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Balancing Risk in a Changing Climate

We Use Deep Learning to Reshape the Reinsurance Industry

ourkettle.com

Nathaniel Manning & Andrew Engler

Andrew Engler - CEO

- VP of ML and Digital Products at Argo, built $72M+ in new product revenue
- Head of Commercial Operations - Allstate AZ

Nathaniel Manning - COO

- Six years CEO of Ushahidi, largest crisis response software platform.
- First Chief Data Officer, USAID

Son Le - CTO

- Head Quant Engineer at Argo
- Built tech that resulted in $72M+ of business
- Masters Mathematics, AI speciality Courant School NYU

Nigel Mortimer - Chief Underwriting Officer

- President, Executive VP at Argo - 12 years
- Built Argo from $800M to $2B/year gross revenue
- EVP of Product at XL Catlin, a $14B/year re/insurer

+ Additional engineering team of 2

Our Team

Combines Technology & Reinsurance Experience

What we have done

Built $72M+ in new business at Argo Group using Digital + ML products

ARGO GROUP

Built largest open source crisis response & mapping software platform in the world to 200,000+ deployments and 1M+ users

Ushahidi

$300B

Industry that is 630 years old, and still uses approved rubber stamps

Our Industry
Reinsurance is the Safety Net Below the Safety Net

Allstate insures millions of homes in CA

They can't handle a catastrophic event (like a wildfire), where they lose 50k+ homes at once
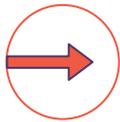
So they buy coverage from reinsurers, like Kettle.

Reinsurers, like Kettle, also pass risk to bigger reinsurers like MunichRE, or Capital Markets, like pension funds.

3x

Increase In $1B+ Catastrophes Over Past 15 Years

Our Problem
Climate Change & Globalization are Changing the Fundamentals of Reinsurance

68%

Drop in Reinsurance Return on Equity Over Last 10 Year

ROE of top 50 Reinsurers

15%

10%

5%

10 11 12 13 14 15 16 17 18 19 20?

Our Timing Is Perfect

Reinsurance is Going to be Remade

Outdated Models
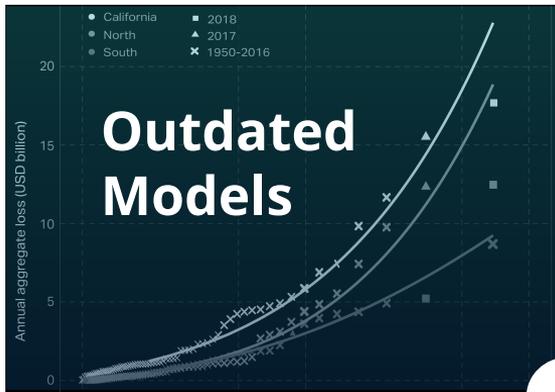
$200B+ in claims from COVID-19 & Climate Crises

80%+
Increase in price/demand for wildfire reinsurance

+

Tech & Data for ML now affordable and available

Insurtech focused on distribution

→

30%+
Underinsured/uninsured

White Space
Reinsurers don't have AI experience, AI experts in insurance take a SaaS approach

The Models Are No Longer Working

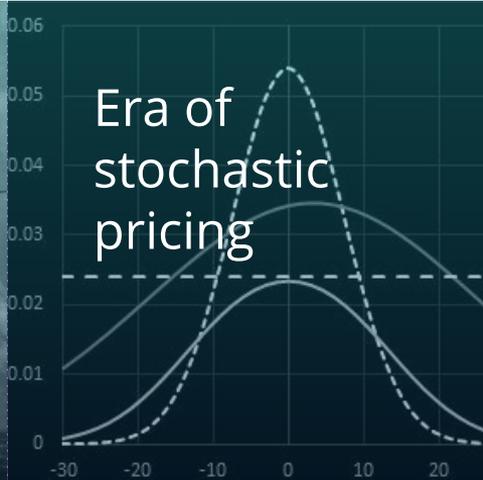Take the last 500 years, run 100k simulations $\longrightarrow$ Predict the next 10 years using frequency of previous fires

1600-1900	1900 - 2020	2010-2020	NOW

Era of simple pricing for merchant vessels

Era of stochastic pricing

Climate change takes effect, the models break down

Era of real-time, accurate pricing through ML

Our Moat

Asynchronous Data
(satellite imagery)

+

Swarm Neural Networks
(derived from robotics)

=

22%+ Higher
Precision
/Recall

We divide CA into **320,000 micro grids** each 0.5 square miles

Get 320m satellite images in unstructured data

Translate into computer readable format through CV

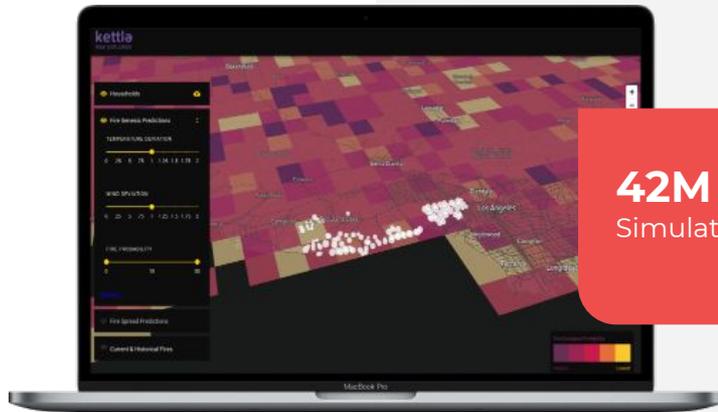**Run a swarm of 115,456** separate neural network nodes

$3x10^{42}$ This equates to **42.3mm simulations and gives us...**

=

84.7% Precision/recall
Compared to 62% industry standard

Our Validation

Kettle RE Model
Prices risk at 0.5 sq miles

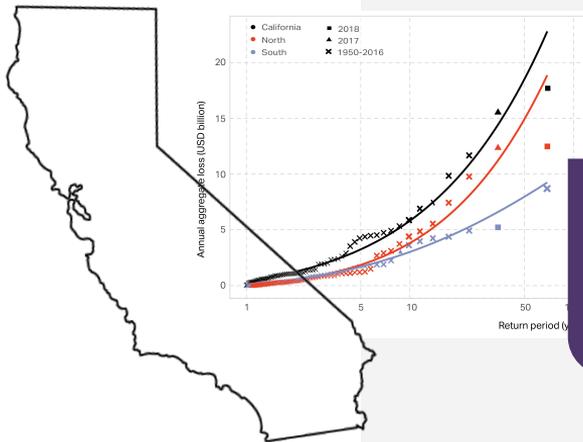**42M** Simulations → **84.7%** Precision/Recall → **7-20%** Return on Capital

Kettle Delivers
18% Higher
Returns

Standard Industry RE Model
Prices risk at state-wide level
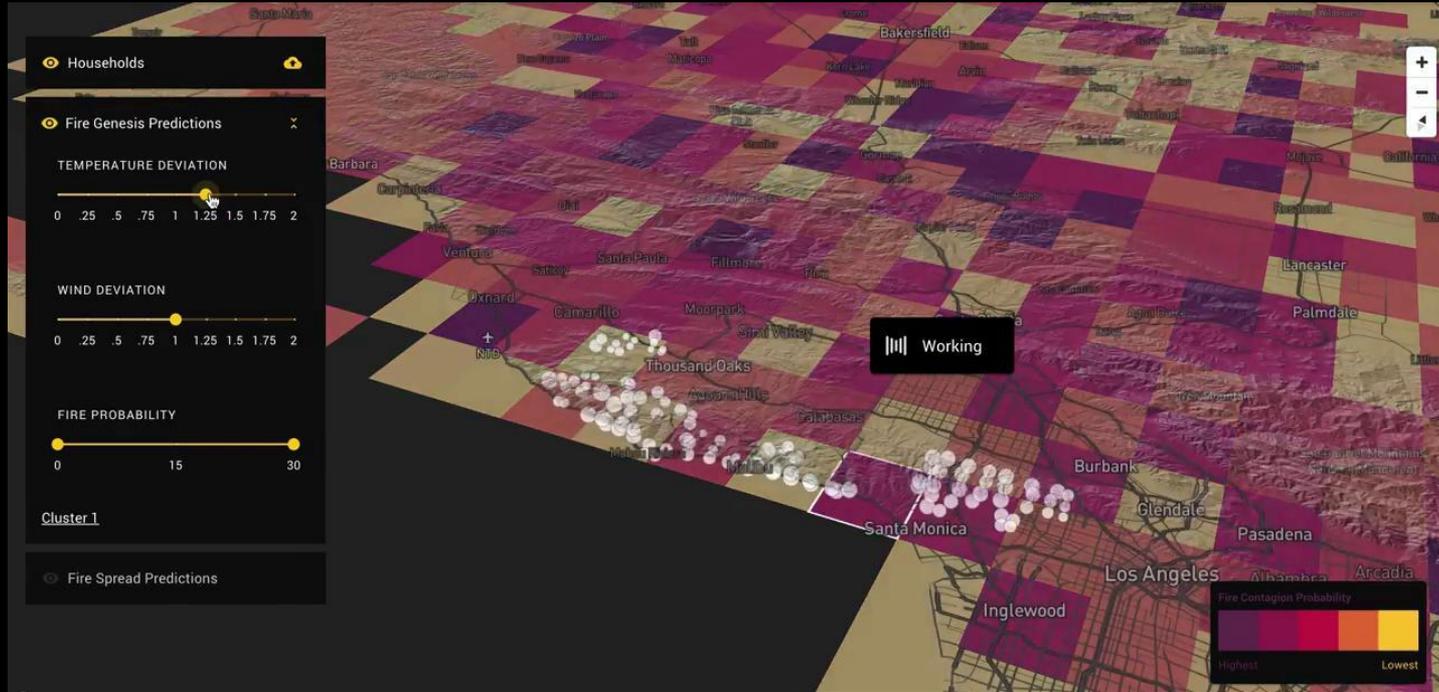
100K Simulations → **62%** Precision/Recall → **1-2%** Return on Capital

We Use Deep Learning
To Price Our Reinsurance Products with High Resolution

1. Product is live
2. Pre-approved by Bermuda Authority for MGA or Class III Reinsurer
3. First customer, Allstate, in negotiation
4. Secured Guy Carpenter, second largest RE broker in the world

"Kettle unlocks **hundreds of millions** of dollars of premium by eliminating wildfire risk."
- Bobby Feldman,
CEO Largest Allstate Fire Broker CA

Our Business Model & First Customer

Because of Fire, Primaries Can't Write $500M+ in Premium

Primaries are **missing out on $500mm - $1bn in** auto/homeowners premium because they can't take fire risks

Kettle covers portfolio of homes fire risk and charges a **30% premium**, and transfers them to a reinsurer

Kettle keeps **18% net revenue**
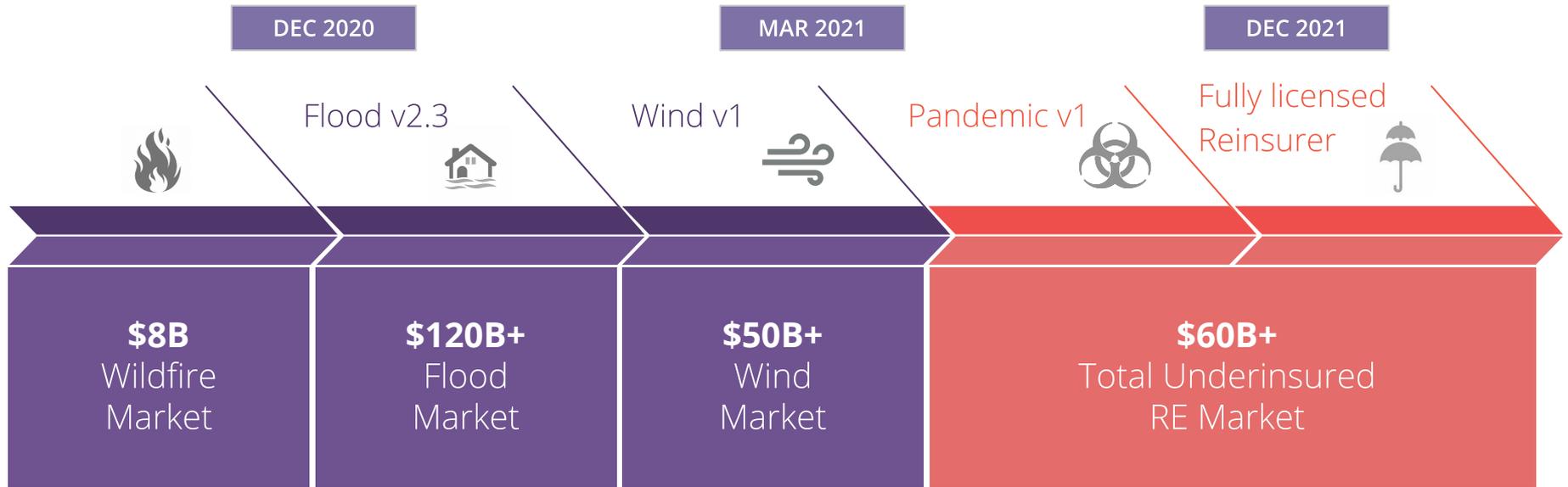
75% - Capacity Provider

7% - Broker Fee (CAC)

18% - Net Revenue

Our $238B+ Serviceable Market

We Will Diversify Our Risk Quickly Into Other Reinsurance Products

DEC 2020

MAR 2021

DEC 2021

Flood v2.3

Wind v1

Pandemic v1

Fully licensed Reinsurer

$8B
Wildfire
Market

$120B+
Flood
Market

$50B+
Wind
Market

$60B+
Total Underinsured
RE Market

An Opportunity in the Competitive Landscape

Large Market with White Space Between Tech and Reinsurance

Entrenched reinsurers lack innovation in a $300B+ market

Technology competitors don't have reinsurance expertise, and take Saas approach, only a $8B market

Swiss Re

AKUR8

Munich RE

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CAPE

HELIX RE

SOTERIS
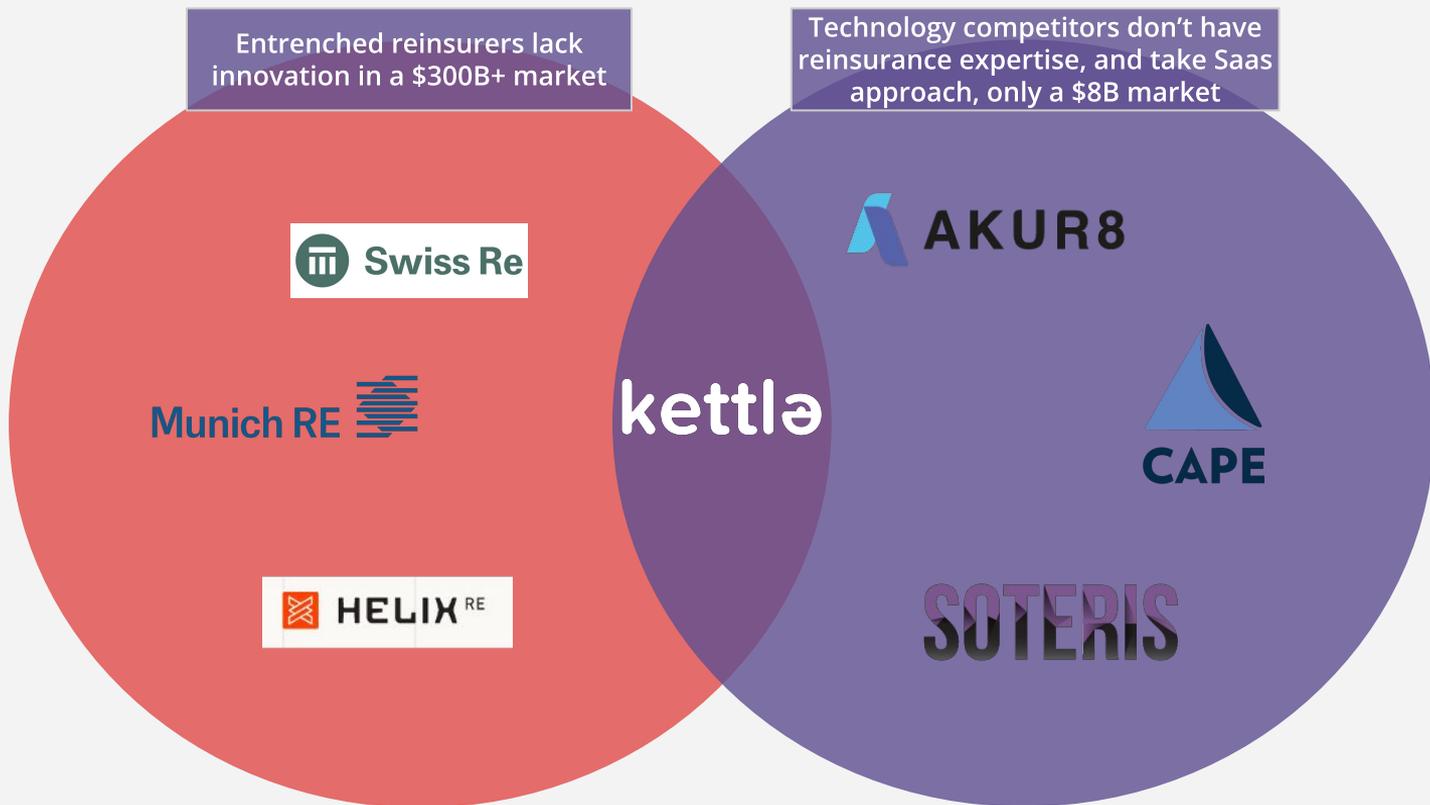
Raising $4.6M To Give Us an 18 month Runway

And to hit $1M/month in recurring revenues

APPENDIX

Our Go To Market

License, first customer, capacity, and broker in negotiation → Land and Expand

RenaissanceRe

- Bermuda license secured
- Capacity in negotiation

GUY CARPENTER

- Our broker helps us expand
- 10 customers insure 80% of the $9B market

Allstate
You're in good hands.

- First customer in negotiation,
- 5th largest CA insurer ($550M)
- Potential contract size of $90M
-

Diversify and expand into flood, wind, and pandemic across USA

Raising $2.5 Million To Give Us 18 Month Runway

	Q3'20	Q4'20	Q1'21	Q2'21	Q3'21	Q4'21	Q1'22	Q2'22	TOTAL
Total Contracts	1	4	8	21	36	51	66	81	81
GROSS PREMIUMS	**$20,833**	**$187,500**	**$395,833**	**$1,020,833**	**$1,937,500**	**$2,875,000**	**$3,812,500**	**$4,750,000**	**$15,000,000**
Cost of Capacity (75%)	$1,458	$13,125	$27,708	$71,458	$135,625	$201,250	$266,875	$332,500	$1,050,000
Broker fee/CAC (7%)	$17,083	$140,625	$296,875	$765,625	$1,453,125	$2,156,250	$2,859,375	$3,562,500	$11,251,458
NET REVENUE	**$2,292**	**$33,750**	**$71,250**	**$183,750**	**$348,750**	**$517,500**	**$686,250**	**$855,000**	**$2,698,542**
Personnel	$263,500	$288,500	$439,750	$439,750	$469,750	$469,750	$469,750	$469,750	$3,416,500
Direct Costs	$72,449	$87,116	$137,199	$137,199	$207,199	$207,199	$207,199	$207,199	$1,262,759
TOTAL EXPENSES	**$353,032**	**$529,366**	**$901,532**	**$1,414,032**	**$2,265,699**	**$3,034,499**	**$3,803,199**	**$4,571,949**	**$16,979,259**
Profit	($332,119)	($341,866)	($505,699)	($393,199)	($328,199)	($159,449)	$9,301	$178,051	
Cash in the bank	**$2,167,801**	**$1,825,935**	**$1,320,236**	**$927,037**	**$598,838**	**$439,389**	**$489,291**	**$626,741**	

An Opportunity in the Competitive Landscape

Large Market with White Space Between Tech and Reinsurance

	kettle	The Current Reinsurance Market		Similar Tech, SaaS Biz Model		
		Swiss Re	HELIX RE	AKUR8	CAPE	SOTERIS
Market Size	**$238B**	$300B	$75B	$8B	$8B	$8B
Product value	**More accurate & can hold risk**	Reinsure your risk	MGA - Can write and transfer risk	AI analytics as a service	AI analytics as a service	AI analytics as a service
Accuracy of models	**84.6%**	62%	62%	unknown	unknown	unknown
Business model	**RE/Insure and transfer risk using AI models**	Insure risk	Insurance provider who brokers risk	SaaS underwriting and data service	SaaS underwriting and data service	SaaS underwriting
Our competitive advantage		More accurate models = competitive pricing	More accurate models = competitive pricing	Larger market + we sell risk and earn % of premium vs selling SaaS	Larger market + we sell risk and earn % of premium vs selling SaaS	Larger market + we sell risk and earn % of premium vs selling SaaS

Traction & Milestones

PAST

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Team forms. Start researching and building

Build and test multiple products. Evacuation insurance, Fire model, etc..

JUN 2019	SEP 2019	DEC 2019

NOW

Finish wildfire model.

Launch Wildfire product

MGA paper finalized

MAR 2020	JUN 2020	SEP 2020

$100M in capacity secured

NEXT

Launch flood/wind products

Pilot pandemic model

Start holding risk ourselves

DEC 2020	MAR 2021	JUN 2021

$125k in monthly recurring revenue

$250k in monthly recurring revenue

$500k in monthly revenues

Our Business Model
As An MGA We Analyze, Hold, & Transfer Risk

Insurers buy reinsurance from us. avg contract value of $250k/year

We transfer the majority of the risk to our capacity providers or to ILS.
We keep 25% commission

We use our models to analyze their portfolios, and we reinsure their risk

Our customers are insurance companies

Because our models are more accurate, we offer more accurate pricing and higher coverage

35%+ Of Risk Transfer Costs Can be Saved by Fixing Inaccurate Models & Inefficiencies

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Broker writes insurance policy

Insurer pools risk into portfolios

The insurer reinsures their portfolios against catastrophic risk (through a broker)

Reinsurers pool multiple policies and buy additional insurance from a Retrocessional (through a broker)

Capital Markets buy risk as a bond, post collateral, and get a return on investment (through a broker)

Our Data

1.2 terabytes of local data

3 petabytes of total available data

1. 1.88 million wildfires in the U.S. - National Fire Program Analysis System
2. All us Weather data since 1980 - Arcgis
3. 26,000 weather stations with daily data feed - Arcgis
4. U.S. Landsat 4-8 Analysis Ready Data (ARD) Level-2 Tiles (Albers projection)
5. ASTER Global Emissivity Dataset 100-meter V003 - AG100
6. ASTER Global Emissivity Dataset 1-kilometer V003 - AG1KM
7. Global Food Security-support Analysis Data (GFSAD) Cropland Extent 2010 North America 30 m V001
8. Global Land Cover Characterization: 1992-1993
9. Global Multi-Resolution Terrain Elevation Data
10. Global Topographic 30 Arc-Second Digital Elevation Model: Released 1996
11. Landsat 7 Enhanced Thematic Mapper Plus Collection 1 Level-1
12. Landsat 7 Collection 1 Level-2 Scene Products (Surface Reflectance)
13. MODIS/Terra and Aqua MAIAC Land Surface BRF Daily L2G Global 500 m and 1 km SIN Grid Version 6
14. MODIS/Terra and Aqua MAIAC Land Aerosol Optical Depth Daily L2G 1 km SIN Grid Version 6
15. MODIS/Terra and Aqua MAIAC BRDF Model Parameters Daily L3 1 km SIN Grid Version 6
16. MCD43A1: MODIS/Terra and Aqua BRDF/Albedo Model Parameters Daily L3 Global 500 m SIN Grid Version 6
17. MCD43A2: MODIS/Terra and Aqua BRDF/Albedo Quality Daily L3 Global 500 m SIN Grid Version 6
18. MCD43A3: MODIS/Terra and Aqua Albedo Daily L3 Global 500 m SIN Grid Version 6
19. MCD43A4: MODIS/Terra and Aqua Nadir BRDF-Adjusted Reflectance Daily L3 Global 500 m SIN Grid Version 6
20. MODIS/TERRA MOD09A1 Surface Reflectance 8-Day L3 Global 500m Version 6
21. MODIS/TERRA MOD09GA Surface Reflectance Daily L2G Global 1km and 500m Version 6
22. MODIS/TERRA MOD09GQ Surface Reflectance Daily L2G Global 250m Version 6
23. MODIS/TERRA MOD09Q1 Surface Reflectance 8-Day L3 Global 250m Version 6
24. MODIS/COMBINED MOD11A1 Land Surface Temperature and Emissivity Daily L3 Global 1 km Grid SIN Version 6
25. MODIS/TERRA MOD11A2 Land Surface Temperature & Emissivity 8-Day L3 Global 1km Version 6
26. MODIS/TERRA MOD11B1 Land Surface Temperature and Emissivity Daily L3 Global 5 km Grid SIN Version 6
27. MODIS/TERRA MOD11B2 Land Surface Temperature and Emissivity Daily L3 Global 5 km Grid SIN Version 6
28. MODIS/TERRA MOD11_L2 Land Surface Temperature and Emissivity 5-Minute L2 Swath 1 km Version 6
29. MODIS/TERRA MOD13A1 Vegetation Indices 16-Day L3 Global 500m Version 6
30. MODIS/TERRA MOD13A2 Vegetation Indices 16-Day L3 Global 1km Version 6
31. MODIS/TERRA MOD13Q1 Vegetation Indices 16-Day L3 Global 250m Version 6
32. MODIS/TERRA MOD14A1 Thermal Anomalies & Fire Daily L3 Global 1km Version 6
33. MODIS/TERRA MOD14A2 Thermal Anomalies & Fire 8-Day L3 Global 1km Version 6
34. MODIS/TERRA MOD14 Thermal Anomalies & Fire 5-Min L2 Swath 1km Version 6
35. MODIS/TERRA MOD15A2H Leaf Area Index - Fraction of Photosynthetically Active Radiation 8-Day L4 Global 500 m Version 6
36. MODIS/Terra Net Evapotranspiration 8-Day L4 Global 500 m SIN Grid Version 6
37. MODIS/TERRA MOD17A2H Gross Primary Productivity 8-Day L4 Global 500m SIN Grid Version 6
38. MODOCGA: MODIS/Terra Ocean Reflectance Daily L2G-Lite Global 1 km SIN Grid Version 6
39. U.S. Landsat 4-8 Burned Area (BA) Landsat Science Product Tiles (Albers projection)
40. U.S. Landsat 4-8 Dynamic Surface Water Extent (DSWE) Landsat Science Product Tiles (Albers projection)
41. Shuttle Radar Topography Mission 1 Arc and 3 Arc Second Digital Terrain Elevation Data
42. Shuttle Radar Topography Mission 1 Arc and 3 Arc Second Digital Terrain Elevation Data - Void Filled
43. Shuttle Radar Topography Mission 1 Arc-Second Digital Terrain Elevation Data - Global
44. NASA Shuttle Radar Topography Mission (SRTM3) Global 1 arc-second
45. NASA Shuttle Radar Topography Mission (SRTM3) Global 3 arc-second
46. NASA Shuttle Radar Topography Mission (SRTM3) Global 30 arc-second
47. NASA Shuttle Radar Topography Mission (SRTM3) Global 3 arc-second sub-sampled

A PICTURE IS WORTH A THOUSAND WORDS
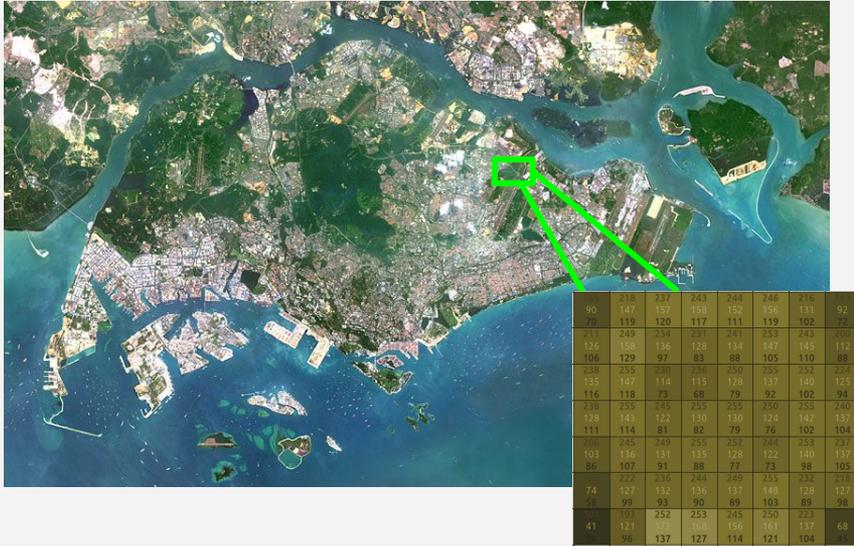
The most important data for underwriting is unreadable by computers (satellite images, weather maps, etc.)

Every image, video, document, or file is a soup of data points

We built an ETL pipeline to notate and order all this unstructured data to run our insurance models

Swap Markets Allow for dynamic pricing and liquidity

Instead of pricing large areas using inaccurate historical data

Use real-time, hyper accurate Swarm NN to produce precision priced products

Create hyper specific returns and match them to markets with appetite
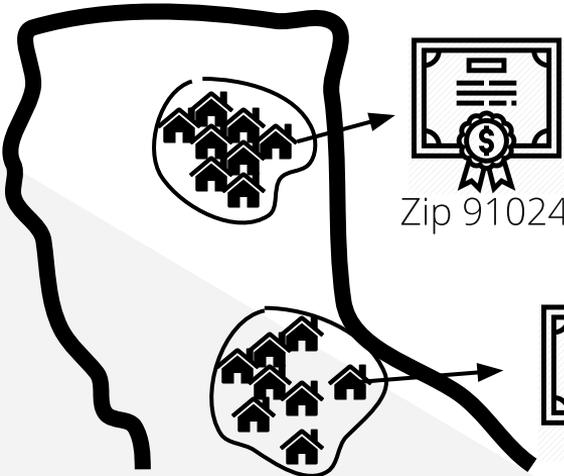
$25m xs $125m
4% ROL
1 year term
Low Level Risk

Zip 91024

$50m xs $75m
18% ROL
6 month term

Zip 91011

4-20% YoY ROI

Our Summary
We are Using Deep Learning to Reshape the Re/Insurance Industry

BUSINESS MODEL

We sell reinsurance to insurers and then transfer that risk, as a Managing General Agent (MGA/MGU)

OUR ADVANTAGE

We use advanced deep learning to assess, underwrite, and transfer risk to deliver **27% higher Return on Capital**

TRACTION

First product complete. Bermuda license pre-approved. In conversations with Allstate as first large customer, and RenRe and AIG as first capacity providers.

ASK

Raising $2.5M to give us 24 months runway. To become the most advanced risk analysis and transfer platform in our **$350B serviceable market.**