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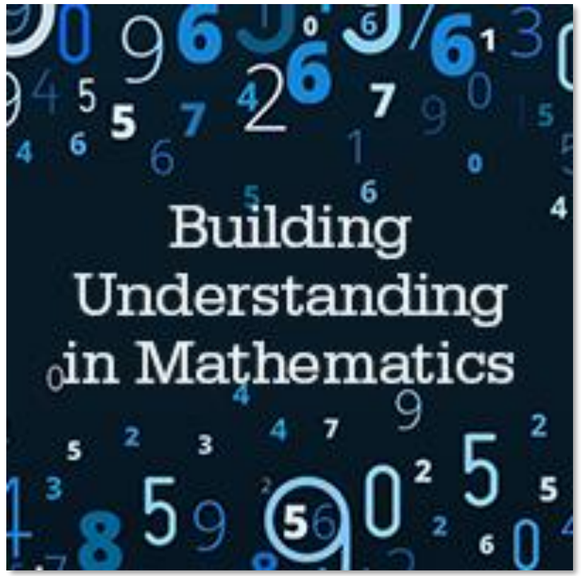

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Denise Singleton has over 25 years of experience as a mathematics educator and educational content marketer. Her conversational style and enthusiasm will engage and entertain you!

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Robert Kaplinsky

Robert Kaplinsky is an educator, presenter, and co-author of HMH AGA and Into AGA. He has been an educator since 2003 as a classroom teacher, teacher specialist for Downey Unified School District in CA, instructor for the University of California, Los Angeles (UCLA), and presenter at conferences around the world. He co-founded the website Open Middle, has been published in Edutopia and Education Week, is the author of Open Middle Math: Problems That Unlock Student Thinking, and created the #ObserveMe movement.

Follow Robert on Twitter @robertkaplinsky.

WHY WE SHOULD RECONSIDER (AND WHAT WE SHOULD BE DOING INSTEAD)

ROBERT KAPLINSKY

robert@robertkaplinsky.com

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WANT THE RESOURCES?

Enter your information at:

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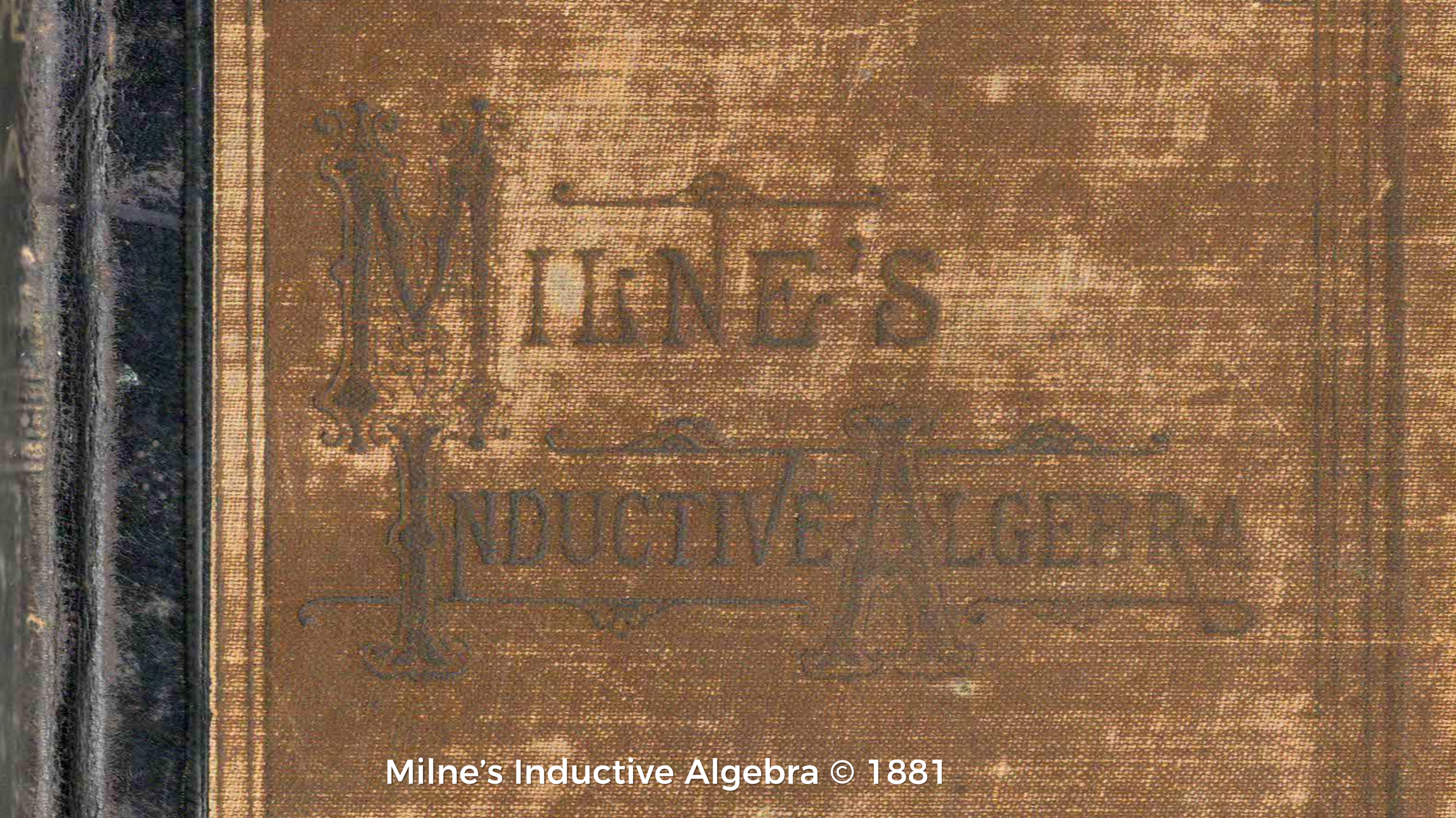
Why do we have word problems?



Milne's Inductive Algebra © 1881

183. DIRECTIONS FOR SOLVING.—*Represent one of the unknown quantities by x, and from the conditions of the problem find an expression for each of the other quantities given.*

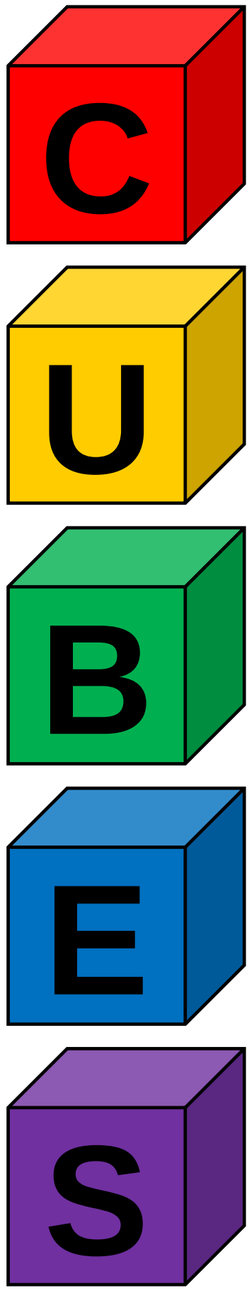
Find from the problem two expressions that are equal, and express them as an equation.

Solve the equation.

51. When the half of a certain number is added to the number, the sum is as much more than 60 as the number is less than 65. What is the number?

52. The difference between two numbers is 8, and the quotient arising from dividing the greater by the less is 3. What are the numbers?

53. A man left one-half of his property to his wife, one-sixth to his children, a twelfth to his brother, and the rest, which was $600, to charitable purposes. How much property had he?



CIRCLE the numbers

UNDERLINE the question

BOX the key words

~~ELIMINATE~~ info not needed

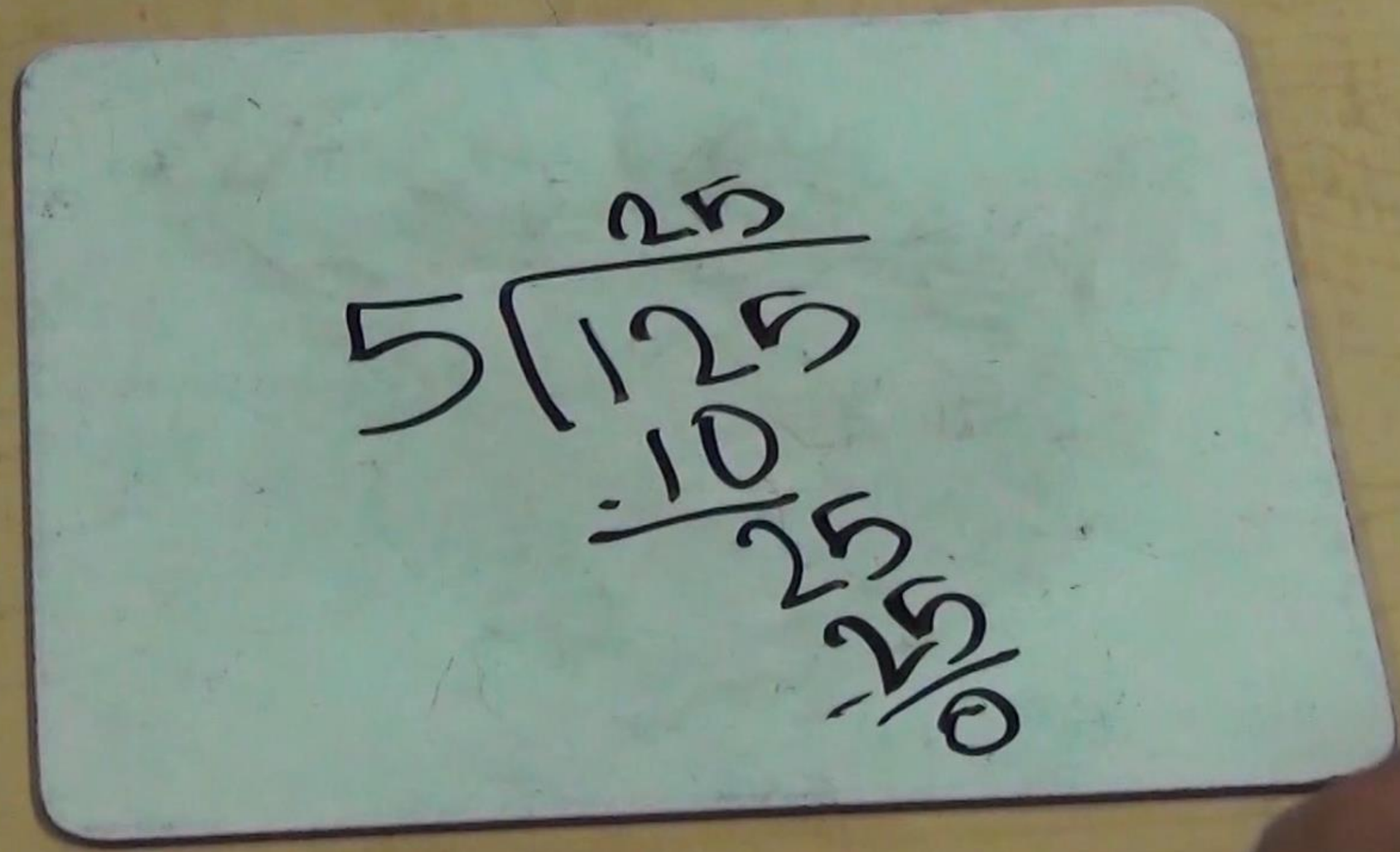
SOLVE and check ✓

In a class of 30 children, there are 3 girls for every 2 boys. How many girls are there altogether?

Source: Marilyn Burns

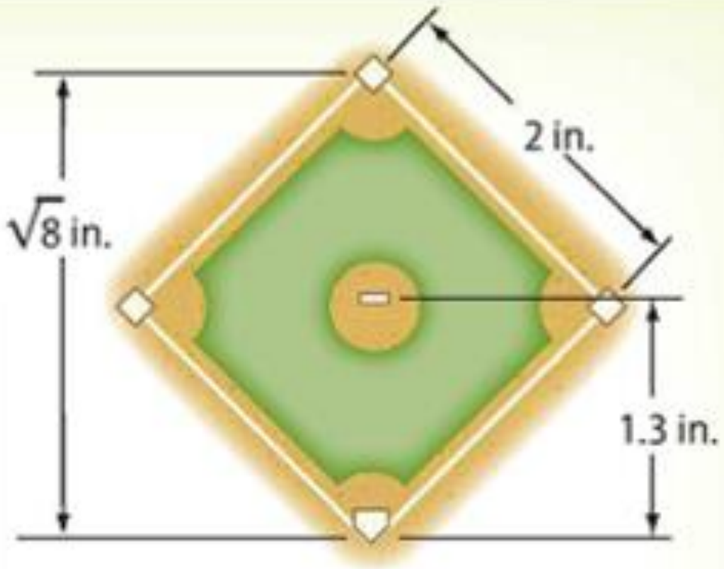
There are 125 sheep and 5 dogs in a flock. How old is the shepherd?

Making sense: 8
Not making sense: 24



Real-World Link

Sports Major League baseball has rules for the dimensions of the baseball diamond. A model of the diamond is shown.



1. On the model, the distance from the pitching mound to home plate is 1.3 inches. Is 1.3 a rational number? Explain.

2. On the model, the distance from first base to second base is 2 inches. Is 2 a rational number? Explain.

3. The distance from home plate to second base is $\sqrt{8}$ inches. Using a calculator, find $\sqrt{8}$. Does it appear to terminate or repeat?

Common Core State Standards

Content Standards
8.NS.1, 8.NS.2, 8.EE.2

Mathematical Practices
1, 3, 4, 6

Real-World Link

Common Core State Standards

Content Standards
8.NS.1, 8.NS.2, 8.EE.2

Mathematical Practices
1, 3, 4, 6

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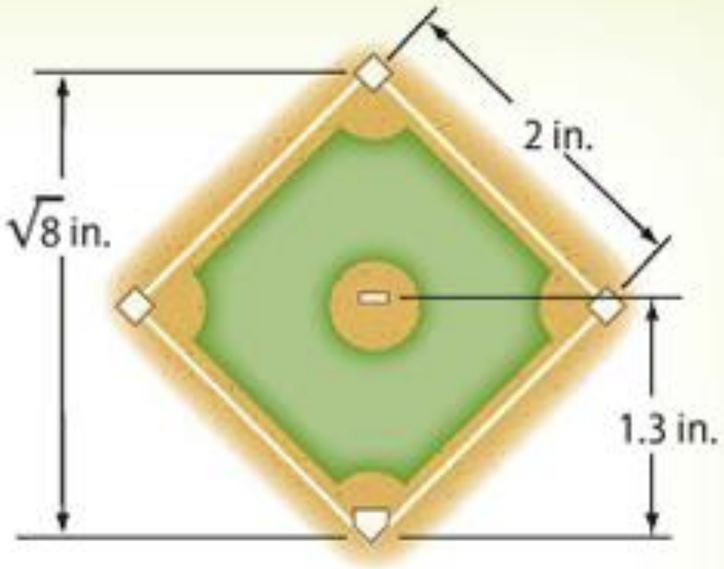

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⚠ WARNING: PREVENT ENTANGLEMENT AND STRANGULATION. KEEP THIS BAG AWAY FROM YOUNG CHILDREN. IT IS NOT A TOY.

THINKING TIME

- Why did many of us expect there to be five of each?
- Why was it not five of each?
- How might they decide on this combination?

Classic Mix

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LAY'S® Classic Potato Chips, DORITOS® Nacho Cheese Flavored Tortilla Chips, DORITOS® COOL RANCH® Flavored Tortilla Chips, CHEETOS® Crunchy Cheese Flavored Snacks, SUNCHIPS® Original Multigrain Snacks, FRITOS® Original Corn Chips (All 1 OZ. Each)

20 INDIVIDUAL BAGS: 1 OZ. EACH, TOTAL NET WT. 20 OZ. (1 LB. 4 OZ.) 567 g

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GOALS

- ❑ HOW DO WE MAKE SENSE OF MATH MODELING?
- ❑ IS IT JUST ANSWERING QUESTIONS?
- ❑ HOW IS MATH MODELING USED IN REAL LIFE?
- ❑ HOW DO WE HELP OUR STUDENTS IMPROVE?
- ❑ WHERE CAN WE FIND MORE RESOURCES?


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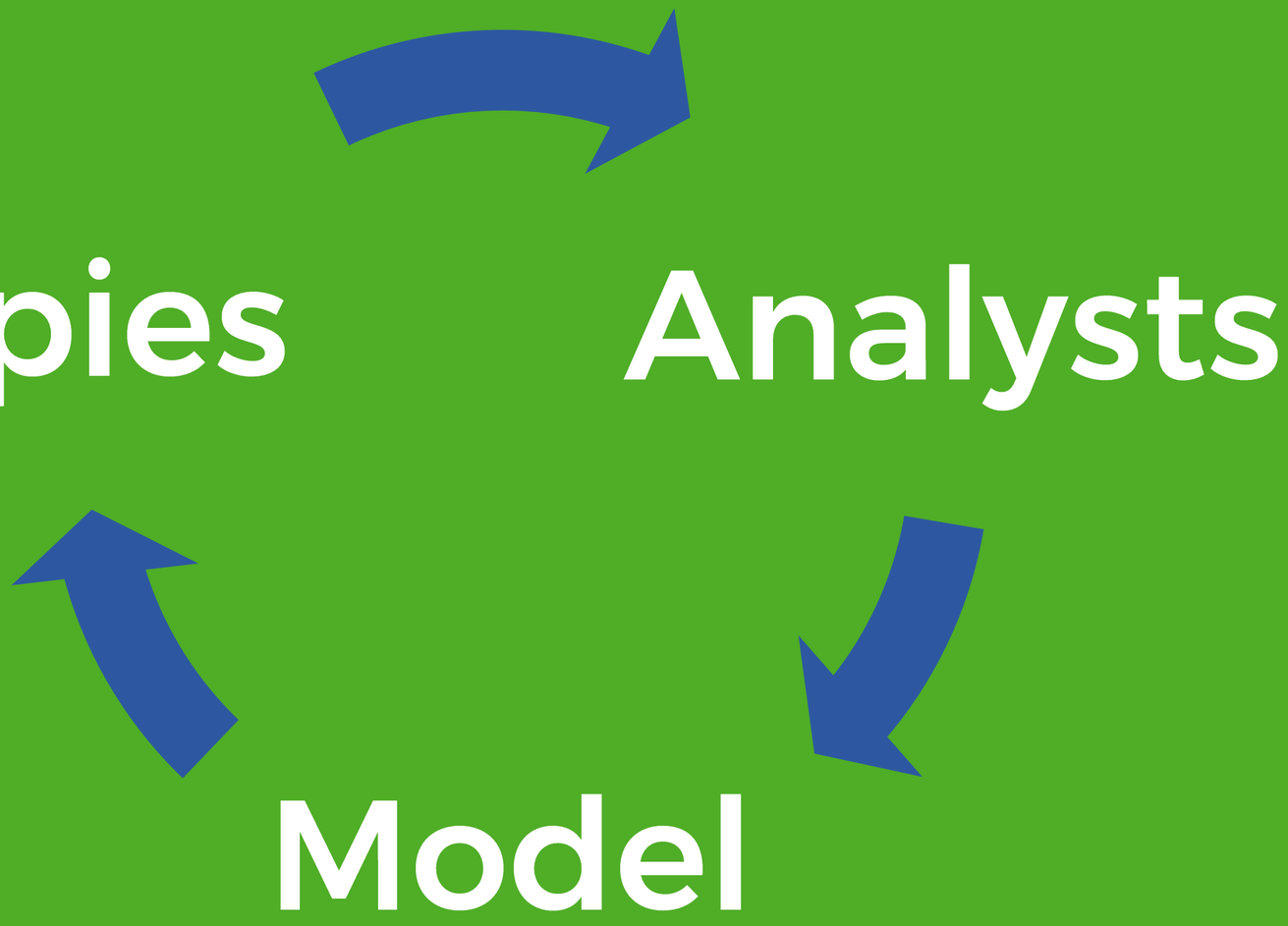
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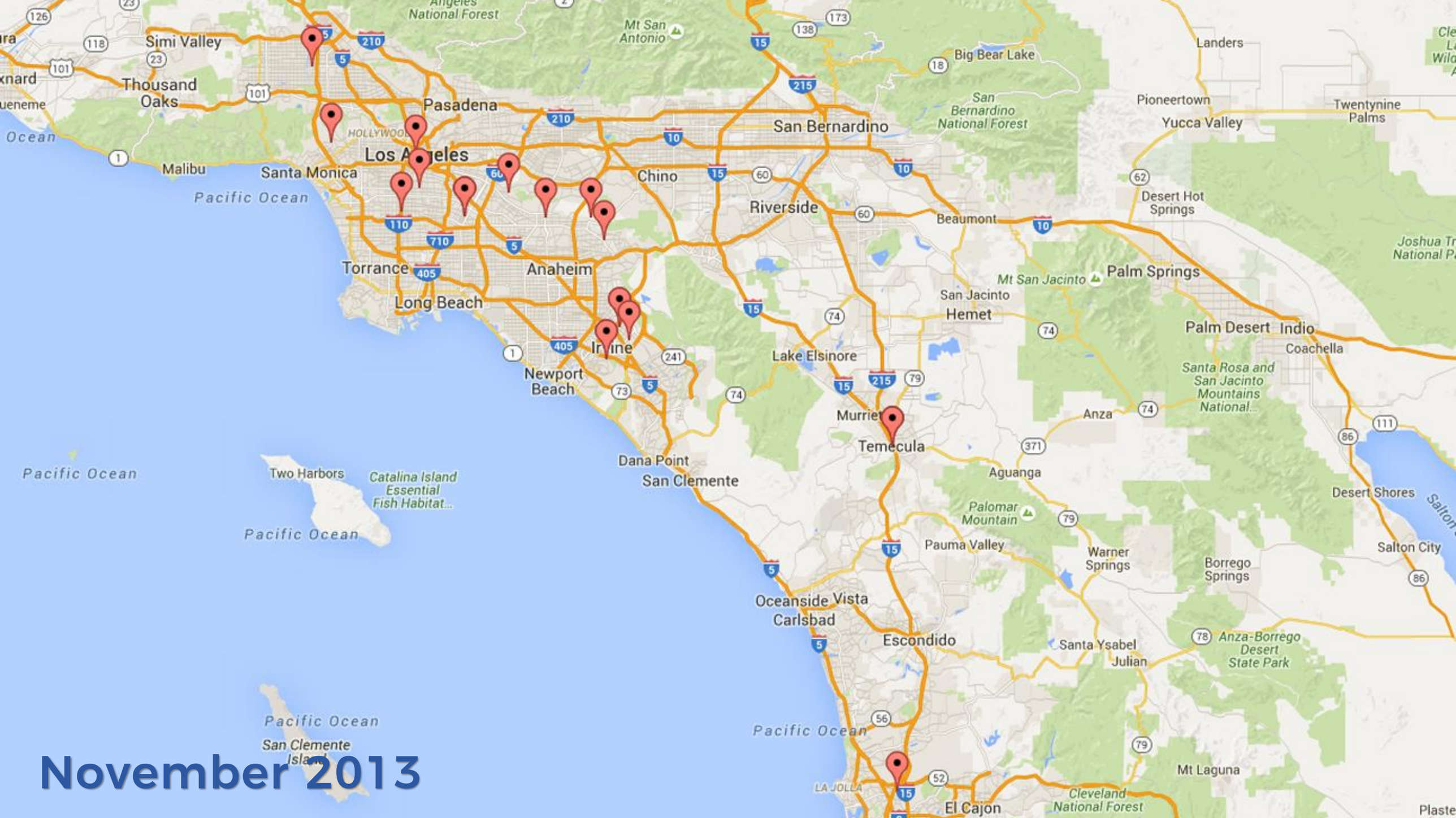

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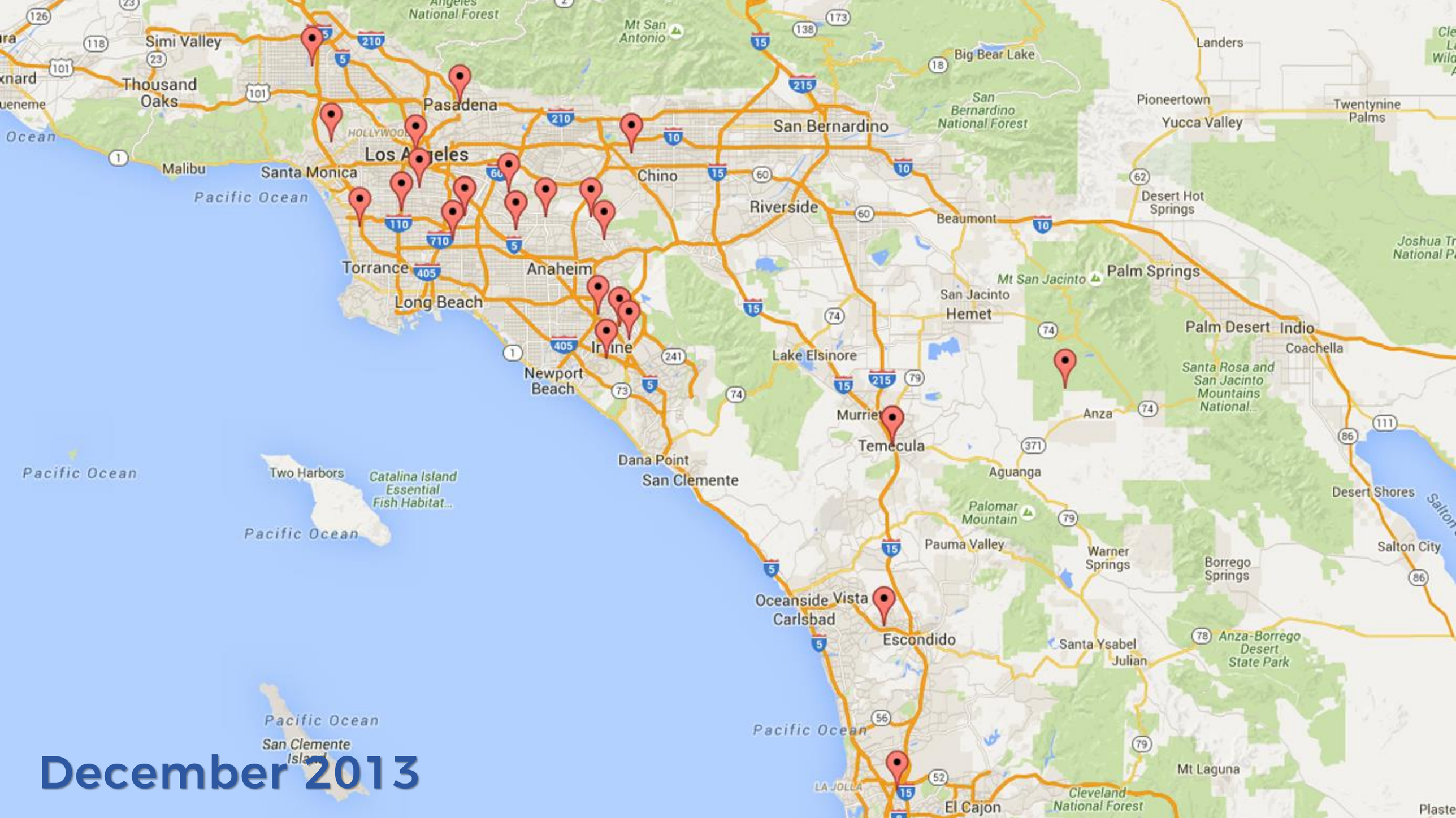

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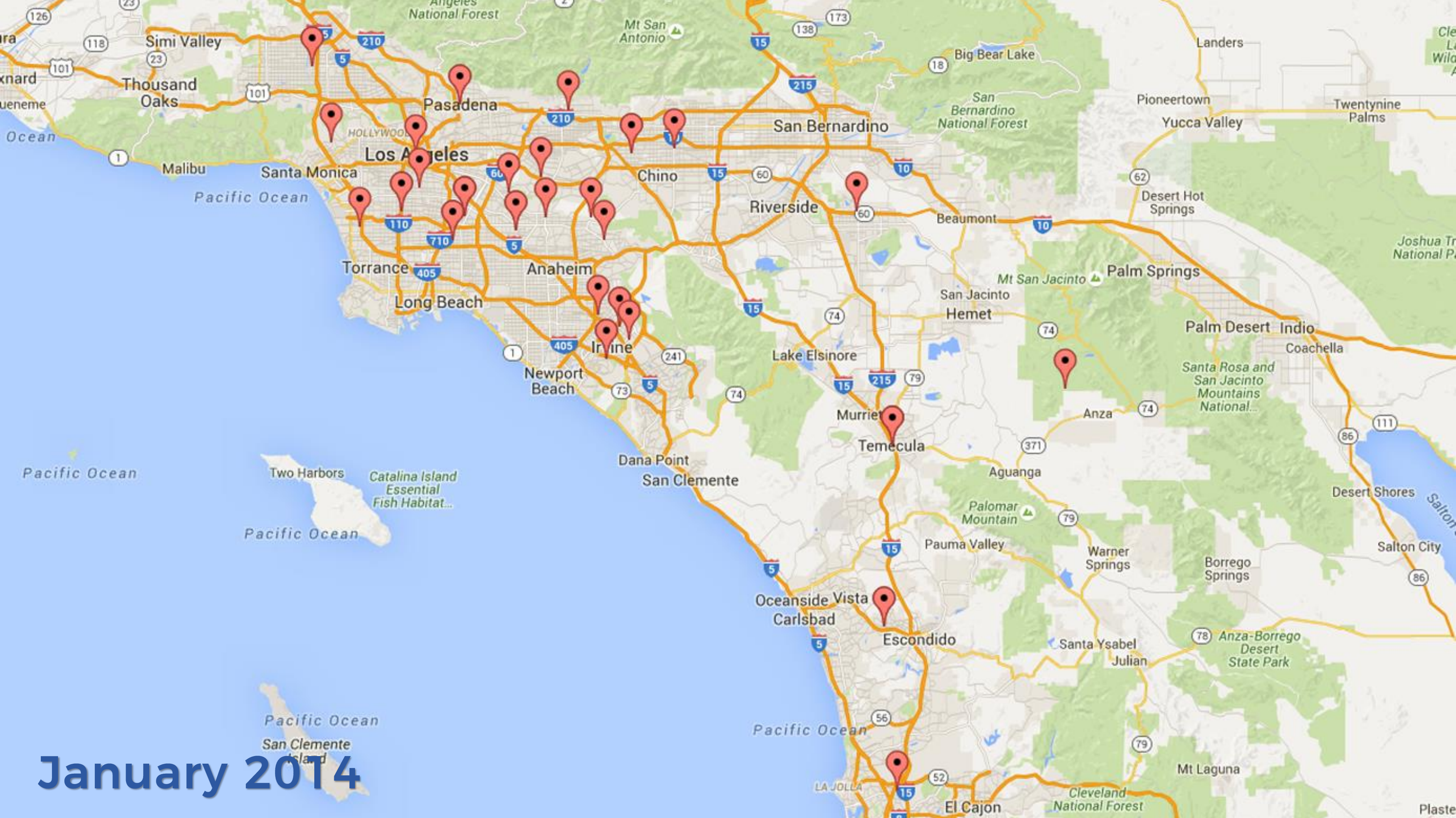

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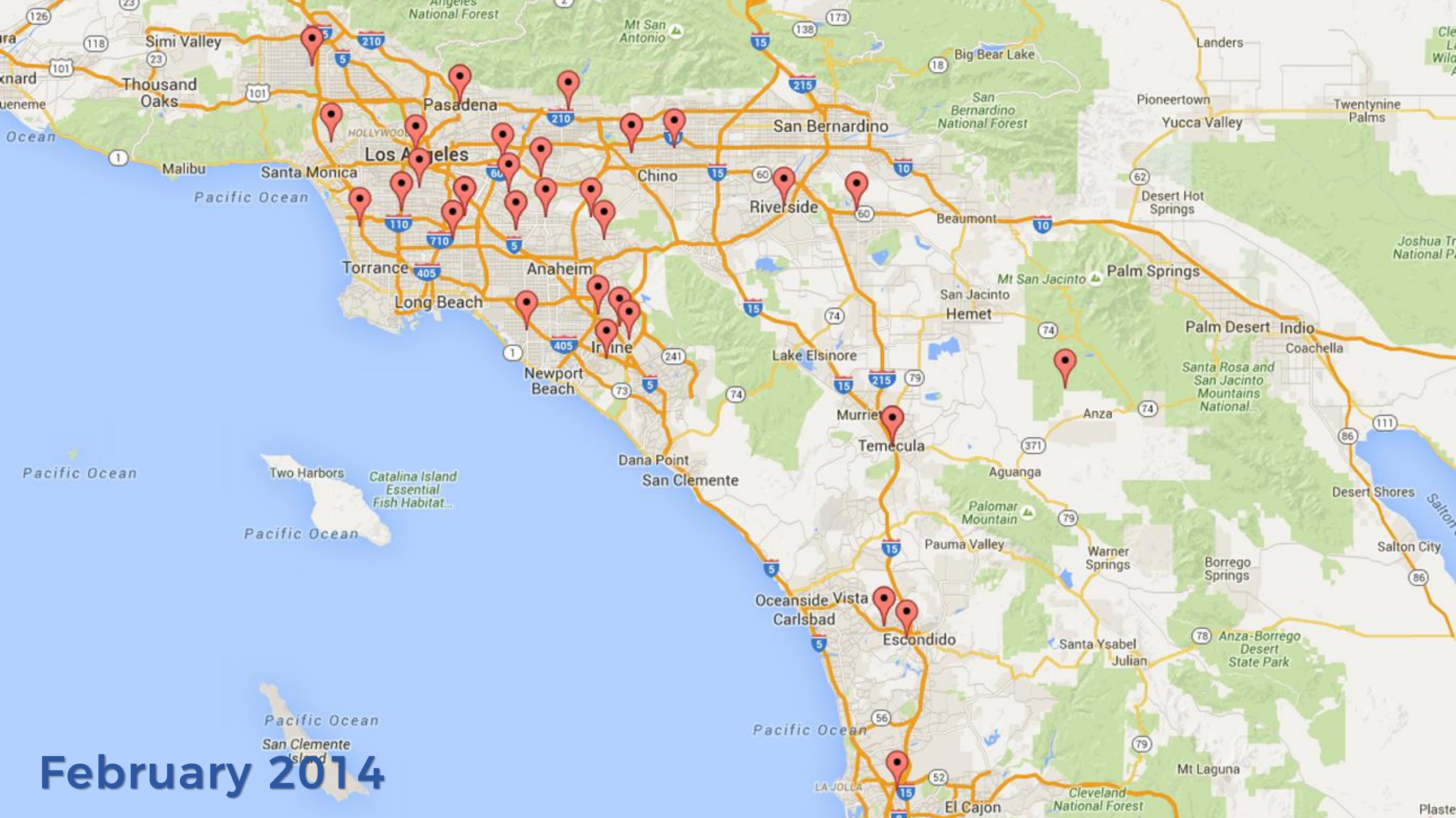

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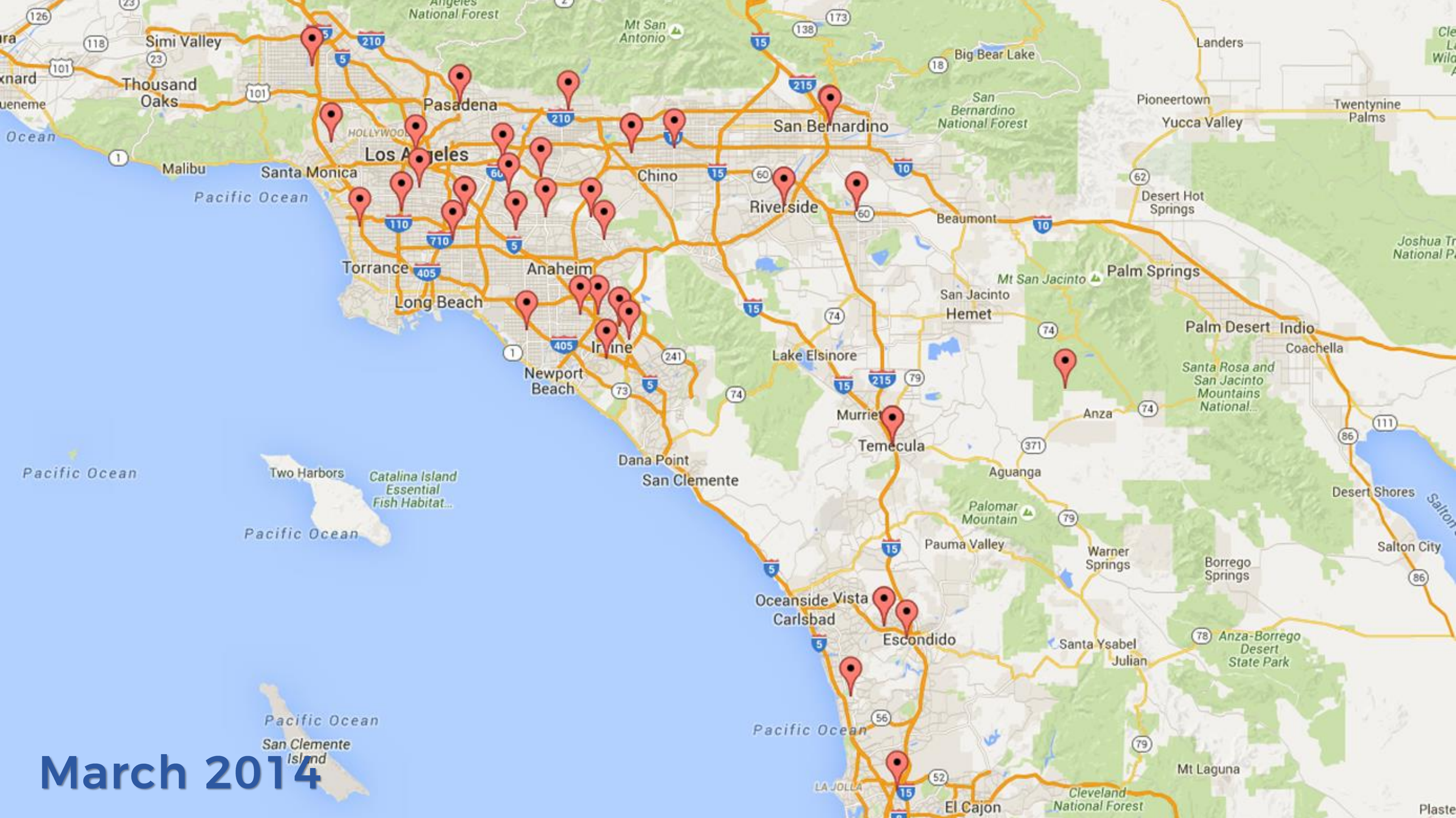
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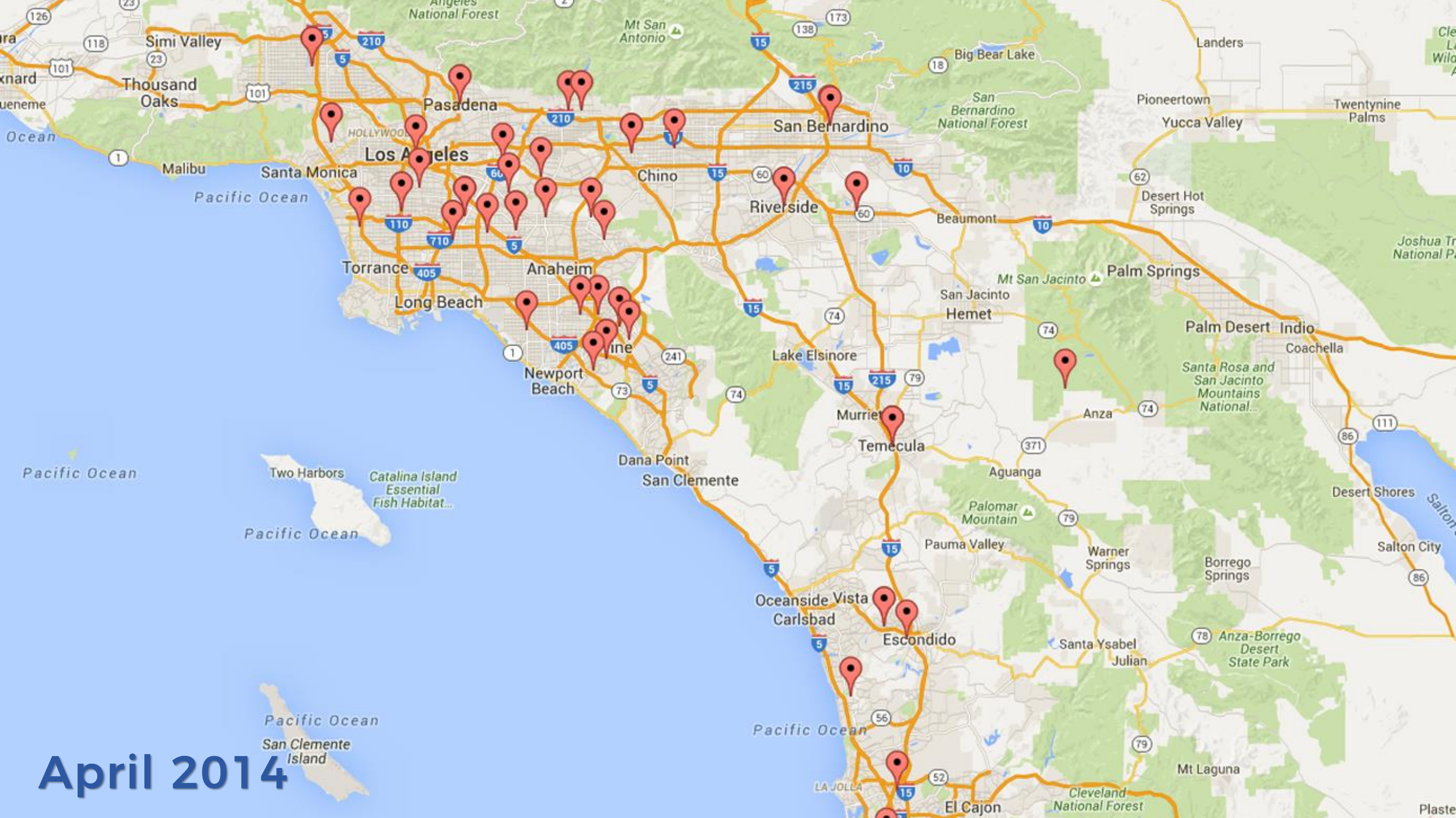
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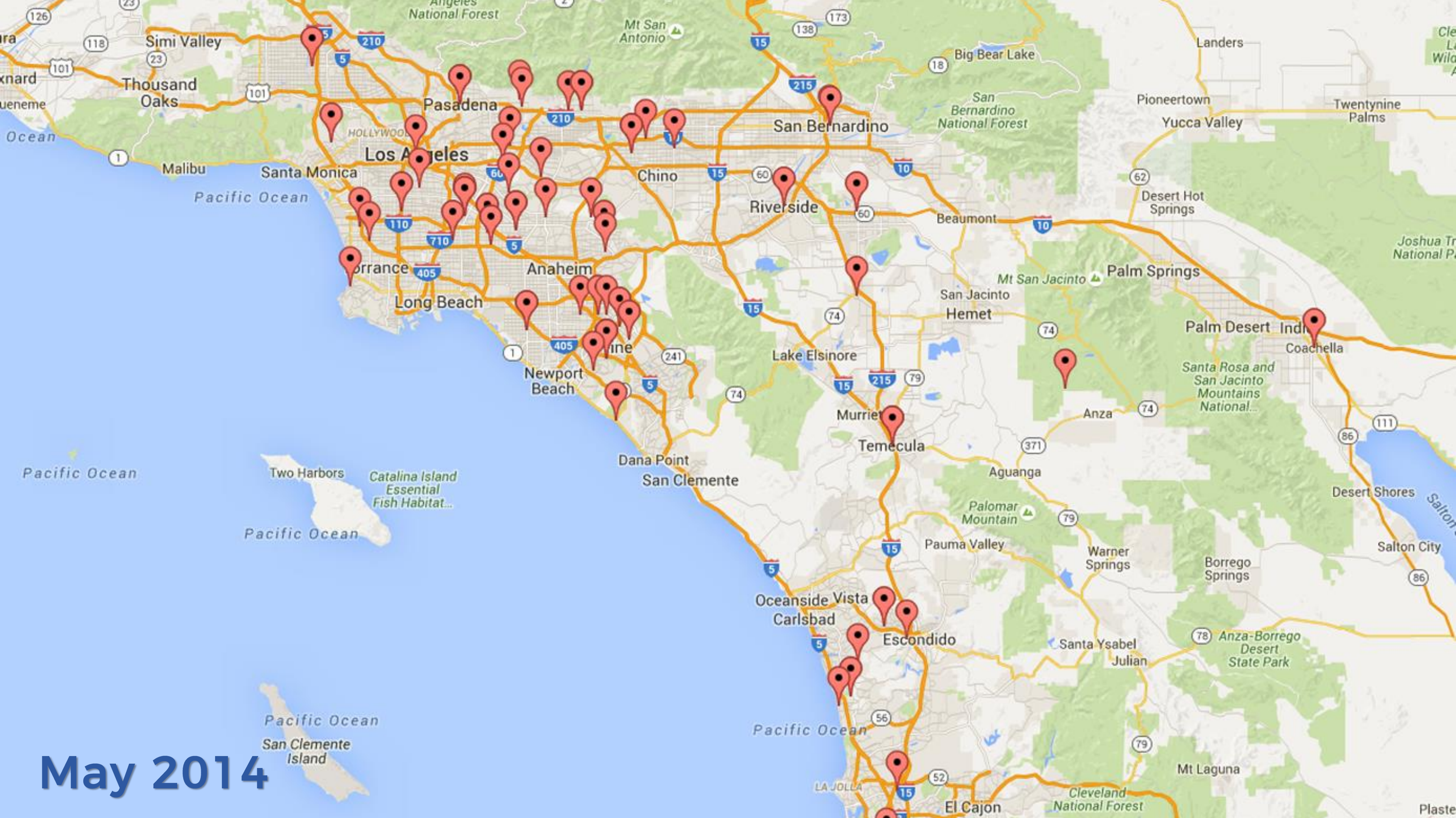
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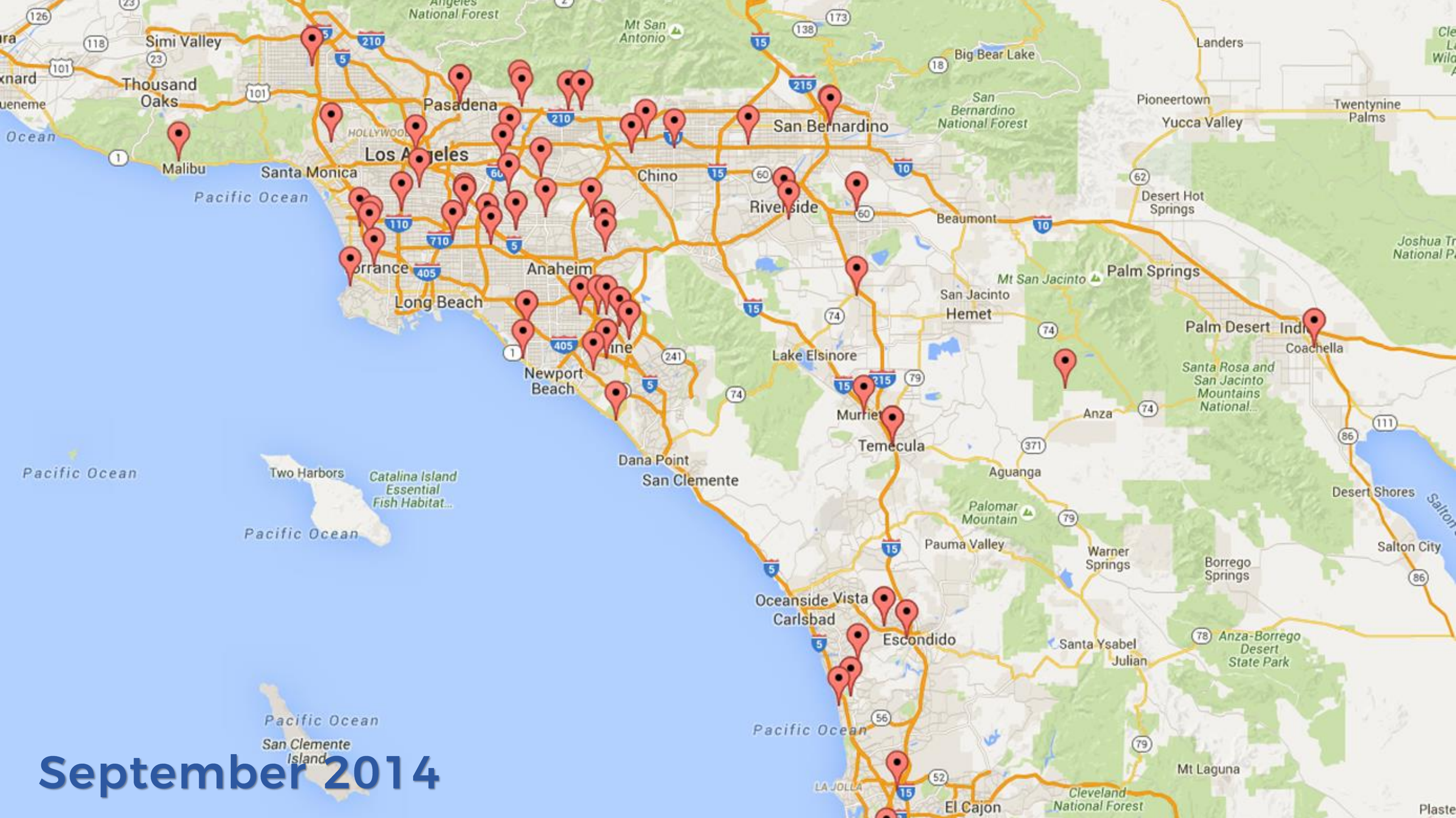

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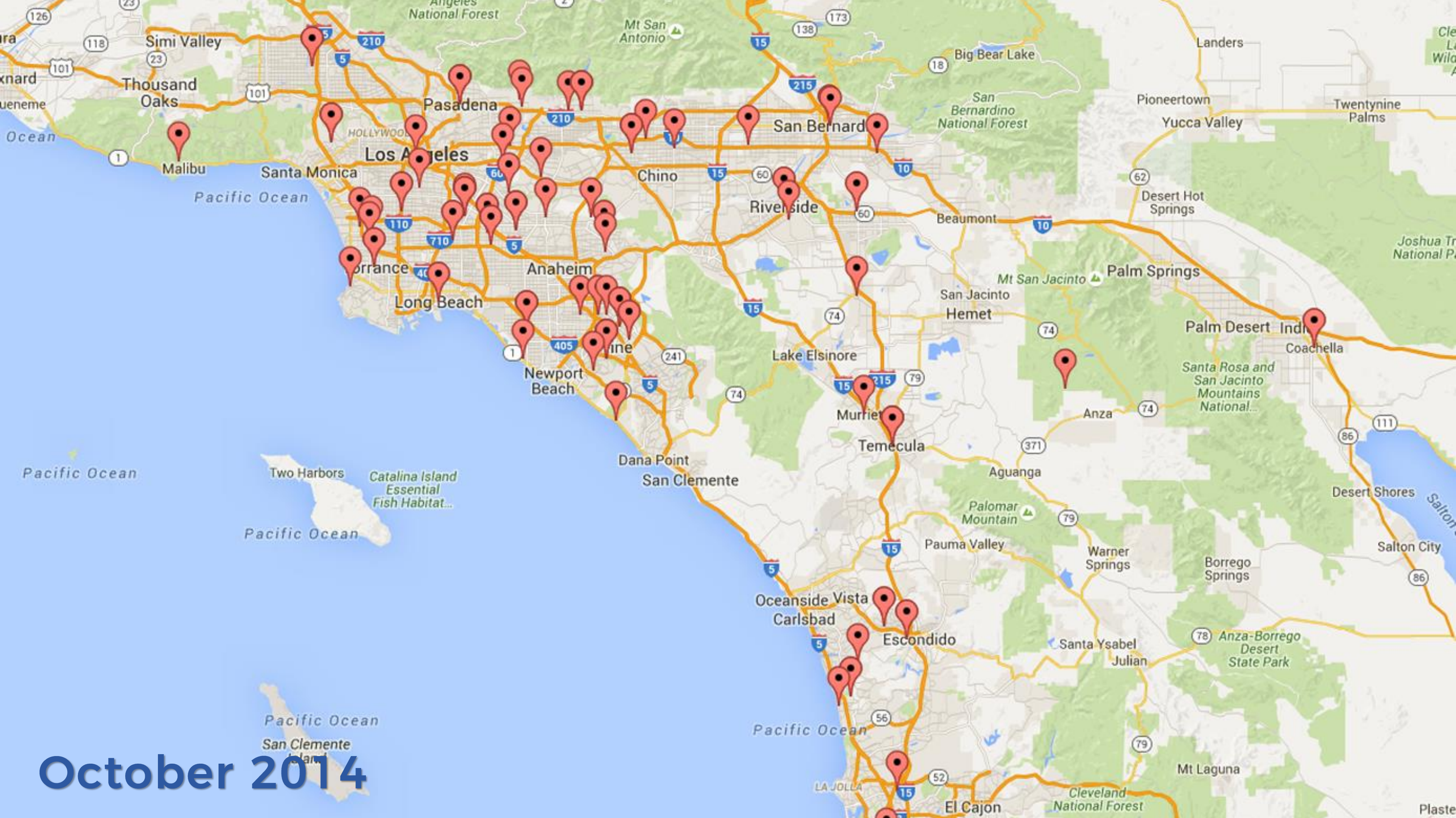

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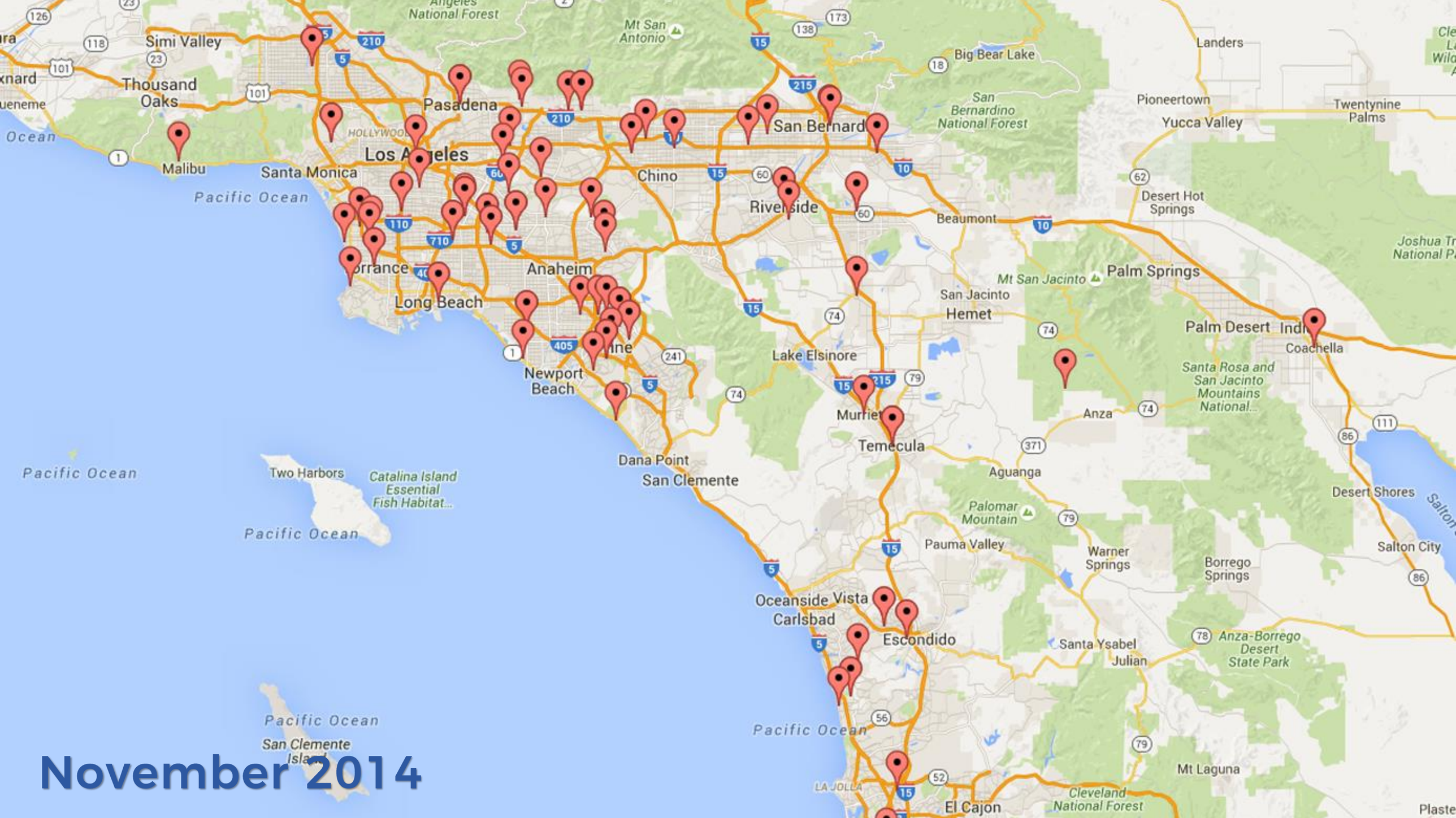

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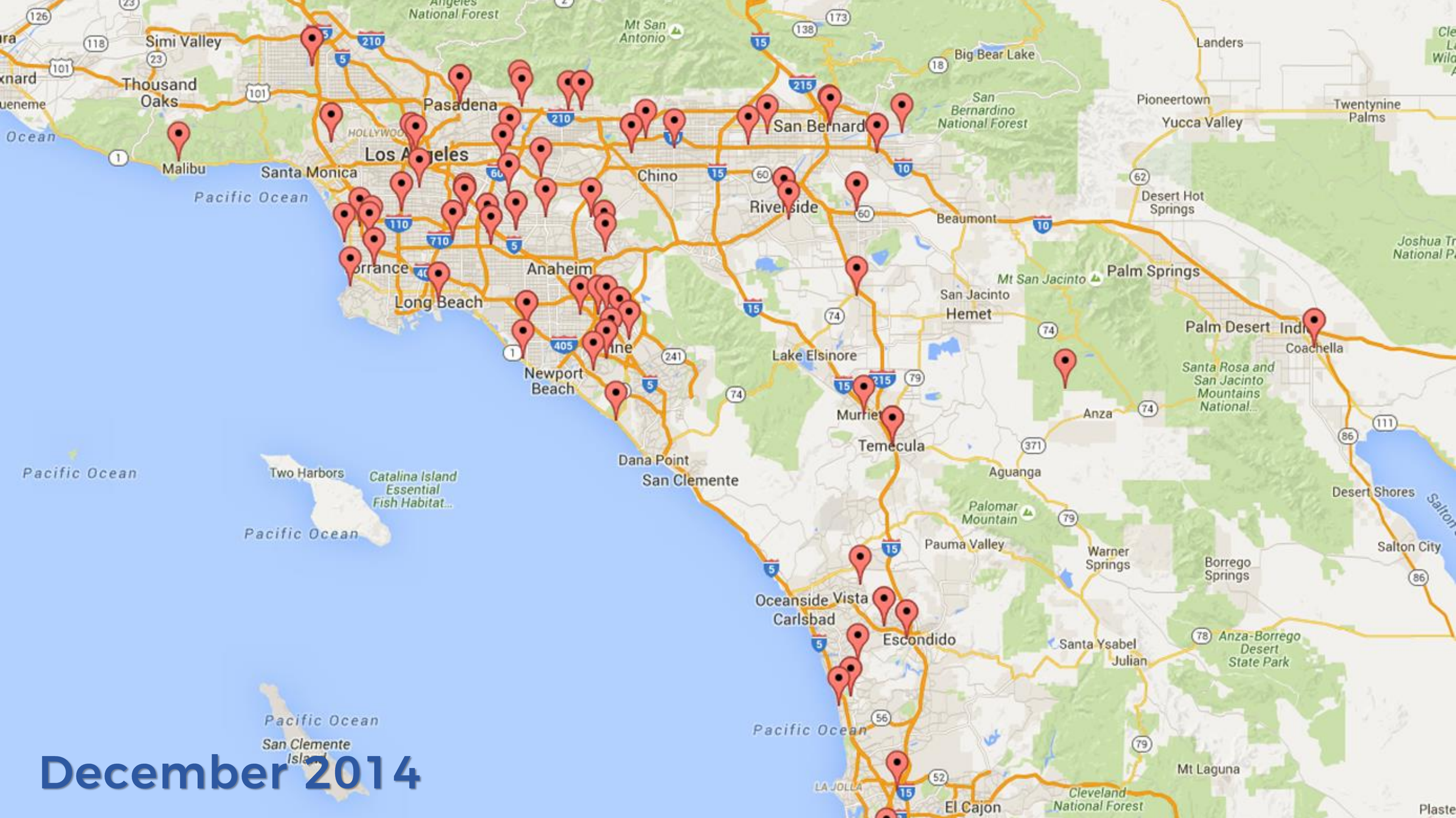

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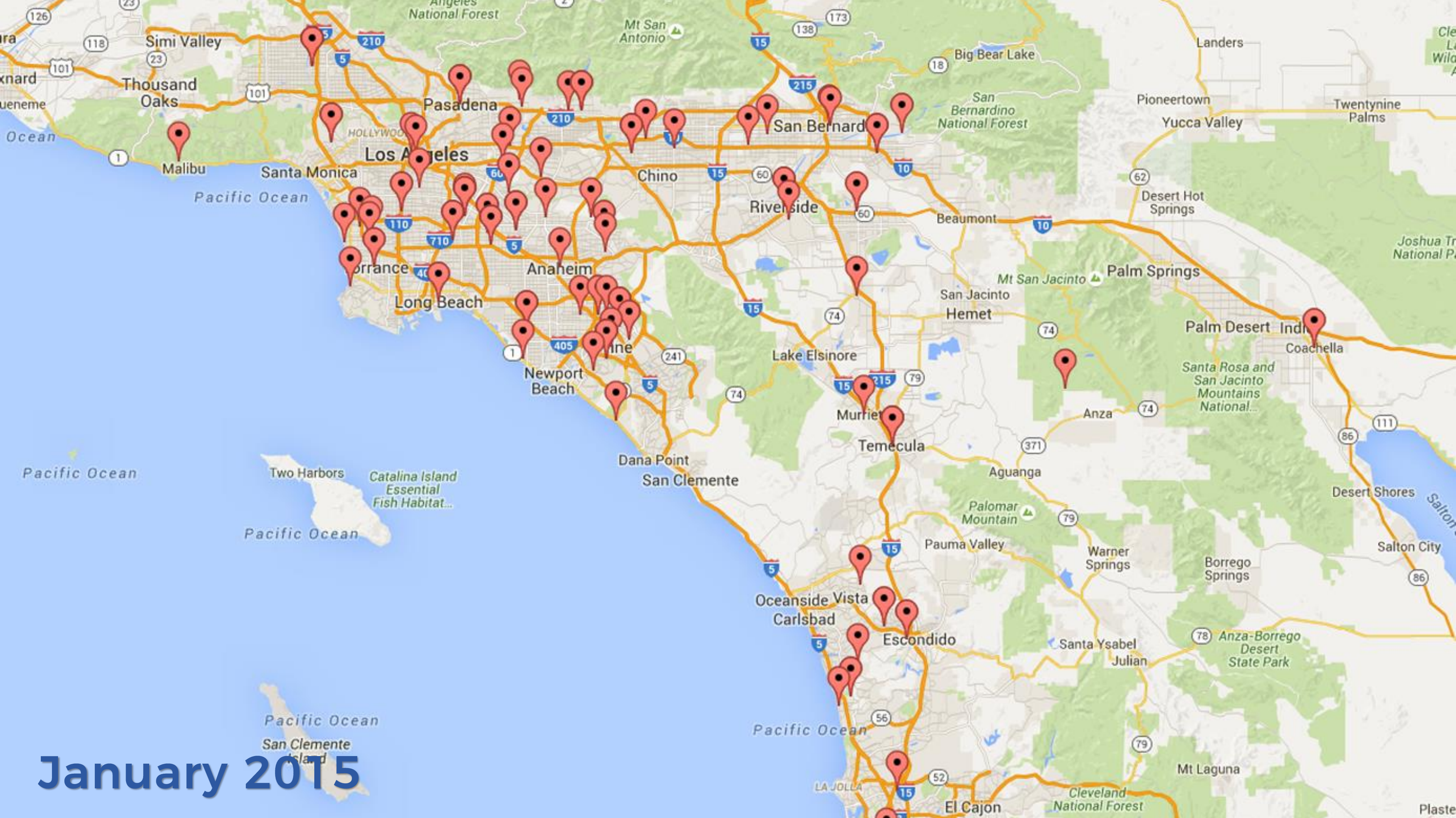

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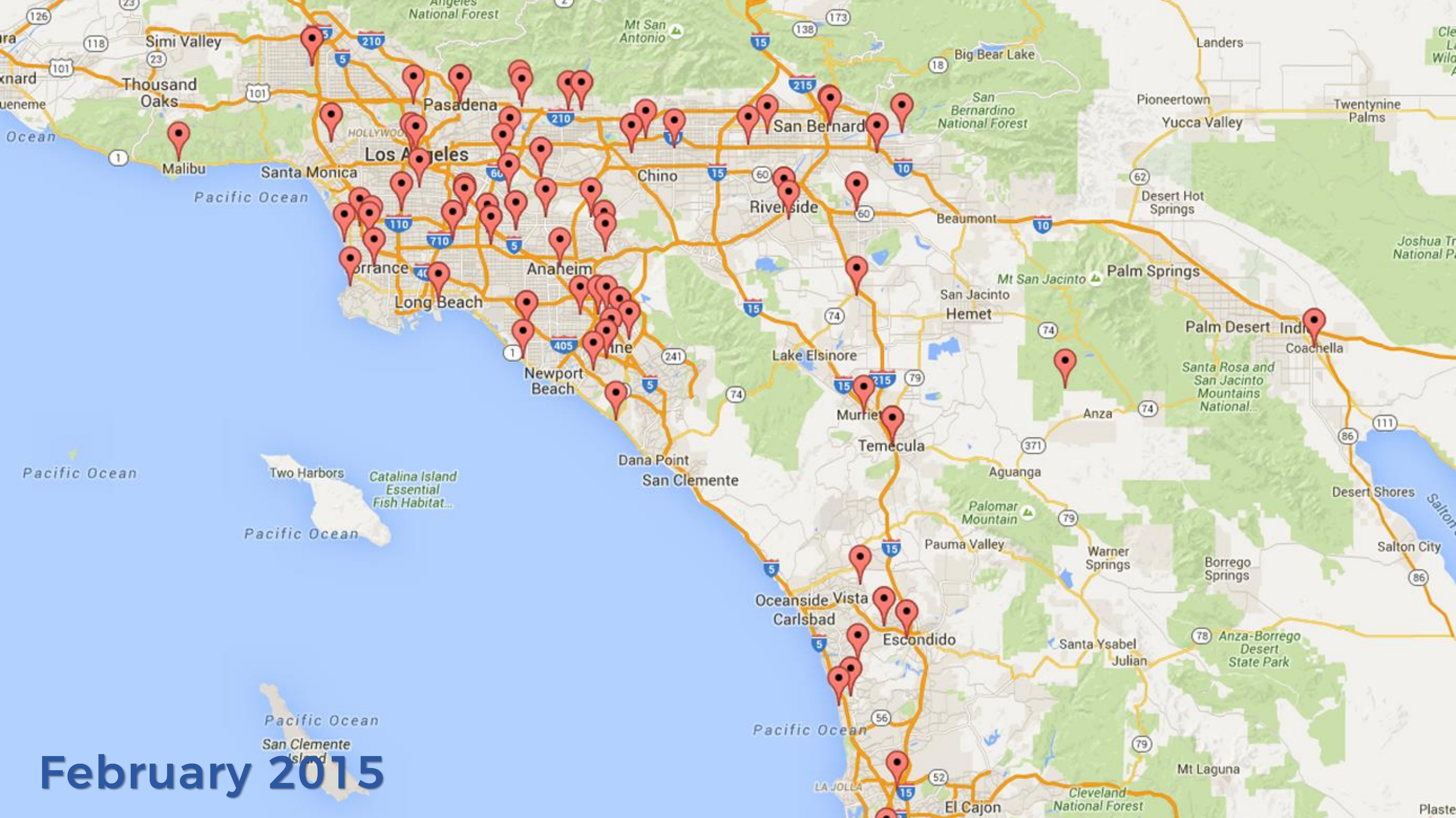

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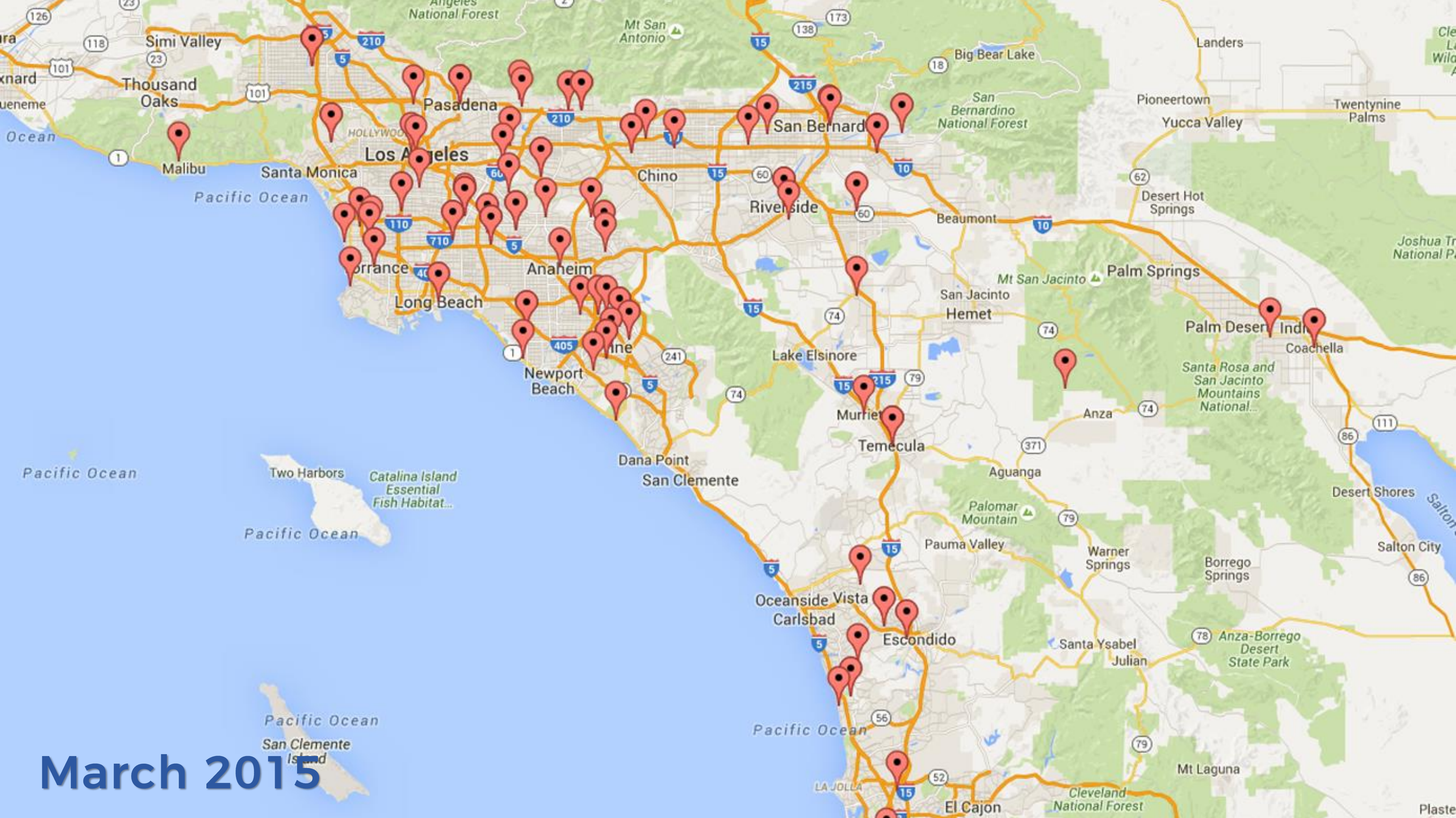
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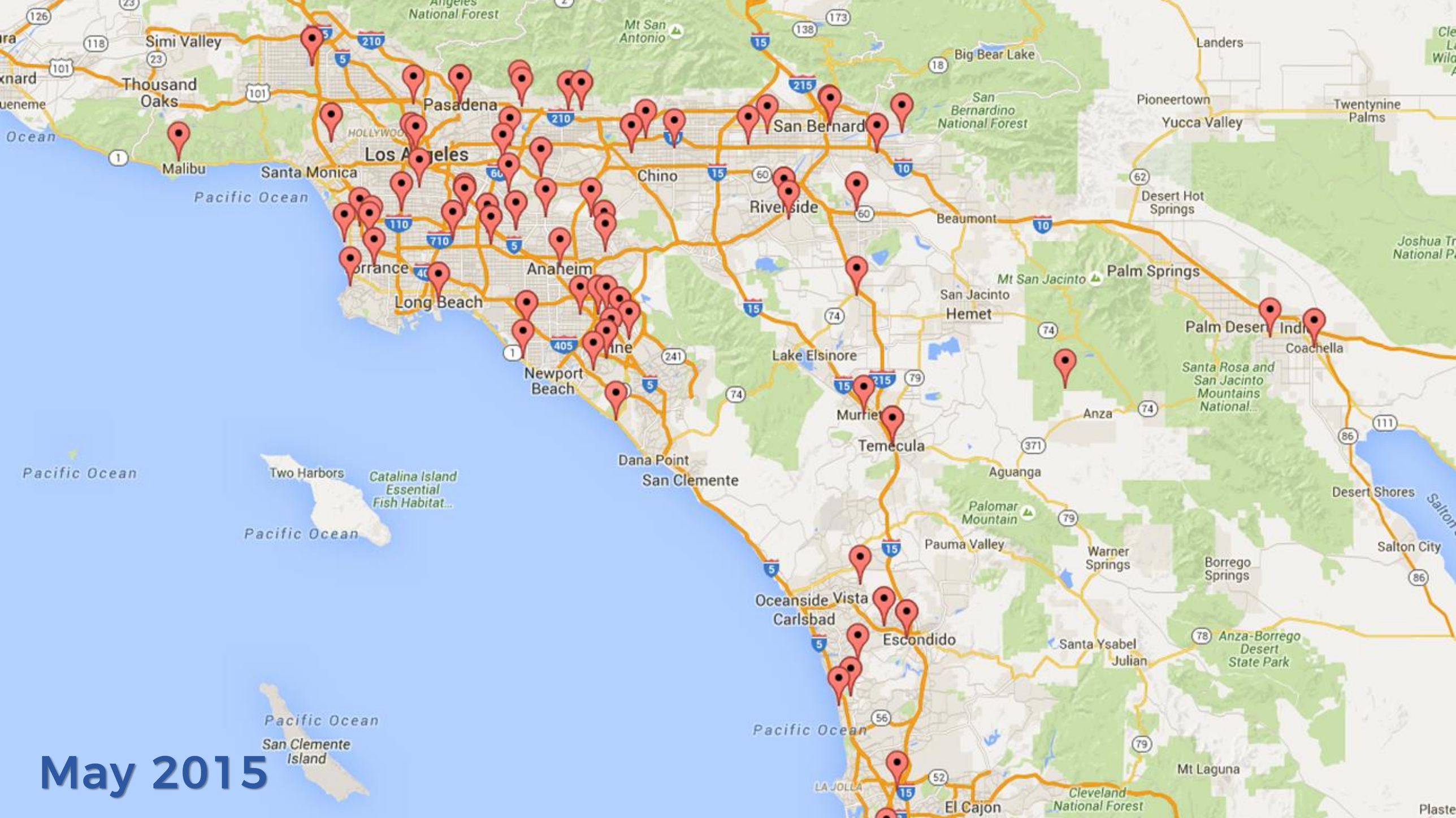
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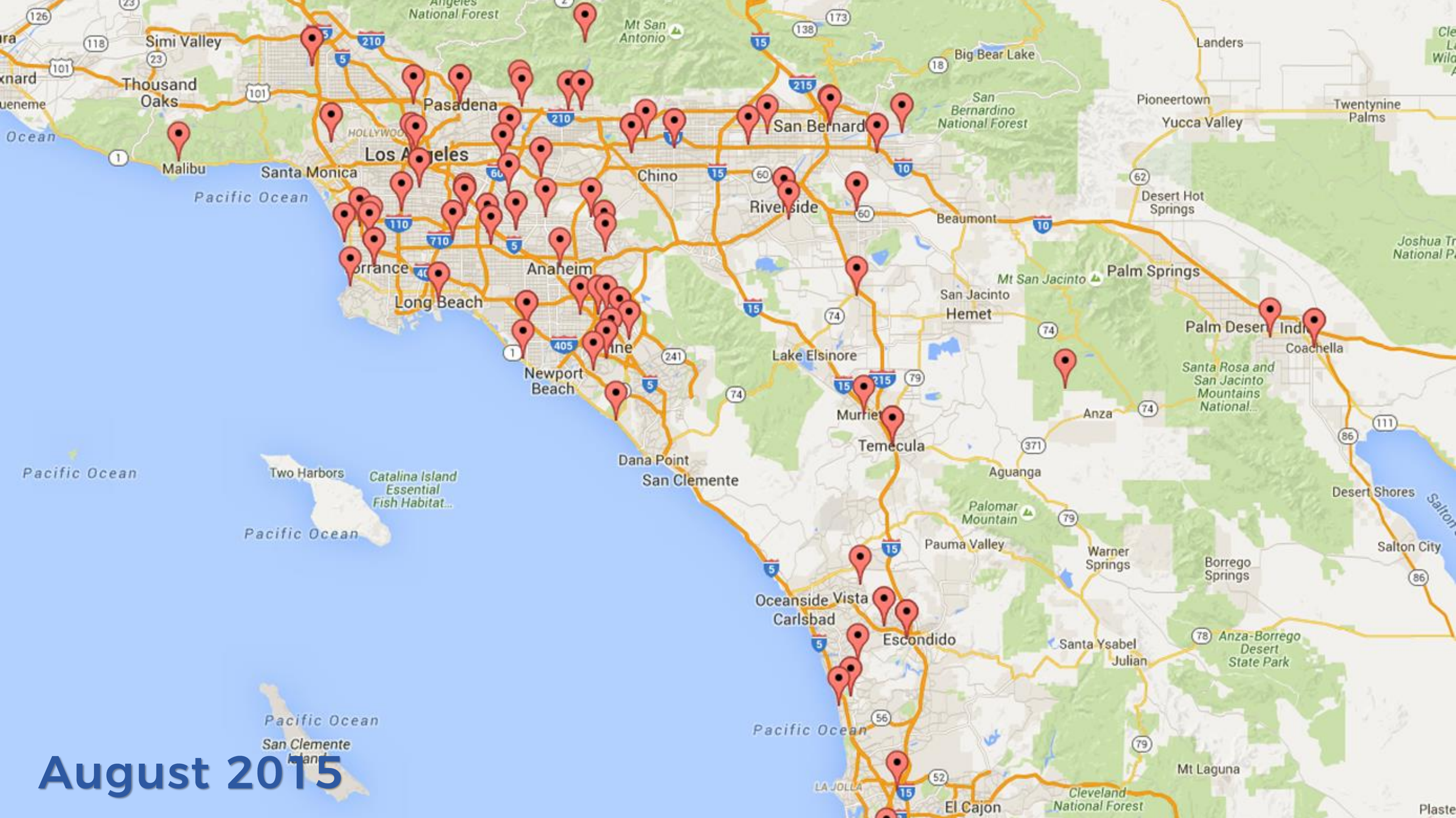
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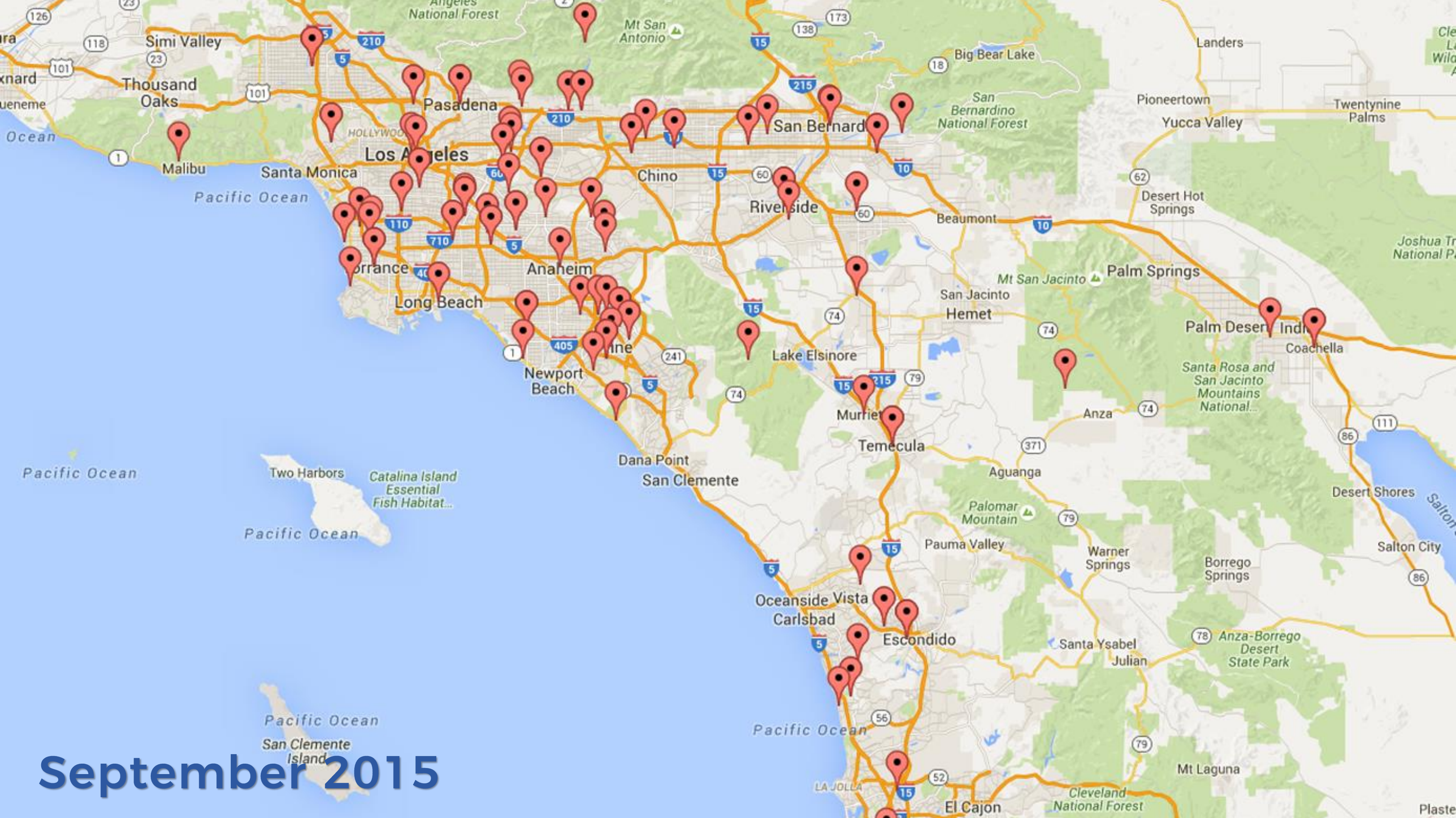

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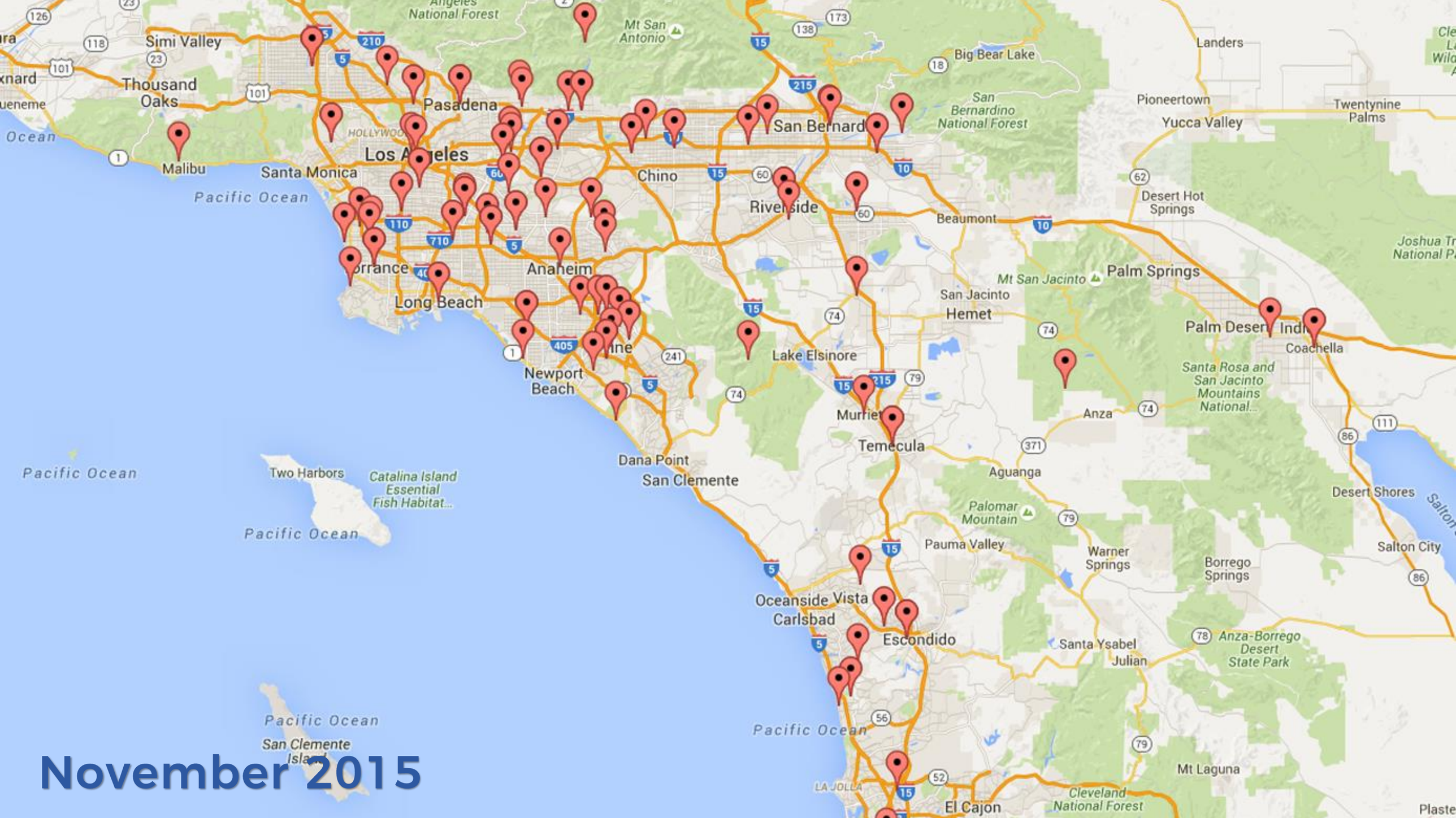

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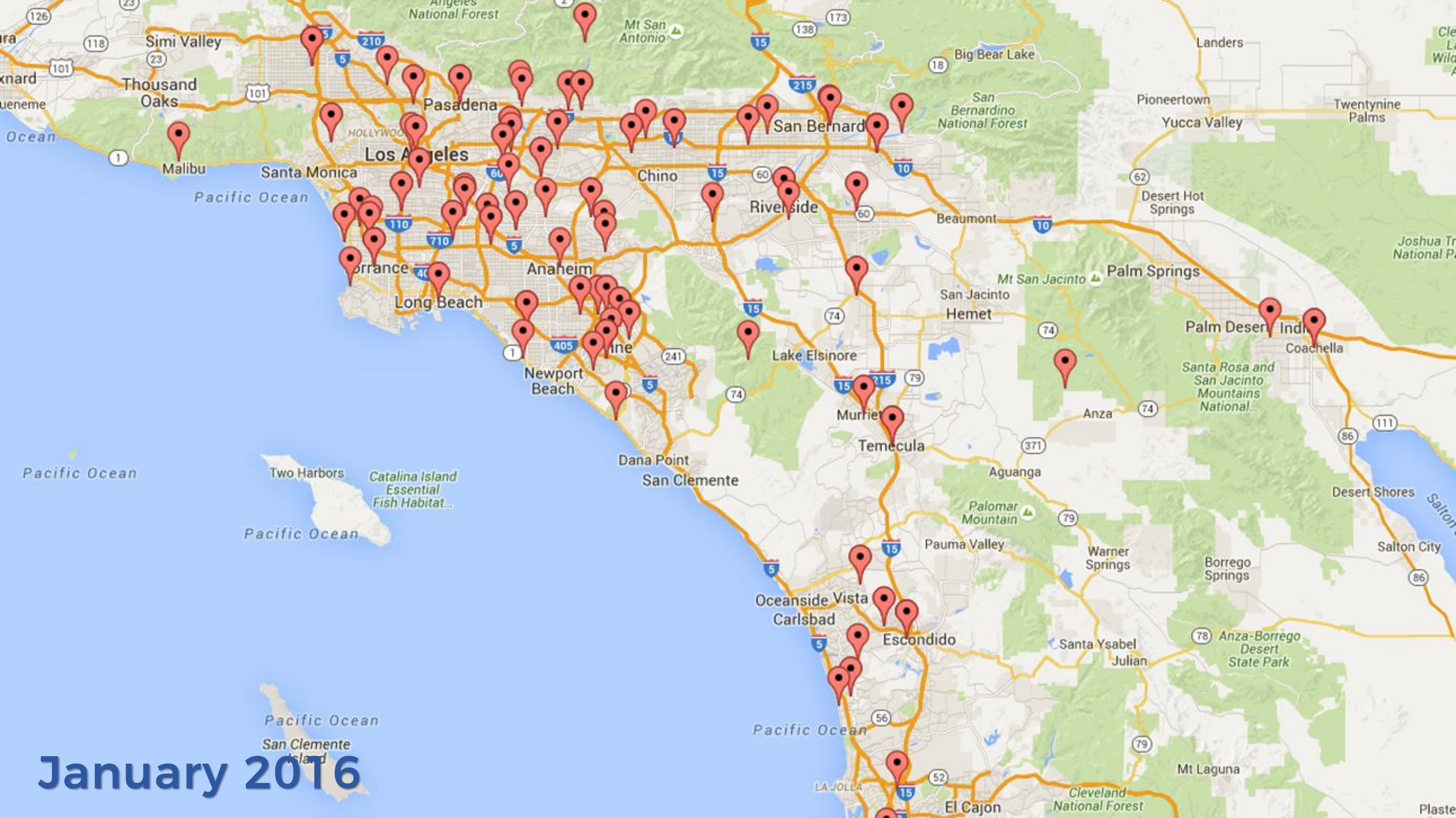

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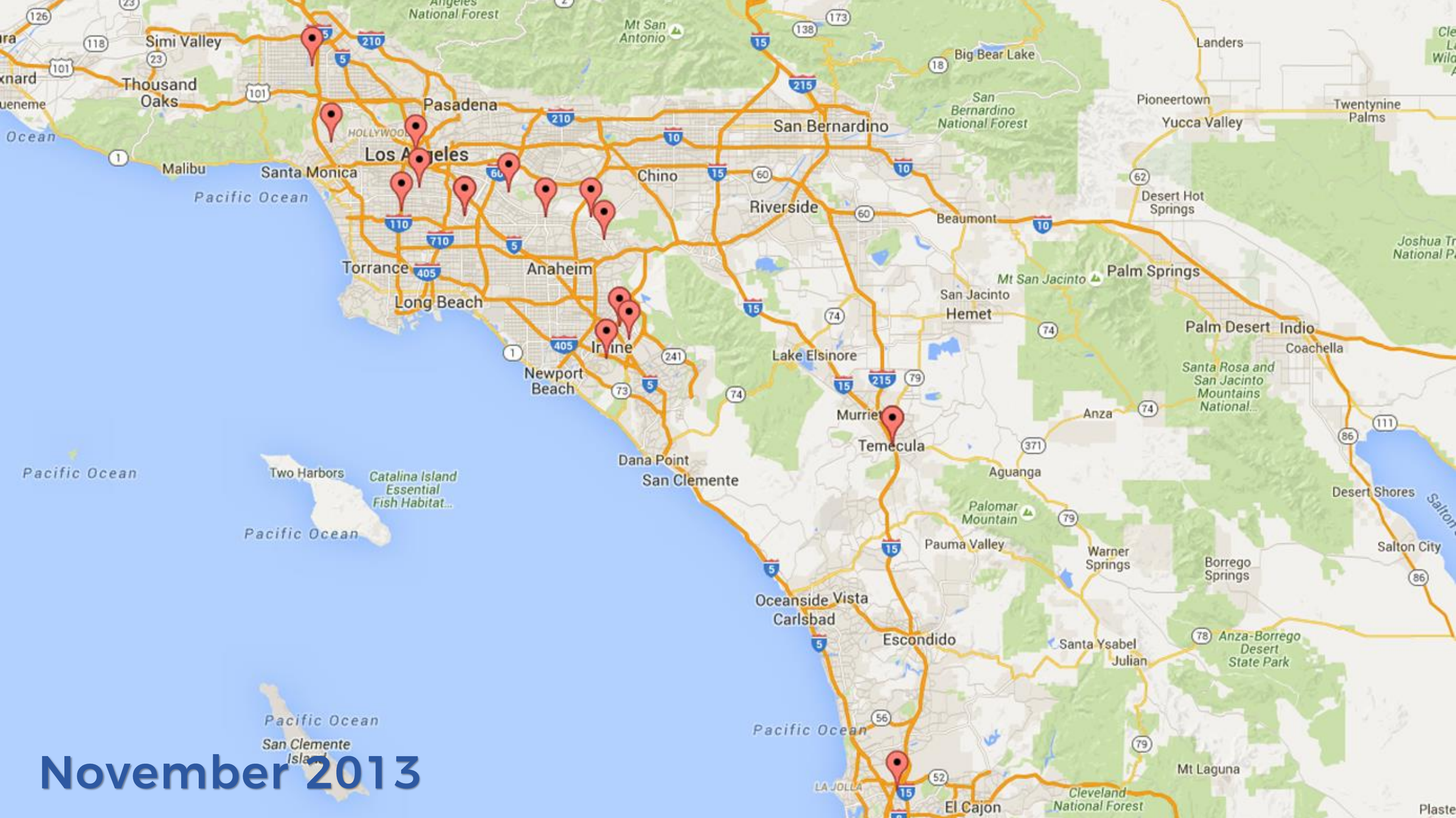

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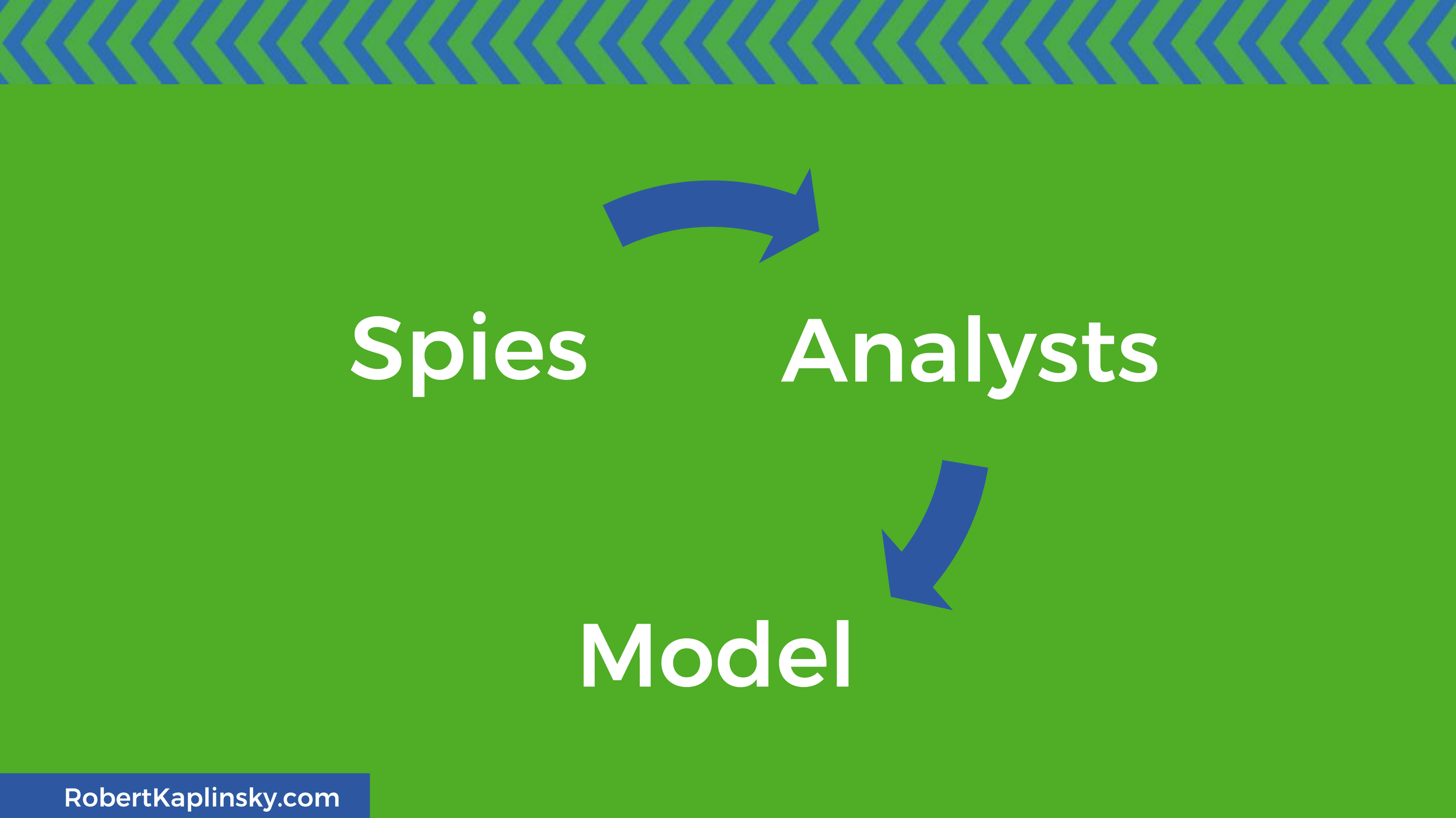
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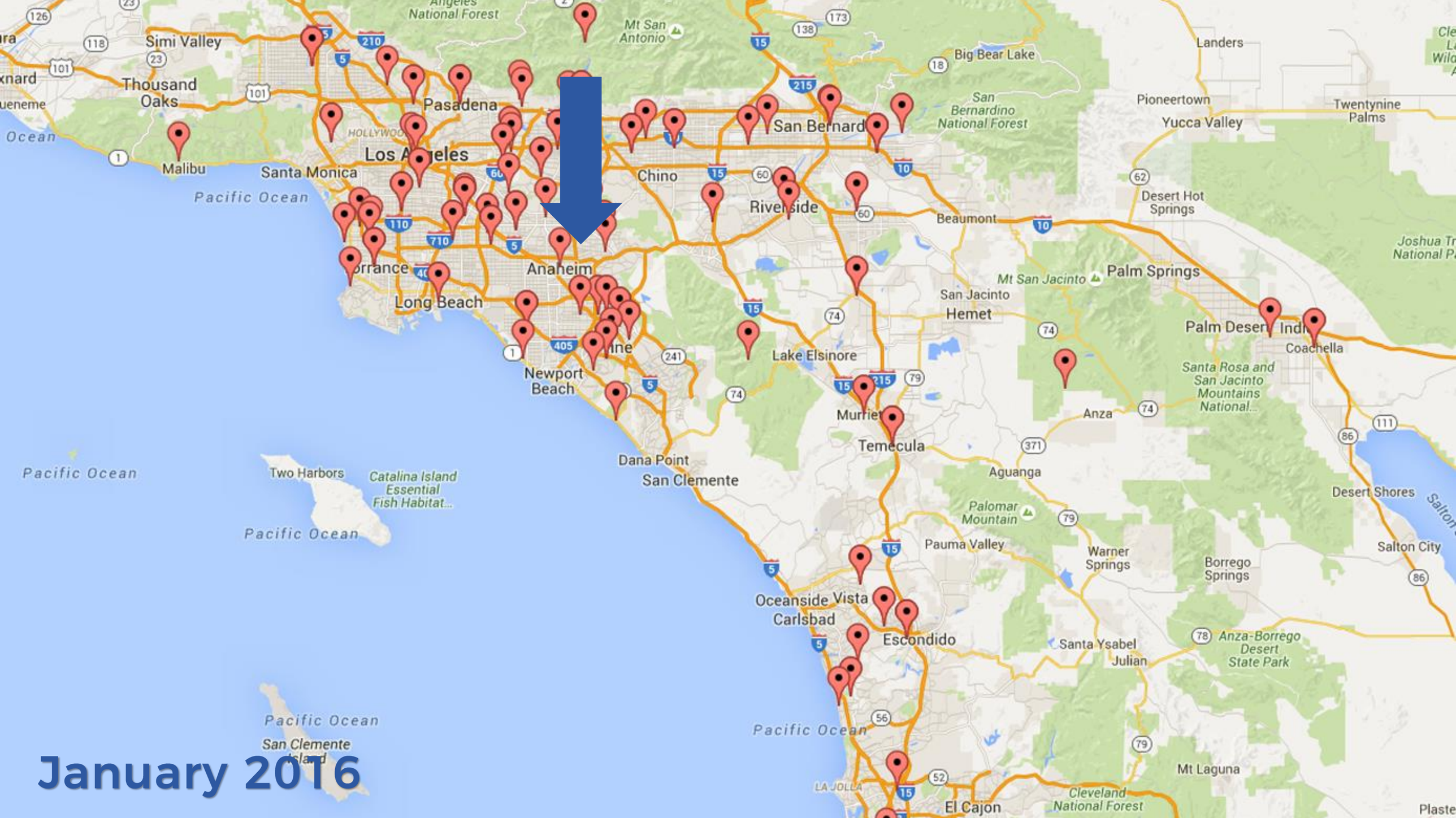
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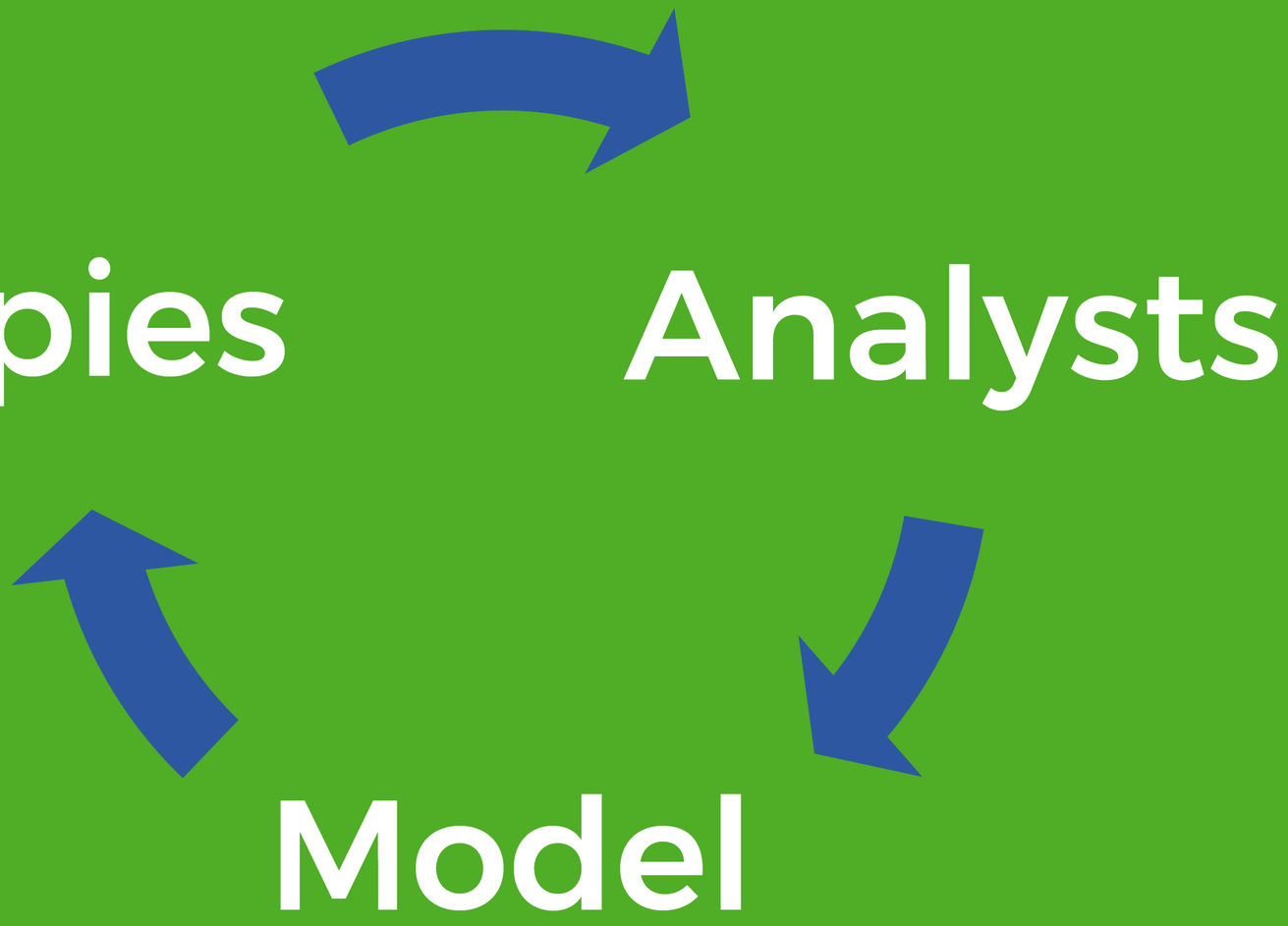
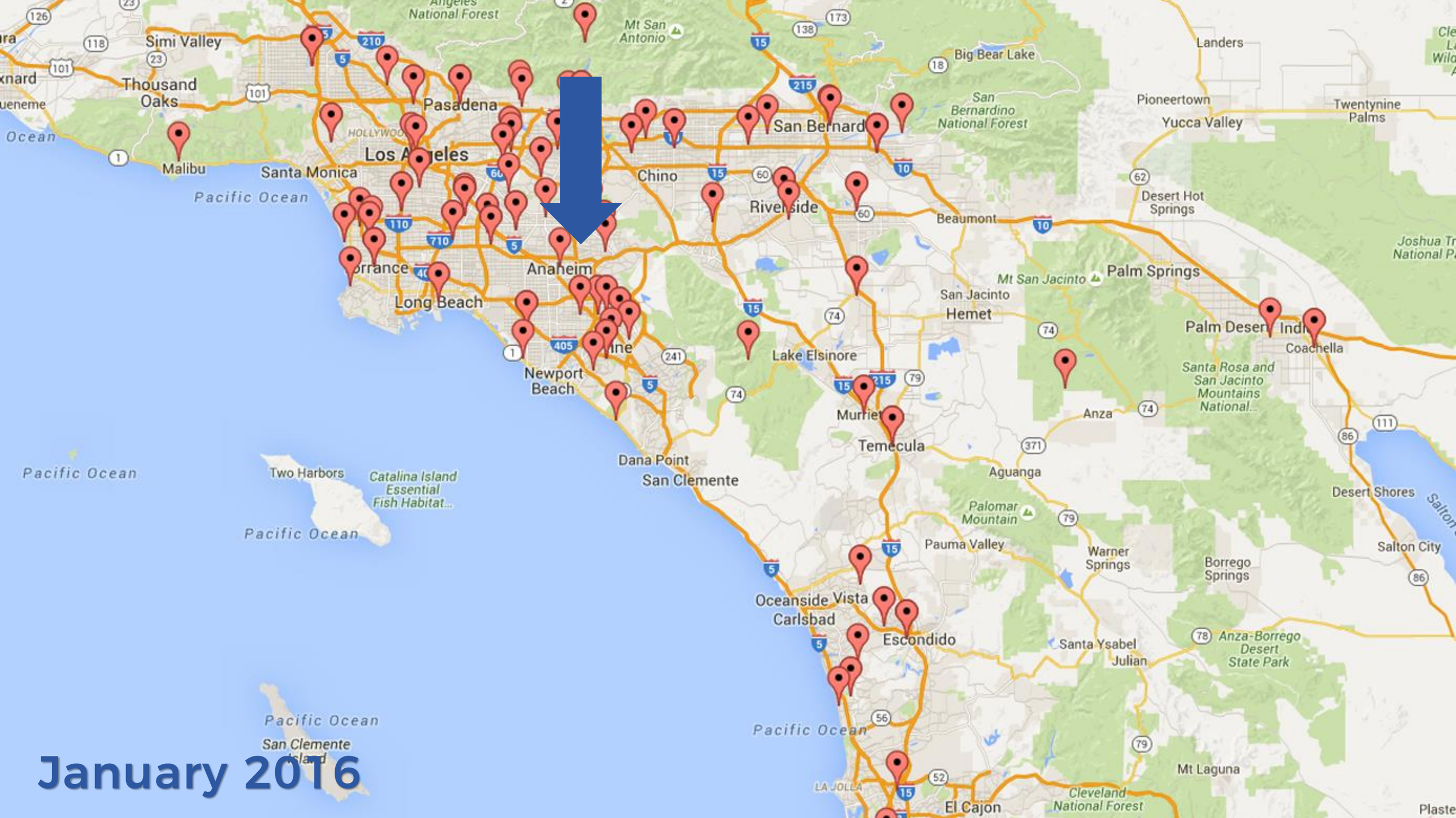
Desert Shores
Salton City
Mt Laguna
El Cajon
Cleveland National Forest
Santa Rosa and San Jacinto Mountains National...
Palomar Mountain
Mt San Antonio
Mt San Jacinto
San Bernardino National Forest
Angeles National Forest


Spies
Analysts
Model


January 2016
Pacific Ocean
Malibu
Santa Monica
Los Angeles
Pasadena
Thousand Oaks
Simi Valley
Anaheim
Long Beach
Chino
Riverside
San Bernardino
Big Bear Lake
Yucca Valley
Pioneertown
Twentynine Palms
Desert Hot Springs
Beaumont
Palm Springs
Hemet
San Jacinto
Lake Elsinore
Murrieta
Temecula
Anza
Aguanga
Coachella
Palm Desert
Indio
Newport Beach
Dana Point
San Clemente
Two Harbors
Catalina Island Essential Fish Habitat...
Oceanside
Carlsbad
Vista
Escondido
Pauma Valley
Warner Springs
Borrego Springs
Julian
Santa Ysabel
Anza-Borrego Desert State Park
Desert Shores
Salton City
Mt Laguna
El Cajon
Cleveland National Forest
Santa Rosa and San Jacinto Mountains National...
Palomar Mountain
Mt San Antonio
Mt San Jacinto
San Bernardino National Forest
Angeles National Forest

All models are wrong, but some are useful.

GEORGE E. P. BOX

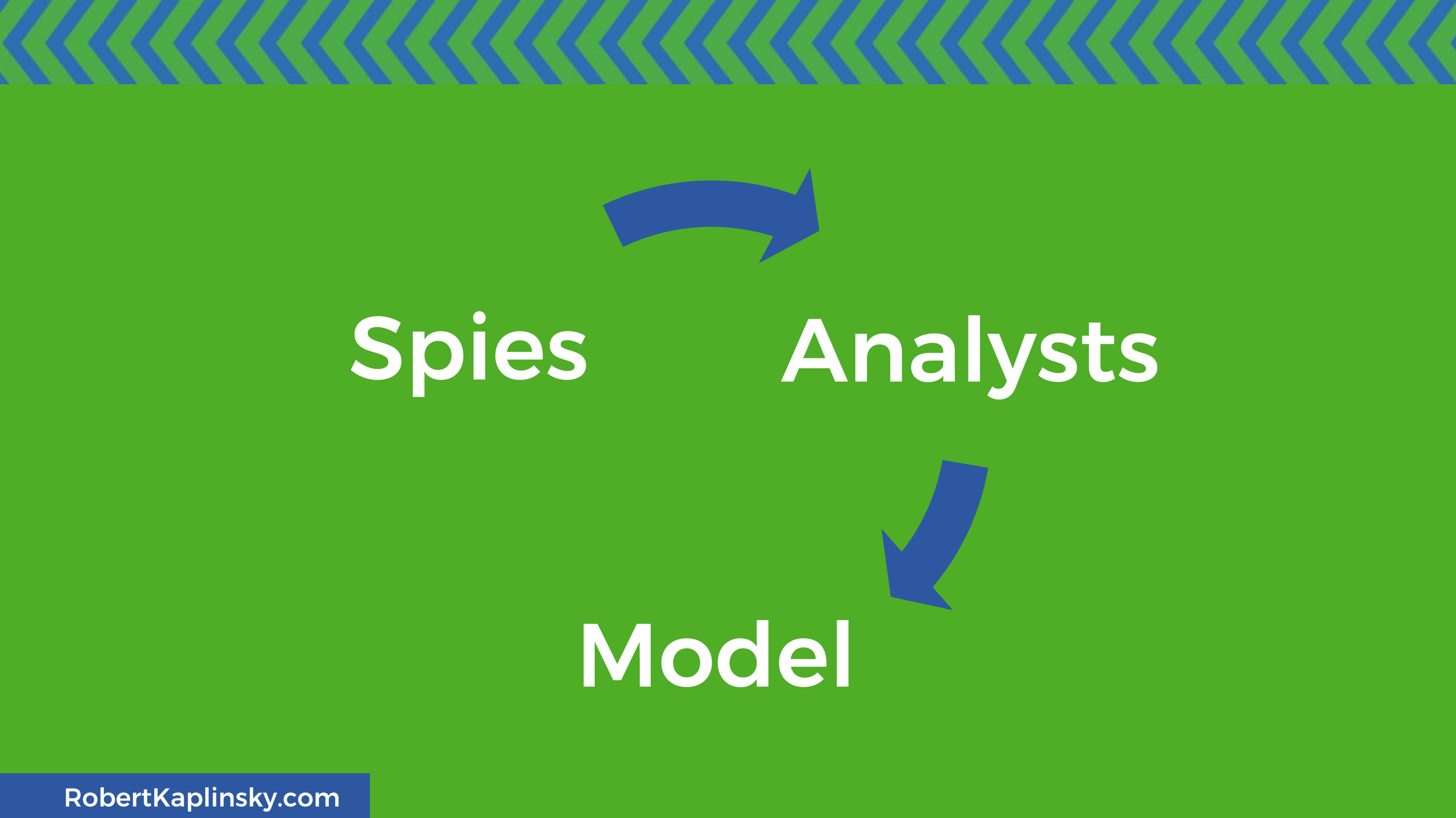
Classic Mix

20 Singles

LAY'S® Classic Potato Chips, DORITOS® Nacho Cheese Flavored Tortilla Chips, DORITOS® COOL RANCH® Flavored Tortilla Chips, CHEETOS® Crunchy Cheese Flavored Snacks, SUNCHIPS® Original Multigrain Snacks, FRITOS® Original Corn Chips (All 1 OZ. Each)

20 INDIVIDUAL BAGS: 1 OZ. EACH, TOTAL NET WT. 20 OZ. (1 LB. 4 OZ.) 567 g

⚠ WARNING: PREVENT ENTANGLEMENT AND STRANGULATION. KEEP THIS BAG AWAY FROM YOUNG CHILDREN. IT IS NOT A TOY.


Spies
Analysts
Model

THINKING TIME

RobertKaplinsky.com

Robert Kaplinsky
@robertkaplinsky

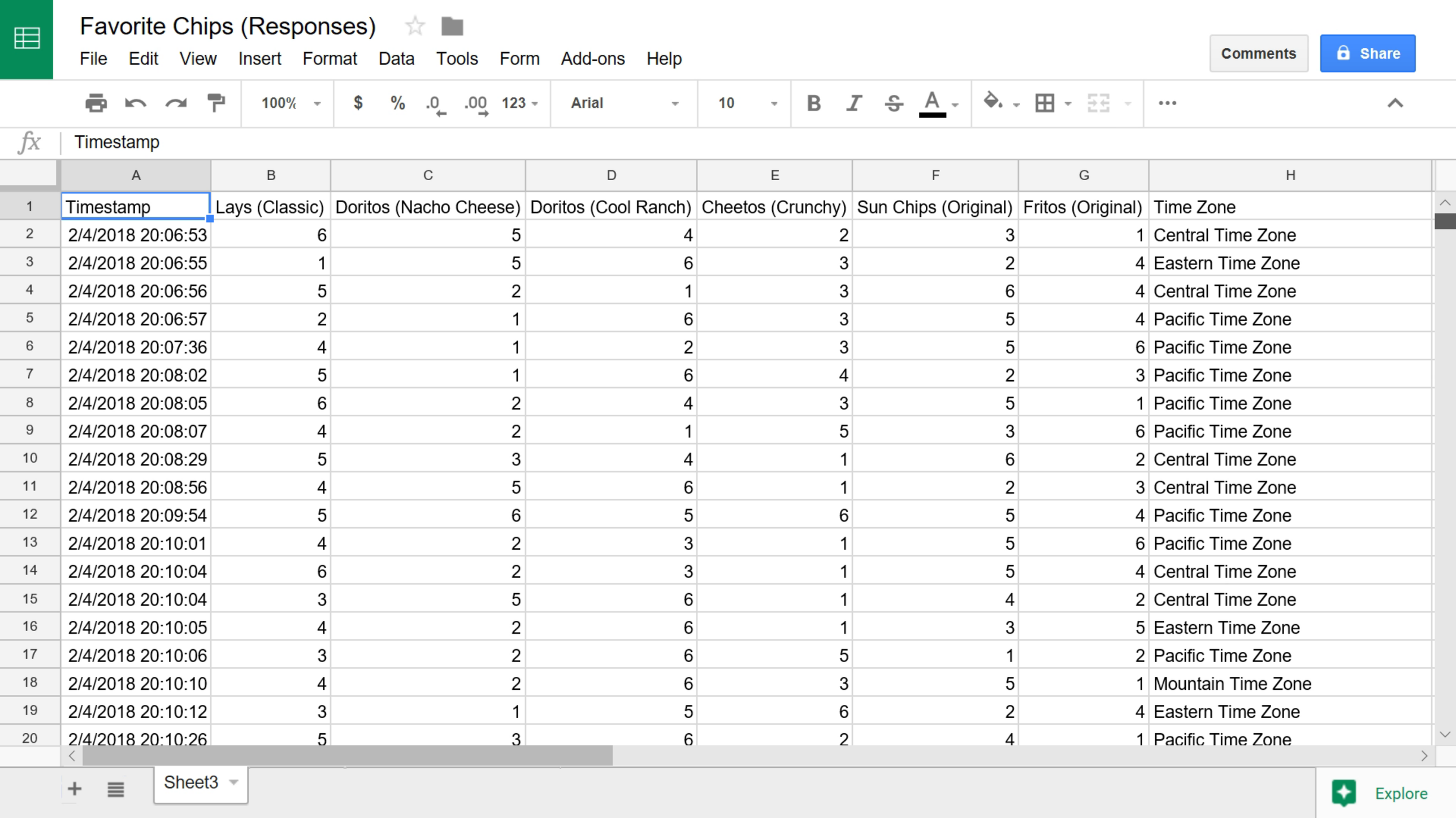
Hey #MTBoS, can you do me a favor and complete this 3 question anonymous survey about your favorite chips? I need data for a presentation. Please RT.
goo.gl/forms/etPtujII… #iteachmath

Favorite Chips
Please complete this anonymous survey. I'll be using this data in a presentation.
docs.google.com

8:05 PM - 4 Feb 2018

63 Retweets **45** Likes

18 63 45



	A	B	C	D	E	F	G	H
1	Timestamp	Lays (Classic)	Doritos (Nacho Cheese)	Doritos (Cool Ranch)	Cheetos (Crunchy)	Sun Chips (Original)	Fritos (Original)	Time Zone
2	2/4/2018 20:06:53	6	5	4	2	3	1	Central Time Zone
3	2/4/2018 20:06:55	1	5	6	3	2	4	Eastern Time Zone
4	2/4/2018 20:06:56	5	2	1	3	6	4	Central Time Zone
5	2/4/2018 20:06:57	2	1	6	3	5	4	Pacific Time Zone
6	2/4/2018 20:07:36	4	1	2	3	5	6	Pacific Time Zone
7	2/4/2018 20:08:02	5	1	6	4	2	3	Pacific Time Zone
8	2/4/2018 20:08:05	6	2	4	3	5	1	Pacific Time Zone
9	2/4/2018 20:08:07	4	2	1	5	3	6	Pacific Time Zone
10	2/4/2018 20:08:29	5	3	4	1	6	2	Central Time Zone
11	2/4/2018 20:08:56	4	5	6	1	2	3	Central Time Zone
12	2/4/2018 20:09:54	5	6	5	6	5	4	Pacific Time Zone
13	2/4/2018 20:10:01	4	2	3	1	5	6	Pacific Time Zone
14	2/4/2018 20:10:04	6	2	3	1	5	4	Central Time Zone
15	2/4/2018 20:10:04	3	5	6	1	4	2	Central Time Zone
16	2/4/2018 20:10:05	4	2	6	1	3	5	Eastern Time Zone
17	2/4/2018 20:10:06	3	2	6	5	1	2	Pacific Time Zone
18	2/4/2018 20:10:10	4	2	6	3	5	1	Mountain Time Zone
19	2/4/2018 20:10:12	3	1	5	6	2	4	Eastern Time Zone
20	2/4/2018 20:10:26	5	3	6	2	4	1	Pacific Time Zone

THINKING TIME

- The available data includes:
  - Lays, Nacho Cheese Doritos, Cool Ranch Doritos, Cheetos, Sun Chips, and Fritos ranked from 1 to 6
  - Geographic region: West, Central, or Eastern

ANALYSTS' JOB FOR THE TOP 1

1. Count all the first place votes for each chip type.
2. Divide the total first place votes for each chip type by the total number of votes.
3. Multiply that fraction by 20 to find how many bags there would be in a twenty pack, rounding as necessary.

ANALYSTS' EXAMPLE

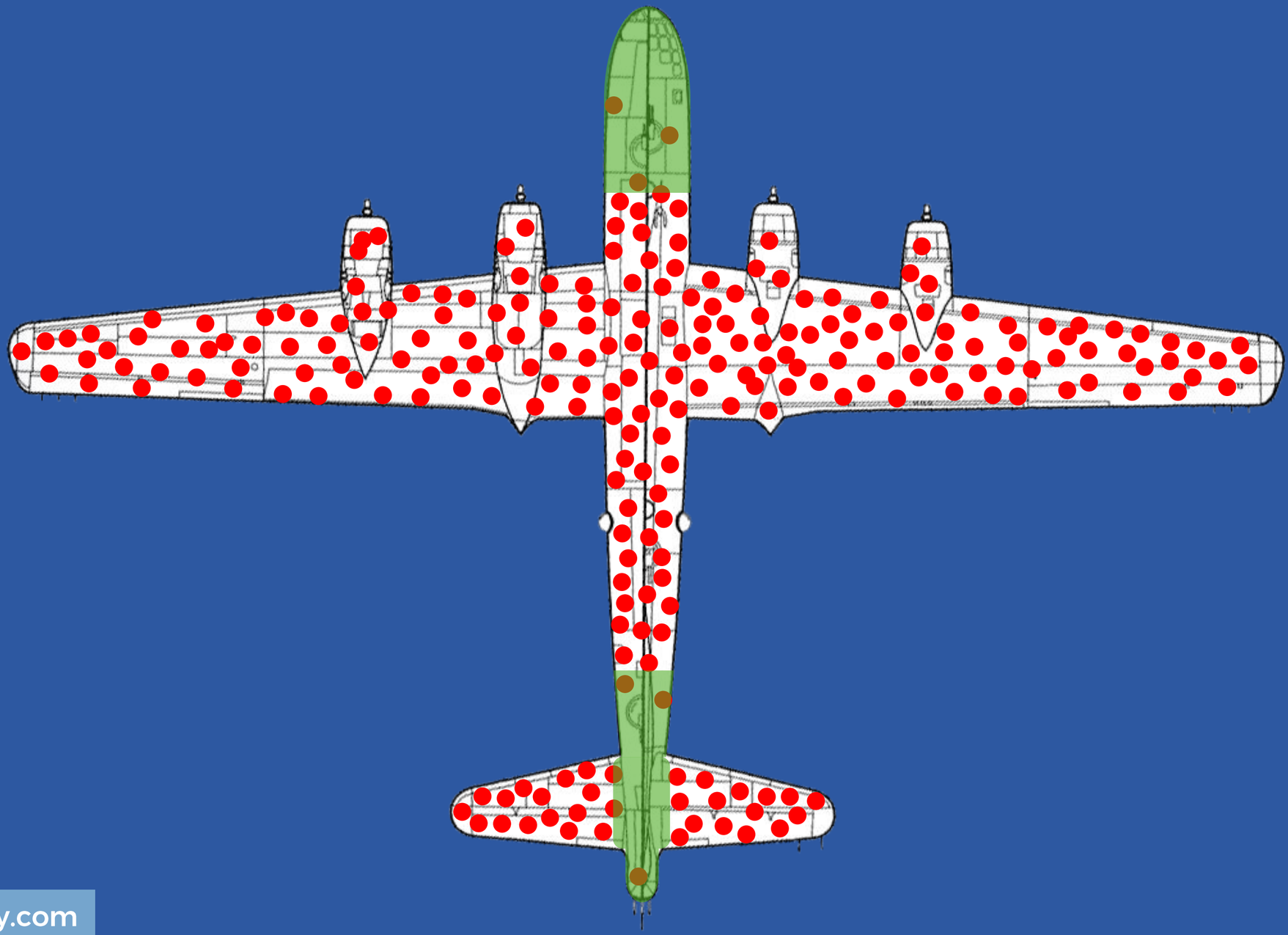
CHIP BAG RESULTS

20. **Food** Frito-Lay puts a variety of flavors in each package of chips. Survey your classmates and use proportions to figure out how many of each flavor there should be, then fill in the blanks.

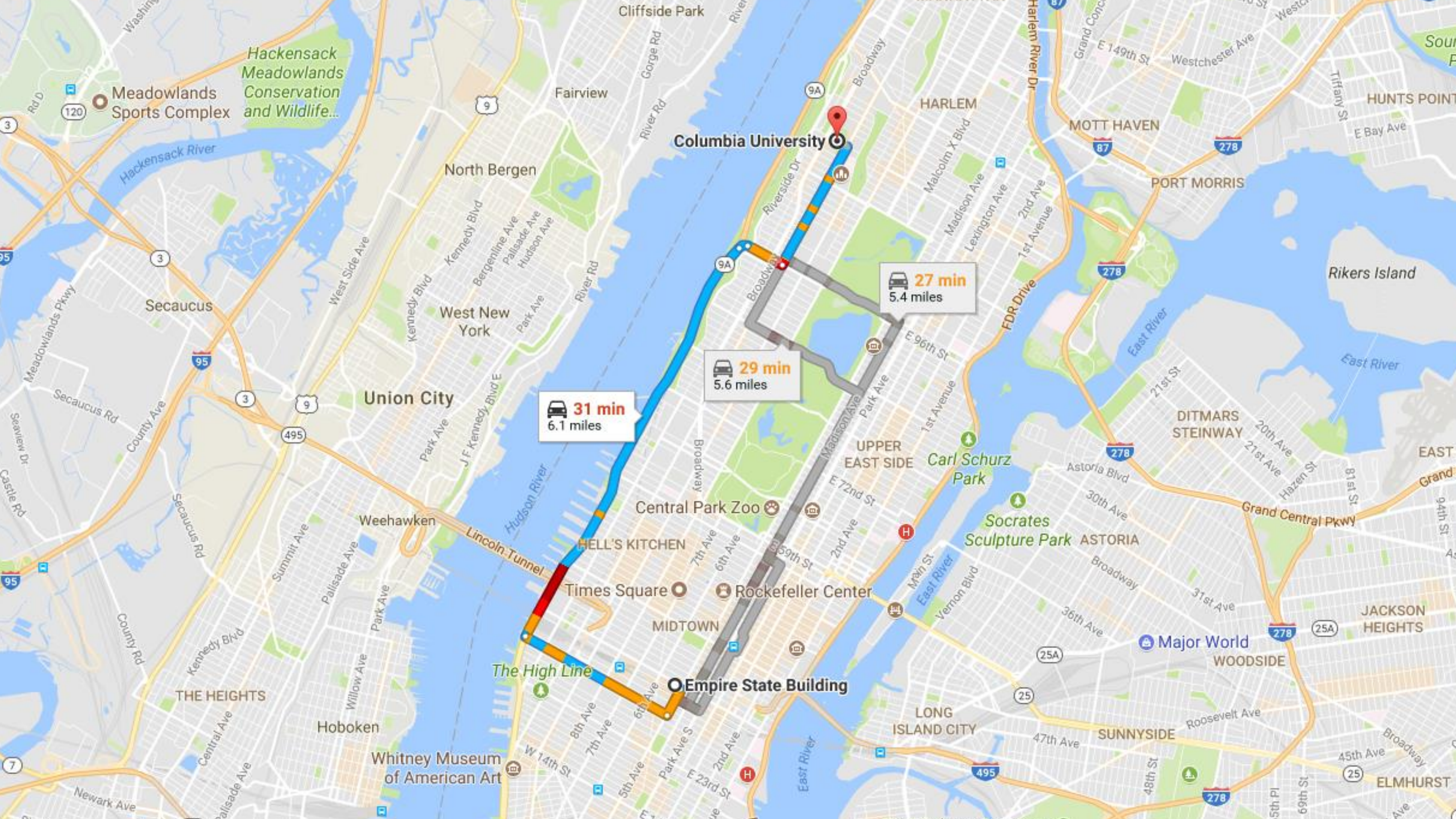
GOALS

- [x] HOW DO WE MAKE SENSE OF MATH MODELING?
- [ ] IS IT JUST ANSWERING QUESTIONS?
- [ ] HOW IS MATH MODELING USED IN REAL LIFE?
- [ ] HOW DO WE HELP OUR STUDENTS IMPROVE?
- [ ] WHERE CAN WE FIND MORE RESOURCES?


224612



- ~~How do we protect our planes?~~
- ~~Which parts of the plane are being hit by the most bullets?~~
- Which parts of the plane are the most critical to protect?


Columbia University
Empire State Building
31 min
6.1 miles
29 min
5.6 miles
27 min
5.4 miles
Cliffside Park
Hackensack Meadowlands Conservation and Wildlife...
Meadowlands Sports Complex
Hackensack River
Fairview
North Bergen
Secaucus
West New York
Union City
Weehawken
Lincoln Tunnel
Hoboken
THE HEIGHTS
Hudson River
HELL'S KITCHEN
Times Square
Rockefeller Center
MIDTOWN
Central Park Zoo
The High Line
Whitney Museum of American Art
HARLEM
MOTT HAVEN
HUNTS POINT
PORT MORRIS
Rikers Island
UPPER EAST SIDE
Carl Schurz Park
Socrates Sculpture Park
ASTORIA
DITMARS STEINWAY
JACKSON HEIGHTS
Major World
WOODSIDE
LONG ISLAND CITY
SUNNYSIDE
ELMHURST
East River
Grand Central Pkwy
FDR Drive
Harlem River Dr

- ~~How do we find the fastest route for each customer?~~
- How do we find the fastest route for each customer without impacting our other customers?

Classic Mix

20 Singles

4 LAY'S® Classic Potato Chips, 4 DORITOS® Nacho Cheese Flavored Tortilla Chips, 2 DORITOS® COOL RANCH® Flavored Tortilla Chips, 4 CHEETOS® Crunchy Cheese Flavored Snacks, 2 SUNCHIPS® Original Multigrain Snacks, 4 FRITOS® Original Corn Chips (All 1 OZ. Each)

20 INDIVIDUAL BAGS: 1 OZ. EACH, TOTAL NET WT. 20 OZ. (1 LB. 4 OZ.) 567 g

⚠ WARNING: PREVENT ENTANGLEMENT AND STRANGULATION. KEEP THIS BAG AWAY FROM YOUNG CHILDREN. IT IS NOT A TOY.

- ~~How many of each flavor should we put in a package?~~
- ~~How many of each flavor should we put in a package for each region?~~
- How can we determine if the extra cost of creating different packages will make us more money?

GOALS

- ☑ HOW DO WE MAKE SENSE OF MATH MODELING?
- ☑ IS IT JUST ANSWERING QUESTIONS?
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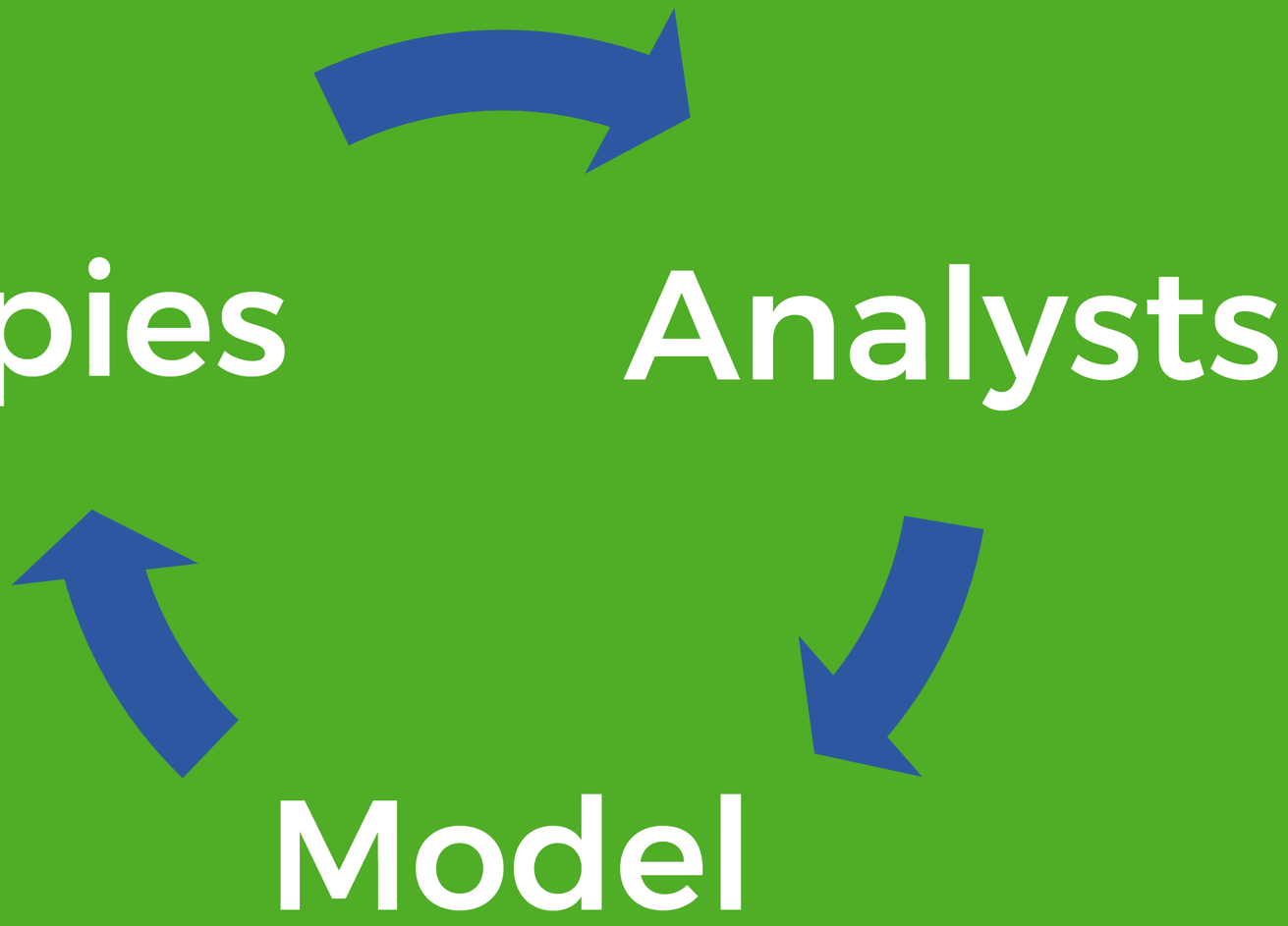
- ❑ HOW DO WE HELP OUR STUDENTS IMPROVE?
- ❑ WHERE CAN WE FIND MORE RESOURCES?


TARGET
TARGET PARKING

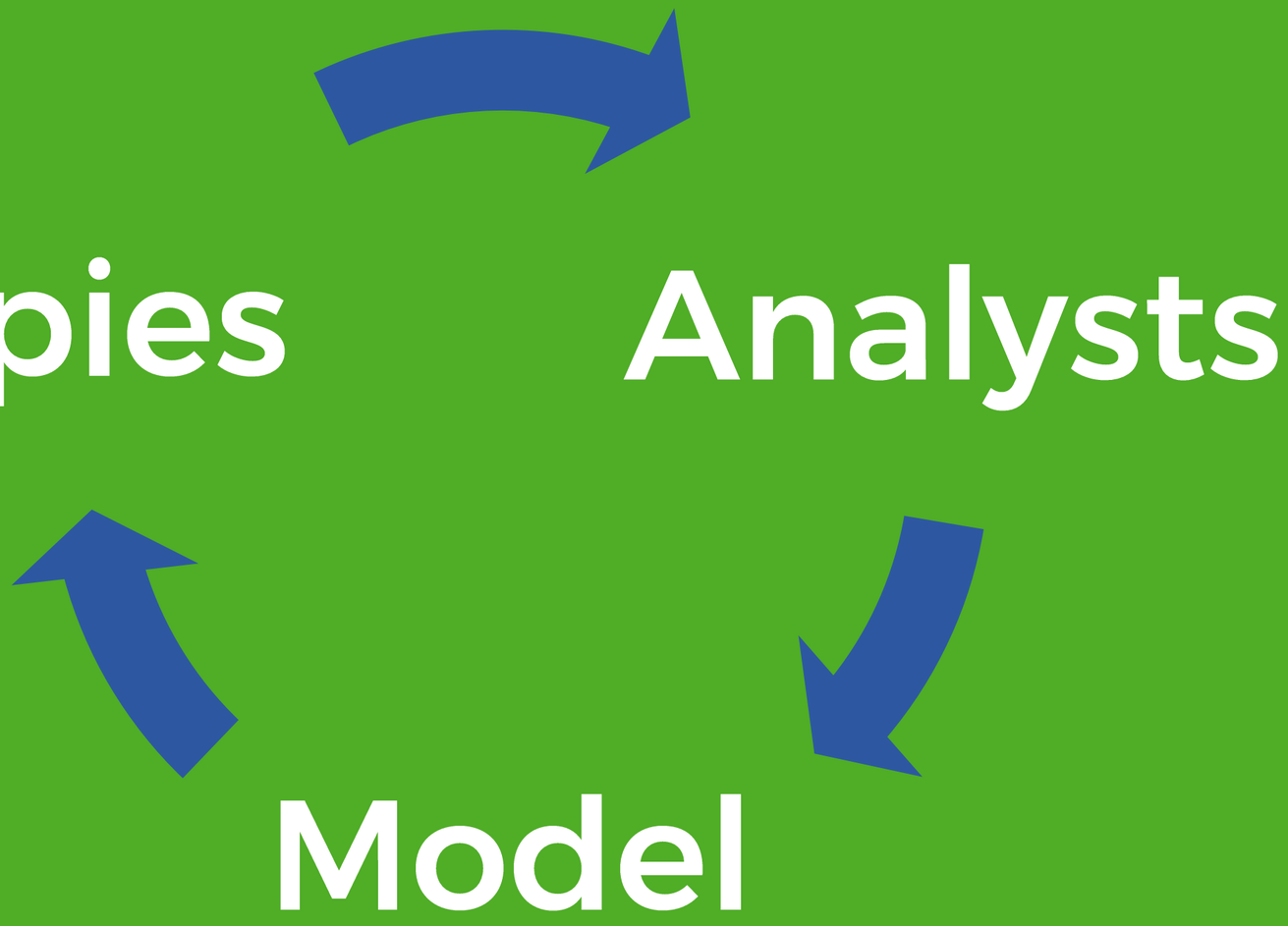

Spies
Analysts
Model

They used 25 products for a pregnancy prediction' score including:

- unscented lotion
- mineral supplements
- cotton balls

Source: New York Times


UNITED


Spies
Analysts
Model

Priority is determined by:

- passenger's fare class
- itinerary
- frequent flyer program membership
- check-in time

Source: United Airlines

Search

Robert | Home

Robert Kaplinsky

- News Feed
- Messenger
- Watch
- Marketplace

Explore

- Pages
- Events
- Groups
- Friend Lists
- On This Day 3
- Insights
- Games 7
- Fundraisers
- Live Video
- Pokes
- See More...

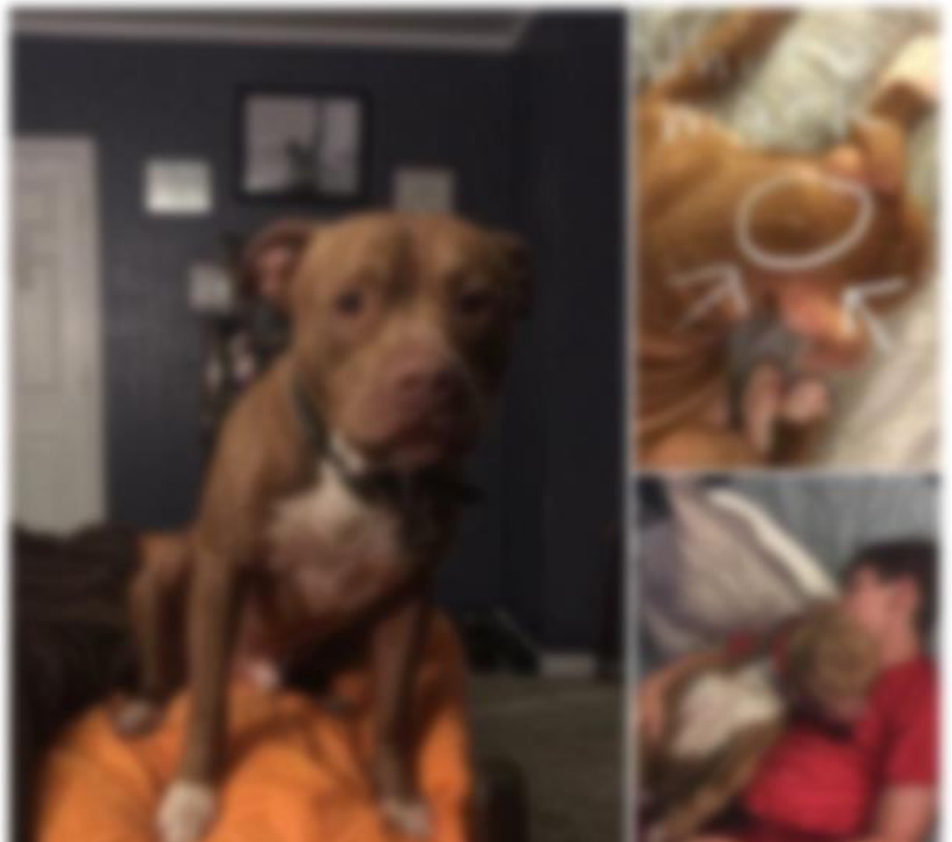
Create

Ad · Page · Group · Event · Fundraiser

Make Post | Photo/Video Album | Live Video

What's on your mind, Robert?

Photo/Video | Feeling/Activity | ...

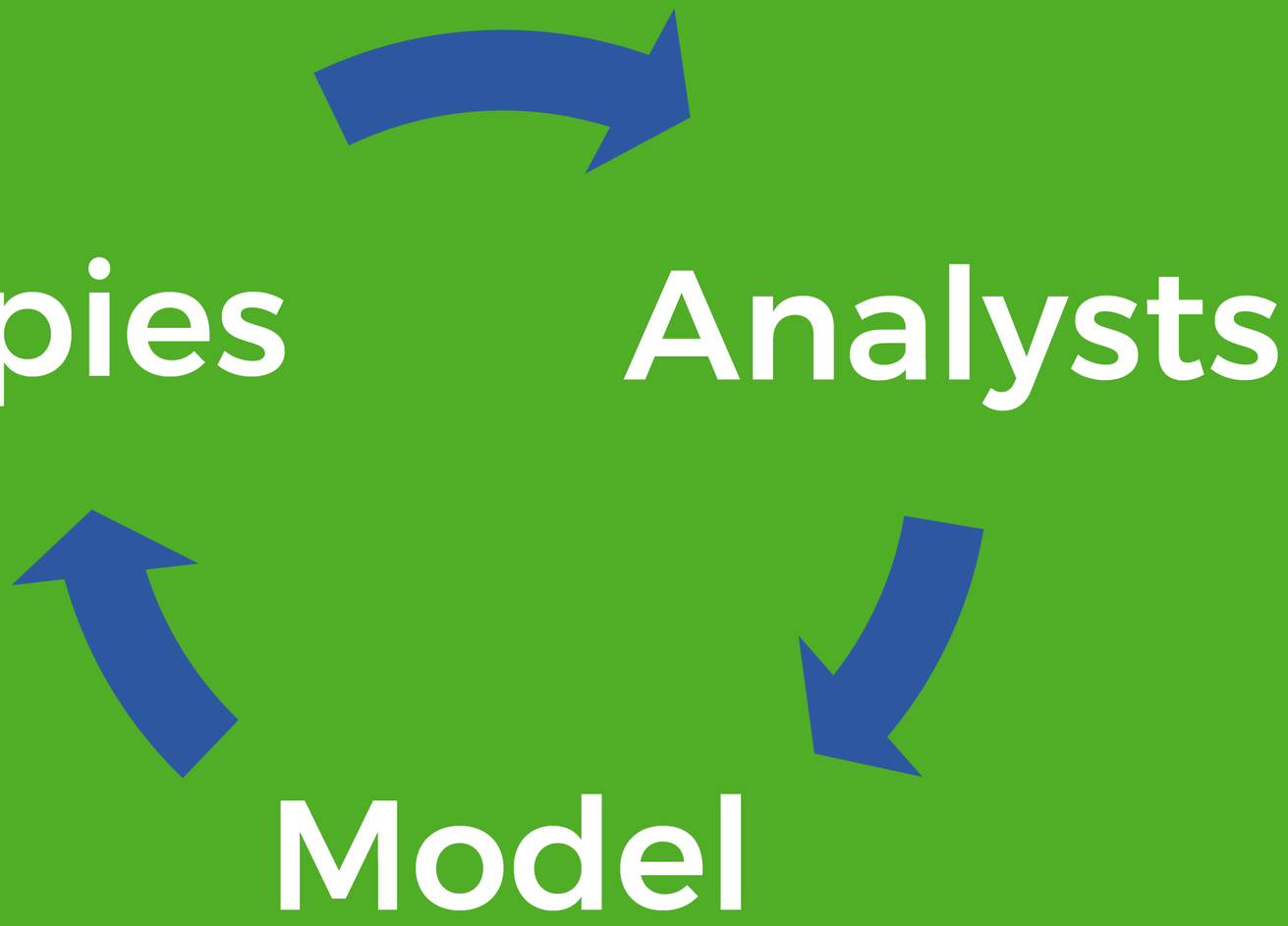


Trending

Watchlist: Latest Episodes

See All

Sponsored Create Ad


Spies
Analysts
Model

The stories that show in your News Feed are influenced by:

- friends you interact with the most
- the number of comments and likes a post receives
- what kind of story it is (ex: photo, video, status update)

Source: Facebook

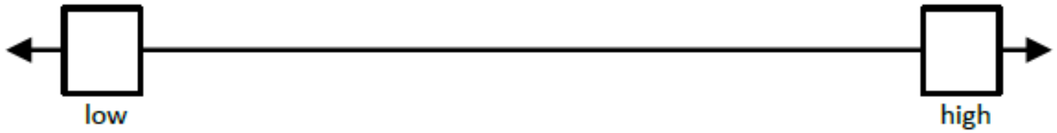
MORE EXAMPLES

- How does US News and World Reports rank colleges?
- How does Google know which results to show?
- How do sports teams know who to draft?
- How does Amazon know what products to recommend?
- How does Zillow estimate home prices?
- How does eHarmony know which people to show you?
- How does a school decide which students should take advanced math classes?
- How do they figure out who should speak at a conference?

GOALS

- ☑ HOW DO WE MAKE SENSE OF MATH MODELING?
- ☑ IS IT JUST ANSWERING QUESTIONS?
- ☑ HOW IS MATH MODELING USED IN REAL LIFE?
- ❑ HOW DO WE HELP OUR STUDENTS IMPROVE?
- ❑ WHERE CAN WE FIND MORE RESOURCES?

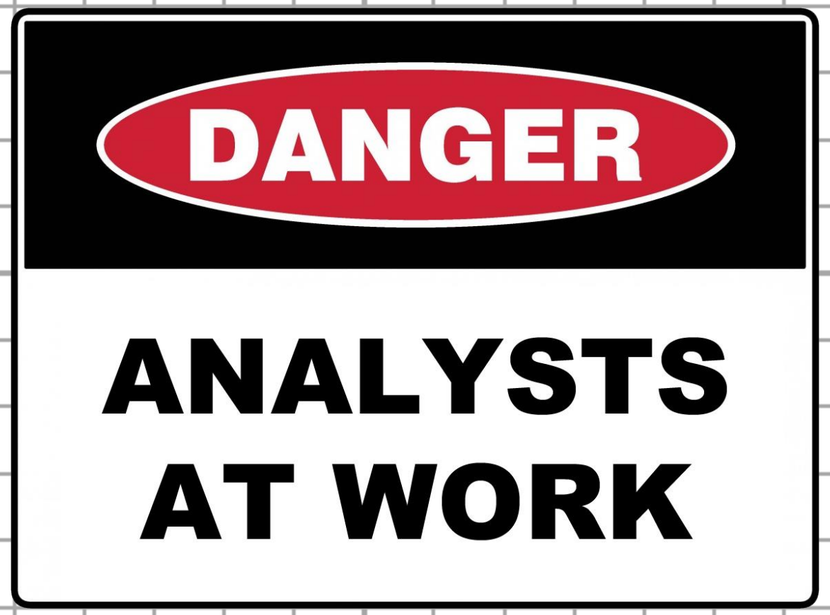
Name: _____ Period: _____ Date: _____

What problem are you trying to figure out?	What estimates do you have?
	 Place your estimate on the number line.
What info do you already know about the problem?	**What info do you need about the problem?**

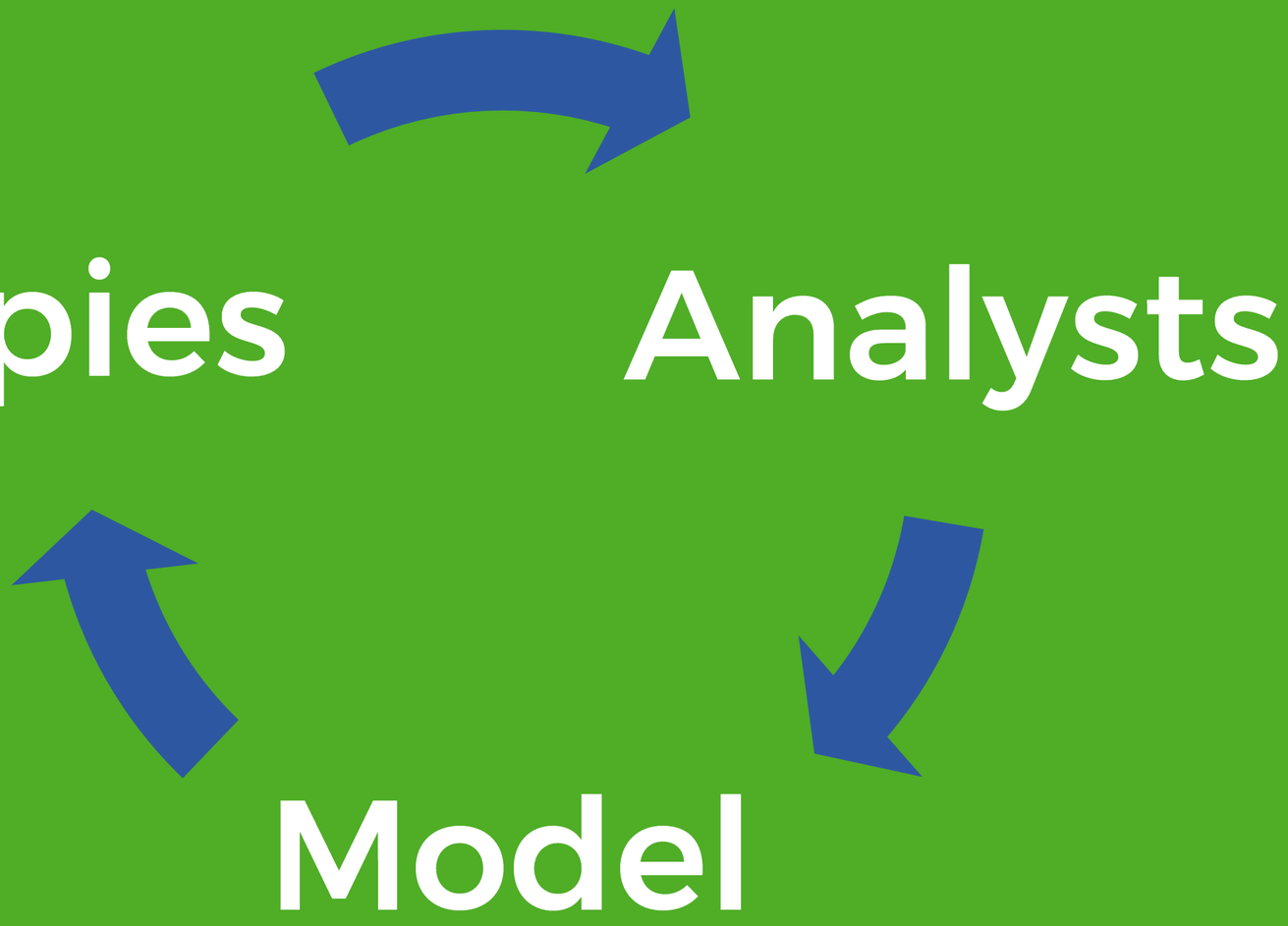
TOP SECRET! SPIES ONLY

What is your conclusion? How did you reach that conclusion?

Your work



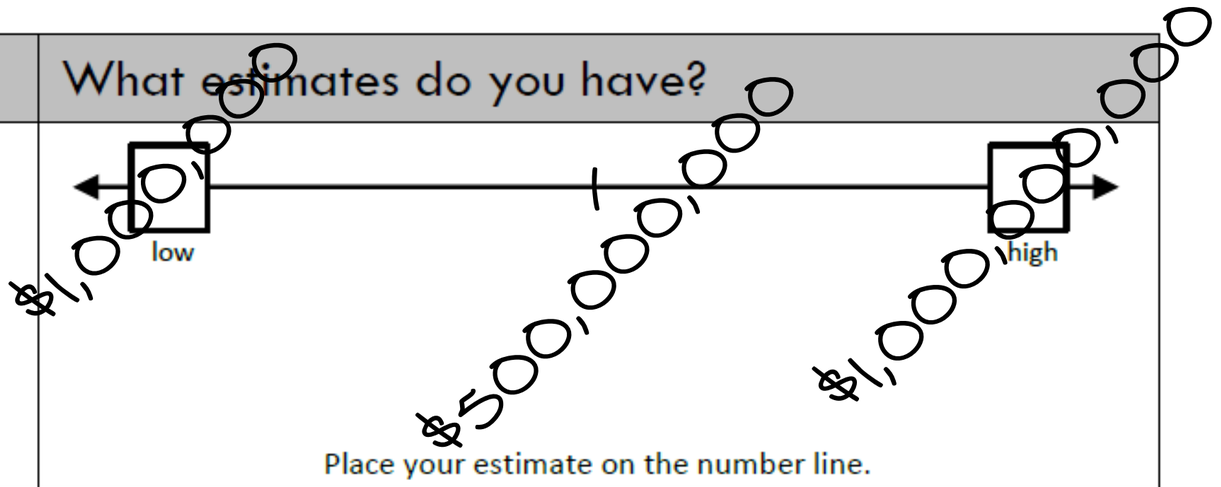
Source: robertkaplinsky.com/lessons


Spies
Analysts
Model

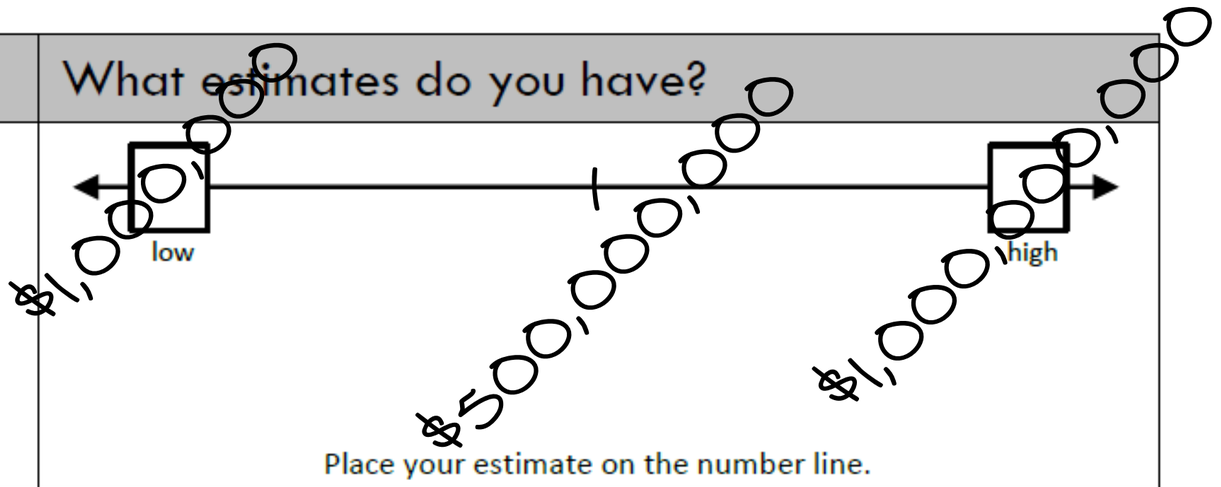
THINKING TIME

RobertKaplinsky.com

Name: _____ Period: _____ Date: _____

What problem are you trying to figure out?	What estimates do you have?
How much money was that?	
What info do you already know about the problem?	**What info do you need about the problem?**
• There is a lot of money. • It is in a pile. • It is in bundles.	• Is it all the same denomination? • ~~How much does one bill weigh?~~ • ~~How much does all the money weigh?~~
What is your conclusion? How did you reach that conclusion?	

Name: _____ Period: _____ Date: _____

What problem are you trying to figure out?	What estimates do you have?
How much money was that?	 Place your estimate on the number line.
What info do you already know about the problem?	**What info do you need about the problem?**
• There is a lot of money. • It is in a pile. • It is in bundles.	• Is it all the same denomination? • How many rows and columns are there? • How many bills are in one stack?
What is your conclusion? How did you reach that conclusion?	


PGR
SIEDO

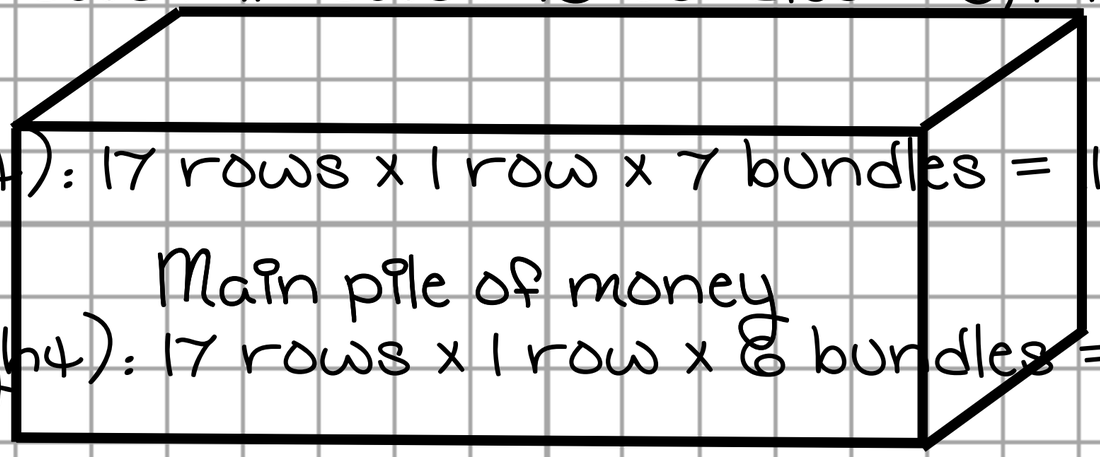

PGR
SIEDO
PGR
SIEDO

Your work

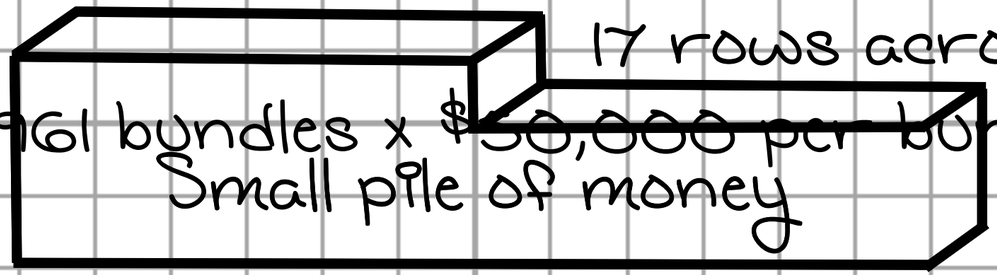
Main pile: 34 rows x 11 rows across x 10 bundles = 3,740 bundles

Small pile (left): 17 rows x 1 row x 7 bundles = 119 bundles

Small pile (right): 17 rows x 1 row x 8 bundles = 136 bundles



Total bundles: 3,740 + 119 + 136 = 3,961 bundles



Total money: 3,961 bundles x $50,000 per bundle = $198,050,000

Source: robertkaplinsky.com/lessons

GOALS

- [x] HOW DO WE MAKE SENSE OF MATH MODELING?
- [x] IS IT JUST ANSWERING QUESTIONS?
- [x] HOW IS MATH MODELING USED IN REAL LIFE?
- [x] HOW DO WE HELP OUR STUDENTS IMPROVE?
- [ ] WHERE CAN WE FIND MORE RESOURCES?

Home

Math resources that create problem solvers, not robots.

Download my favorite lessons for elementary, middle, and high school.

GET FREE LESSONS TAKE MY WORKSHOP

What happens next?

1

Keep coming back for more free lessons and resources.

2

Learn implementation tips from my blog and weekly emails.

3

Take my online workshop for more implementation support.

GOALS

- ☑ HOW DO WE MAKE SENSE OF MATH MODELING?
- ☑ IS IT JUST ANSWERING QUESTIONS?
- ☑ HOW IS MATH MODELING USED IN REAL LIFE?
- ☑ HOW DO WE HELP OUR STUDENTS IMPROVE?
- ☑ WHERE CAN WE FIND MORE RESOURCES?

Scary & Dangerous

WHY WE SHOULD RECONSIDER USING WORD PROBLEMS (AND WHAT WE SHOULD BE DOING INSTEAD)

ROBERT KAPLINSKY

robert@robertkaplinsky.com

robertkaplinsky.com

@robertkaplinsky

WANT THE RESOURCES?

Enter your information at:

robertkaplinsky.com/words

Questions & Answers

Denise Singleton
Product Marketing Director, Core Mathematics Marketing
Houghton Mifflin Harcourt
Twitter @DSingletonMath

Robert Kaplinsky
Educator, Speaker, and Co-Author of *HMH AGA* and *Into AGA*
Twitter @robertkaplinsky

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Growth

Thank you for attending!

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Twitter @robertkaplinsky

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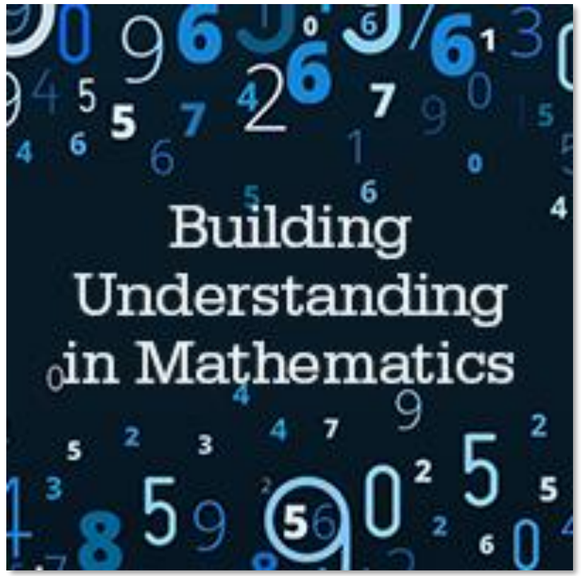

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Presented by

Timothy D. Kanold, Ph.D., Professor, Presenter, Speaker and Co-Author of *HMH AGA* and *Into Math*

Tuesday, May 12 @ 5:00 pm Eastern Time

Register here:

home.edweb.net/webinar/math20200512

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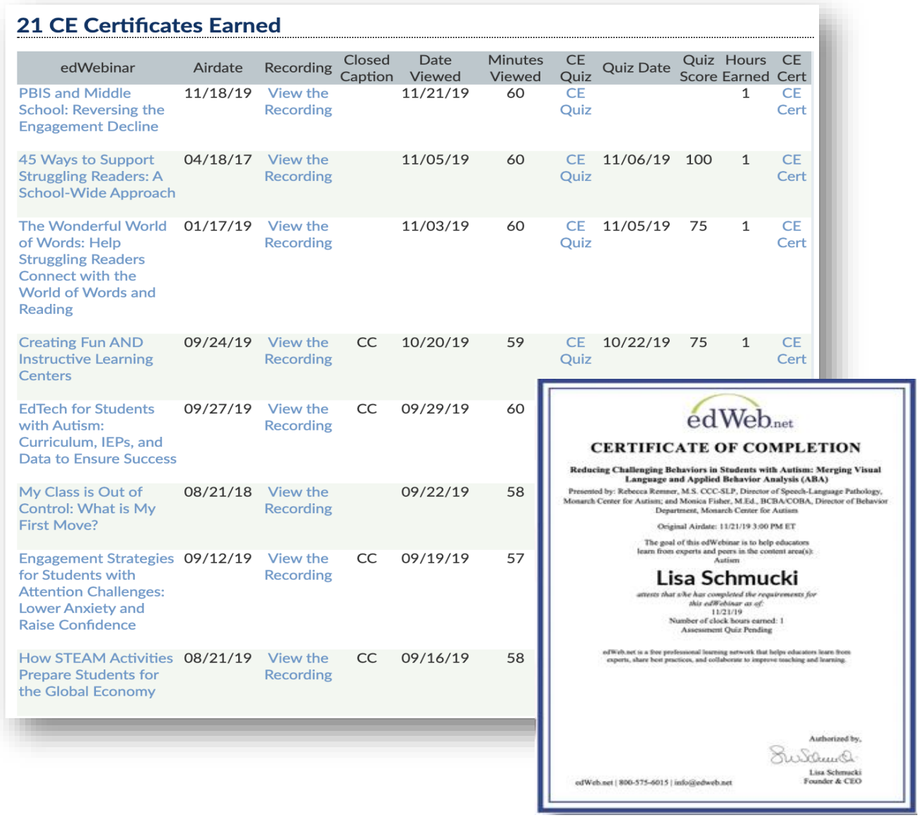

21 CE Certificates Earned

edWebinar	Airdate	Recording	Closed Caption	Date Viewed	Minutes Viewed	CE Quiz	Quiz Date	Quiz Score	Hours Earned	CE Cert
PBIS and Middle School: Reversing the Engagement Decline	11/18/19	View the Recording		11/21/19	60	CE Quiz			1	CE Cert
45 Ways to Support Struggling Readers: A School-Wide Approach	04/18/17	View the Recording		11/05/19	60	CE Quiz	11/06/19	100	1	CE Cert
The Wonderful World of Words: Help Struggling Readers Connect with the World of Words and Reading	01/17/19	View the Recording		11/03/19	60	CE Quiz	11/05/19	75	1	CE Cert
Creating Fun AND Instructive Learning Centers	09/24/19	View the Recording	CC	10/20/19	59	CE Quiz	10/22/19	75	1	CE Cert
EdTech for Students with Autism: Curriculum, IEPs, and Data to Ensure Success	09/27/19	View the Recording	CC	09/29/19	60					
My Class is Out of Control: What is My First Move?	08/21/18	View the Recording		09/22/19	58					
Engagement Strategies for Students with Attention Challenges: Lower Anxiety and Raise Confidence	09/12/19	View the Recording	CC	09/19/19	57					
How STEAM Activities Prepare Students for the Global Economy	08/21/19	View the Recording	CC	09/16/19	58					

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CERTIFICATE OF COMPLETION

Reducing Challenging Behaviors in Students with Autism: Merging Visual Language and Applied Behavior Analysis (ABA)

Presented by: Rebecca Renner, M.S. CCC-SLP, Director of Speech-Language Pathology, Monarch Center for Autism; and Monica Fisher, M.Ed., BCBA/COBA, Director of Behavior Department, Monarch Center for Autism

Original Airdate: 11/21/19 3:00 PM ET

The goal of this edWebinar is to help educators learn from experts and peers in the content area(s): Autism

Lisa Schmucki

attests that s/he has completed the requirements for this edWebinar as of: 11/21/19

Number of clock hours earned: 1
Assessment Quiz Pending

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