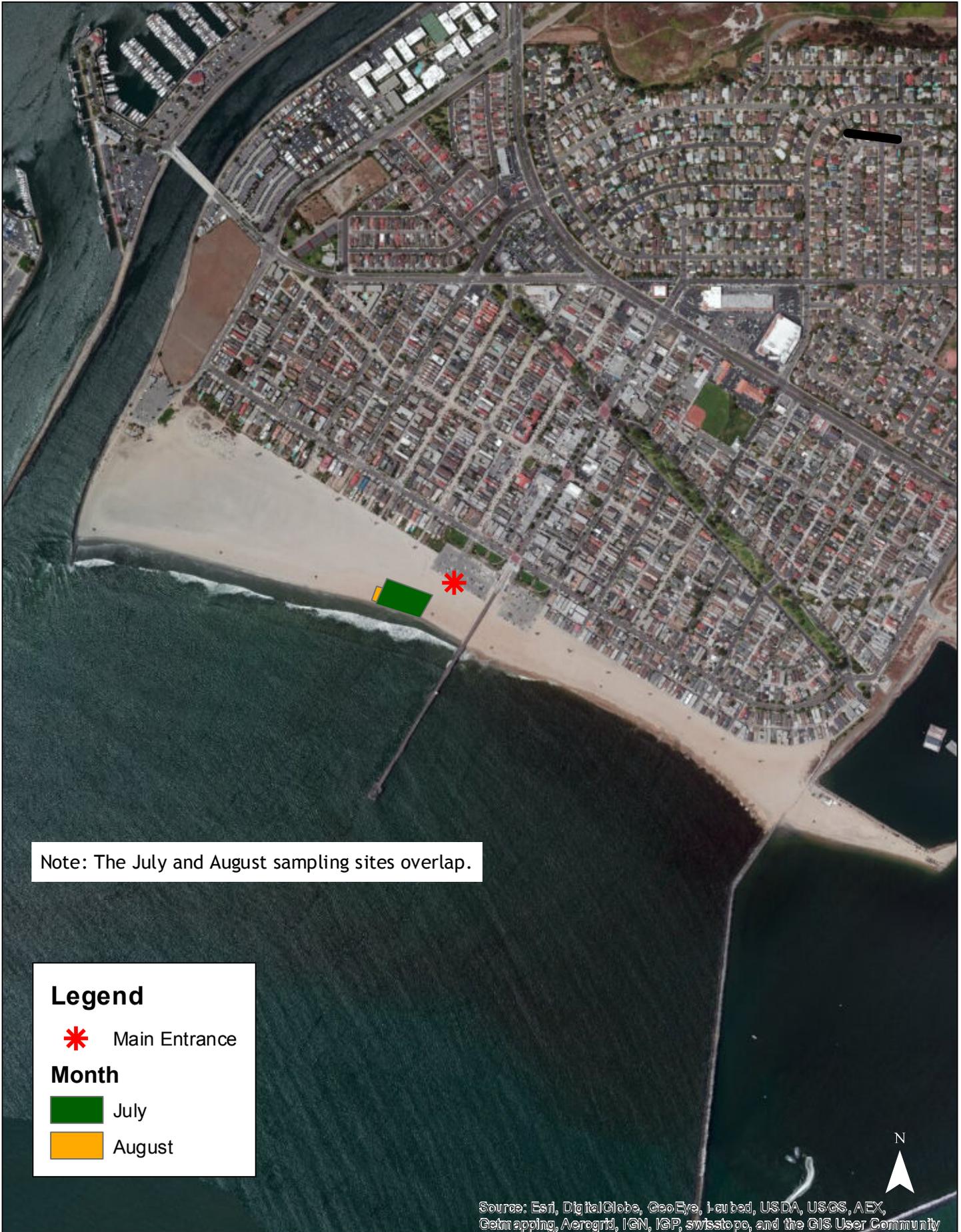
- July
- August

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

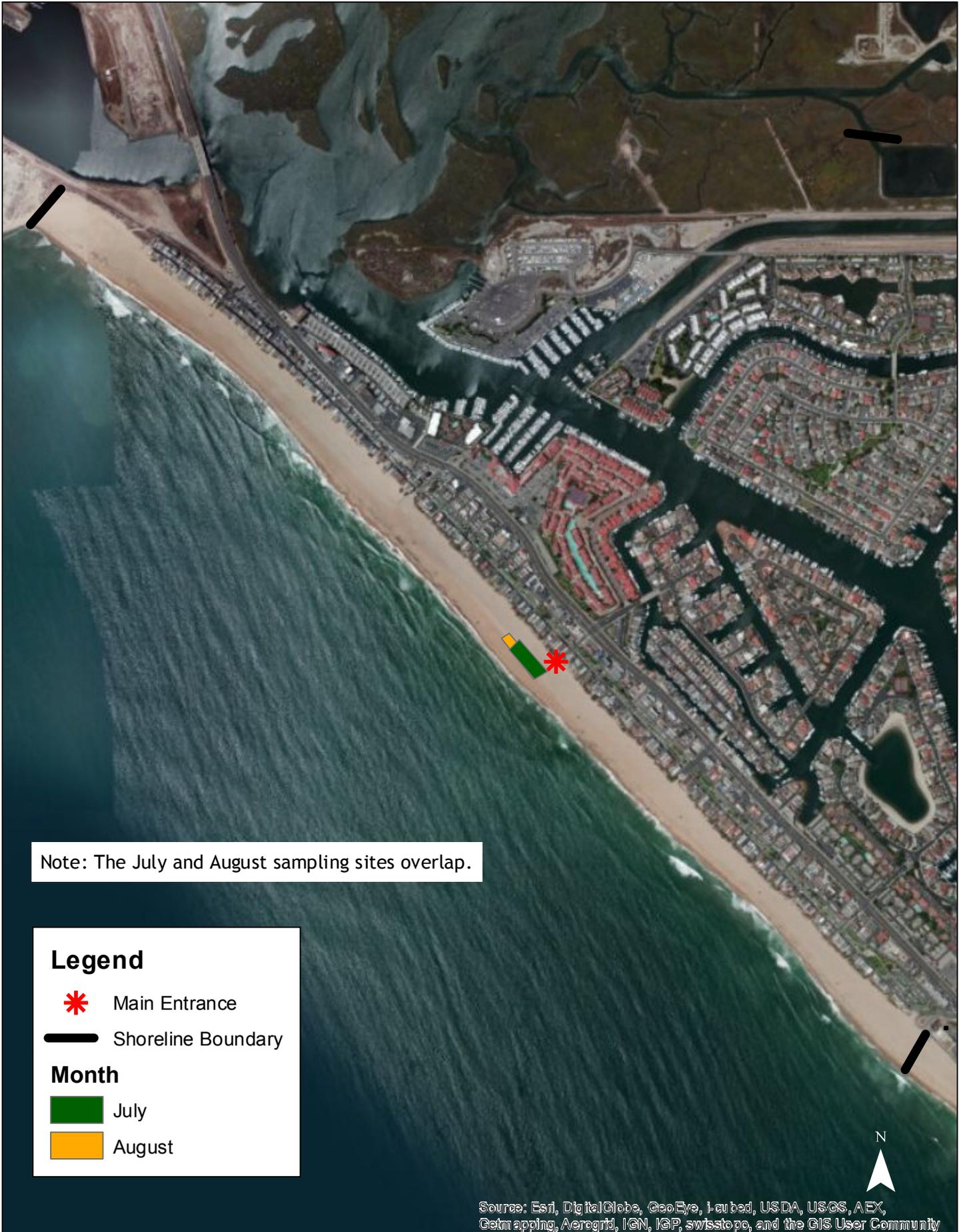
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Seal Beach



Sunset/Surfside Beach



Note: The July and August sampling sites overlap.

Legend

-  Main Entrance
-  Shoreline Boundary

Month

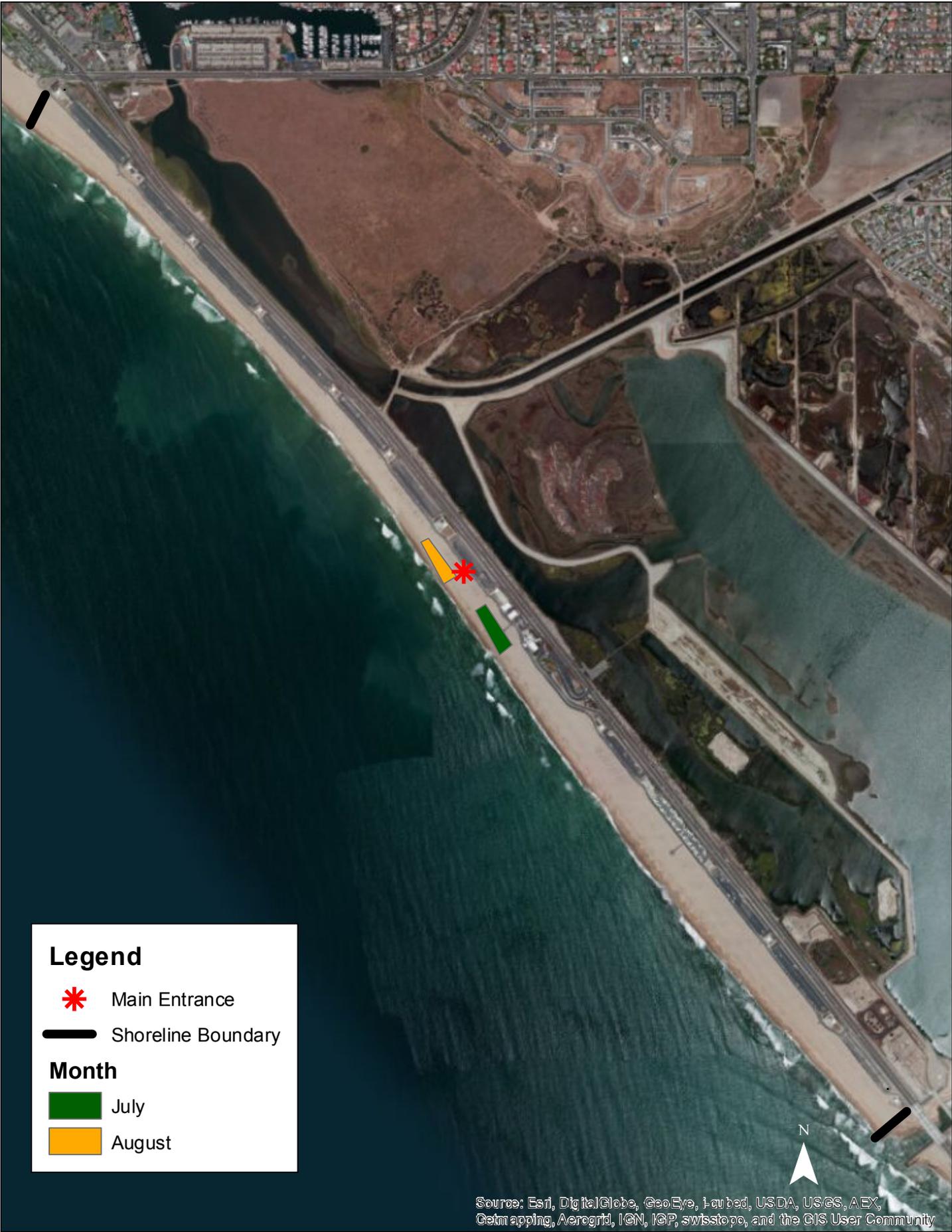
-  July
-  August

0 235 470 940 Meters



Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Bolsa Chica Beach



Legend

-  Main Entrance
-  Shoreline Boundary

Month

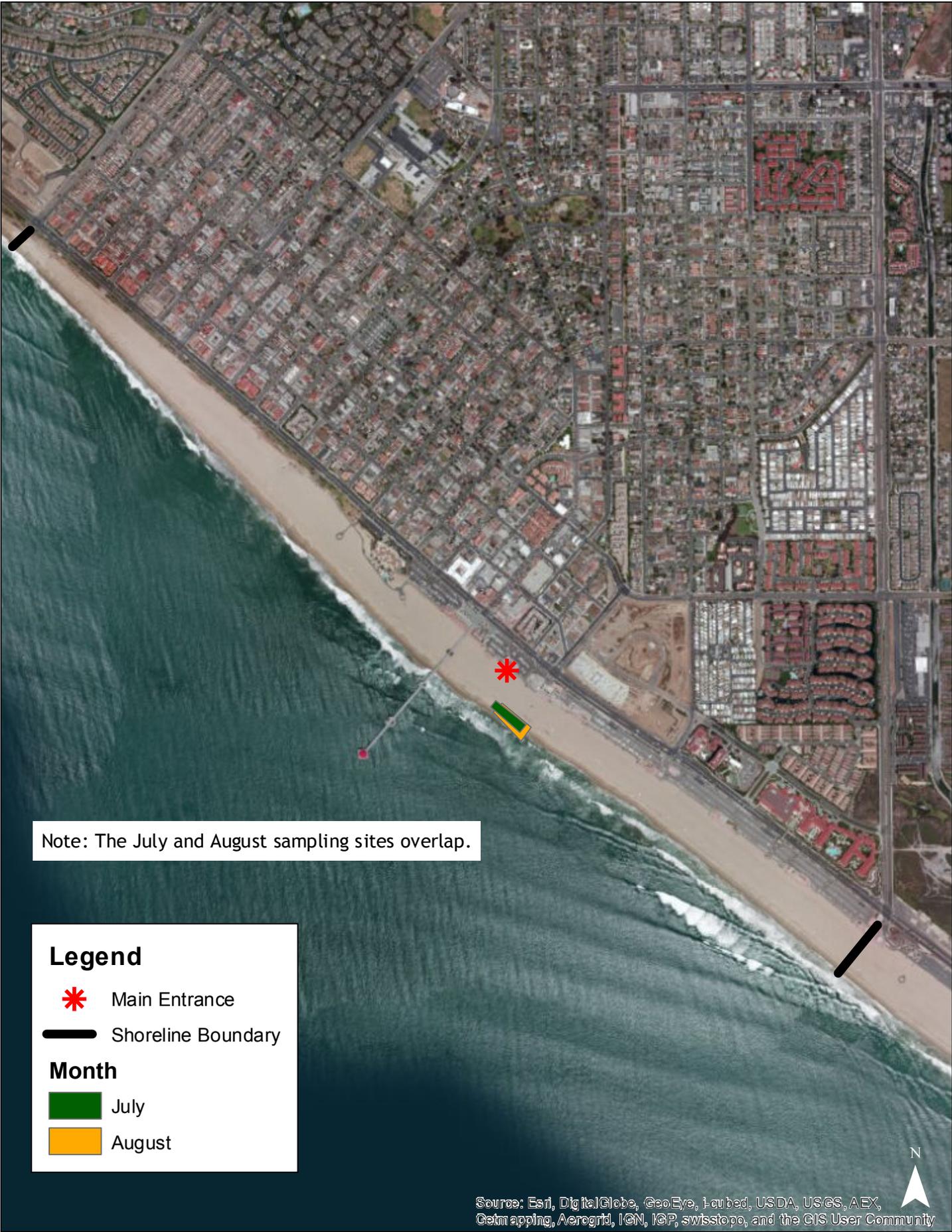
-  July
-  August



0 262.5 525 1,050 Meters

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Huntington City Beach



Note: The July and August sampling sites overlap.

Legend

-  Main Entrance
-  Shoreline Boundary

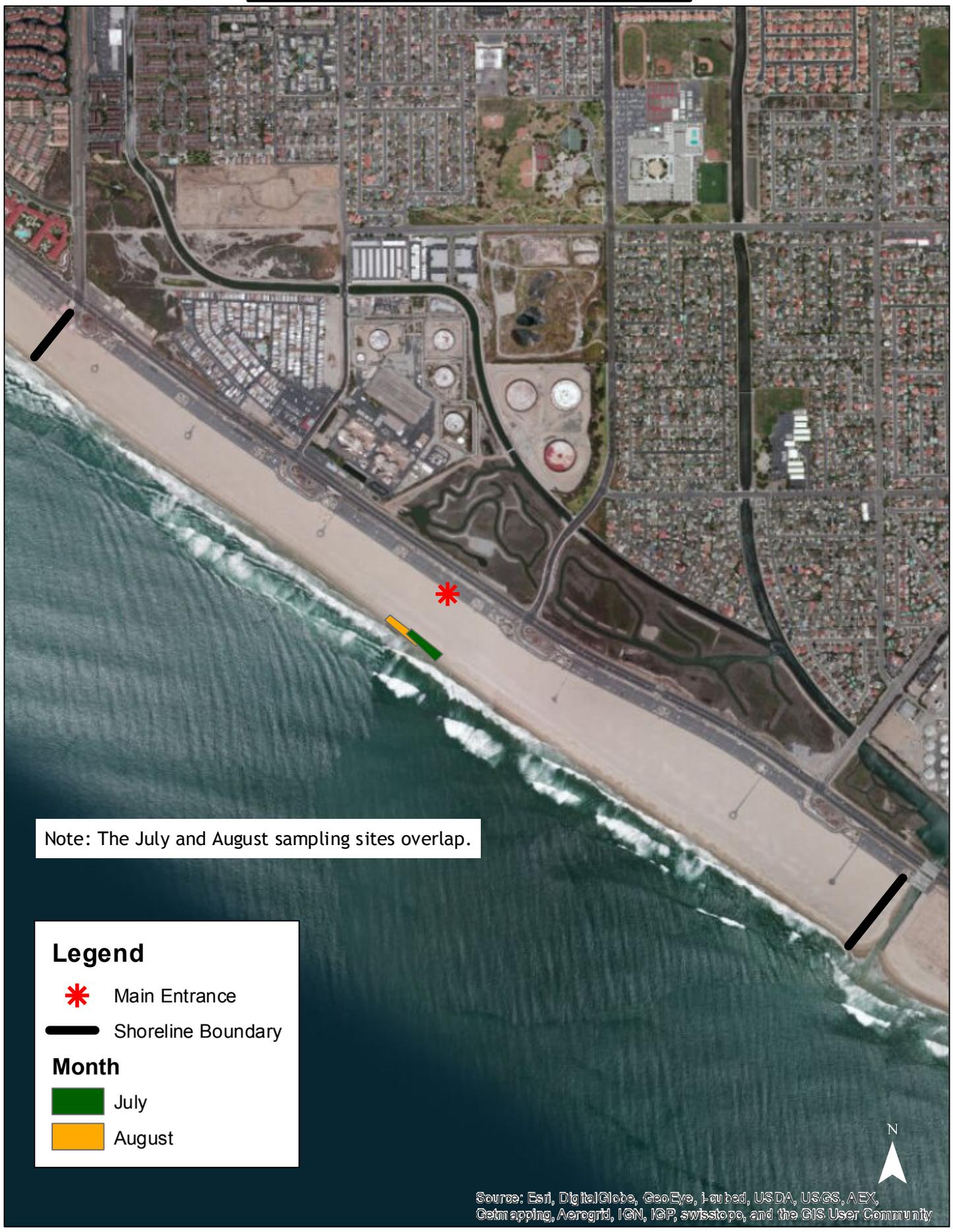
Month

-  July
-  August



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Huntington State Beach



Newport Beach



Legend

- * Main Entrance
- Shoreline Boundary

Month

- July
- August

Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Balboa Beach



0 345 690 1,380 Meters

Corona Del Mar



Source: Esri, DigitalGlobe, GeoEye, Icu bed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Crystal Cove



Note: The July and August sampling sites overlap.

Legend

- * Main Entrance
- Shoreline Boundary

Month

- July
- August

Source: Esri, DigitalGlobe, GeoEye, IGN, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Laguna Cove



Legend

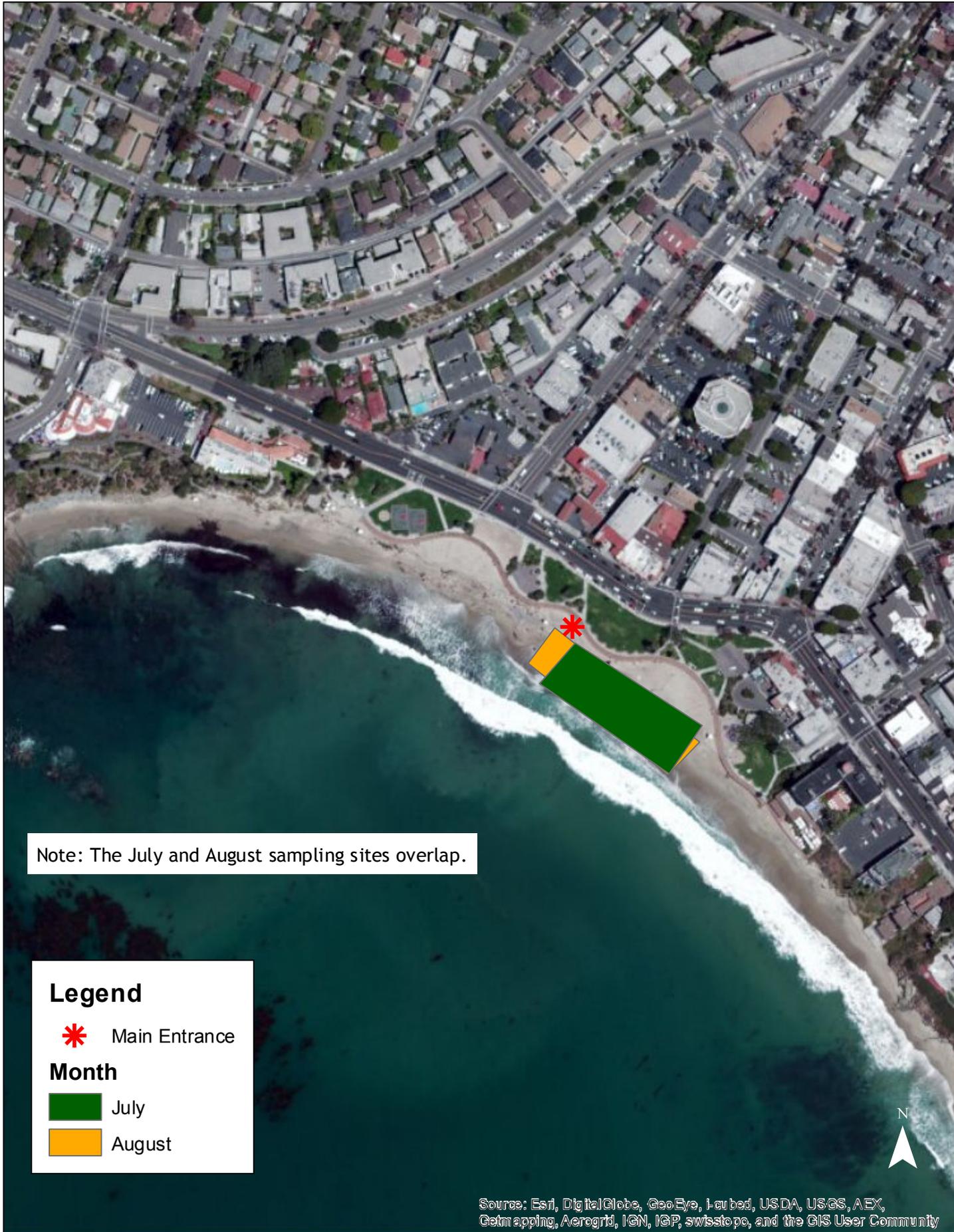
-  Main Entrance

Month

-  July
-  August

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Laguna Beach Main



Aliso Beach



Note: The July and August sampling sites overlap.

Legend

-  Main Entrance
- Month**
-  July
-  August

Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 55 110 220 Meters

Salt Creek State Beach



Legend

-  Main Entrance
-  Shoreline Boundary

Month

-  July
-  August

Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 70 140 280 Meters

Doheny State Beach



Capistrano Beach



Note: The July and August sampling sites overlap.

Legend

-  Main Entrance
-  Shoreline Boundary

Month

-  July
-  August

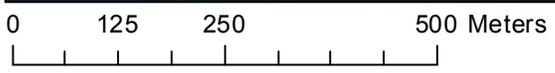
Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



San Clemente City



Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Calafia/San Clemente State Beach



Legend

* Main Entrance

Month

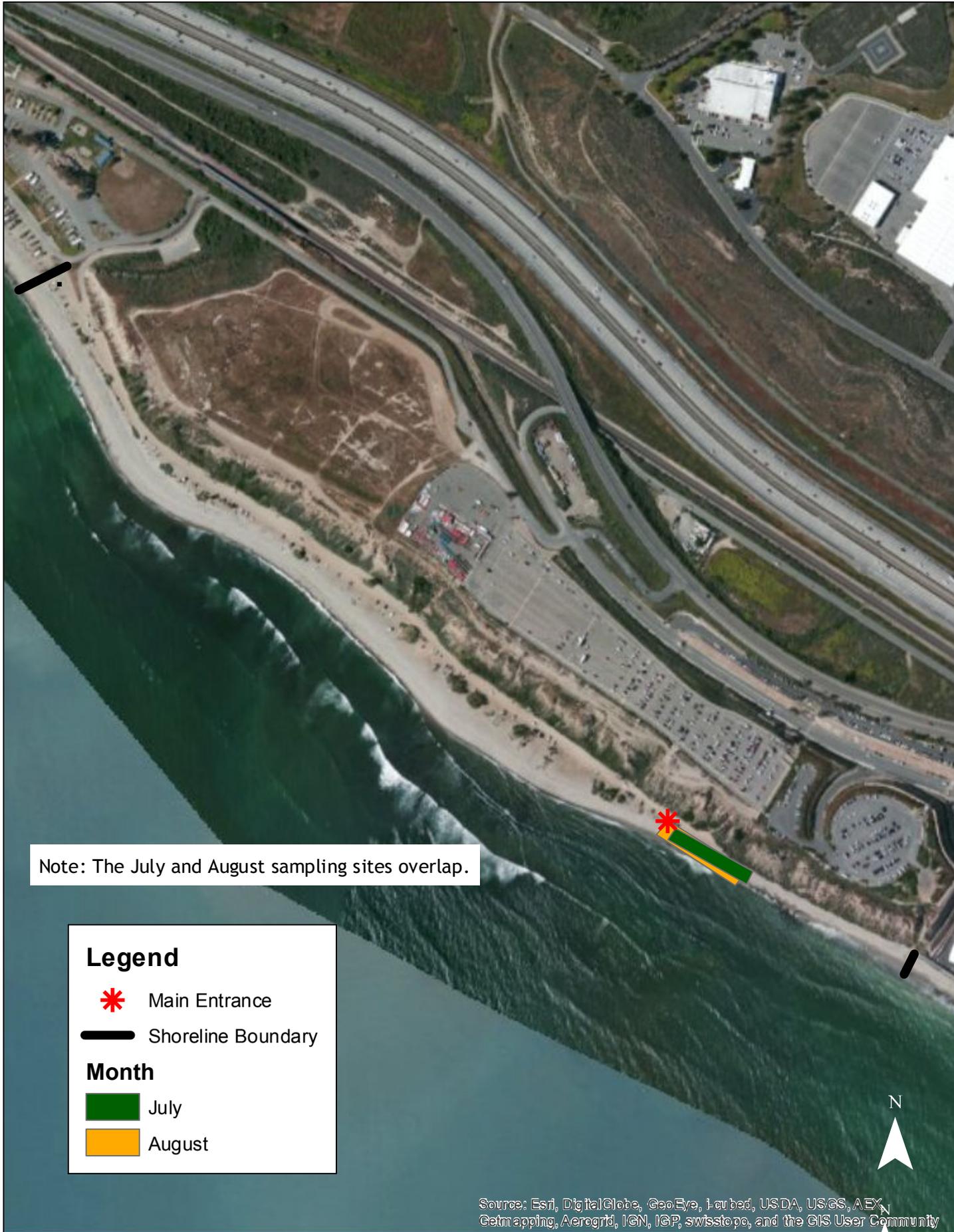
July

August

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 190 380 760 Meters

San Onofre State Beach



Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

