

GAMBLING ON THE ENVIRONMENT

**A CASE STUDY FOR STARTUP
SUCCESS IN THE ERA OF BIG DATA**

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I290
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The Data Deluge

The world creates about 5 exabytes
(10^{18}) of data every 2 days

-Eric Schmidt, Google (2010)

Double that for 2012 by Moore's Law

That's five billion gigabytes per day...

THE ERA
OF BIG
DATA

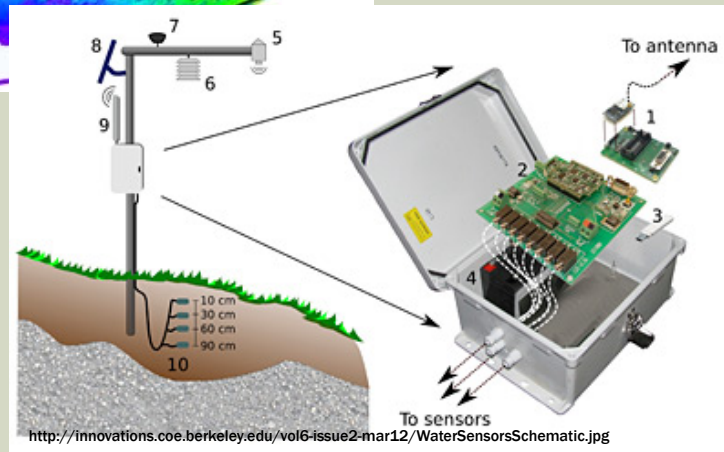
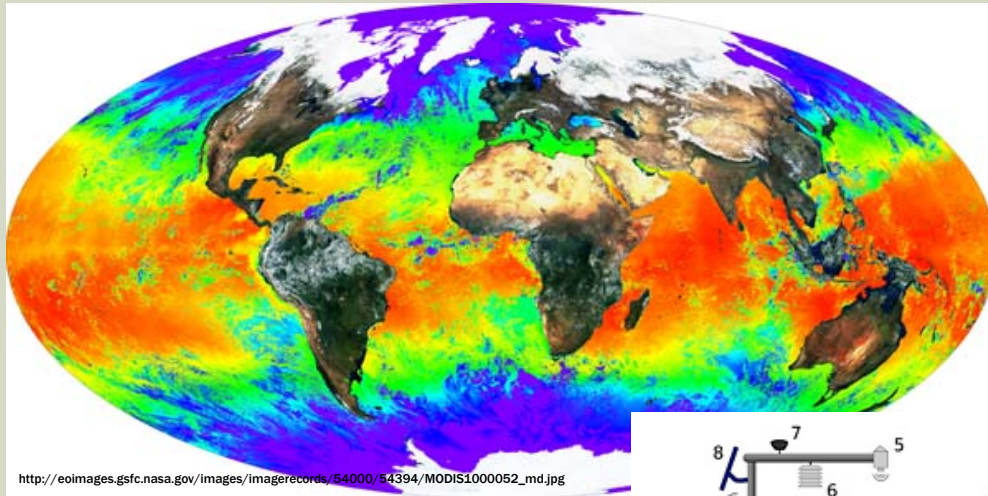
... That's a football field per day of terabyte density data



BIG DATA AND THE BIG GAME

5 exabytes of data requires the equivalent of a football field of terabyte density data storage every day

Big Environmental Data



<http://sensorlab.cs.dartmouth.edu/images/phonesicons.png>

A single NASA sensor (MODIS) produces 1TB per day

Wireless scientific instruments are propagating rapidly

Mobile sensing still under-developed

Big Data needs Big Analytics

Environmental analysis moving
toward petascale

Terabytes are no longer
impressive.

New sources of information
can overwhelm...

**BIG
ANALYTICS**

***“Time is lost, confusion
results and money is spent.”***

- *Manufacturing manager in Connecticut,
regarding the telephone, 1917*

Source: The Economist, Feb 25th 2010

Innovator's View:

This is the perfect time to strike, even better than 90s

Case Study: What are some factors needed to succeed in this climate?

**BIG
DISRUPTION**

1. It's nice if the data is cheap or even free

A partial list of publicly available environmental data:

HOW TO SUCCEED IN ERA OF BIG ENV DATA

The screenshot shows the National Weather Service website with a grid of environmental data sources and their costs. The grid is overlaid on a map of the United States. The data sources and their costs are:

Rainfall	National Weather Service (NWS)	FREE
Rainfall	NOAA	Cheap
Temperature	NWS	FREE
Vegetation	NASA	FREE
River flow	US Geological Survey (USGS)	FREE

The website also features a search bar, navigation links, and a sidebar with various services. A legend on the right indicates rainfall amounts in inches, ranging from 0.01 to 10.0. The bottom of the page contains a note: "NOTE: Data for the entire country are usually available by 12:30 pm Eastern Time (9:30 am Pacific Time)."

2. Cut computing overhead to almost nothing

Cloud Computing.

2a. Become largest
MapReduce user on AWS



HOW TO
SUCCEED IN
ERA OF BIG
ENV DATA

3. Have Useful Friends

Founder: David Friedberg



Alum (astrophysics)

Corporate Development

Tapped Google colleagues for
angel investing

Today: CEO of one of the hottest startups
in the Bay Area with a \$T idea...

FRIENDS IN
BIG PLACES

WEATHER GAMBLING!



<http://www.hindustantimes.com/Images/2010/10/b5d6fb8d-8ccb-4105-bb5b-402dfe9c14eHiRes.JPG>

Or, as they brand it...

Data-Driven Weather Insurance

The screenshot shows a web browser at climate.com. The page features the Climate Corporation logo and navigation links for 'Look Up Policy', 'Contact Us', and 'Agent Login'. Two buttons are available: 'FOR GROWERS' and 'FOR AGENTS'. The main content area is a large banner with a farmer in a field. The banner text reads 'Total Weather Insurance' and 'Protect Your Profits From Bad Weather'. Below this, a four-step process is outlined with icons: 1. Get Your Weather Risk Report, 2. Get Custom Weather Insurance Plan, 3. Weather Happens, and 4. Get Paid Automatically. On the right side of the banner, a green call-to-action box says 'Start Here' and 'Get your FREE WEATHER RISK ANALYSIS'. Below this, there are input fields for 'County or Zip Code' and 'Corn', and a 'Get Started' button. At the bottom right of the banner, it says 'BRENT B., ILLINOIS TWI 2012 INSURED'.

climate.com

Look Up Policy Contact Us Agent Login

THE CLIMATE CORPORATION

FOR GROWERS FOR AGENTS

Total Weather Insurance

Protect Your Profits From Bad Weather

- 1 Get Your Weather Risk Report
- 2 Get Custom Weather Insurance Plan
- 3 Weather Happens
- 4 Get Paid Automatically

Start Here

Get your **FREE WEATHER RISK ANALYSIS**

County or Zip Code

Corn

Get Started

BRENT B., ILLINOIS
TWI 2012 INSURED

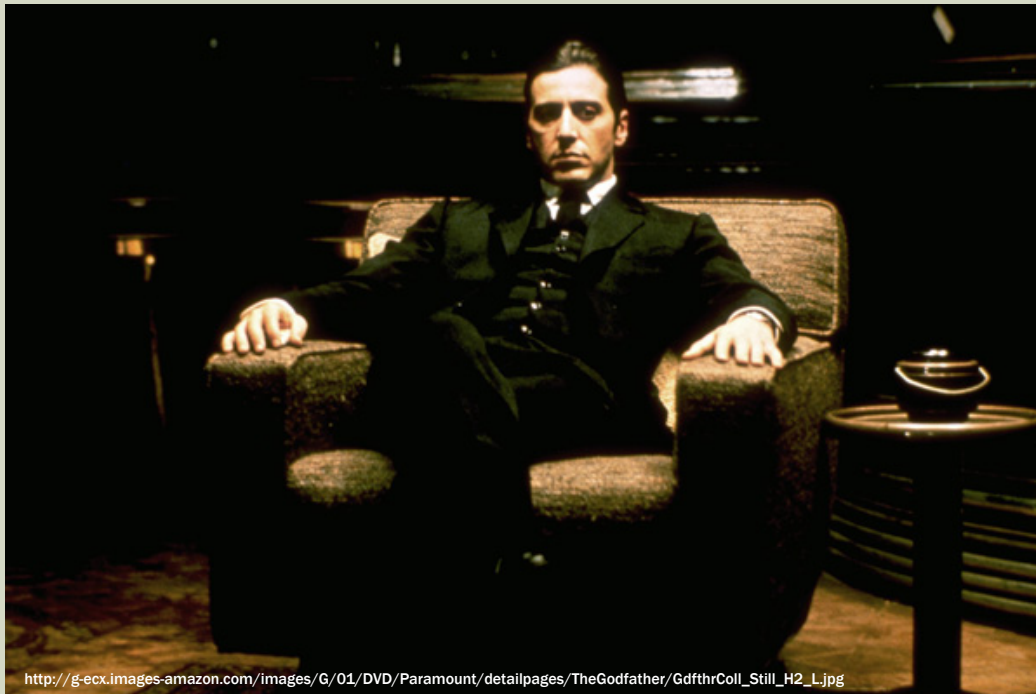
Which sounds less fun.

The CC Proposition

Collect payout if bad weather happens

CC calls it “Protection”...

other organizations also use that term



http://g-ecx.images-amazon.com/images/G/01/DVD/Paramount/detailpages/TheGodfather/GdfthrColl_Still_H2_L.jpg

Founder David Friedberg speaks fondly of learning poker while working in a pool hall in his teens

Climate Corp pays out for wagers on the weather

Rain and Temperature “Perils”



Drought



Freeze

Rainy
Days



The concept was inspired by the observation that a bike rental shop in SF had no customers when it rained

Choose your game: Rainy Days

THE CLIMATE CORPORATION

Look Up Policy | Contact Us | Agent Login

FOR GROWERS **FOR AGENTS**

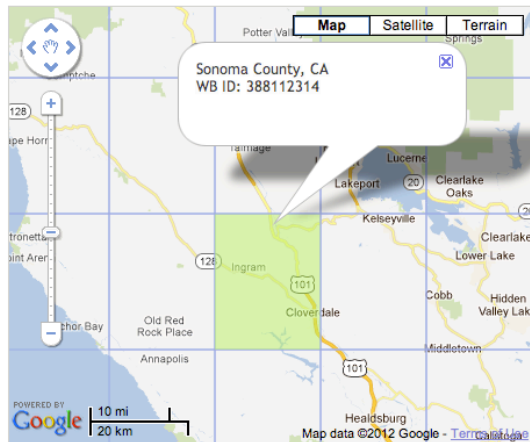
The Climate Corporation - Rainy Days Protection

[Help Guide](#)

- 1. Location**
Enter a city, county, state, or address and click Locate. To select a different coverage area, click outside the highlighted grid.
Hopland, CA
Location selected: Sonoma County, CA - WB ID: 388112314 (RMA ID: null)
- 2. Dates**
Select the start date and end date for your coverage period.
Start Date: 10/4/2012
End Date: 10/11/2012
- 3. Rainfall**
Set how much rain qualifies as a rainy event and the payout for each rainy event.

rainy event length	rain threshold	\$/acre per rainy event
1 day	1"	\$
- 4. Coverage**
Choose the coverage limit and number of deductible rainy events. [Suggest values.](#)
Max Coverage Amount: \$ per acre
Rainy Event Deductible:
Number of Acres:

Location and Dates



How does Rainy Days Protection work?

Rainy Days Protection pays growers for frequent rainfall that can damage crops. This coverage pays out each time the daily rainfall between the start date and end date exceeds your specified threshold, up to your Max Coverage Amount.

Key Terms

Rain Event Length

The number of days used to determine if the Rain Threshold was exceeded.

Rain Threshold

The amount of rain that will trigger a payout.

\$/acre per Rain Event

The payout amount for each rainfall event.

Maximum Coverage per acre

The highest total amount that can be paid per acre. This should match the total amount of risk to be covered.

Deductible

The number of rainy days that must be reached before coverage will pay out. If the calculated payout exceeds the Max Coverage Amount, the final payout will be the Max Coverage Amount.

[View Common Questions](#)

[View Examples](#)

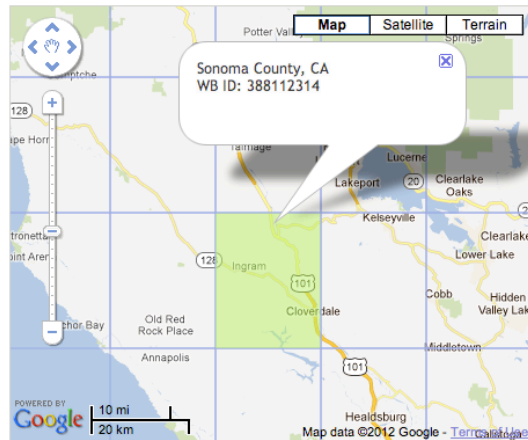
**PICK
LOCATION
AND DATES**
Hopland, CA
First week of
October, 2012

Choose your action and payout

The screenshot shows the 'Rainy Days Protection' configuration page. It is divided into four main sections: 1. Location, 2. Dates, 3. Rainfall, and 4. Coverage. In the 'Rainfall' section, a table is used to define the criteria for a rainy event. The table has three columns: 'rainy event length', 'rain threshold', and '\$/acre per rainy event'. The values entered are '1 day', '1"', and '\$ 10000' respectively. Red arrows point to these three input fields with the text 'Action and Payout' below them. In the 'Coverage' section, the 'Max Coverage Amount' is set to '\$ 10000 per acre', the 'Rainy Event Deductible' is '0', and the 'Number of Acres' is '1'. A 'Get Quote' button is visible at the bottom of the coverage section.

rainy event length	rain threshold	\$/acre per rainy event
1 day	1"	\$ 10000

Action and Payout



How does Rainy Days Protection work?

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[View Common Questions](#)

[View Examples](#)

NO
STORMS

\$10,000
PAYOUT

NO
MINIMUM,
NO LIMIT

Get Your Odds (aka "Quote")

10 : 2.4
ODDS

HOUSE PAYS
\$10K FOR
\$2.4K BET

House puts odds
of a 1" rainstorm
at 19%

1. Location ?
Enter a city, county, state, or address and click Locate. To select a different coverage area, click outside the highlighted grid.
hopland, ca
Location selected: Sonoma County, CA - WB ID: 388112314 (RMA ID: null)

2. Dates ?
Select the start date and end date for your coverage period.
Start Date:
End Date:

3. Rainfall ?
Set how much rain qualifies as a rainy event and the payout for each rainy event.

rainy event length	rain threshold	\$/acre per rainy event
1 day	1"	\$ 10000

4. Coverage ?
Choose the coverage limit and number of deductible rainy events. [Suggest values.](#)
Max Coverage Amount: \$ per acre
Rainy Event Deductible:
Number of Acres:

\$2,359.86 Premium per Acre
\$10,000.00 Coverage per Acre
\$2,359.86 Total Premium
\$10,000.00 Total Coverage

Wager

Coverage Details

Location
Sonoma County, CA - WB ID: 388112314 (RMA ID)

Terms
Start Date: 10/04/2012
End Date: 10/11/2012
Max Coverage Amount: \$10,000.00 / acre
Rainy Event Deductible: 0 events
Number of Acres: 1

Payout Structure
This coverage will pay each time the rainfall in the coverage period exceeds one of the rainfall thresholds. Payouts are determined by the severity and timing of the rainfall event according to the table below.
Rainfall threshold: 1.00"

number of events	payout/acre
0	\$0.00
1 and above	\$10,000.00

Historical Data

10 Wettest Years
Shows number of events that exceeded each threshold during coverage period.

year	1 day @ 1.00
1957	2
1975	2
1962	2
2007	1
1972	1
1963	1
1997	1
1968	1
1954	1
2011	1

year	payout/acre
2011	\$10,000.00
2007	\$10,000.00
1997	\$10,000.00
1975	\$10,000.00
1972	\$10,000.00
1968	\$10,000.00
1963	\$10,000.00
1962	\$10,000.00
1957	\$10,000.00
1954	\$10,000.00

Other Odds

Payout : Wager

**Odds for Temperature
> 90° in Boston first
week of this May**

10 : 1.3
12% likely

**Odds for Temperature
< 45° in Los Angeles
the 3rd week of this
April**

100 : 7.5
7% likely

Forecast for LA the week prior:
Low of 47°

Are these odds
tempting?

Can the House be Beat?

Climate Corp has asymmetric weather knowledge

But:

Weather and climate are chaotic, not random → discernible patterns

The data CC uses is accessible to anyone

The climate is changing

Is weather analysis the next card counting?

Climate Corporation Numbers

U.S. Market: 70% of biz affected by weather,
\$3.8T at stake

Current Focus: \$6B sales potential for corn and
soybeans crop coverage

50% of farmers offered CC coverage buy it

Growth in Last Year:

30 → 200+ employees

\$M's → \$10M's sales per quarter

Entrepreneurship Talk by Founder David Friedberg

<http://ecorner.stanford.edu/authorMaterialInfo.html?mid=2789>

Compelling story of startup experience, with a big idea, no
customers, pivots, luck, and a focus on innovation above all.

“We are not an
insurance
company or a
weather company,
we are an
innovation
company”