

# **FEMA & S.H.I.E.L.D.**

## **An Analysis of Natural Disasters through the lens of the Marvel Universe**

This project started as thought experiment. Since I have been in "school mode" lately, I tend to view everything with half my mind on data analytics and superhero movies are no different. While watching Marvel's "Agents of S.H.I.E.L.D." I found myself wondering how many background characters might be data analysts like myself, and thinking about the sort of assignments they might be handed.



Ms. Romano,

Welcome to S.H.I.E.L.D. B.A.S.H. (Background Analytics S.H.I.E.L.D. HQ). You have been assigned to a team that is working to determine possible peacetime activities for the superhumans in the Avengers Initiative.

Your specific task is to see if a FEMA collaboration would be tenable. Using recent FEMA Disaster Declarations and Public Assistance Application data, identify disaster types that are likely targets for superhuman intervention. This could entail prevention, mitigation, or participation in cleanup/repair.

Propose a response team from our database of known friendly superhumans appropriate in size and scale.

The set of superhumans you will be provided has already been screened to determine that they are sufficiently powered to survive and thrive in disaster situations.

Transportation is not an issue and should be left out of this analysis.

Susan Nelson,  
Director, S.H.I.E.L.D. B.A.S.H.

I had a vision of getting an inter-office memo or email that looked like this:

So please indulge me as I run through this analysis as though it is my very first assignment on my very first day as a SHIELD analyst.



My first question when handed an assignment is what is the source of the data, and what is their focus?

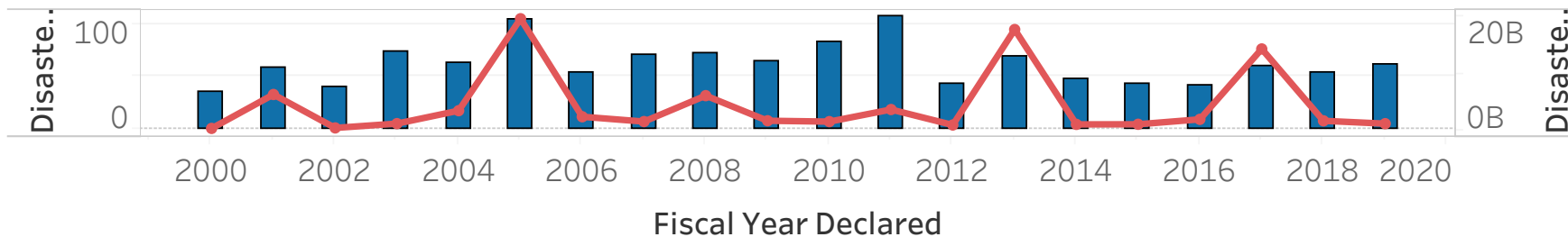
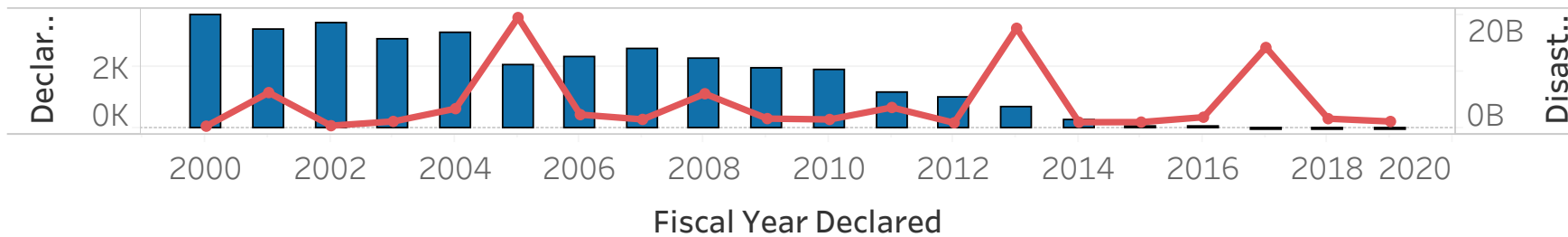
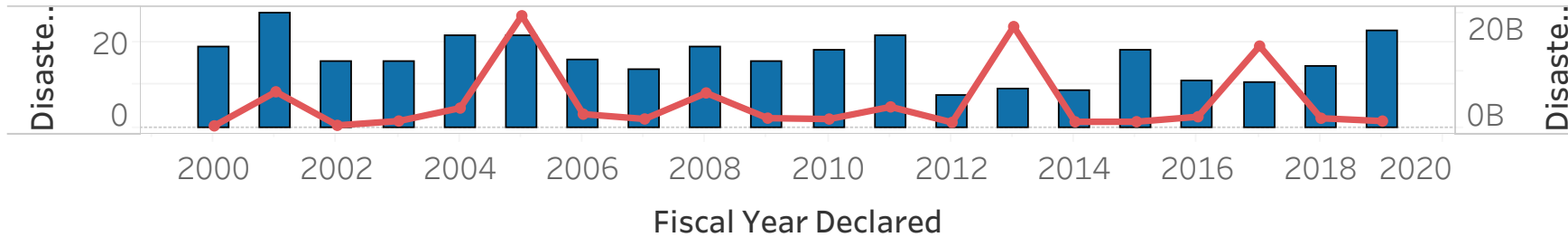


# FEMA

Federal Emergency Management Agency  
Part of DHS

Helps people before, during, and after disasters.

Specifically, FEMA helps by handling the costs associated with those disasters. Most commonly, that involves evacuation/search&rescue, cleanup, repairs, and the organization/administration of all of the above.



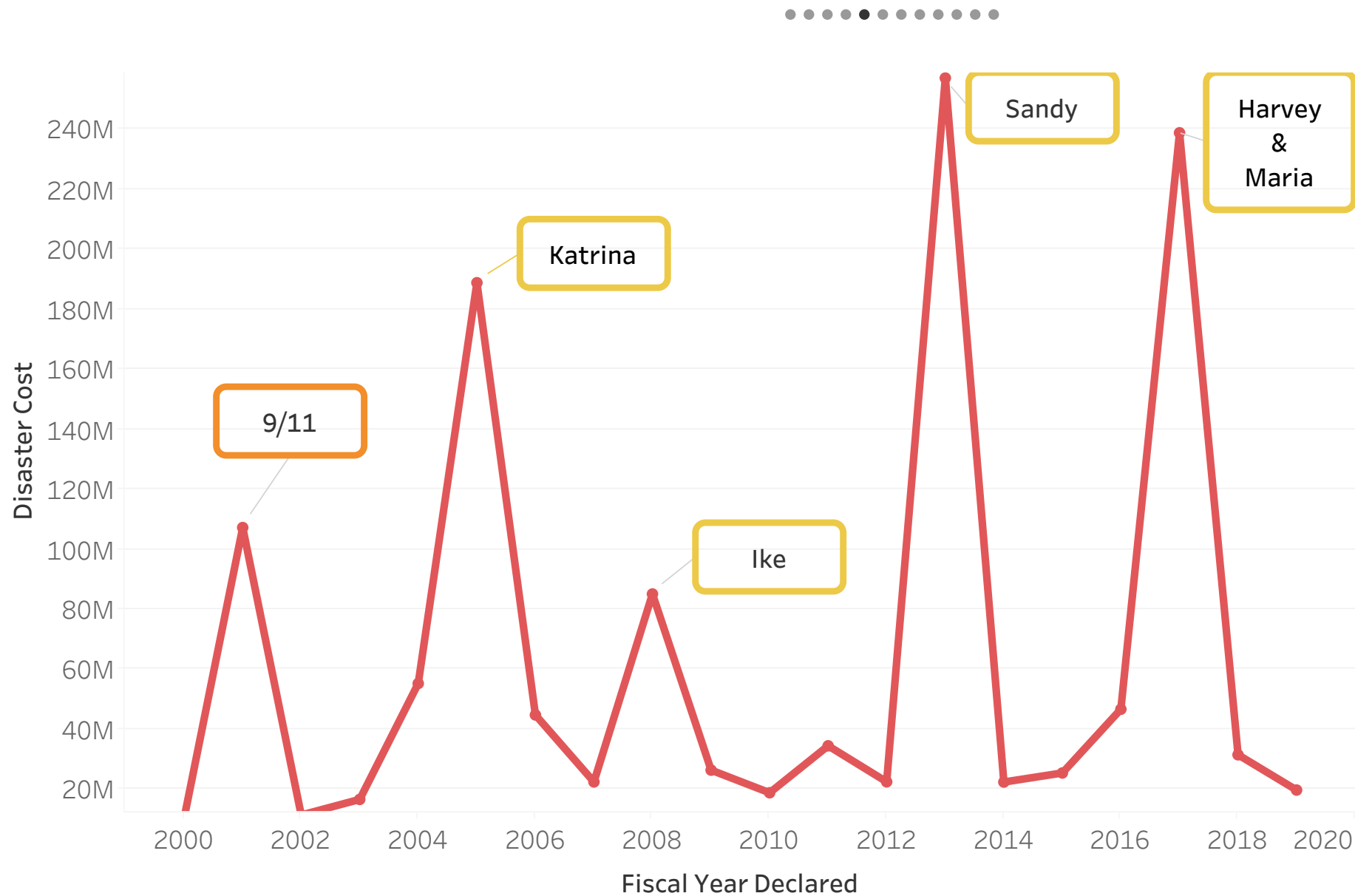
So I looked at 3 major factors and compared them to the sum spent in each fiscal year:

**Disaster Duration**, the length of time a particular disaster lasts,

**Declaration Filing Length**, which is the time from when a disaster is declared by FEMA until the cleanup is done and paid for,

and Number of Disasters per Fiscal Year.

All of these concerns affect the kind of powers needed to have the desired effect. For example, if costs go down when Disaster Duration goes down, we might focus strongly on mitigation. If Declaration Filing Length has a stronger impact, may..



In this chart, you can see that 4 out of those 5 big cost spikes are due to hurricanes. Seeing this, I suspect that cost is more related to the kind of disaster that occurs. Shall we look at the cost across disaster types, then?

# Average Disaster Cost by Disaster Type



Yes, it appears that **Disaster Type** has the strongest effect on how much FEMA spends. This chart draws our attention specifically to Hurricanes, Fires, and Severe Ice Storms as the most costly of all disaster types.

I'd like to drill down and investigate these further.

The question in my mind is this:  
Do these disaster types occur with the kind of predictable frequency that warrants a purpose-built strike team?





That brings us back to S.H.I.E.L.D.  
What can we do to partner with FEMA  
on disasters?  
Well, what are we?



(and if that long list of words doesn't make any sense at all, it's because it is fictional and acronyms that formed complicated words were very popular in the 60's when Marvel comics fir..





S.H.I.E.L.D. got in  
the superhero  
business in the  
1990's when agent  
Nick Fury here ->



witnessed the epic battle between Captain Marvel and Ronin the Accuser and  
decided we needed to form...





## Avengers Initiative



To find some superpowered friends to protect the earth from superpowered Bad Guys.



And how can our avengers protect the earth from disasters? By neutralizing the..

Hurricane: **Weather** system with fast **winds** that kick up a deadly storm surge (**water**).

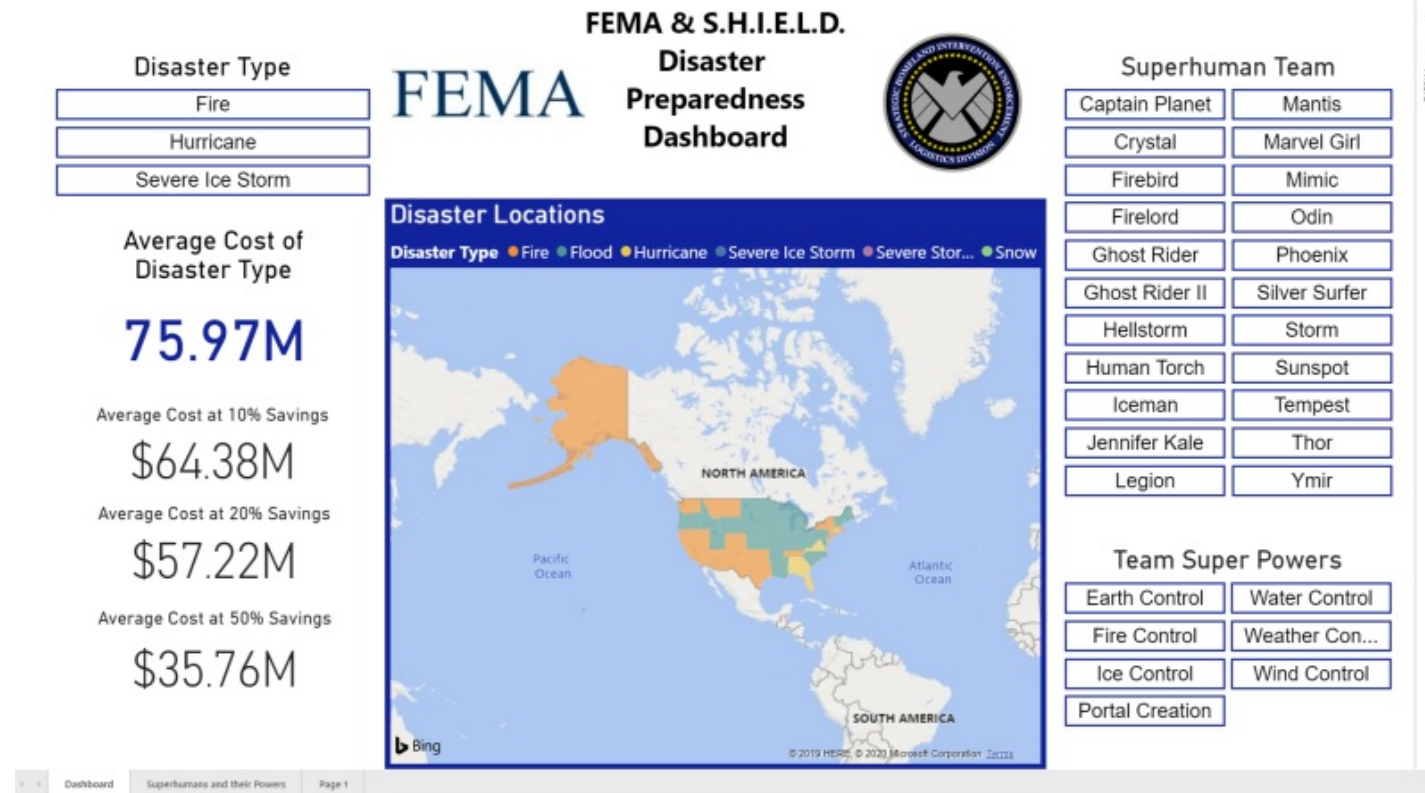


Send in Storm (left, weather control powers), Crystal, (middle, wind control powers) and Iceman (right, water control powers), and suddenly your hurricane is veering harmlessly off course into the Gulf, or dissipating entirely.





All you need is the right team.  
To aid in team selection, I have created this dashboard.



To use the interactive PowerBI dashboard, please follow this link:

<https://app.powerbi.com/view?r=eyJrIjojZDQzNWVjZDctNTBiNy00ZjQ2LTgyZDctNDc1ZTRjYmM5ZjQwIiwidCI6IjEwMWRhNTg3LTE4NDMtNGY1Mi04YjhhLTE3..>