

MATH MODELING CAN

MAKE YOU FILTHY RICH

ROBERT KAPLINSKY

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robertkaplinsky.com

[@robertkaplinsky](https://www.instagram.com/robertkaplinsky)





Real-World Link



Common Core
State Standards

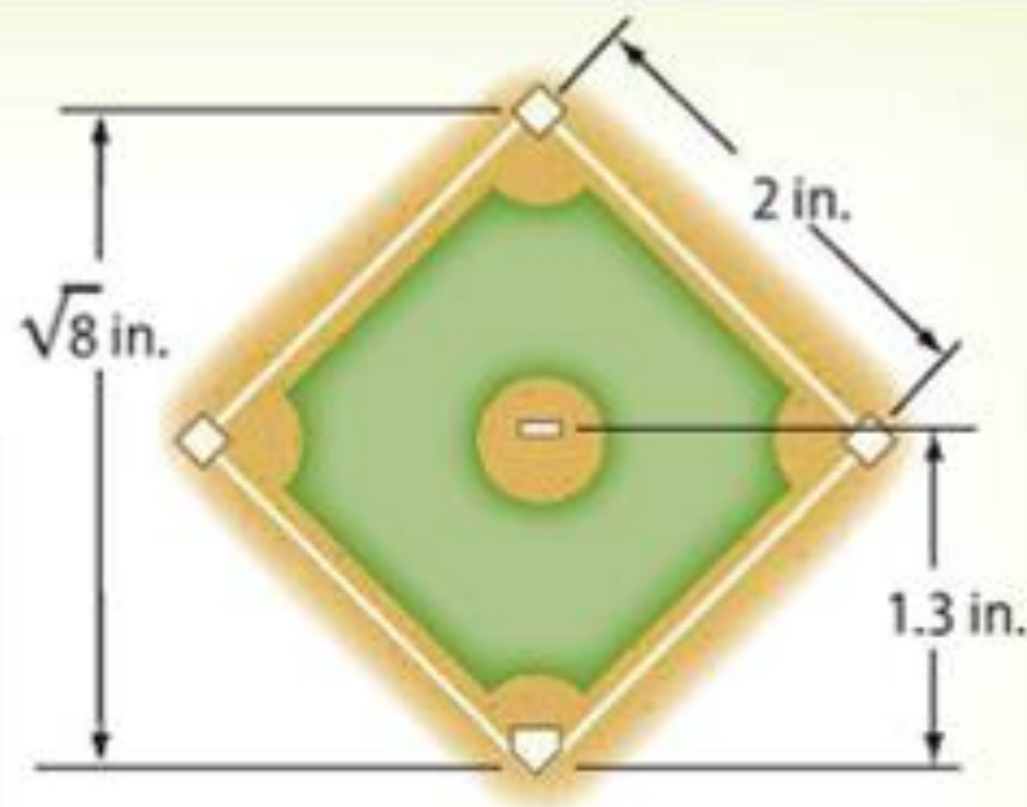
Content Standards

8.NS.1, 8.NS.2, 8.EE.2

Mathematical Practices

1, 3, 4, 6

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?





Real-World Link



Common Core State Standards

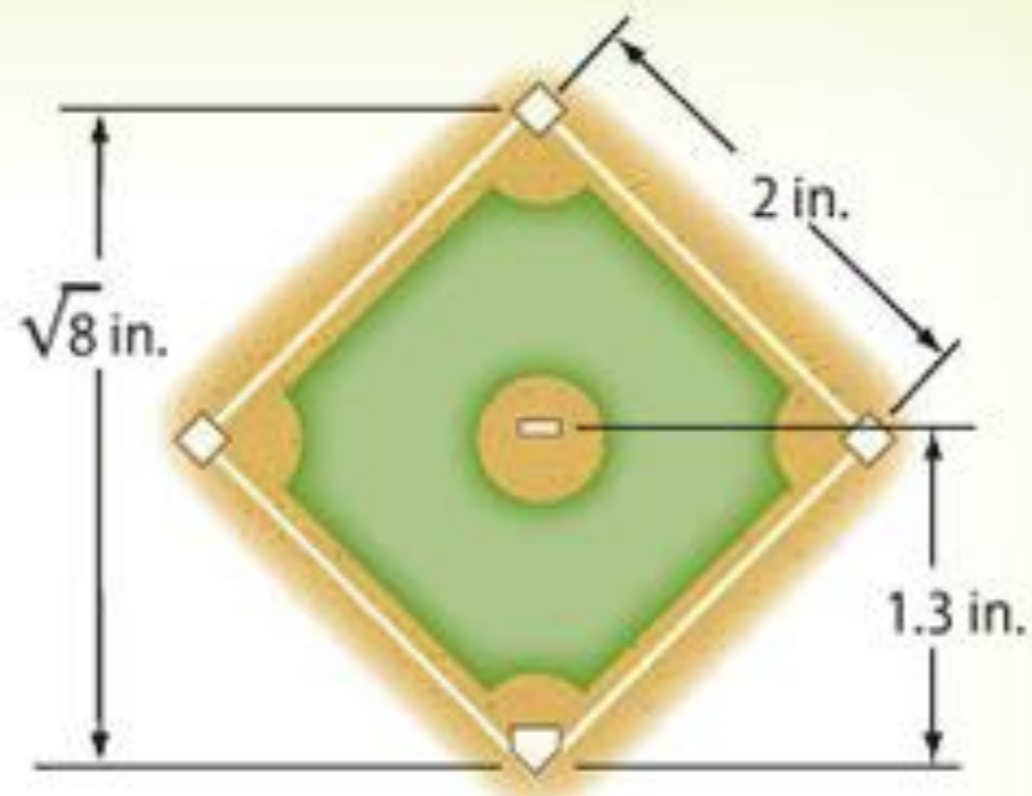
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Doritos® & Cheetos® Mix **20** Singles

DORITOS® Nacho Cheese Flavored Tortilla Chips 1 OZ. EA. DORITOS® COOL RANCH® Flavored Tortilla Chips 1 OZ. EA. CHEETOS® Puffs Cheese Flavored Snacks 7/8 OZ. EA. CHEETOS® Crunchy Cheese Flavored Snacks 1 OZ. EA.

20 INDIVIDUAL BAGS: 7/8 OZ. EACH, 1 OZ. EACH, TOTAL NET WT. 19 5/8 OZ. (1 LB. 3 5/8 OZ.) 556.3 g ⚠ WARNING: PREVENT ENTANGLEMENT AND STRANGULATION. KEEP THIS BAG AWAY FROM YOUNG CHILDREN. IT IS NOT A TOY.

THINKING TIME

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



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

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GOALS

HOW DO WE MAKE SENSE OF MATH MODELING?

IS IT JUST ANSWERING QUESTIONS?

HOW DO YOU PROFIT FROM MATH MODELING?

HOW DO WE HELP OUR STUDENTS IMPROVE?

WHERE CAN WE FIND MORE RESOURCES?









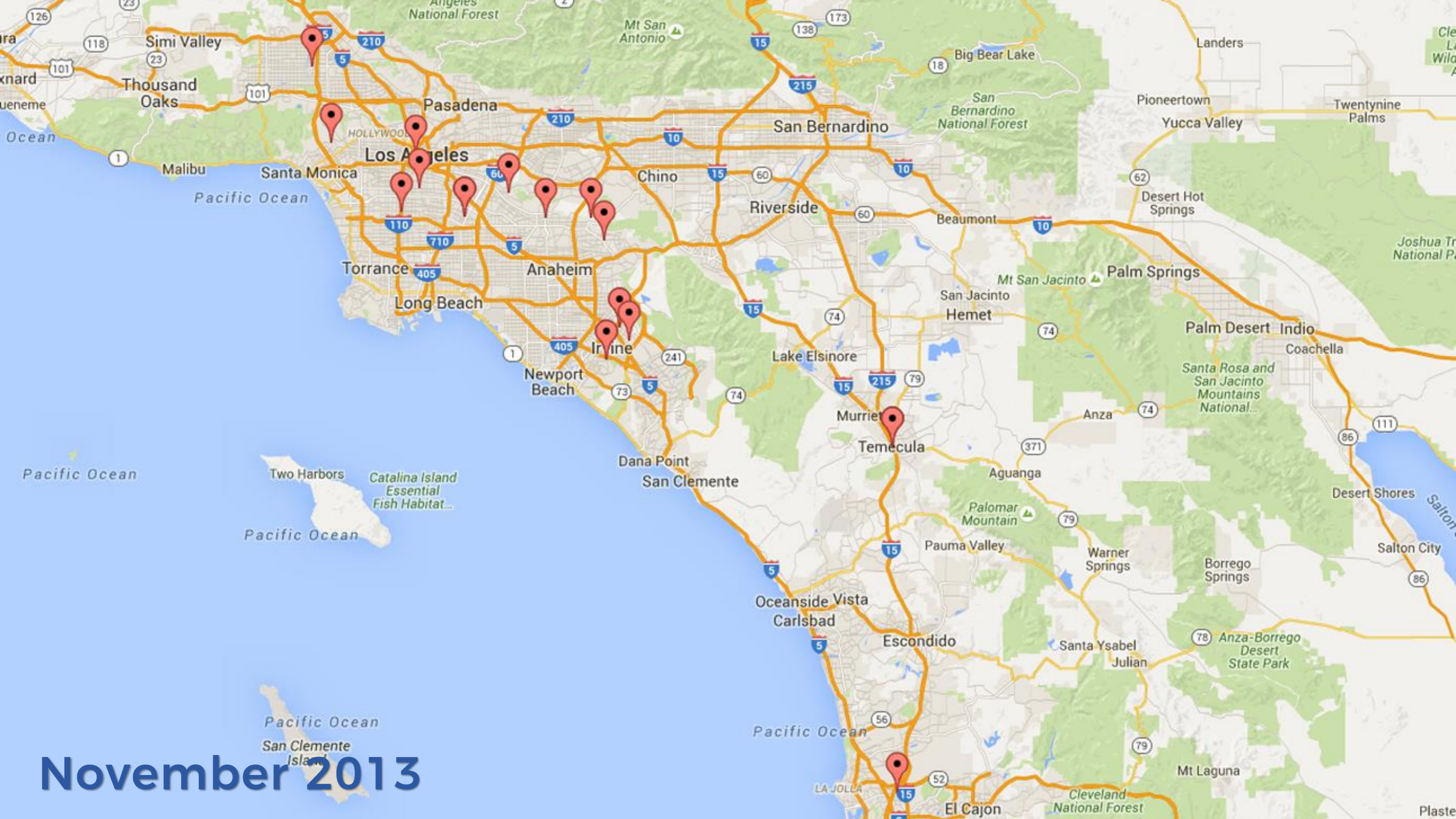


Spies

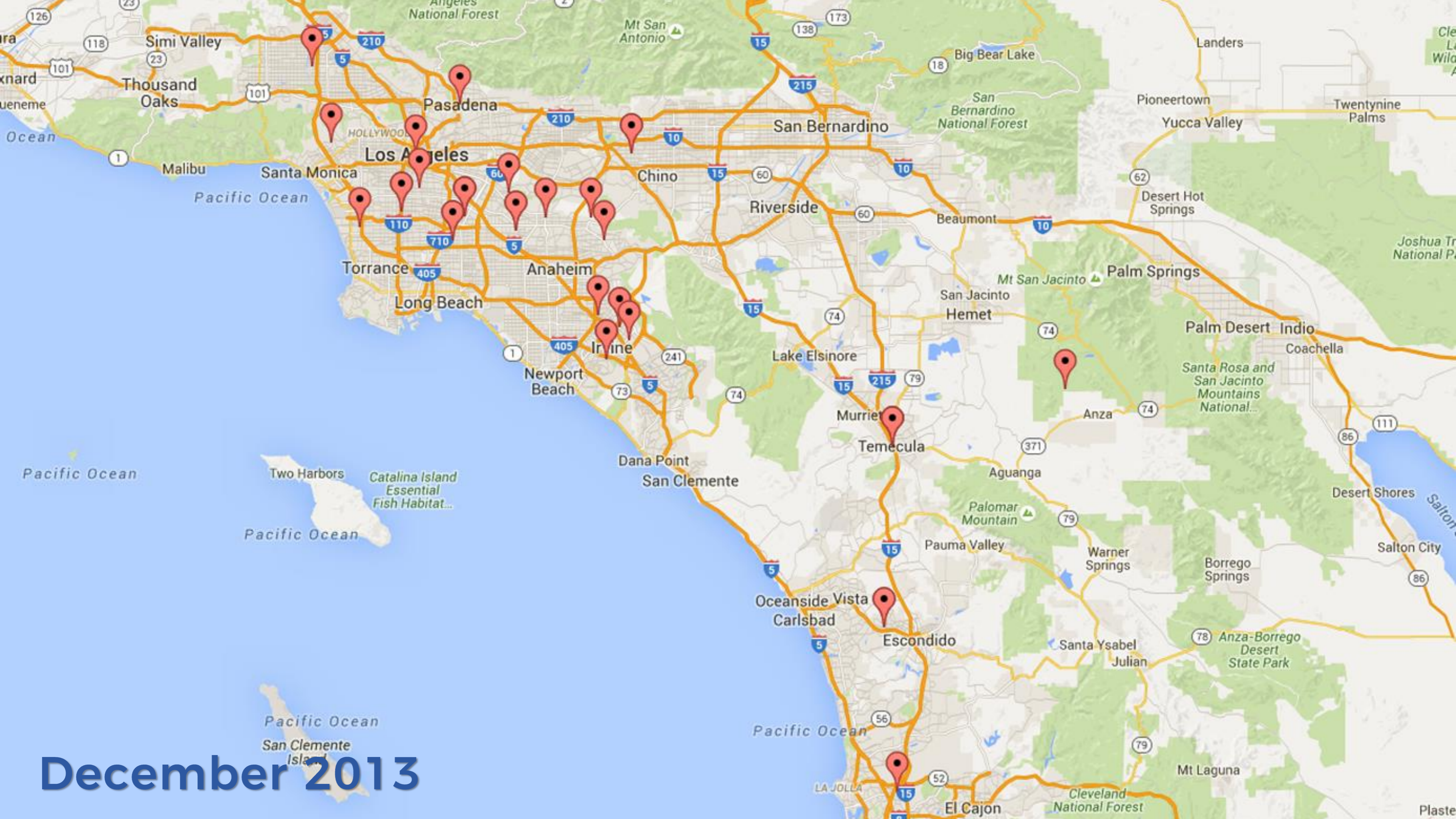
Analysts

Model

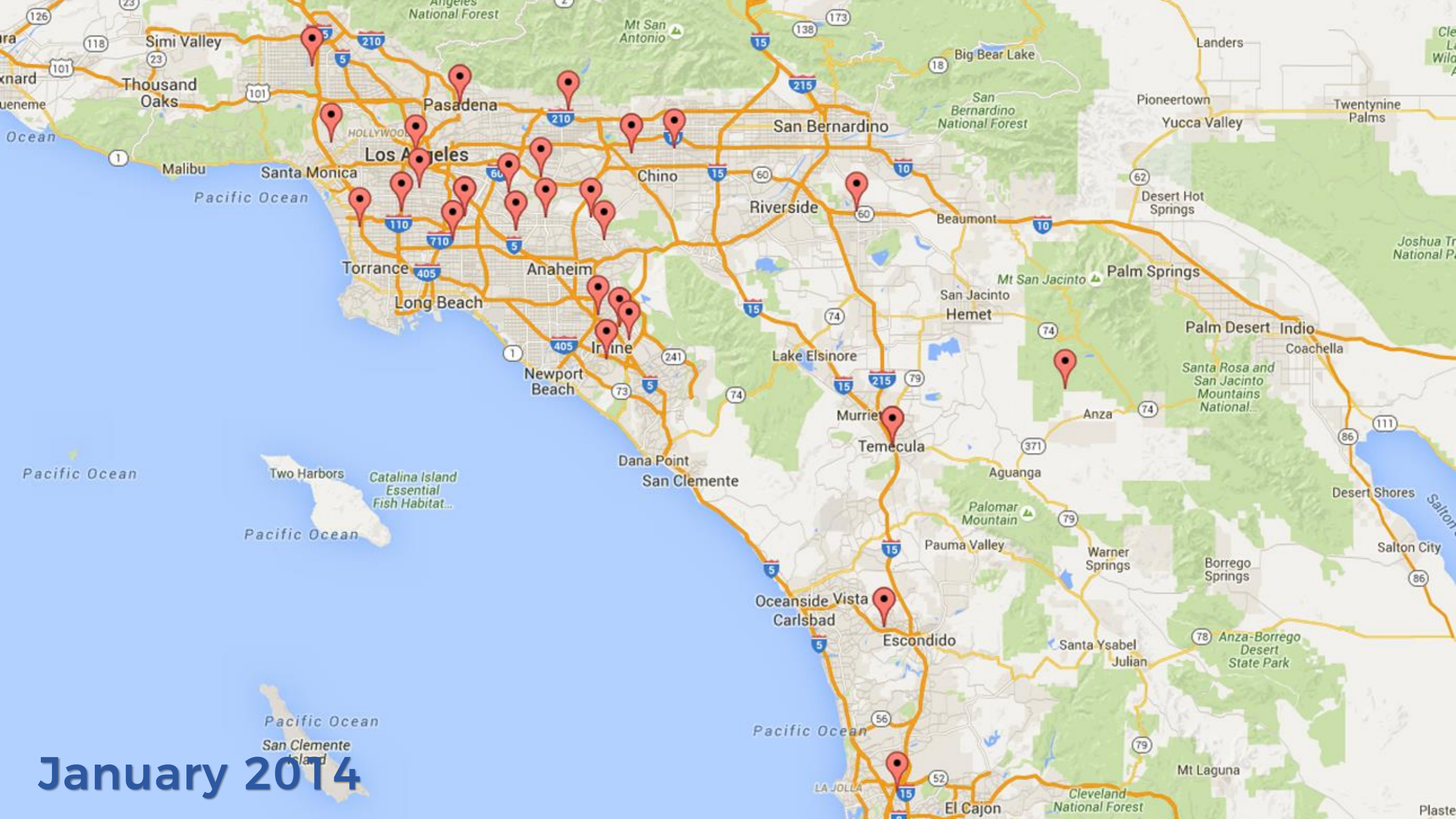




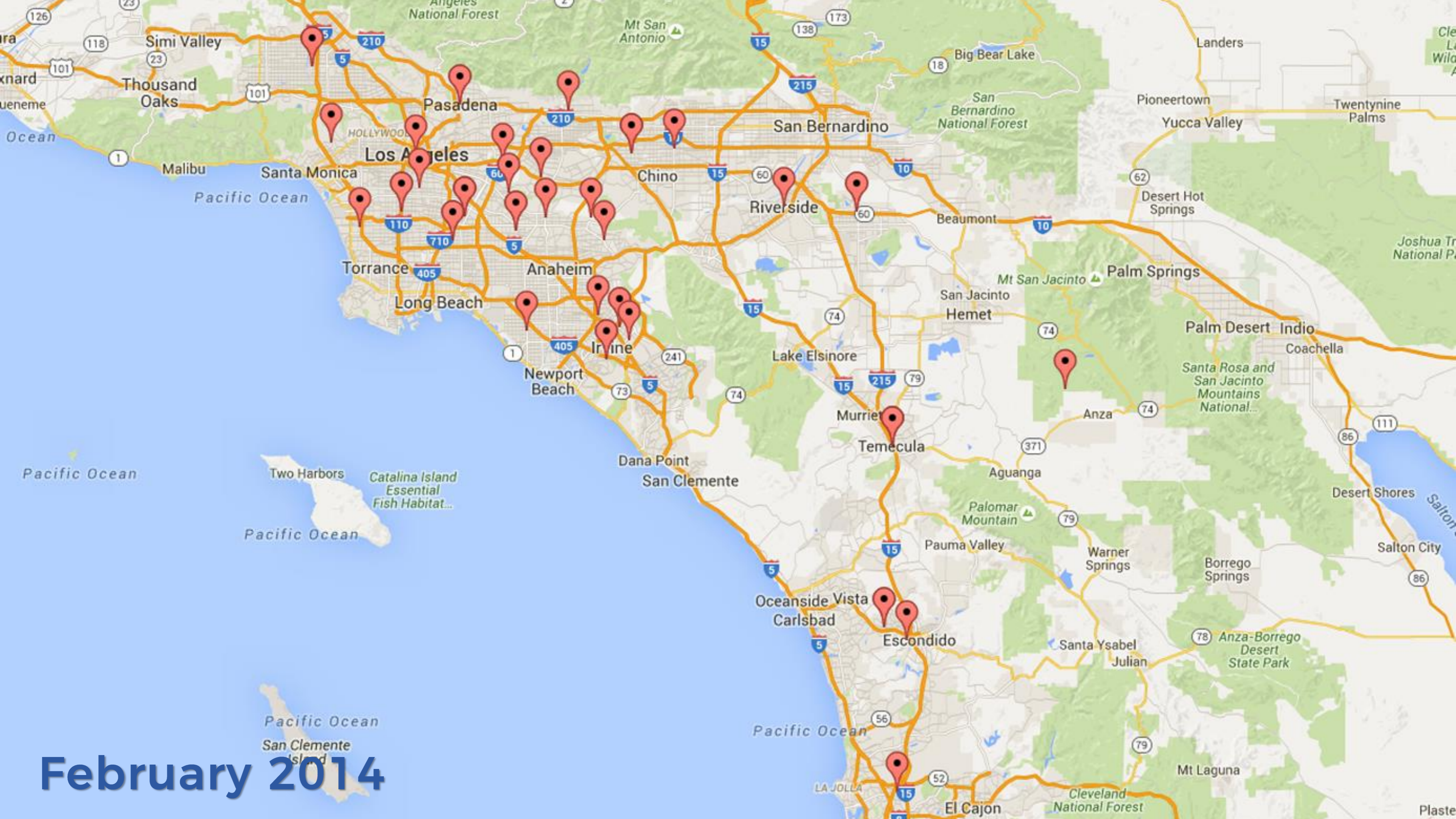
November 2013



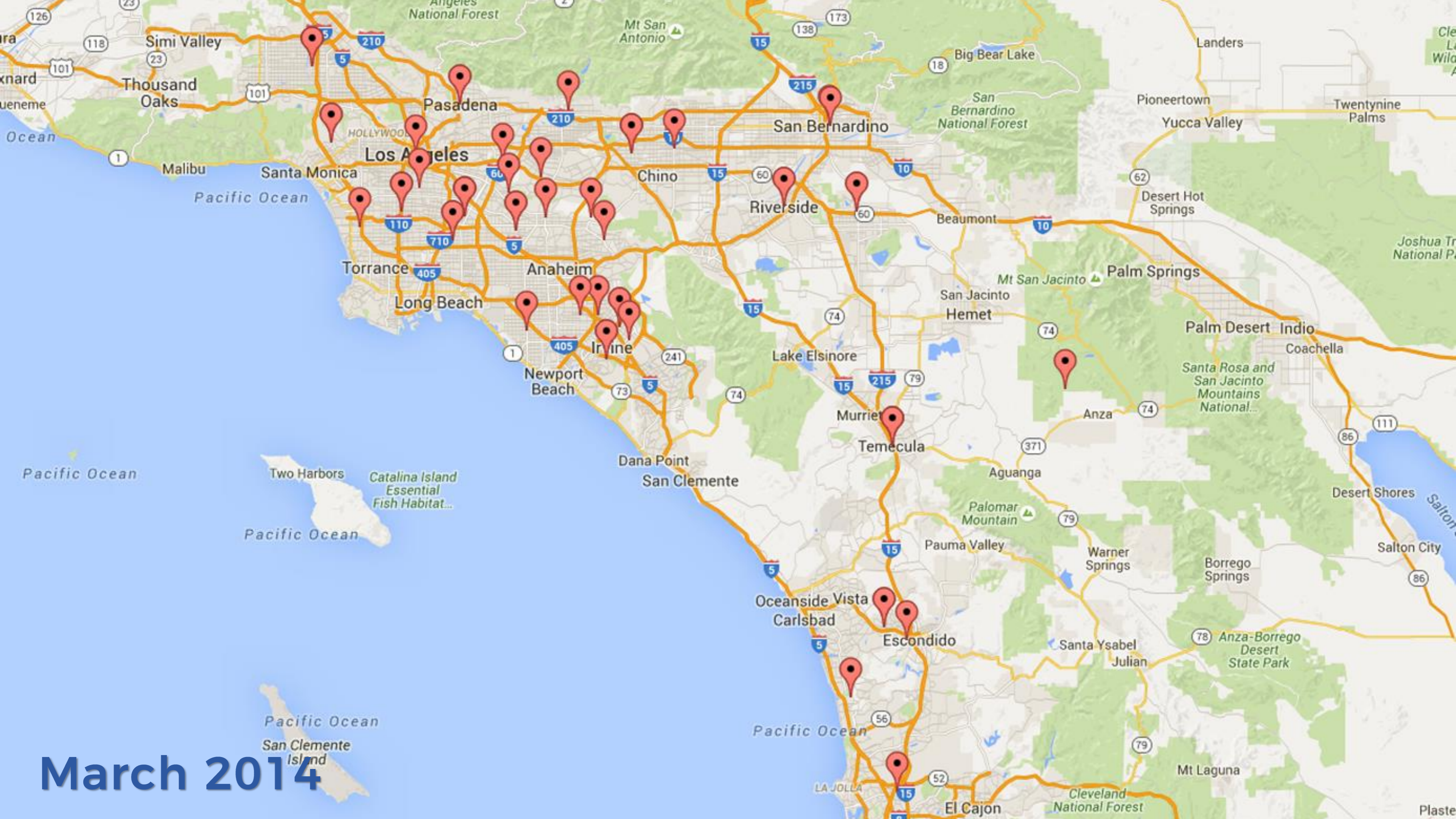
December 2013



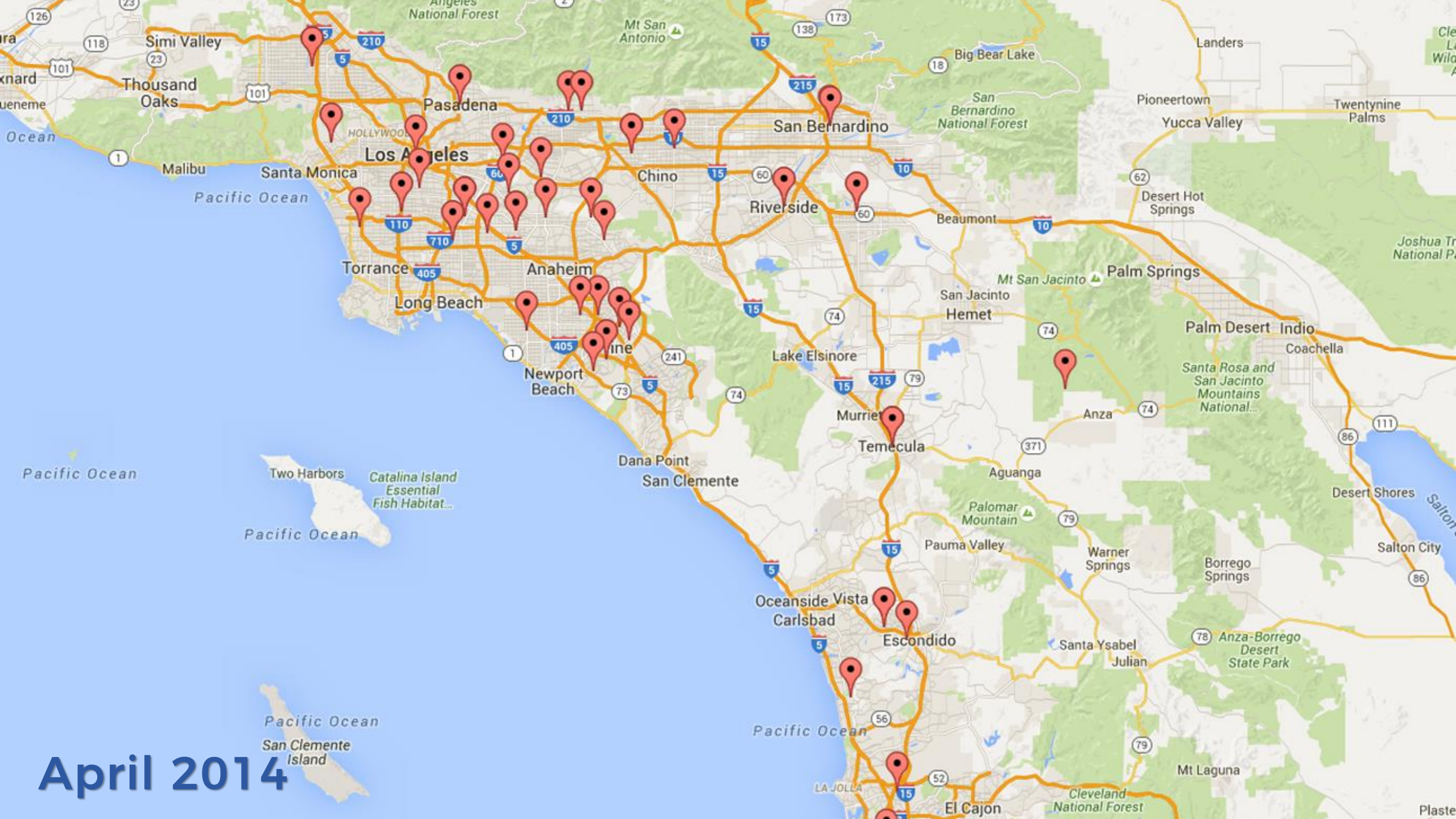
January 2014



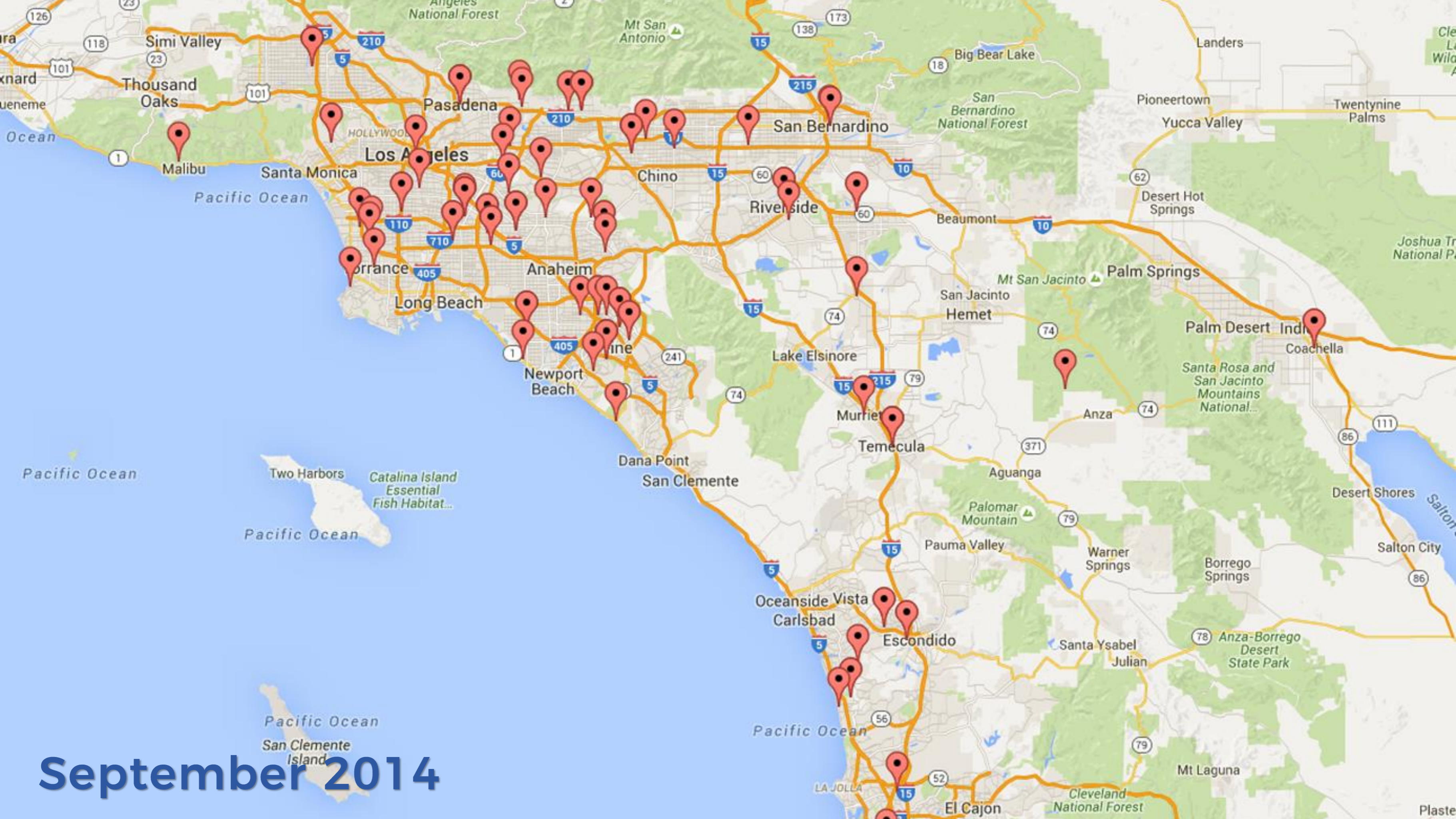
February 2014



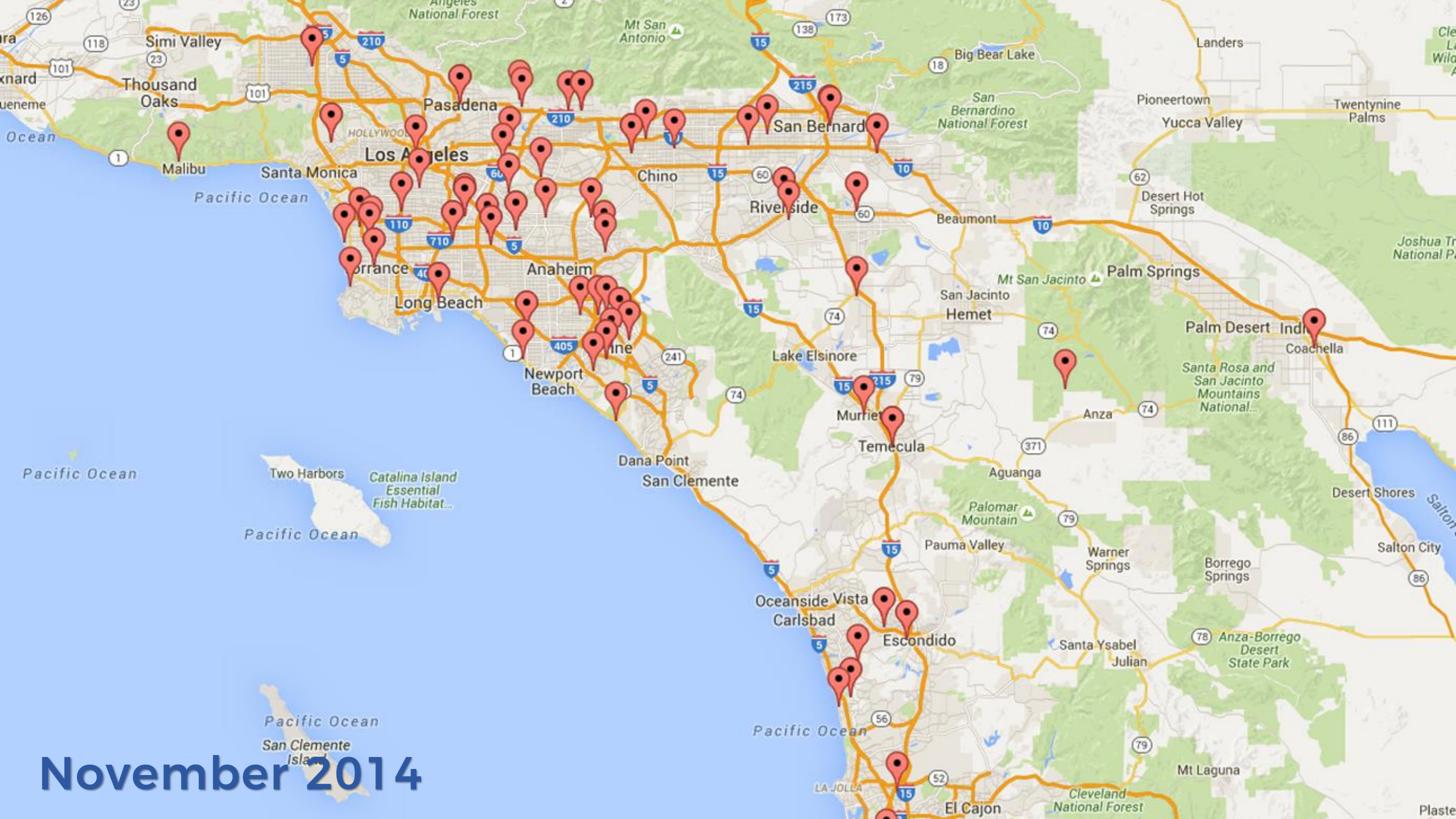
March 2014



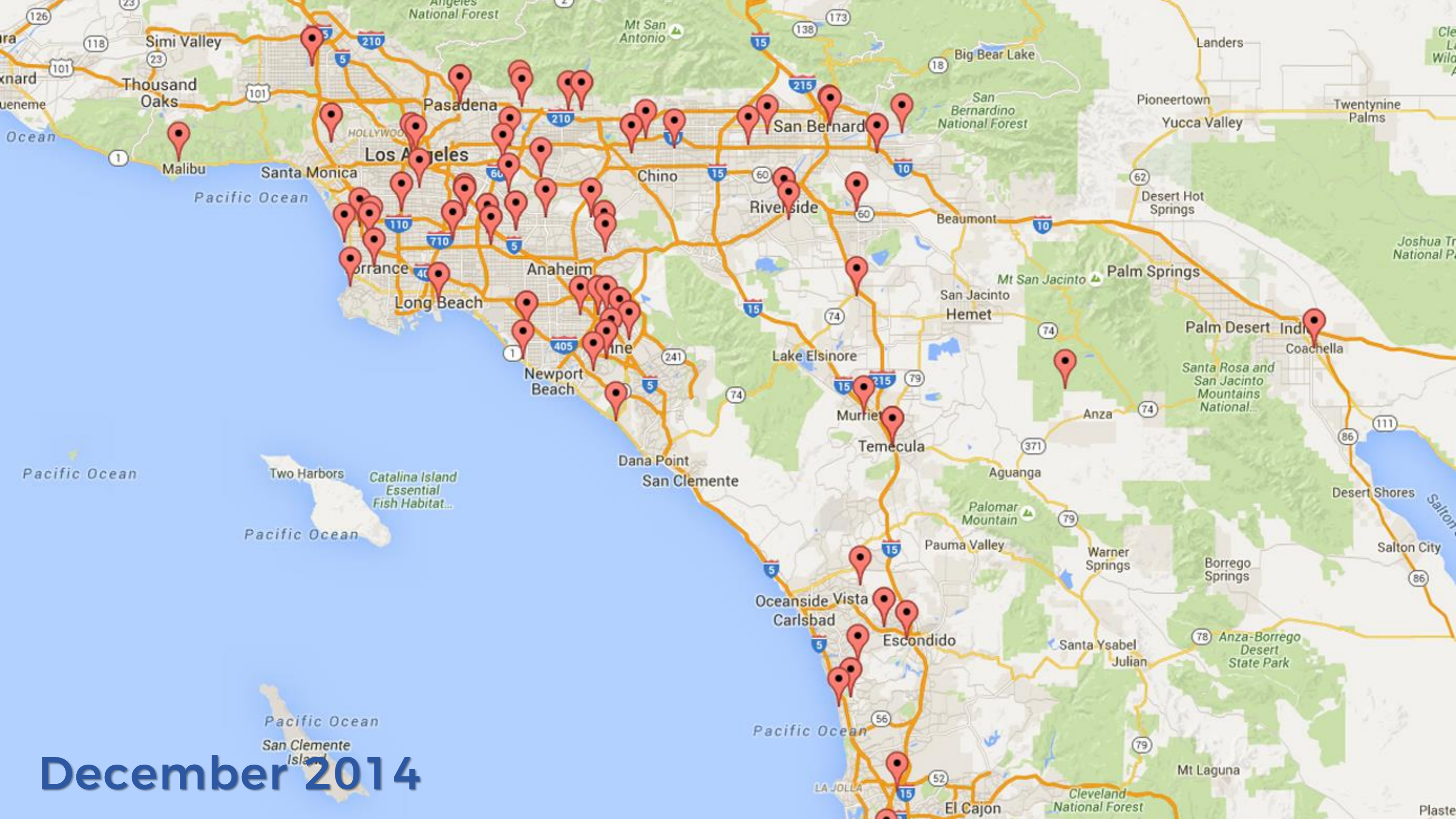
April 2014



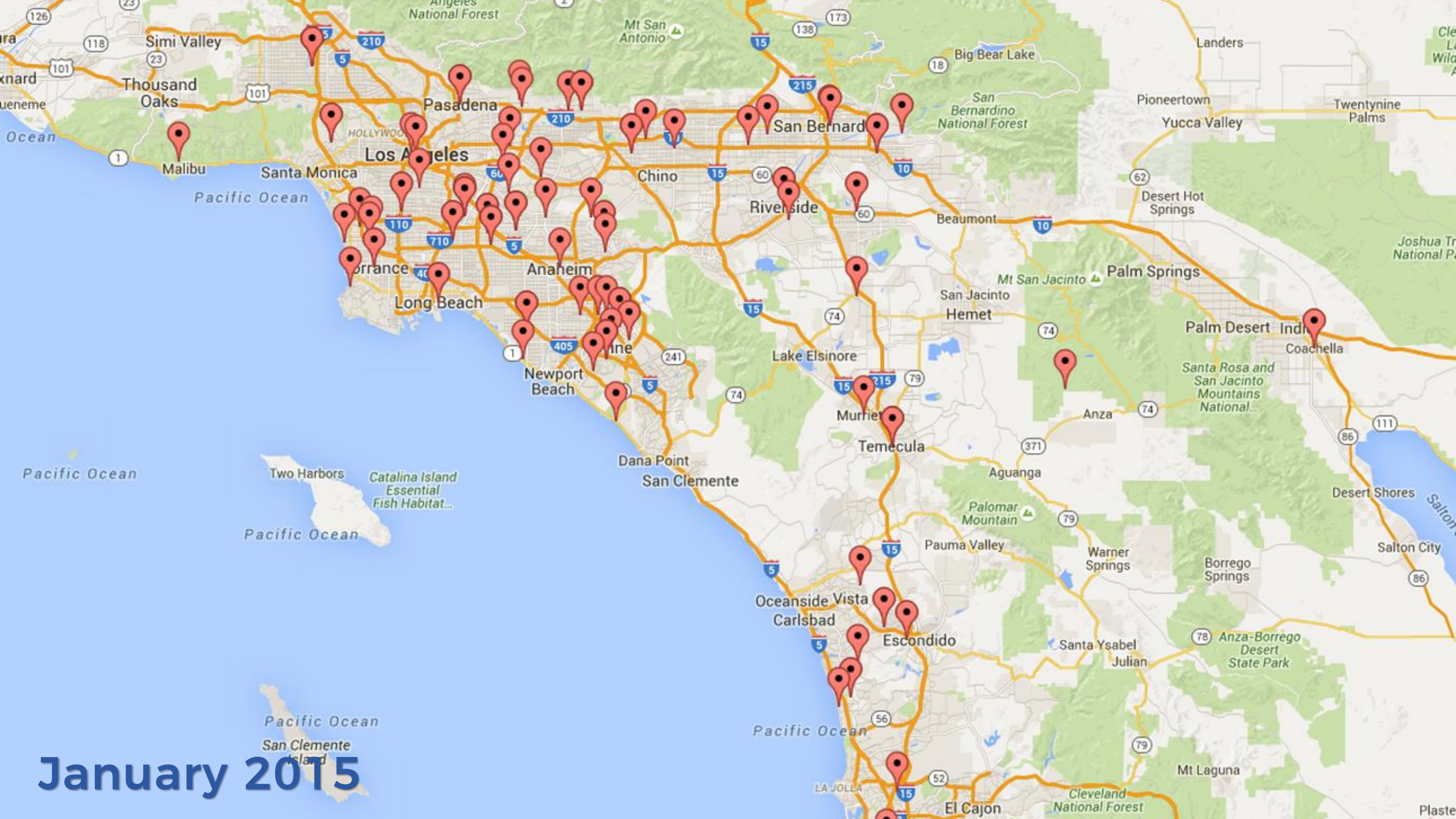
September 2014



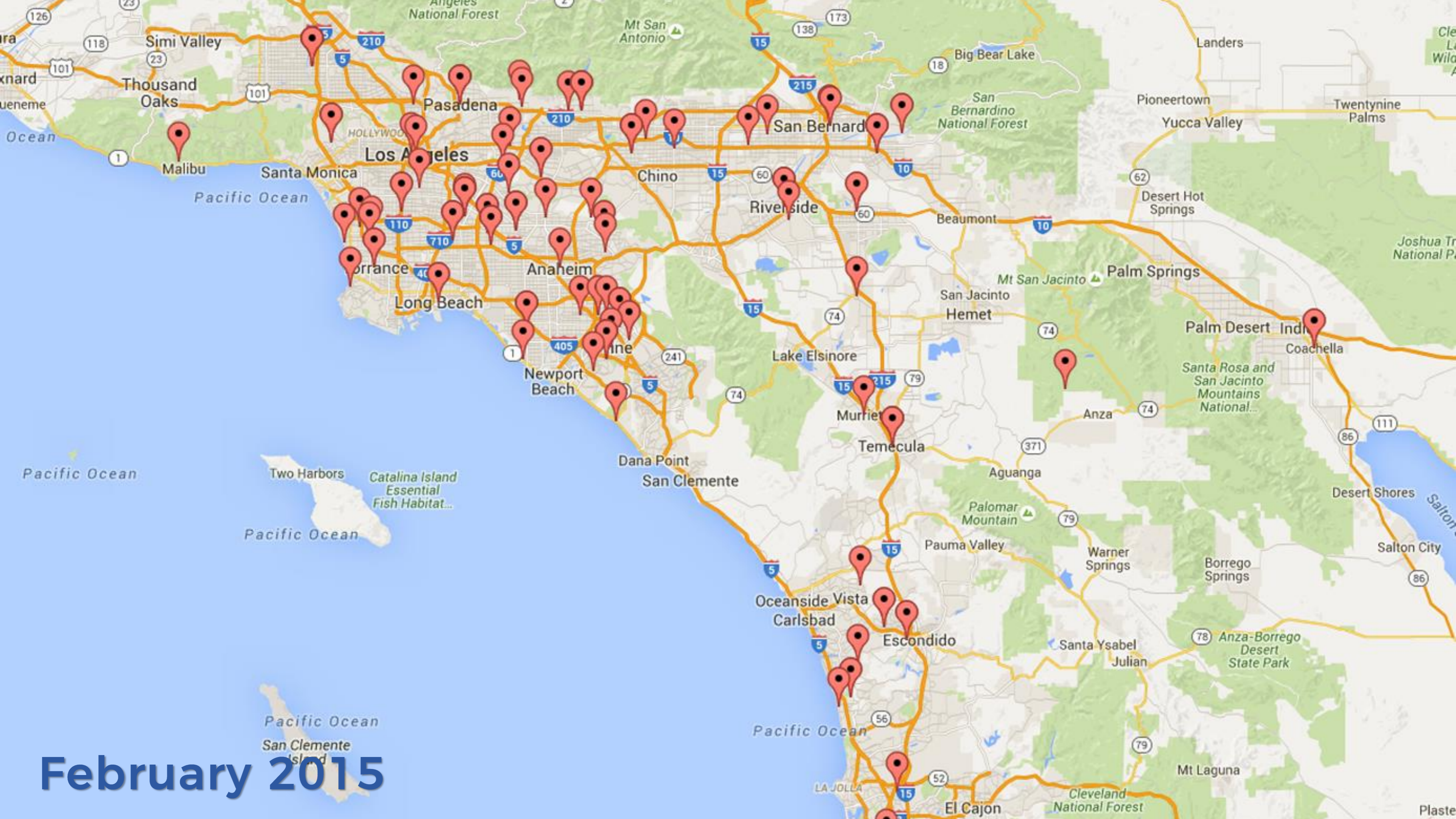
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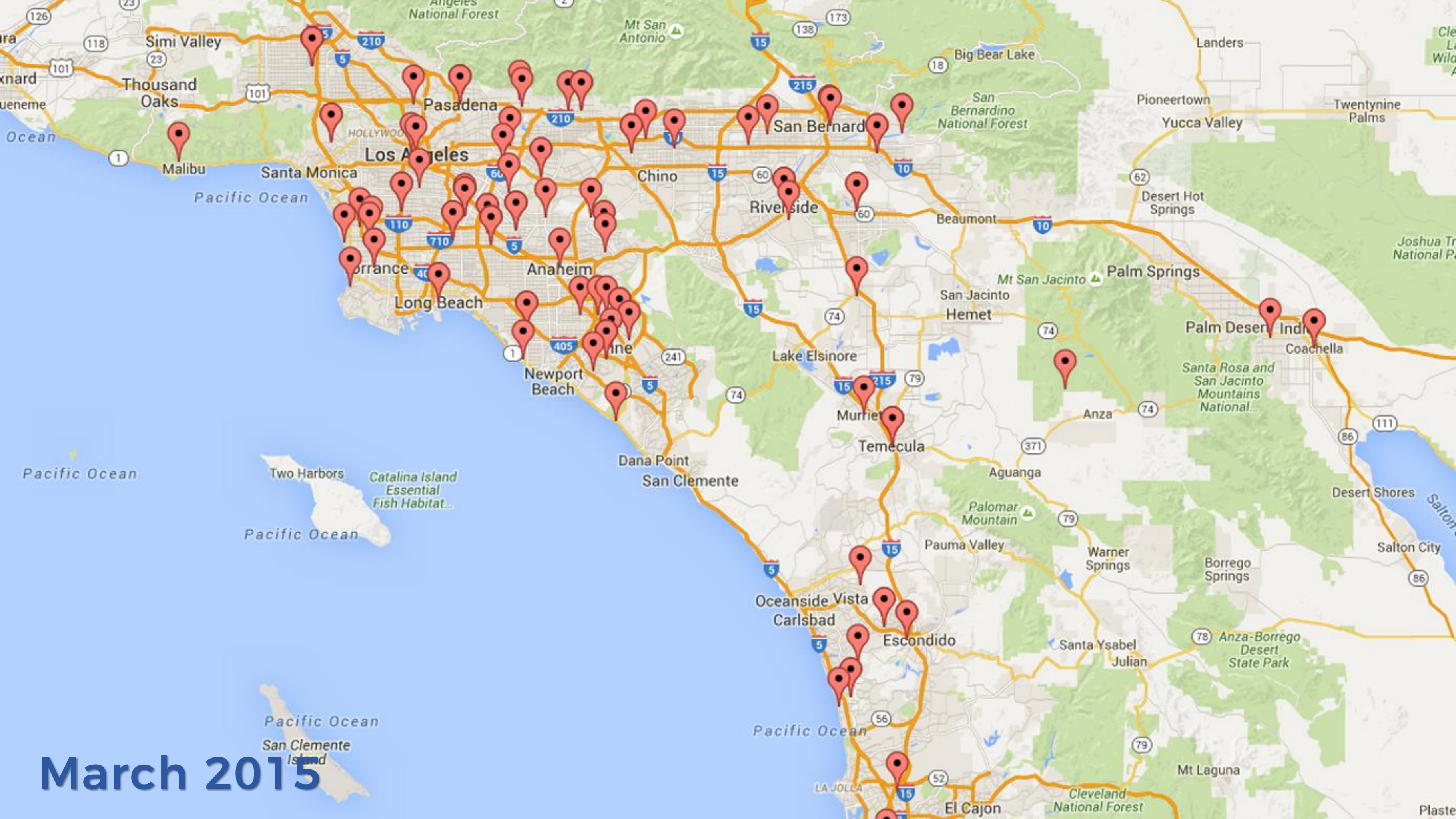
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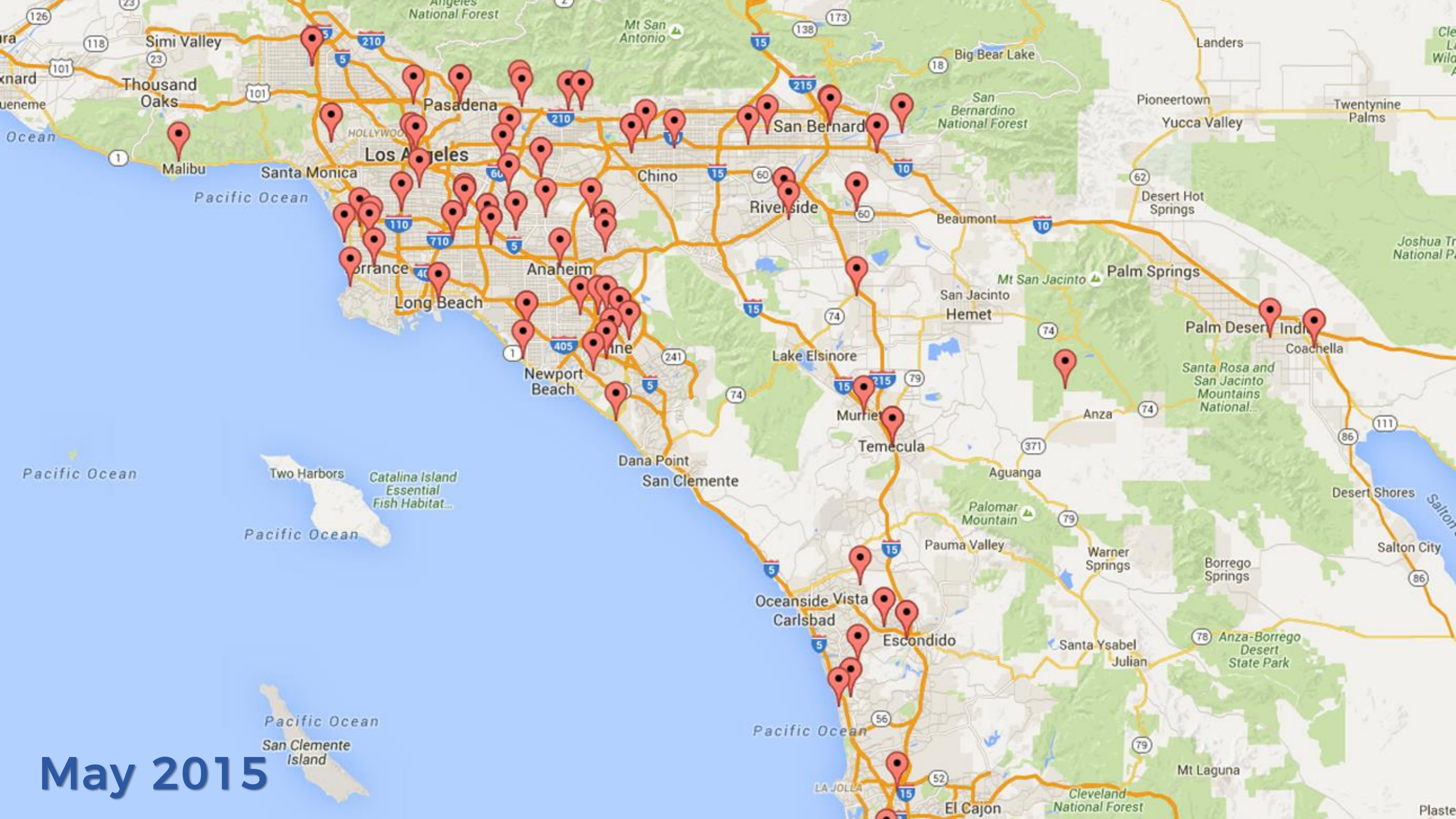
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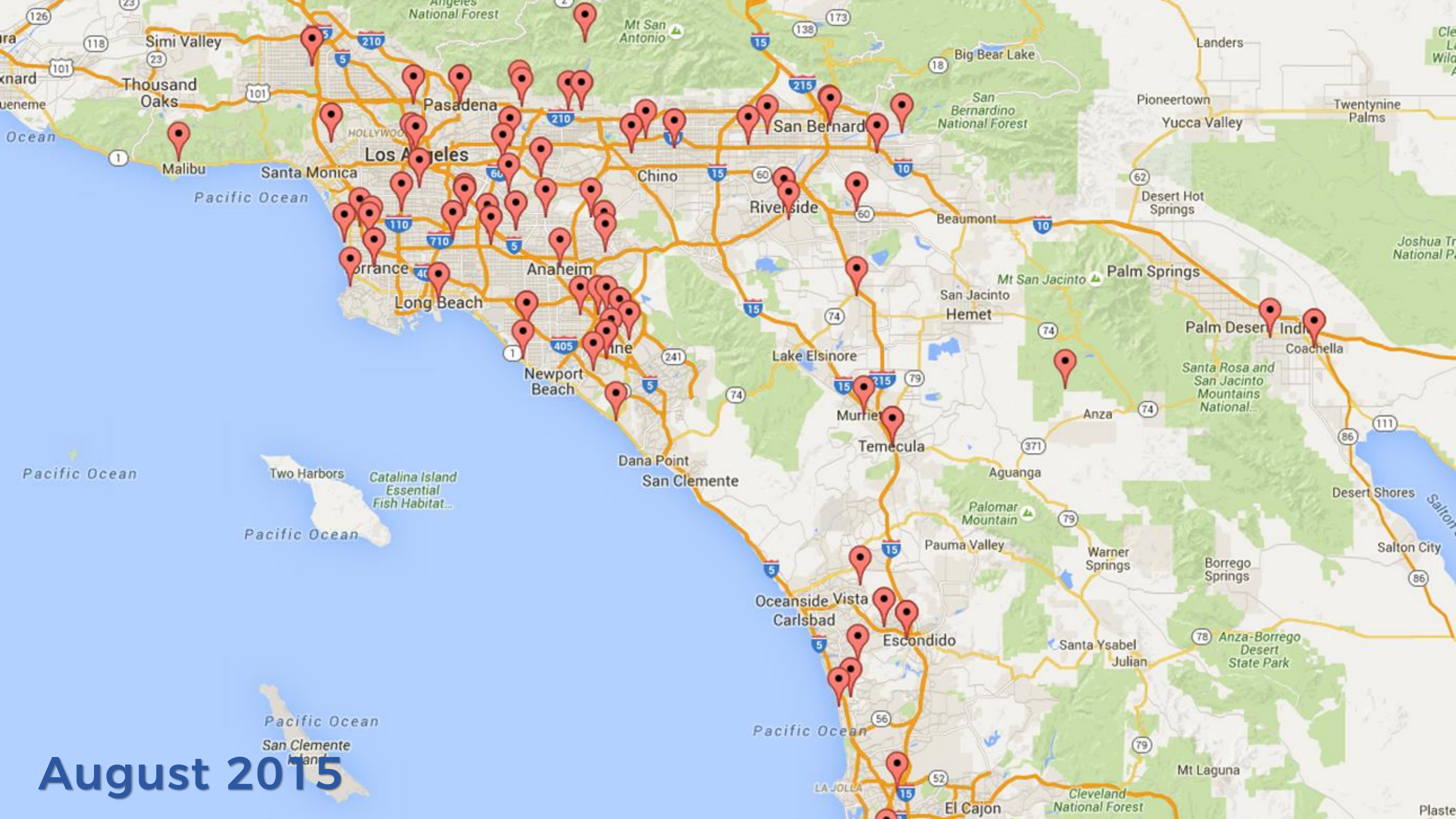
February 2015



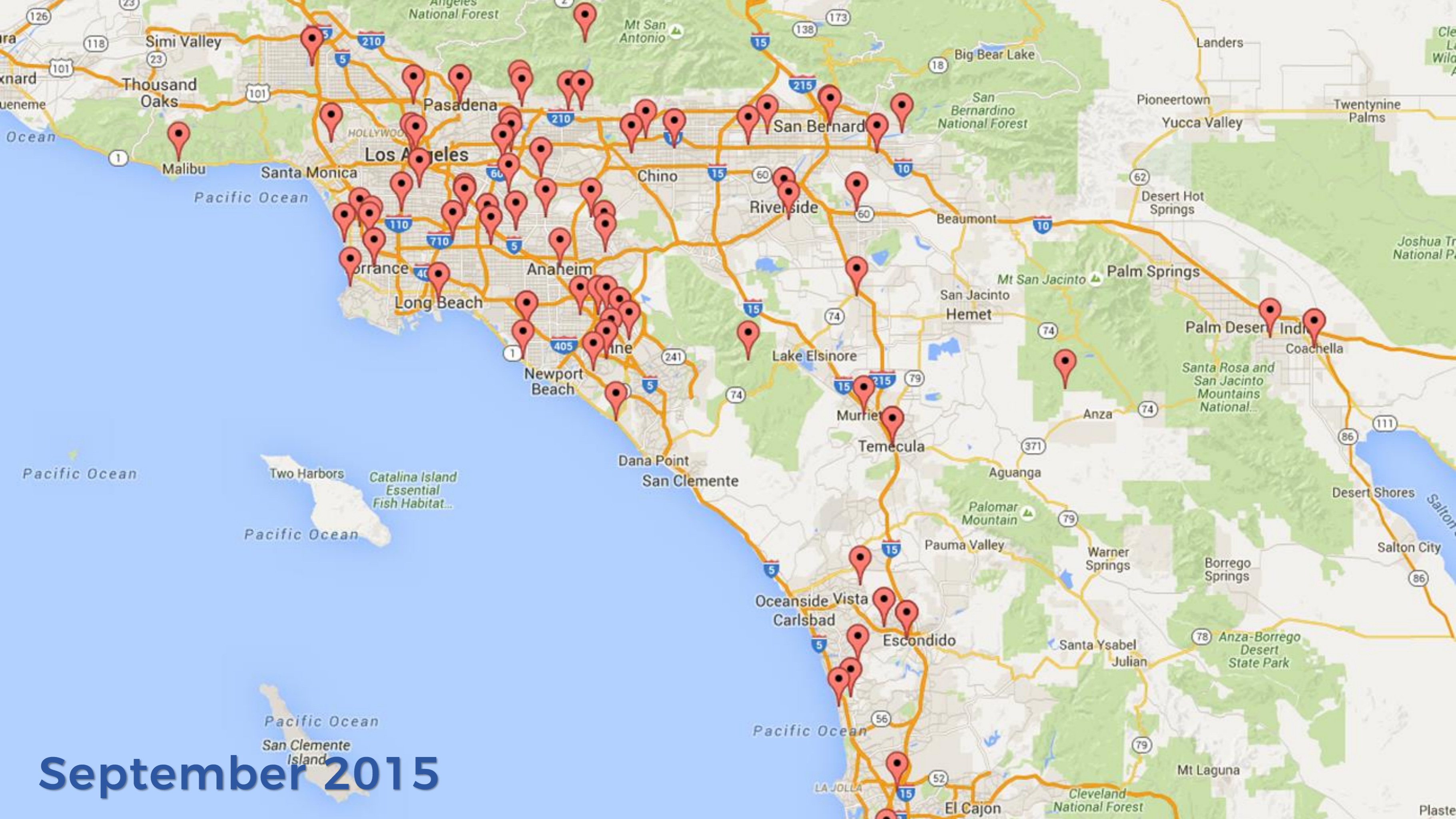
March 2015



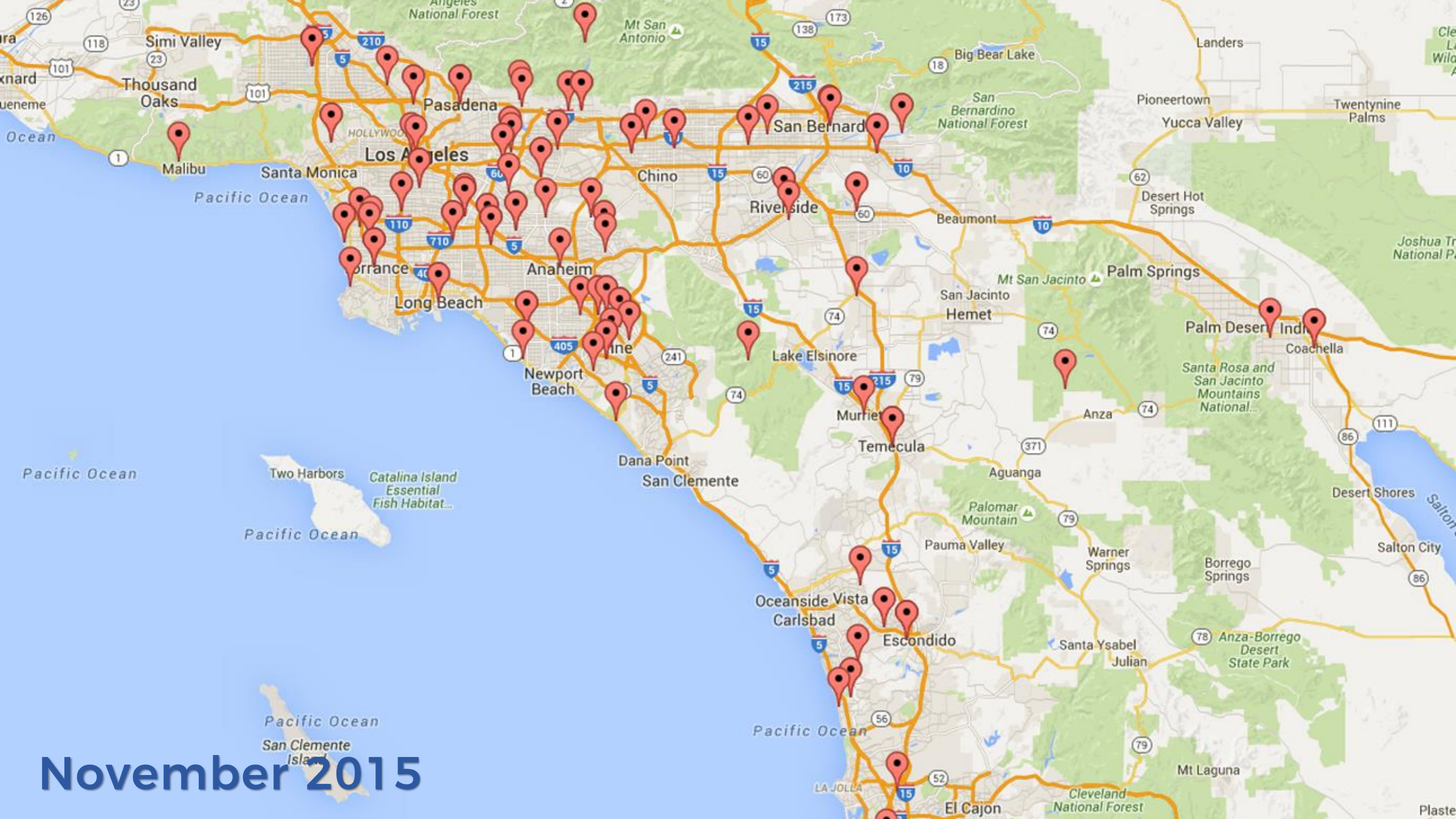
May 2015



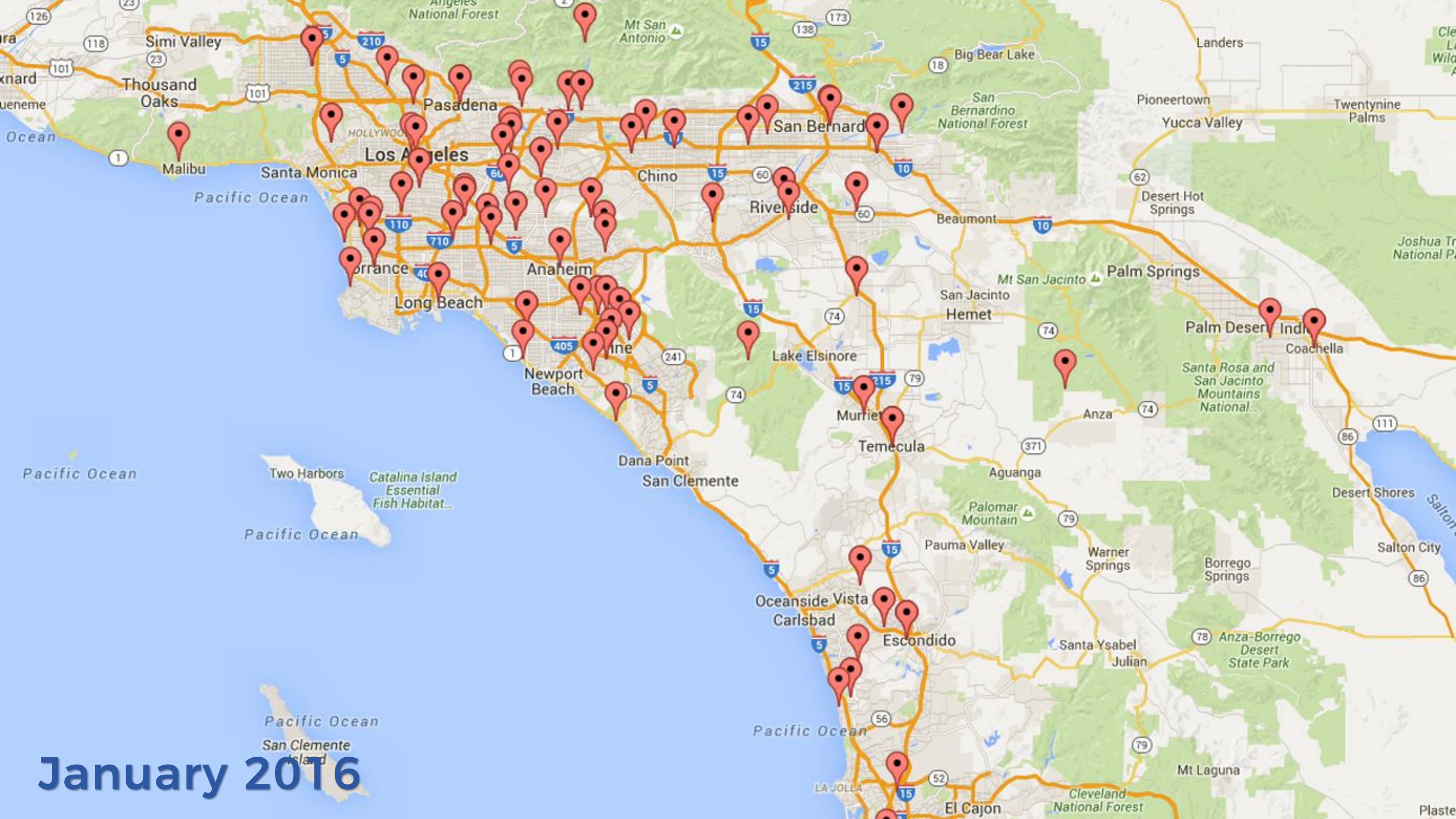
August 2015



September 2015



November 2015




January 2016

Spies

Analysts

Model



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



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/etPtujll... #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



Favorite Chips (Responses)

File Edit View Insert Format Data Tools Form Add-ons Help

Comments

Share

100%
 \$ % .0 .00 123
Arial
10
B *I* ~~U~~ A

...

fx Timestamp

	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

+ ≡ Sheet3

Explore

THINKING TIME

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

ANALYSTS' JOB FOR THE TOP 4

1. **Count** all the first, second, third, and fourth place votes for each chip type.
2. **Multiply** the first place votes by four, the second place votes by three, the third place votes by two, and the fourth place votes by one.
3. **Add** the weighted votes for each chip type and **divide** by the total number of weighted votes.
4. **Divide** the weighted votes for each chip type by the total number of votes.
5. **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

GOALS

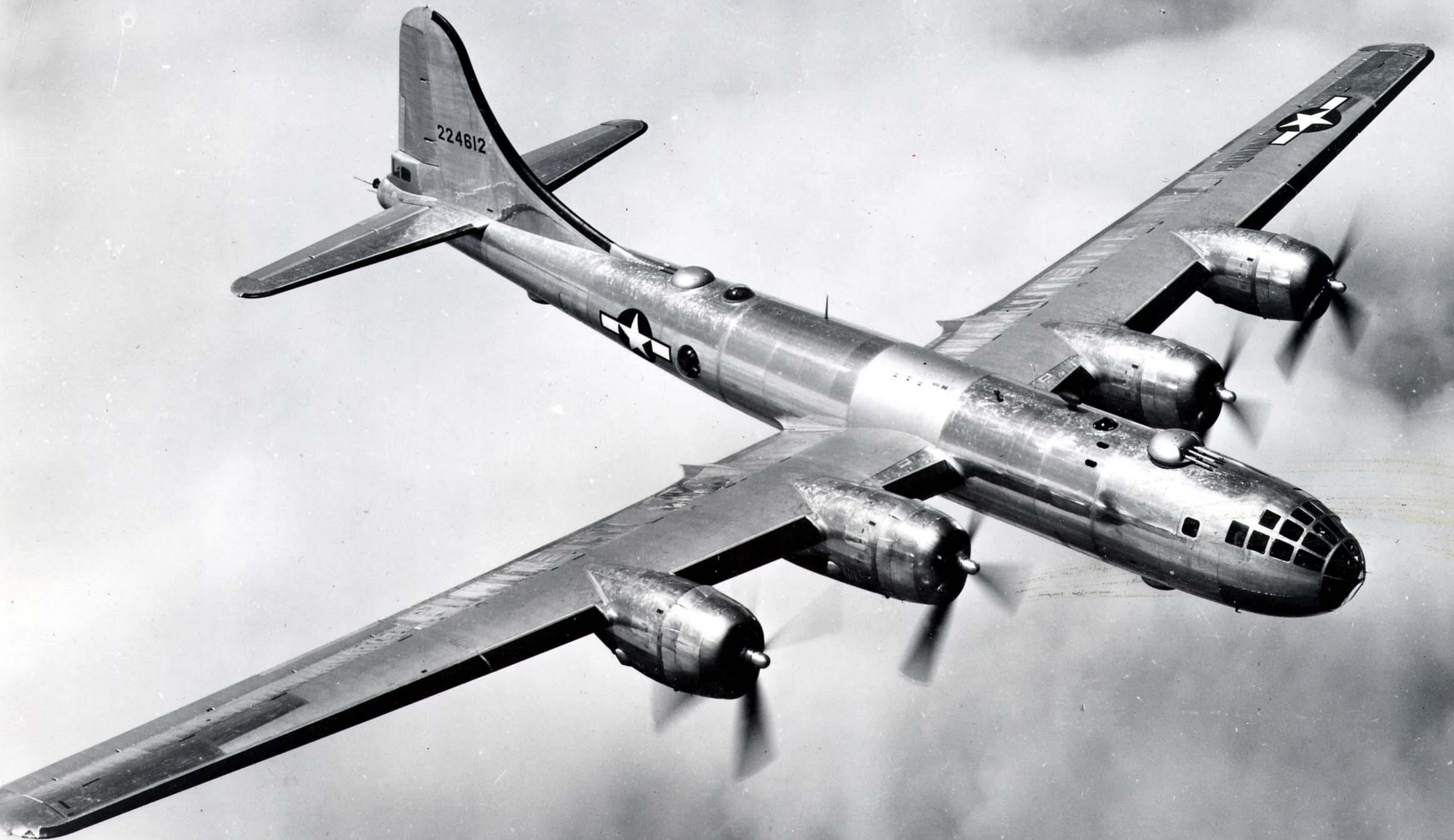
HOW DO WE MAKE SENSE OF MATH MODELING?

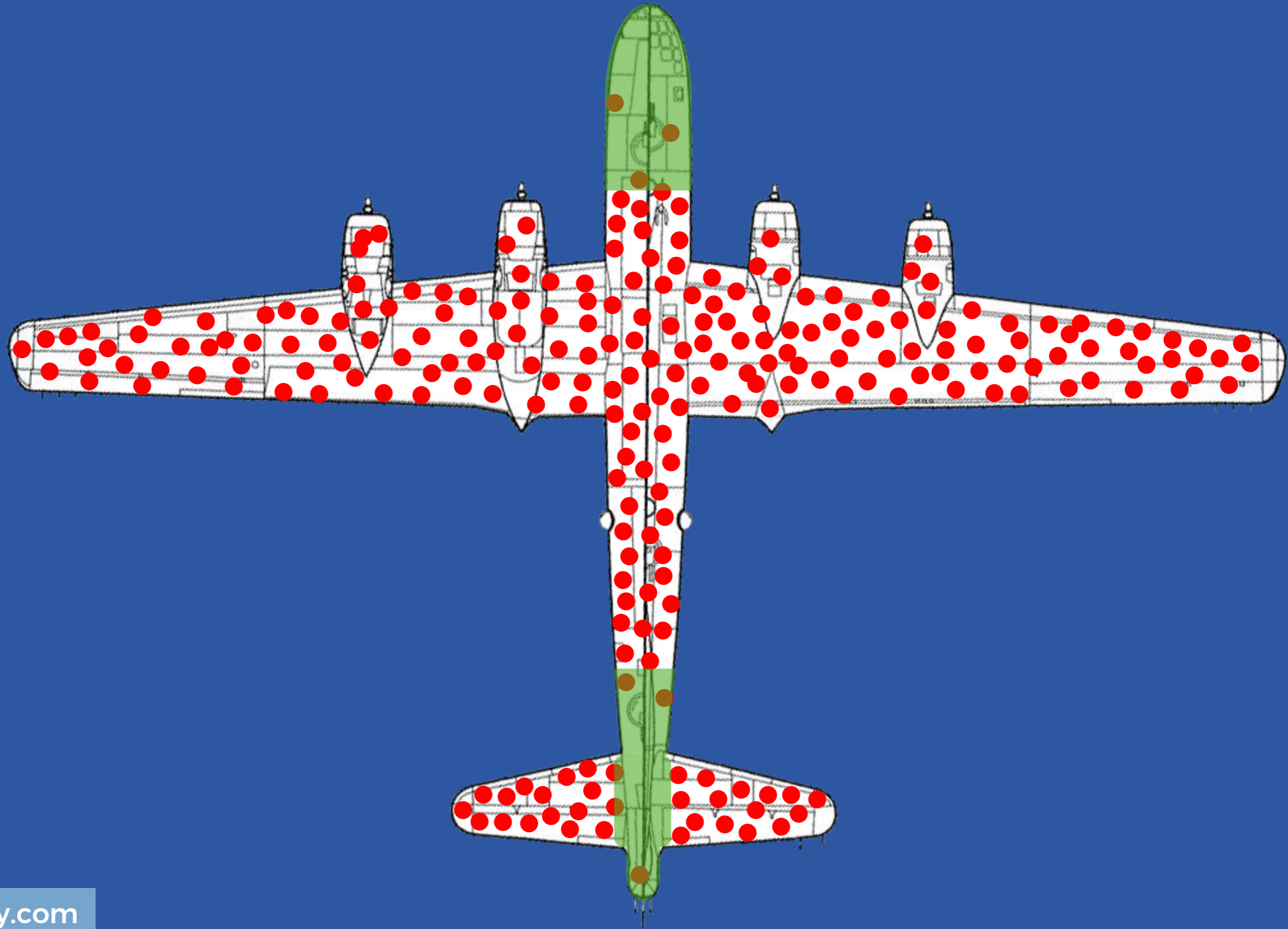
IS IT JUST ANSWERING QUESTIONS?

HOW DO YOU PROFIT FROM MATH MODELING?

HOW DO WE HELP OUR STUDENTS IMPROVE?

WHERE CAN WE FIND MORE RESOURCES?





- ~~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?

- ~~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)


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⚠ 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?

Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later.

CCSS MATH PRACTICE 4



They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

CCSS MATH PRACTICE 4

GOALS

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IS IT JUST ANSWERING QUESTIONS?

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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

ANALYSTS' EXAMPLE

1. Add the number of bottles of unscented lotion, jars of mineral supplements, and bags of cotton balls.
2. Multiply that times the day of the week.
3. Click your heels twice.
4. Repeat the phrase "There's no place like home!"



UNITED



N4047

B G →

B →

← G A

A319
4047

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

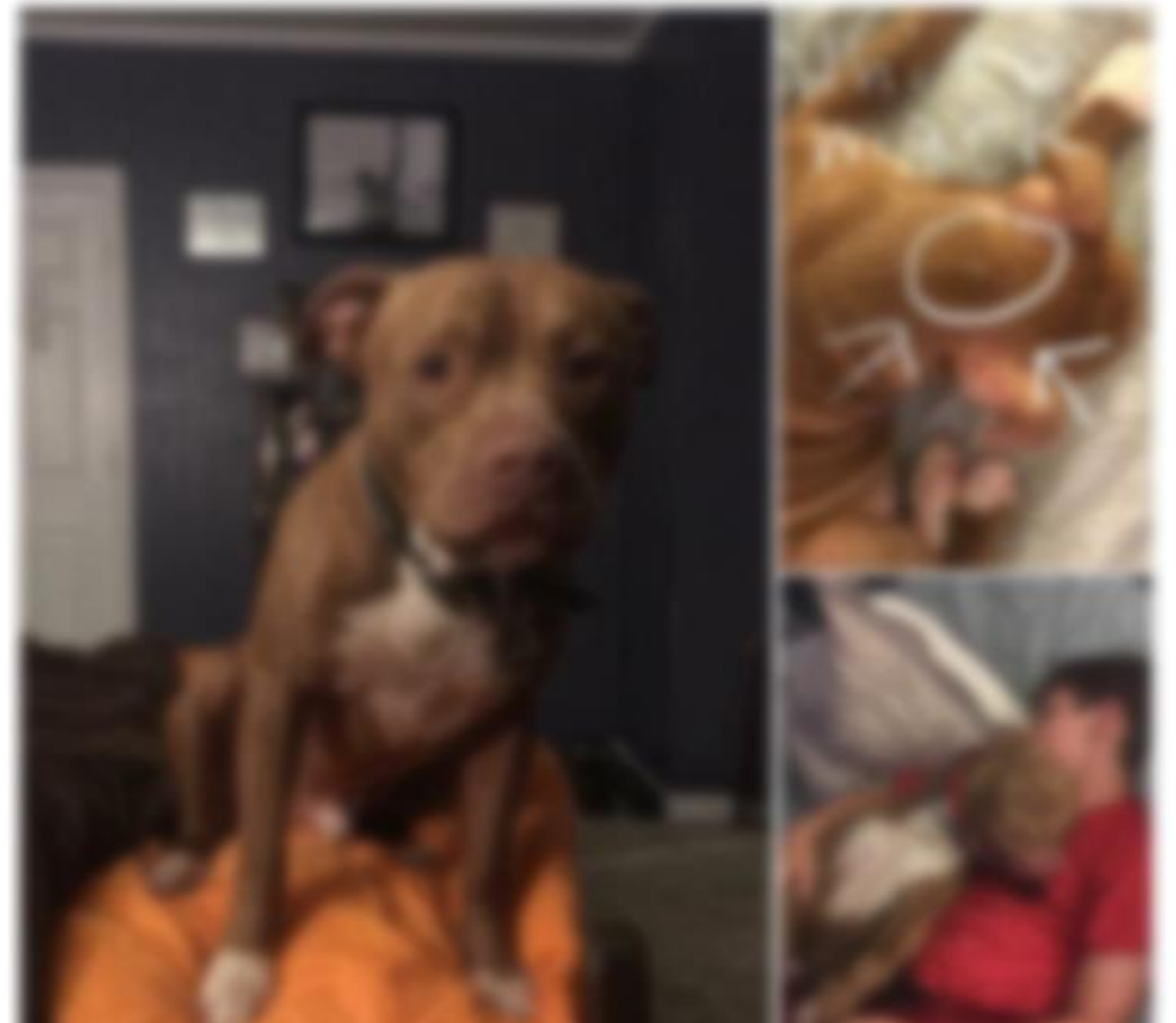
What's on your mind, Robert?

Photo/Video

Feeling/Activity

...

Hopeing this boy gets back to his family



News Better Business Bureau's activities in today

Trending

- James Madison: The Disappearance of James and Isabella's Personal Email Server - freemove.com
- Fredericksburg, Virginia: Mother recovering from copperhead snake bite at Virginia Wildlife - foxnews.com
- Anthony Weiner: Anthony Weiner Sentenced to 21 Months in Prison - washington.com

Watchlist: Latest Episodes

- Episode 1: The Making of a Legend
- Episode 2: Back to the Family
- Episode 3: The Making of a Legend
- Episode 4: Back to the Family

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



NEW & INTERESTING FINDS ON AMAZON

EXPLORE



All ▾



black friday deals week

Departments ▾

Your Pickup Location Browsing History ▾ Robert's Amazon.com Black Friday Deals Week Gift Cards & Registry Sell Help

EN

Hello, Robert Account & Lists ▾

Orders

Prime ▾



Introducing

echo plus \$149⁹⁹

Now shipping. With built-in smart home hub.

PRIME

Prime members save on...
...s at Whole Foods



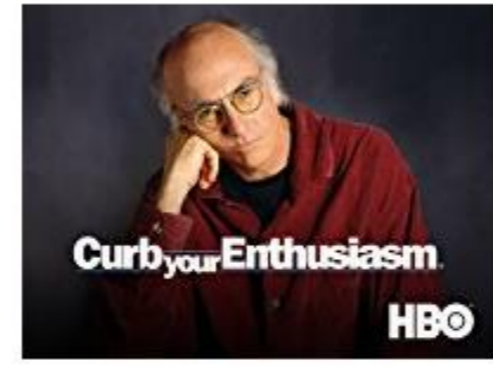
FRESH

NOW AVAILABLE
Try our selection



VIDEO

Recommended for you:
Curb Your Enthusiasm Seaso...



MUSIC

Recommended for you:
The Hamilton Mixtape [Expli...



MEET ALEXA

Voice control your world with
Echo & Alexa devices



RECENT VIEWS

View your browsing history



Related to items you've viewed [See more](#)



Verizon Prepaid.
Save up to \$80/mo

Spies

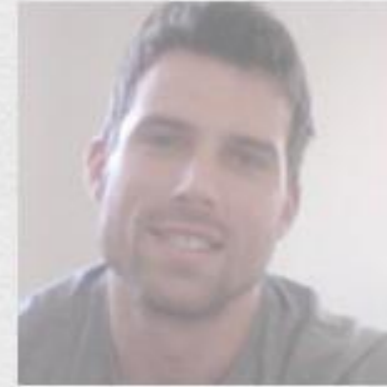
Analysts

Model

Amazon's recommendation system is based on:

- what a user has bought in the past
- which items they have in their shopping cart
- items they've rated and liked
- what other customers have viewed and purchased

Source: Fortune



#1 in dates, relationships and marriages

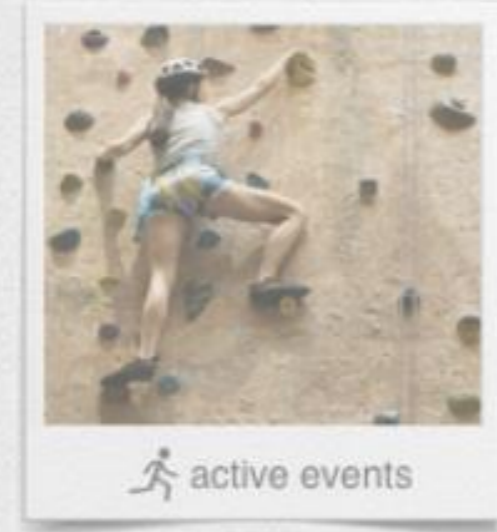


I am a: Seeking a:

Between ages: and

Near ZIP/Postal code:

[View Photos »](#)



active events



happy hours

Do fun stuff, meet cool people
matchevents



cooking classes



game nights

Spies

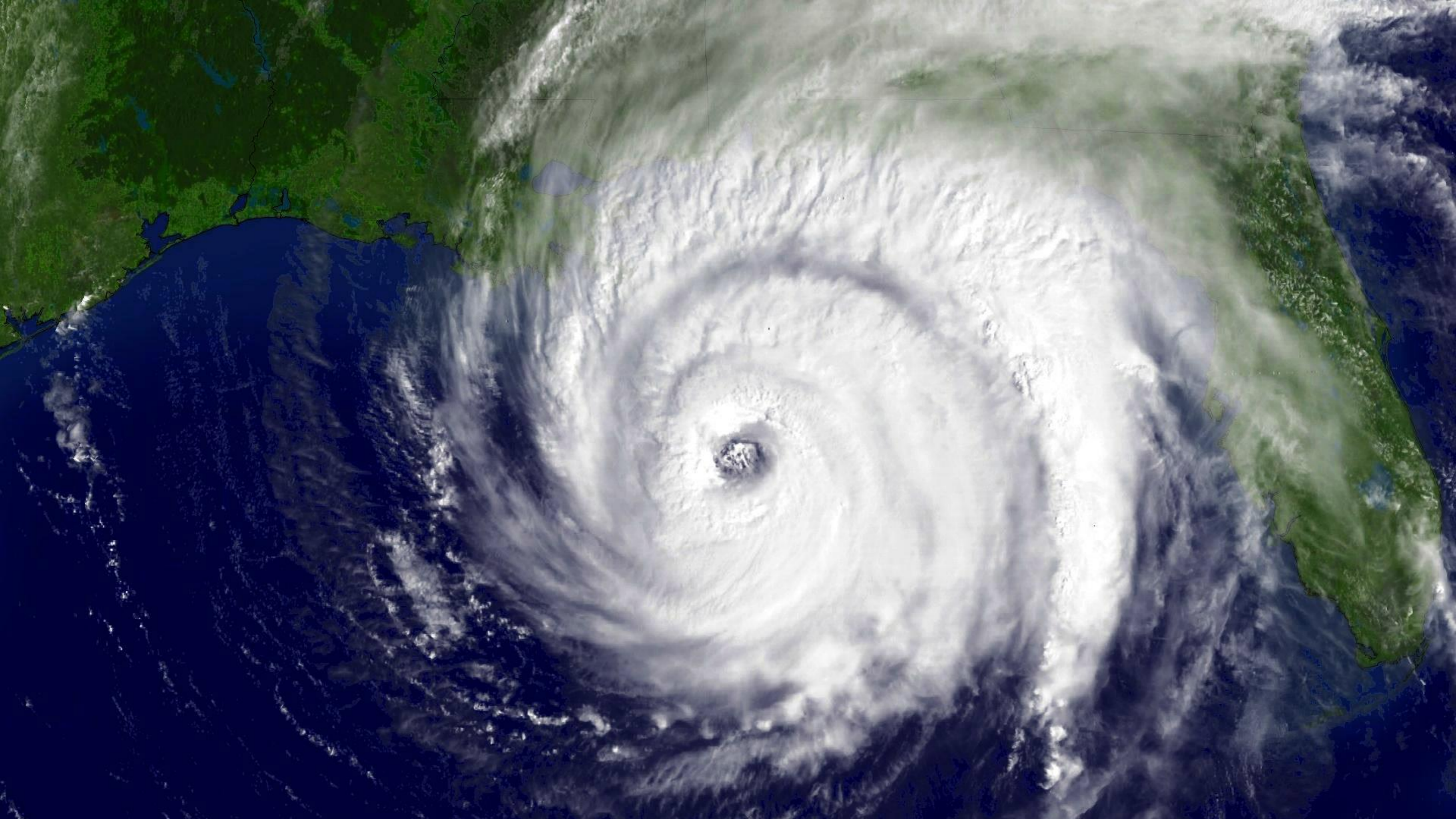
Analysts

Model

The four main components of the equations are:

- what you say
- what you do
- what people like you do
- historical data

Source: Mashable



Spies

Analysts

Model



WAFFLE HOUSE

WAFFLE HOUSE

The index has three levels:

- **Green:** full menu - restaurant has power and damage is limited.
- **Yellow:** limited menu - no power or only power from a generator, or food supplies may be low.
- **Red:** the restaurant is closed - indicating severe damage.

Source: Wikipedia

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 SpaceX make boosters land standing up?
- How does Zillow estimate home prices?
- How does Pandora know what music to play?
- How did the BCS rank college football teams?
- How do they figure out who should speak at a conference?

GOALS

HOW DO WE MAKE SENSE OF MATH MODELING?

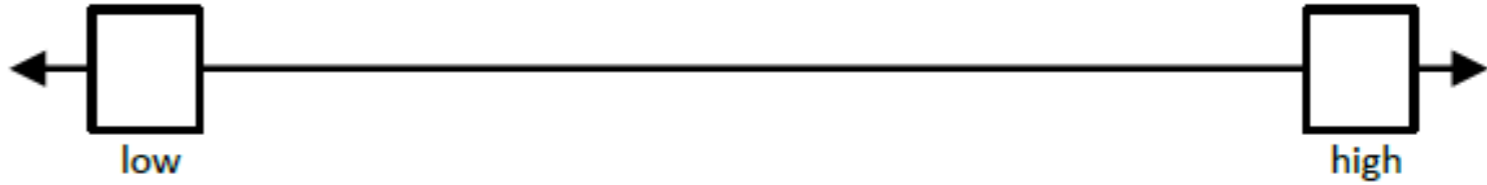
IS IT JUST ANSWERING QUESTIONS?

HOW DO YOU PROFIT FROM MATH MODELING?

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?
	 <p data-bbox="2059 714 2768 752">Place your estimate on the number line.</p>
What info do you already know about the problem?	What info do you need about the problem?
<p data-bbox="736 1001 1685 1365">TOP SECRET!</p>	<p data-bbox="1725 767 2558 1103">SPIES ONLY</p>
What is your conclusion? How did you reach that conclusion?	

Your work

DANGER

**ANALYSTS
AT WORK**

MODELING EXAMPLES

ELEMENTARY SCHOOL

MIDDLE SCHOOL

HIGH SCHOOL



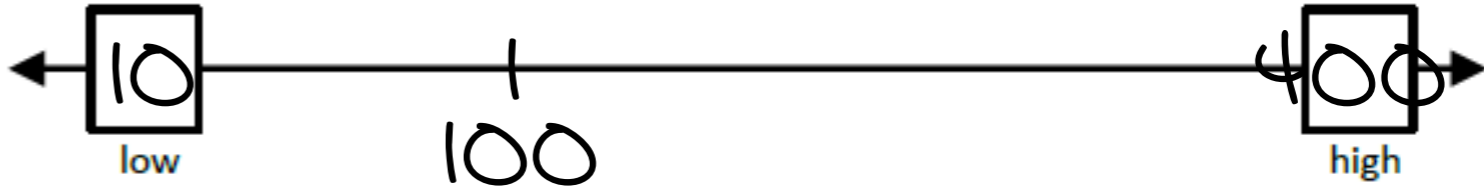
Spies

Analysts

Model



THINKING TIME

What problem are you trying to figure out?	What estimates do you have?
<p>How many beverage choices are there?</p>	 <p style="text-align: center;">Place your estimate on the number line.</p>
What info do you already know about the problem?	What info do you need about the problem?
<ul style="list-style-type: none"> • There are main flavors and added flavors. • Lemonade is yummy. 	<ul style="list-style-type: none"> • How many main flavors are there? • How many added flavors are there? • Can we mix them all together?
What is your conclusion? How did you reach that conclusion?	

COUNT ALL



1		8		16		24		27		32		40		46	
			no caffeine		no caffeine						no caffeine		no caffeine		
2		5		9		13		17		21		28		30	
3		6		10		14		18		22		29		31	
4		7		11		15		19		23		33		37	
				12				20				41		44	
									no caffeine			45		48	
								25				49		52	
									no caffeine			50		53	
								26							

low/no calories

54		62		69		76		84		92		95		103		111		117		125	
					no caffeine		no caffeine		no caffeine		no caffeine		no caffeine		no caffeine		no caffeine				
55		59		63		66		70		73		77		81		85		89			
56		60		64		67		71		74		78		82		86					
57		61		65		68		72		75		79		83		87					
58						80				88				91							
										93											
									no caffeine												
										94											
										96		100		104		108		112			
										97		101		105		109		113			
										98		102		106		110		114			
										99		107									
																115		118			
																116		119			
																120					
																121					
																		122			
																		123			
																		124			

COUNT GROUPS



7



8



8



1



5



8



6



8



low/no calories



8



7



no caffeine



7



no caffeine



8



no caffeine



8



1



2



no caffeine



8



no caffeine



8



no caffeine



6



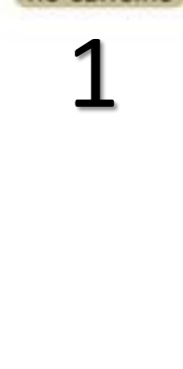
no caffeine



8



no caffeine



1

INVENTED STRATEGY



8

- Coke Cherry
- Coke Raspberry
- Coke Orange
- Coke Vanilla
- Coke Lime
- Coke Cherry Vanilla

8

no caffeine

- Sprite Strawberry
- Sprite Cherry
- Sprite Grape
- Sprite Peach
- Sprite Raspberry
- Sprite Orange
- NEW Sprite Vanilla

8

no caffeine

- Fanta Fruit Punch
- Fanta Strawberry
- Fanta Raspberry
- Fanta Cherry
- Fanta Lime
- Fanta Grape
- Fanta Peach

NEW

7

- Vault Red Berry
- Vault Grape
- Vault Orange
- Vault Peach

7

no caffeine

- Hi-C Fruit Punch
- Hi-C Strawberry
- Hi-C Raspberry
- Hi-C Cherry
- Hi-C Grape
- Hi-C Raspberry Lime
- NEW Hi-C Orange Vanilla

7

no caffeine

- Minute Maid Strawberry
- Minute Maid Cherry
- Minute Maid Orange
- Minute Maid Raspberry
- NEW Minute Maid Fruit Punch

8

no caffeine

- Powerade Fruit Punch
- Powerade Strawberry
- Powerade Raspberry
- Powerade Cherry
- Powerade Lime
- Powerade Grape
- Powerade Lemon

low/no calories

- Coke zero Cherry
- Coke zero Raspberry
- NEW Coke zero Orange
- NEW Coke zero Vanilla
- NEW Coke zero Lime
- NEW Coke zero Cherry Vanilla
- NEW Coke zero Lemon

8

- Coke Diet Cherry
- Coke Diet Raspberry
- Coke Diet Orange
- Coke Diet Vanilla
- Coke Diet Lime
- Coke Diet Cherry Vanilla

8

no caffeine

- Coke Diet Cherry
- Coke Diet Raspberry
- Coke Diet Orange
- Coke Diet Vanilla
- Coke Diet Lime
- Coke Diet Cherry Vanilla

8

no caffeine

- Sprite zero Strawberry
- Sprite zero Cherry
- Sprite zero Grape
- Sprite zero Peach
- Sprite zero Raspberry
- Sprite zero Orange
- NEW Sprite zero Vanilla

8

no caffeine

- Fanta zero Fruit Punch
- Fanta zero Strawberry
- Fanta zero Raspberry
- Fanta zero Cherry
- Fanta zero Lime
- Fanta zero Grape
- Fanta zero Peach

8

NEW

no caffeine

- Dasani Orange
- Dasani Strawberry
- Dasani Raspberry
- Dasani Cherry
- Dasani Lime
- Dasani Grape
- Dasani Peach

8

no caffeine

- Dasani Sensations Orange
- Dasani Sensations Strawberry
- Dasani Sensations Raspberry
- Dasani Sensations Cherry
- Dasani Sensations Lime
- Dasani Sensations Grape
- Dasani Sensations Peach

8

no caffeine

- Minute Maid Light Strawberry
- Minute Maid Light Cherry
- Minute Maid Light Orange
- Minute Maid Light Raspberry
- NEW Minute Maid Light Fruit Punch

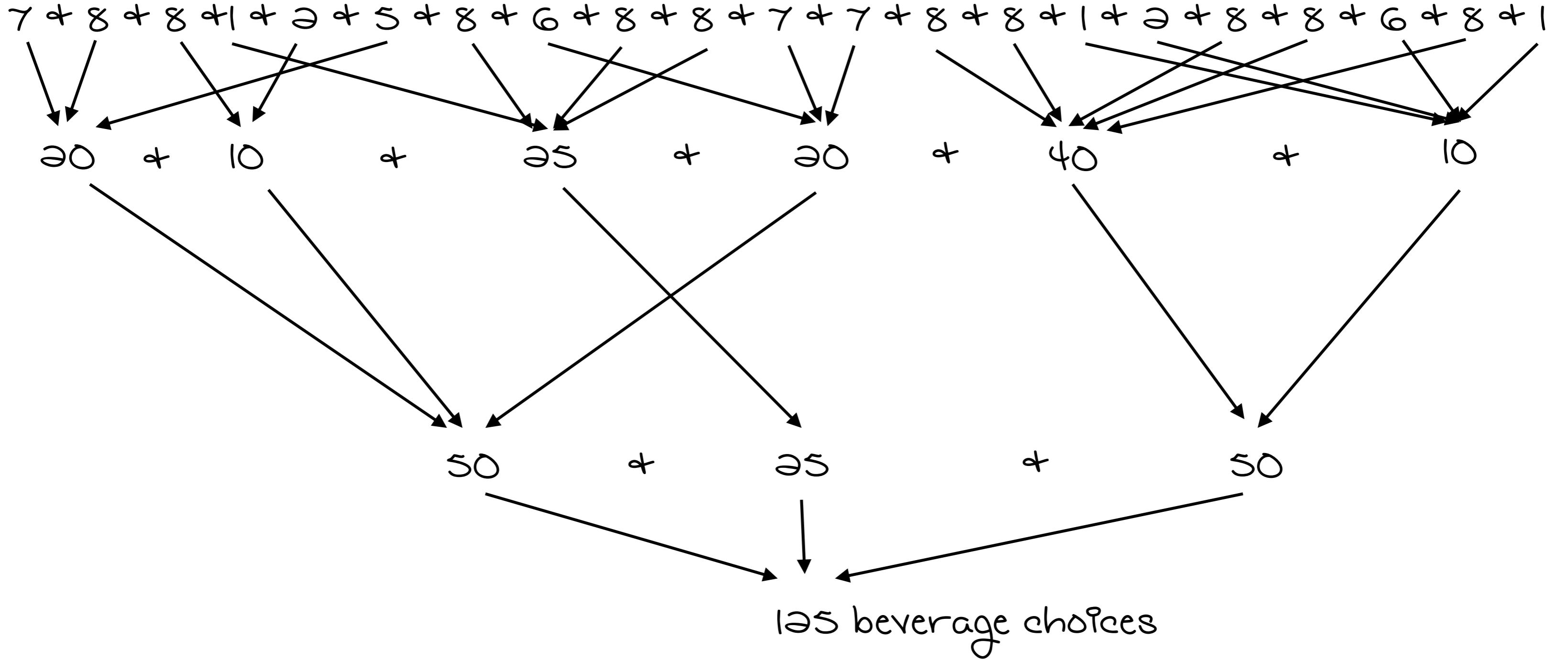
8

no caffeine

- Powerade Zero Fruit Punch
- Powerade Zero Strawberry
- Powerade Zero Raspberry
- Powerade Zero Cherry
- Powerade Zero Lime
- Powerade Zero Grape
- Powerade Zero Lemon

8

NEW



The main attraction for a busload of Dover fifth-graders was supposed to be the Museum of Fine Arts, but that all changed when they stopped by Kelly's Roast Beef and got a glimpse of their soda-drinking future.

At the entrance of Kelly's sat a sleek **Coca-Cola** Freestyle fountain crafted to resemble an old-fashioned vending machine, but with a twist: a touchscreen computer embedded in the machine gives customers **the option of 125 flavors**. You can quench your thirst with a Coke or a Sprite, or try something more exotic — Sprite with Grape or a Hi-C Orange Vanilla.

MODELING EXAMPLES

ELEMENTARY SCHOOL

MIDDLE SCHOOL

HIGH SCHOOL



IVE

FOX
NEWS

Junction

Spies

Analysts

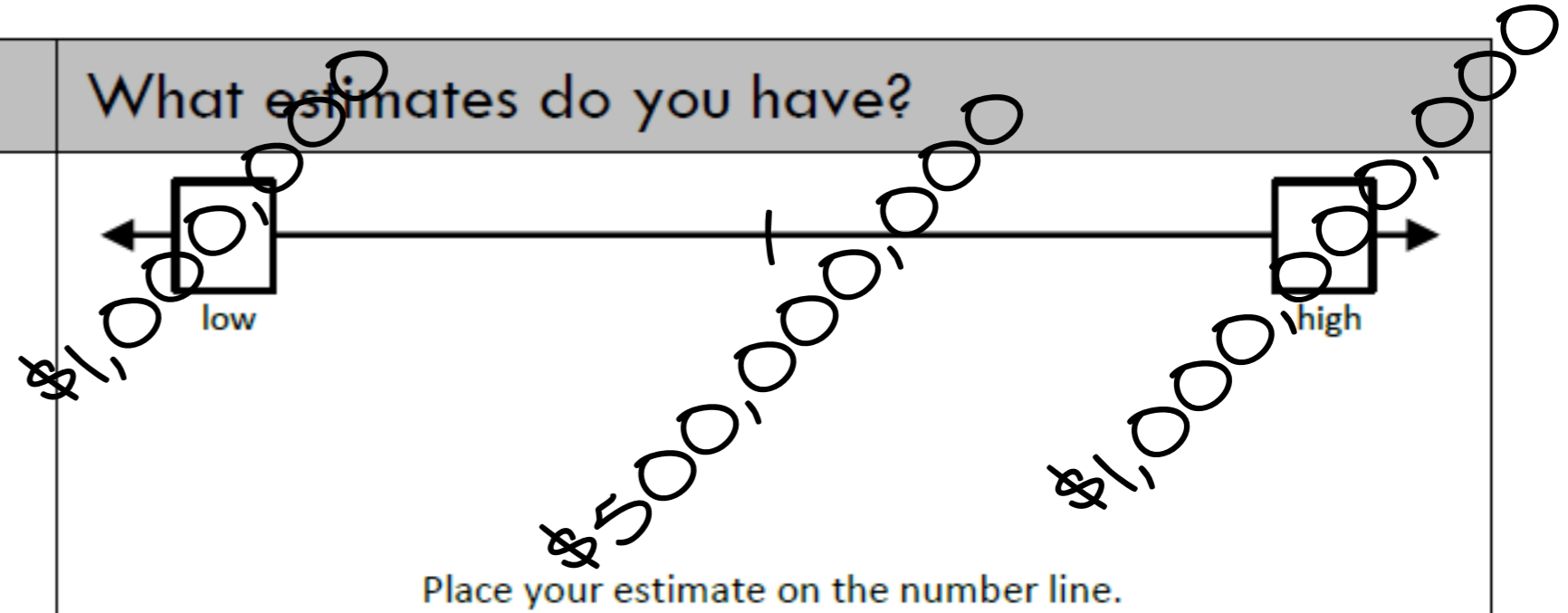
Model

THINKING TIME

What problem are you trying to figure out?

How much money was that?

What estimates do you have?



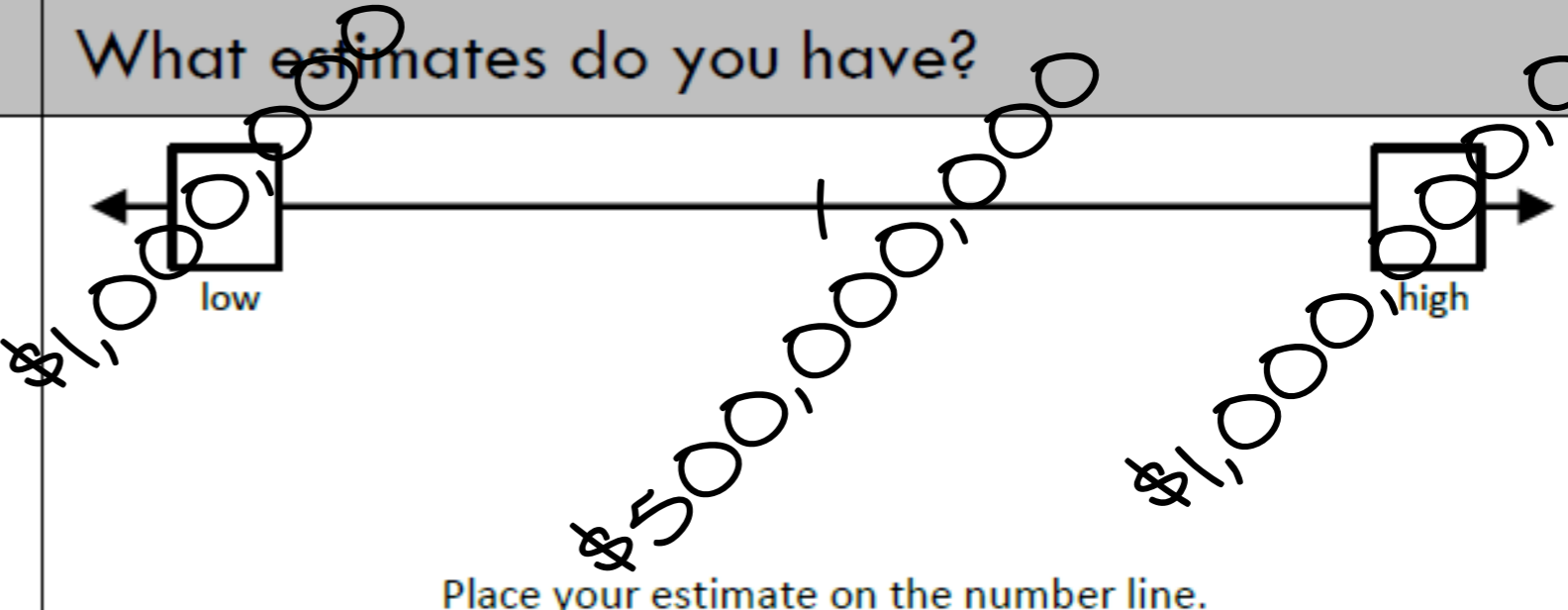
What info do you already know about the problem?

- There is a lot of money.
- It is in a pile.
- It is in bundles.

What info do you need about the problem?

- 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?

What problem are you trying to figure out?	What estimates do you have?
<p>How much money was that?</p>	 <p>Place your estimate on the number line.</p>
What info do you already know about the problem?	What info do you need about the problem?
<ul style="list-style-type: none"> • There is a lot of money. • It is in a pile. • It is in bundles. 	<ul style="list-style-type: none"> • 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?	



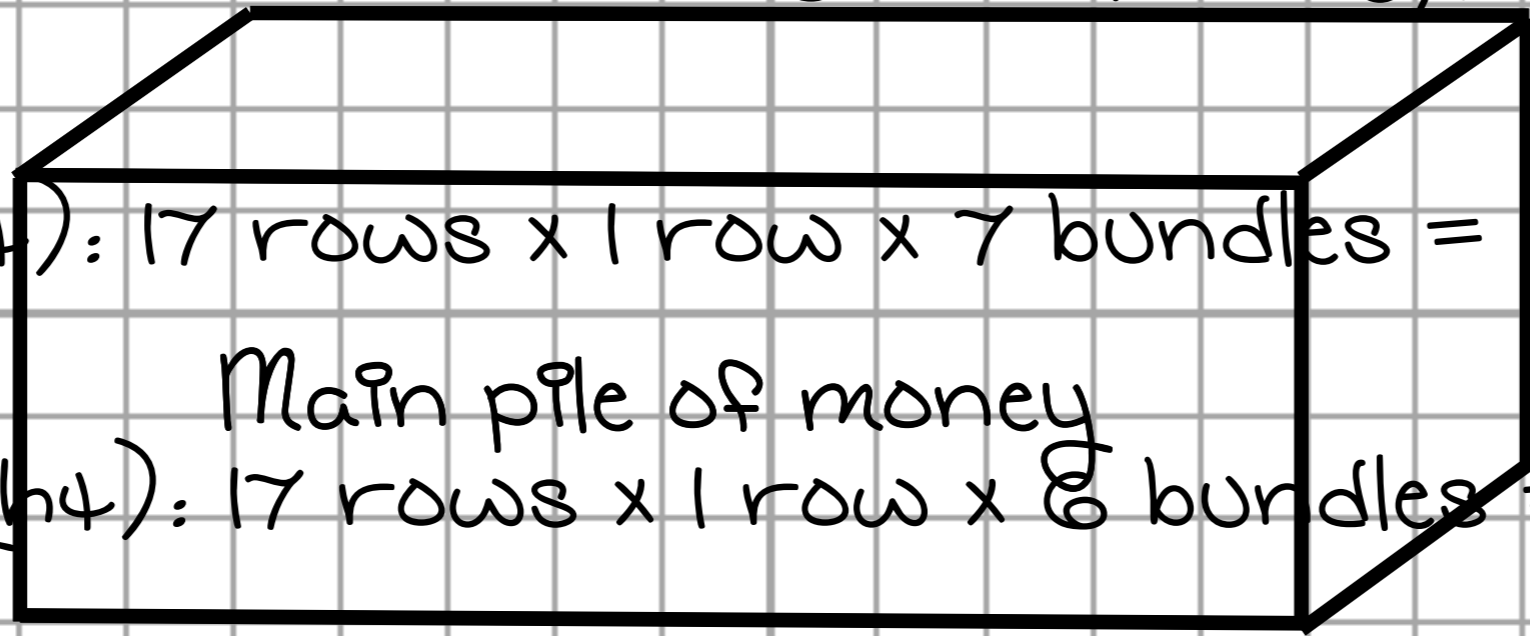


Your work

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

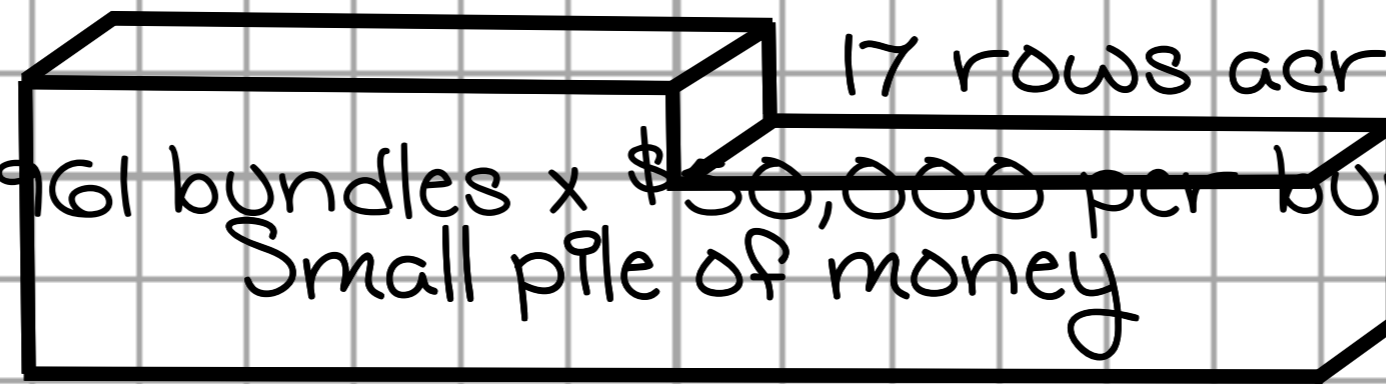
Small pile (left): 17 rows x 1 row x 7 bundles = 19 bundles
10 bundles

Small ^{high} pile (right): 17 rows x 1 row x 8 bundles = 102 bundles
11 rows deep



Total bundles: 3,740 + 19 + 102 = 3,961 bundles
17 rows across

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



8 bundles
high

7 bundles
high

FOX



50%

MODELING EXAMPLES

ELEMENTARY SCHOOL

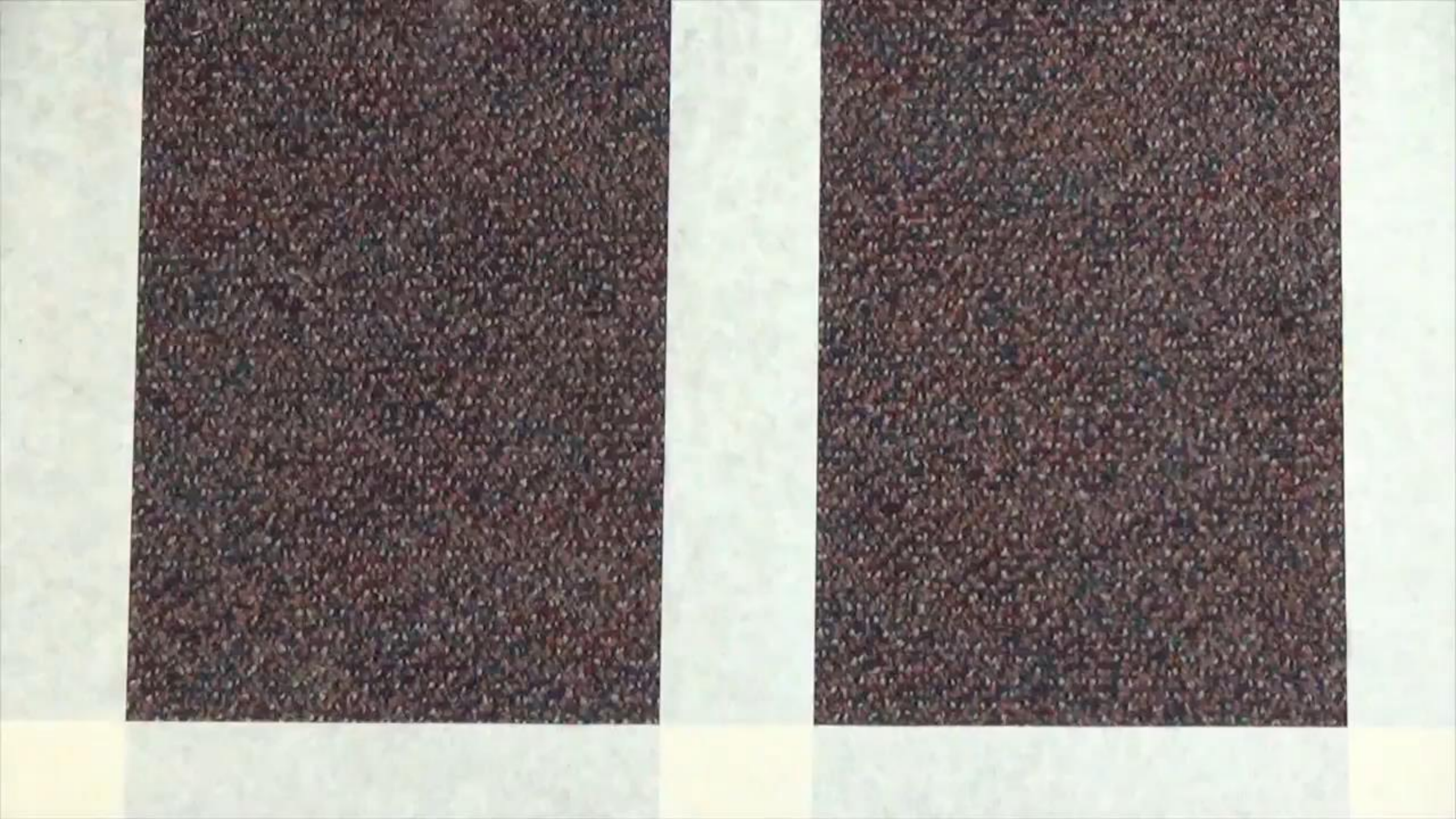
MIDDLE SCHOOL

HIGH SCHOOL



NON-STAGGERED

STAGGERED

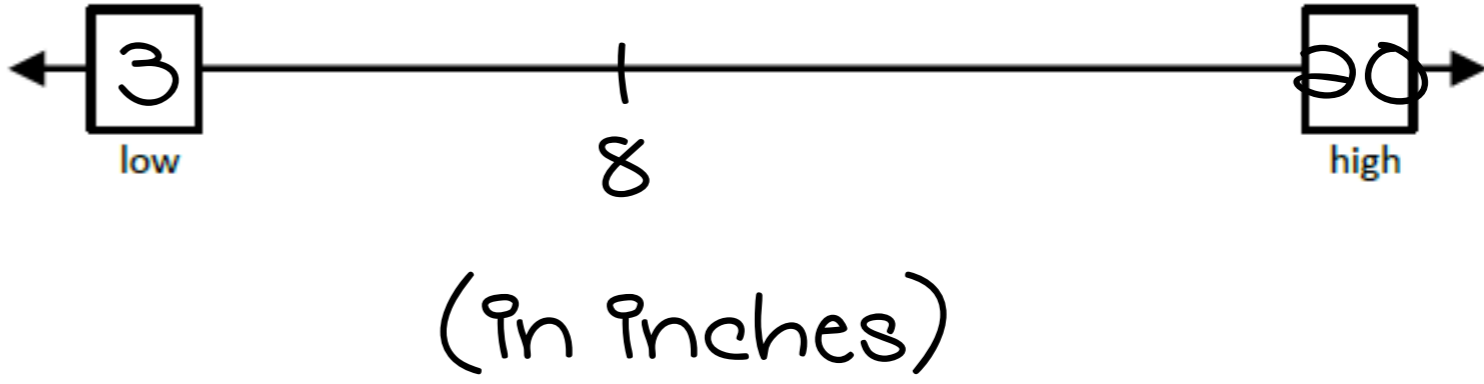


Spies

Analysts

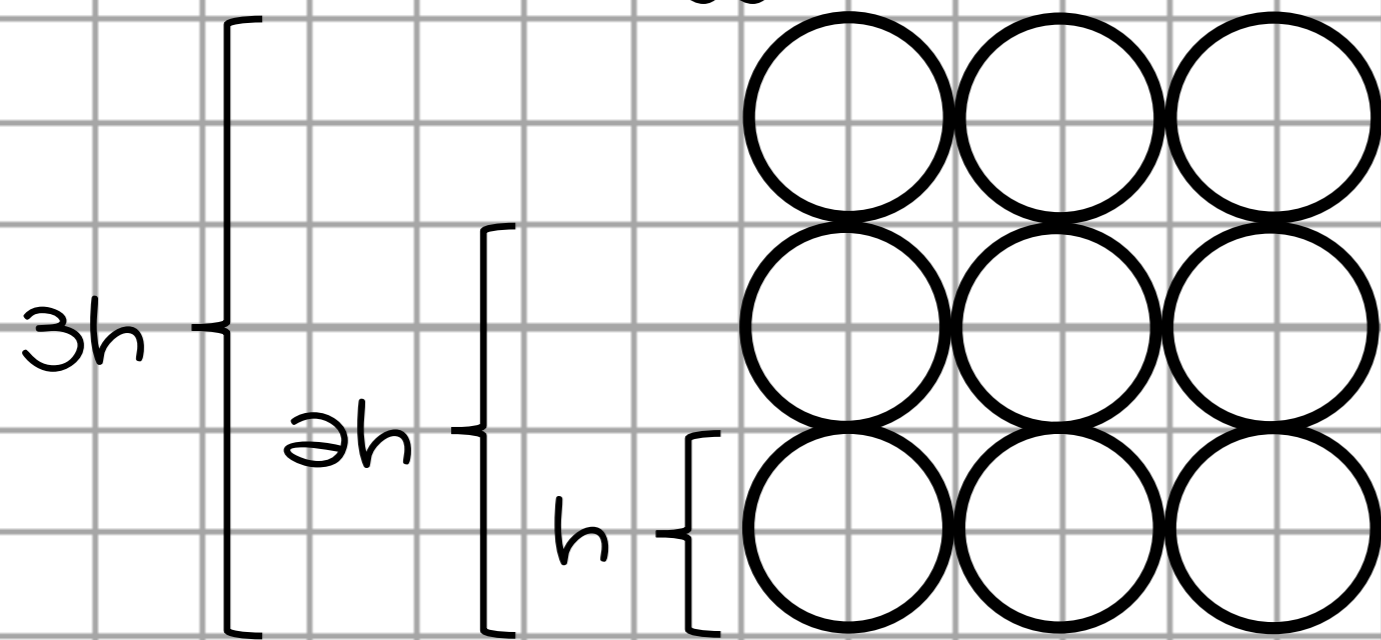
Model

THINKING TIME

What problem are you trying to figure out?	What estimates do you have?
<p>How much shorter are 20 layers of non-staggered pipes?</p>	 <p>(in inches)</p> <p>Place your estimate on the number line.</p>
What info do you already know about the problem?	What info do you need about the problem?
<ul style="list-style-type: none"> • One pile of pipes is staggered. • One pile of pipes is not staggered. • We have to compare 20 layers of each. 	<ul style="list-style-type: none"> • What are the dimensions of a pipe? • What units are we using to measure?
What is your conclusion? How did you reach that conclusion?	



Non-staggered pipes



1 pipe = h cm

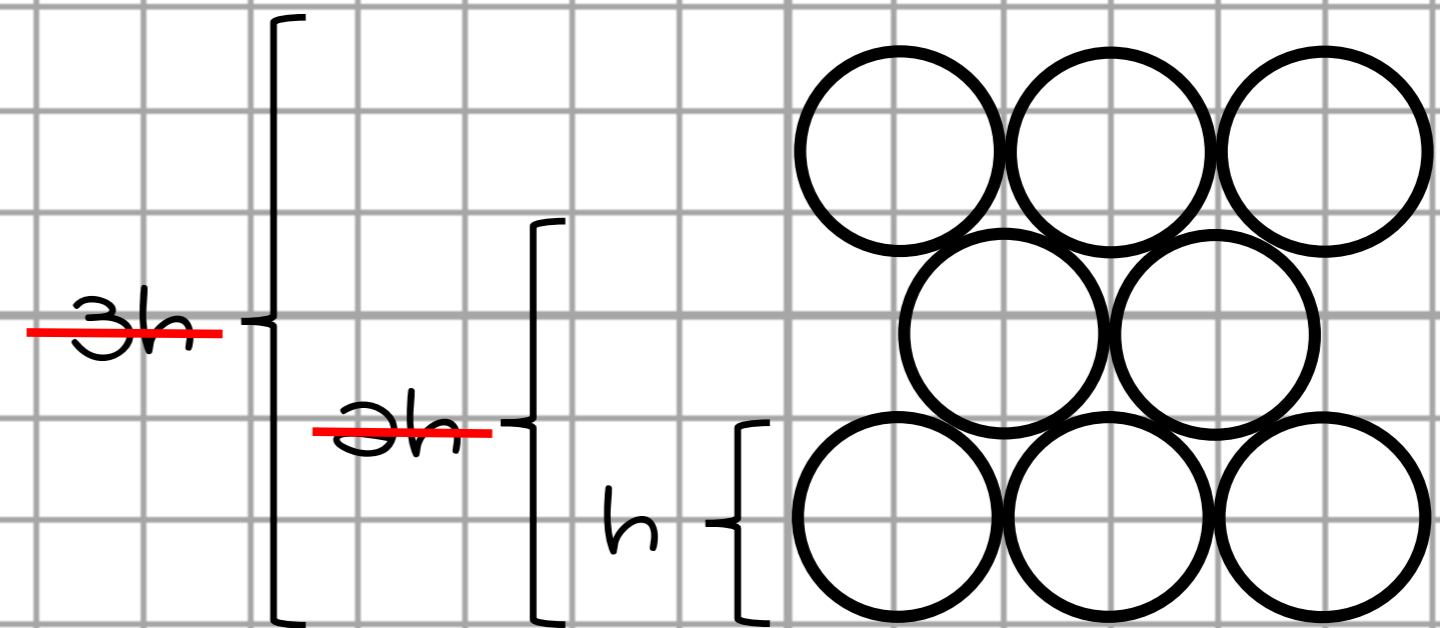
2 pipes = $2h$ cm

3 pipes = $3h$ cm

⋮

n pipes = nh cm

Staggered pipes



1 pipe = h cm

2 pipes = $2h$ cm

3 pipes = $2h$ cm

⋮

n pipes = $2h$ cm

MODELING EXAMPLES

ELEMENTARY SCHOOL

MIDDLE SCHOOL

HIGH SCHOOL

GOALS

HOW DO WE MAKE SENSE OF MATH MODELING?

IS IT JUST ANSWERING QUESTIONS?

HOW DO YOU PROFIT FROM MATH MODELING?

HOW DO WE HELP OUR STUDENTS IMPROVE?

WHERE CAN WE FIND MORE RESOURCES?

PBL RESOURCES

- Problem-based lesson search engine:
robertkaplinsky.com/prbl-search-engine
- My lessons (Elementary, Middle, and High School)
robertkaplinsky.com/lessons
- Dan Meyer (Middle and High School)
threeacts.mrmeyer.com
- Andrew Stadel (Elementary and Middle School)
www.esteemation180.com/lessons.html
- Graham Fletcher (Elementary and Middle School)
gfletchy.com/3-act-lessons



Home



How Much Money IS That?!
(Volume of a rectangular prism)

Search

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First Name

How I Can Help You



Real World Problems

My workshops help teachers implement problem-based lessons by helping them experience them from both student and teacher perspective, leading to increase students' success with performance tasks and the Common Core State Standards.



Depth of Knowledge

Problems at higher depth of knowledge levels have the potential to challenge your most talented student yet remain accessible to everyone. I can help teachers develop best practices for implementing them so that students persevere longer towards finding the solution.

Lessons

- [View all](#)
- [Kinder](#)
- [1st](#)
- [2nd](#)
- [3rd](#)
- [4th](#)
- [5th](#)
- [6th](#)
- [7th](#)
- [8th](#)
- [Alg 1](#)
- [Geo](#)
- [Alg 2](#)



How Much Money Were Those Pennies?



How Can We #SaveNelly?



How Many Chip Bags Will There Be?



How Can We Make Stronger Passwords?

Search

Subscribe for Updates

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First Name

Robert Kaplinsky's Problem-Based Lessons

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	A	B	C	D	E	F	G	H	I
1	Lesson	Concept / Skill	Standard 1	Standard 2	Standard 3	Standard 4	Standard 5	Standard 6	Standard 7
2	How Much Money Were Those Pennies?	Money, Multiplying Decimals, Proportions	4.MD.2	5.NBT.5	5.NBT.7	7.RP.3			
3	How Can We #SaveNelly?	Dividing Decimals	6.NS.3						
4	How Many Chip Bags Will There Be?	Ratio and Proportions, Population Sampling	6.RP.3	6.RP.3c	7.RP.2	7.RP.3	7.SP.1	7.SP.2	
5	How Can We Make Stronger Passwords?	Permutations, Combinations, Probability, Exponents, Exponential Growth	7.SP.8	8.EE.1	S-MD.7	S-CP.5	S-CP.9		
6	How Many Hot Dogs And Buns Should He Buy?	Least Common Multiple (LCM)	6.NS.4						
7	What Does 2000 Calories Look Like?	Unit Rates, Ratios, Solving Equations, and Solving Inequalities	6.EE.3	6.EE.4	6.EE.5	6.EE.6	6.EE.7	6.EE.8	6.RP.2
8	How Much Money Are The Coins Worth?	Decimal Operations and Coin Counting	2.MD.8	5.NBT.7	6.NS.3				
9	How Many Times Will A Case of Paper Jam?	Interpreting Percentages	6.RP.3c	7.RP.3					
10	How Many Soda Combinations Are There On A Coke Freestyle?	Counting, Composing, and Decomposing Numbers	K.CC.5	K.CC.6	K.OA.1	K.OA.2	K.OA.3	K.OA.4	K.NB.1
11	What Should The Freeway Sign Show?	Fractions on Number Lines, Converting Units, Decimal and Fraction Operations	3.NF.1	3.NF.2	3.NF.2a	3.NF.2b	3.NF.3	3.NF.3a	4.MD.1
12	How Fast Was The Fastest Motorcycle Speeding Ticket Ever?	Converting Units and Unit Rates	5.MD.1	6.RP.3d	7.RP.1	N.Q.1			
13	How Much Did Patrick Peterson Lose By Not Cashing His Check?	Compound and/or Simple Interest	7.RP.3	N-RN.2	A-SSE.1	A-SSE.3c	A-SSE.4	A-REI.11	F-IF.4
14	How Many Biscuits Can You Make?	Dividing Fractions and Mixed Numbers	5.NF.7	5.NF.7a	5.NF.7b	5.NF.7c	6.NS.1		
15	How Much Bigger Should They Make Zoolander's School?	Scale and Proportions	5.NF.5A	7.RP.2	7.G.1				
16	Where Is The Freeway Sign Located?	Identifying Fractions on a Number Line	3.NF.1	3.NF.2	3.NF.2a	3.NF.2b	3.NF.3	3.NF.3a	3.NF.3b
17	How Far Apart Are Exits On A Ring Road?	Arc length measures	G-C.5						
18	How Much Is One Third Of A Cup Of Butter?	Identifying Fractions on a Number Line	3.NF.1	3.NF.2	3.NF.2a	3.NF.2b	3.NF.3	3.NF.3a	3.NF.3b
19	How Do Skytypers Write Messages?	Transformations (Rotations, Reflections, Dilations, and Translations)	8.G.1	8.G.2	8.G.3	8.G.4	G-CO.2	G-CO.3	G-CO.4
20	How Big Is The Bermuda Triangle?	Coordinate Geometry: Area of Triangle	G-GPE.7						
21	What Fraction Of Children Are In The Right Car Seat?	Representing and Comparing Fractions	3.NF.1	3.NF.2	3.NF.3	4.NF.1	4.NF.2		
22	How Much Did The Temperature Drop?	Absolute Value	6.NS.7c	7.NS.1c					
23	How Much Shorter Are Staggered Pipe Stacks?	Circles, Pythagorean Theorem, trigonometric ratios, and linear functions	8.G.7	A-CED.1	A-CED.3	A-CED.4	A-SSE.1a	A-SSE.1b	A-SSE.1c
24	How Do You Write A Check To Pay For Something?	Expanded Form	2.NBT.3	4.NBT.2	5.NBT.3a				
25	How Can We Correct The Scarecrow?	Pythagorean Theorem	8.G.6	G-SRT.4					
26	How Much Does A 100x100 In-N-Out Cheeseburger Cost?	Building and Interpreting Linear Functions	8.F.1	8.F.3	8.F.4	8.F.5	F-IF.4	F-IF.5	F-IF.6
27	How Can We Water All Of The Grass?	Circles, Pythagorean Theorem, trigonometric ratios	7.G.4	8.G.7	G-SRT.8	G-MG.1	G-MG.3		
28	How Much Money IS That?!	Volume of rectangular prism	5.MD.3	5.MD.4	5.MD.5	5.MD.5b	5.MD.5c	6.G.2	7.G.6
29	How Much Money Should Dr. Evil Demand?	Exponential Growth	N-RN.2	A-SSE.1	A-SSE.3c	A-SSE.4	A-REI.11	F-IF.4	F-IF.7
30	How Tall Is Mini-Me?	Scale and Dividing Decimals	5.NF.5	5.NF.5a	5.NF.5b	6.NS.3			
31	How Did They Make Ms. Pac-Man?	Transformations (Rotations, Reflections, and Translations)	8.G.1	8.G.2	8.G.3	8.G.4	G-SRT.2	G-CO.4	G-CO.5
32	Which Ticket Option Is The Best Deal?	Unit Rates and Ratios	6.RP.2	6.RP.3	6.RP.3a	6.RP.3b			
33	How Far Apart Are The Freeway Exits?	Fractions on a Number Line and Subtracting Fractions	3.NF.2	3.NF.2b	4.NF.2	4.NF.3a	4.NF.3c	4.NF.3d	5.NF.1
34	Do We Have Enough Paint?	Area	3.MD.5	3.MD.6	3.MD.7				

GOALS

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WHERE CAN WE FIND MORE RESOURCES?



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