

The Mighty Human, destroyer of worlds

Introduction

Humans were once fairly harmless and peaceful (minus some animal killing, and some human killing and well a lot of killing but yeah, you get the point) but then, somehow (ehem colonialism and industrial revolution) they became LETHAL!!! at least to many other species (we have always been lethal towards our own).

Over the millennia Earth has experienced many cyclic changes including climate variation and its consequent temperature fluctuation (glacial advance and retreat). The end of last Ice Age allowed us to thrive so yeah to climate change!! But is this temperature change all part of Earth's plan? or are humans responsible for this? Climate change is very real and facts show that Earth's plan was not having all this tiny humans messing around. So, let us stop with all the babbling and start seeing some facts.

Questions and Hypotheses

Before analysing the data some questions were considered:

- Q1. Have the threatened species, the human population and the temperature increased over the years?
- Q2. Is human growth affecting non-human populations and temperature?
- Q3. Are vertebrates, invertebrates and plants affected in a different manner?

And the following hypotheses were proposed:

- H1. Humans are related to the extinction of non-human population
- H2. Temperature is related to the extinction of non-human population
- H3. Vertebrates and invertebrates are affected differently, being the latter the most affected
- H4. Plants and animals are affected differently, being the plants the most affected
- H5. As the temperature varies, the ratio of the most affected non-human populations change

Methods

For this project, APIs and web scrapping were initially the main resources to obtain information. Nonetheless, API access was complicated and obtaining tokens proved to be a challenge that could not be successfully completed. Web scrapping on the other hand, was very useful to gather initial data to have a general idea about what to do, but useless due to lack of common variables. At the end, csv datasets were the main source of information.

Intended resources:

- APIs:
 - <https://endangeredanimals.docs.apiry.io/#/>
 - <https://api.v3.iucnredlist.org>
 - <https://dev.meteostat.net/>
 - <https://datahelpdesk.worldbank.org/>
- Web scrapping:
 - <http://earthsendangered.com/search-regions3.asp>
 - <https://www.statista.com/statistics/978577/number-threatened-species-brazil-type/>
 - <https://knemo.es/WBWDI2019Jan/world-development-indicators-wdi>

Actual resources:

- (<https://www.iucnredlist.org/resources/summary-statistics>)
- (<https://climate.nasa.gov/vital-signs/global-temperature/>)
- (<https://databank.worldbank.org/>)

Workflow:

- Questions
- Hypotheses
- Dataset research
- Web scrapping + API requests
- Dataset enquiries
- Data cleaning
- Data analysis
- Results
- Conclusions

Data retrieval and data information

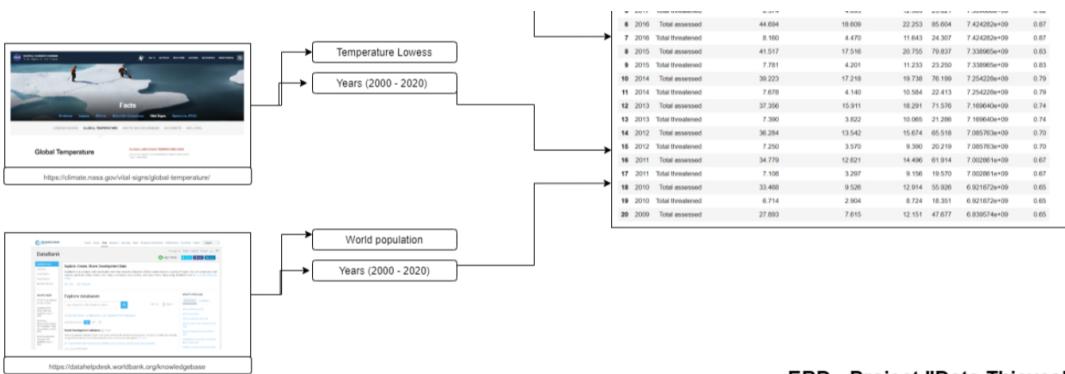
Data was retrieved from 3 main sources: the IUCN webpage, the NASA webpage and the world bank open data. As shown in the image above, from each webpage different information was retrieved in order to generate a unified table with the information about the threatened species (divided into four subgroups: vertebrate animals, invertebrate animals, plants and fungi and protists; each of them divided into more subgroups), the temperature change and the human population growth. Information was ordered by year from 1996 until 2019 and by assessed and threatened non-human species.



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graph LR
    A[Summary Statistics] --> B[Endanger vertebrates]
    A --> C[Endanger invertebrates]
    A --> D[Endanger plants]
    A --> E[Total endangered species]
    A --> F[Years (2000 - 2020)]
  
```

Year	Assessment	Subtotal(n/Vertebrates)	Subtotal(n/invertebrates)	Subtotal(n/Plants)	TOTAL	Population_total	Liveness()
0	Total assessed	50 819	22 698	36 630	112 412	7 673534e+09	0.99
1	Total threatened	9 013	5 221	15 774	30 178	7 673534e+09	0.99
2	Total assessed	47 470	21 806	27 514	96 951	7 591833e+09	0.95
3	Total threatened	8 442	5 040	13 299	26 840	7 591833e+09	0.95
4	Total assessed	46 092	21 130	24 230	91 523	7 509000e+09	0.92
5	Total threatened	8 032	4 665	14 865	37 562	7 509000e+09	0.92



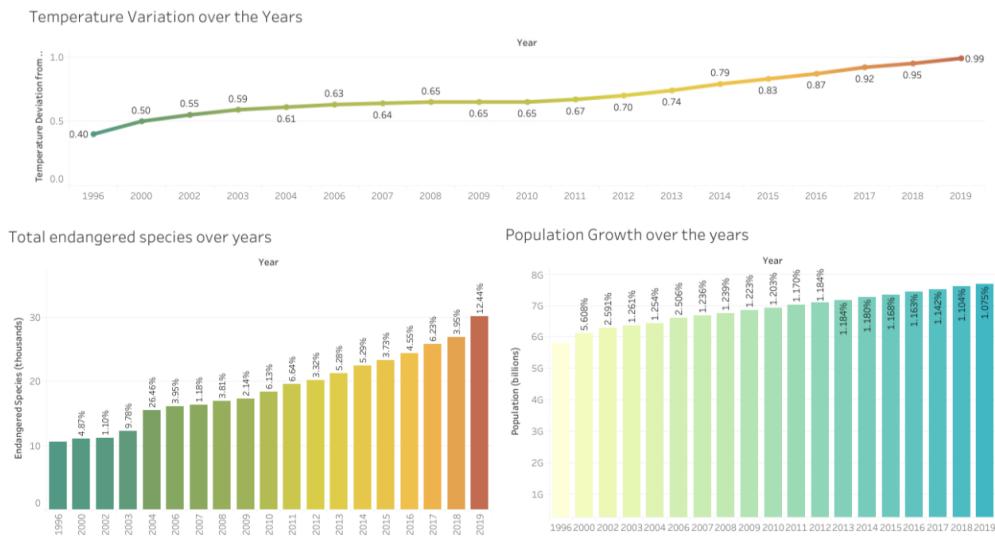
ERD - Project "Data Thieves"

The mighty Human - Destroyer of Worlds

by Mar Cánovas, Mireia Guinovart and Carles Rosell

Results

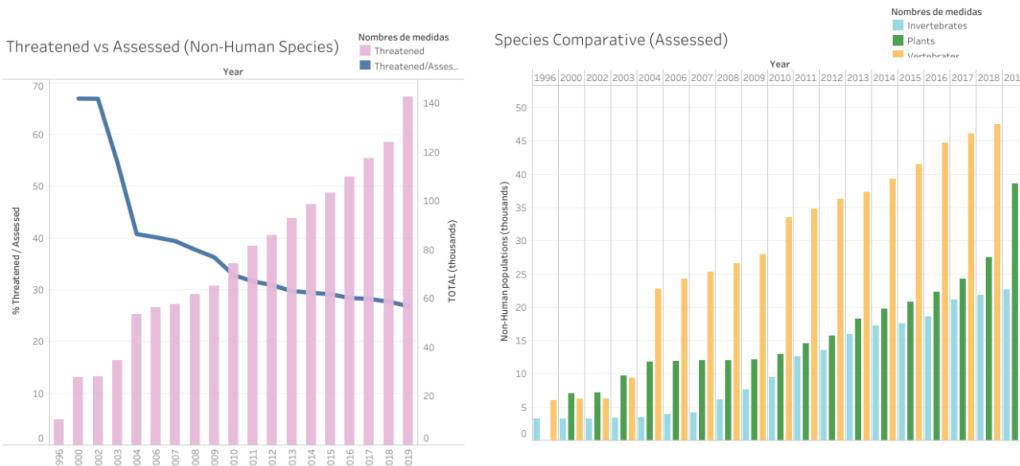
Q1: Have the threatened species, the human population and the temperature increased over the years?



Plot1 (top figure) There is an increasing trend with values specially remarkable from 2010 onwards

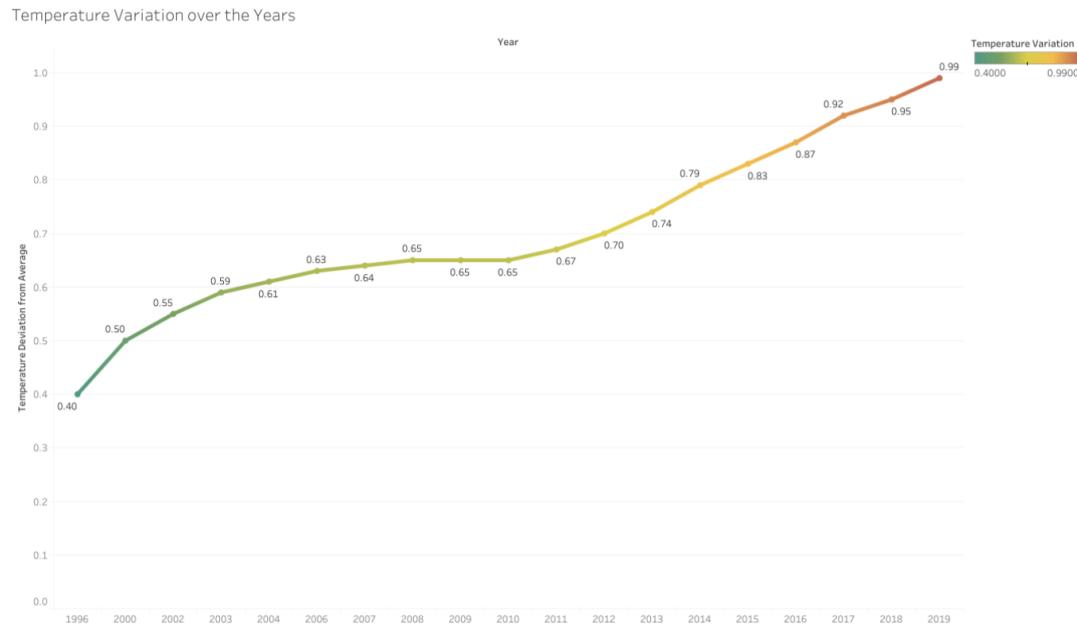
Plot2 (bottom left) There is clearly an increasing trend throughout the plot, but there is a larger different in between 2003-2004 years and from 2010 onwards.

Plot3 (bottom right) This plot also shows an increasing trend with a gradual rate of 1.1-1.3



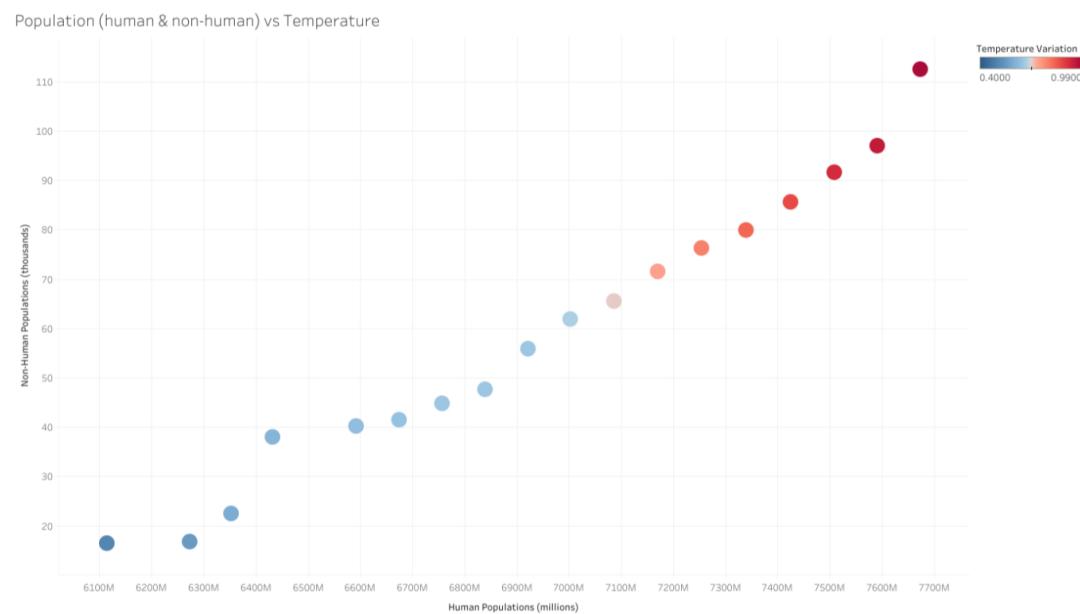
Plot1 (left figure) We can see that the threatened species increase over the years but the index diminishes starting on the year 2002 indicating that each year more species have been assessed.

Plot2 (right figure) With a common increasing rate, we detected that vertebrates are the most affected, followed by plants and then invertebrates, though the rate is not constant, specially during the first studied years.



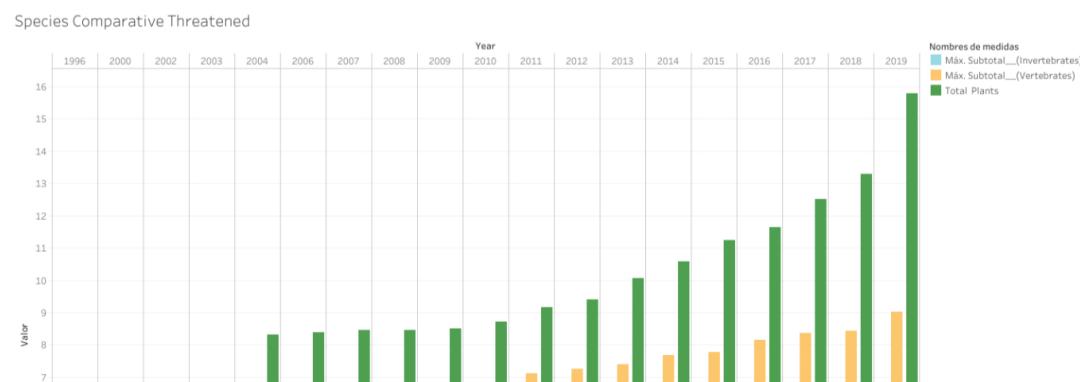
It seems that it was not until 2010 that the increase was a lot more accused reaching almost 1 degree of difference

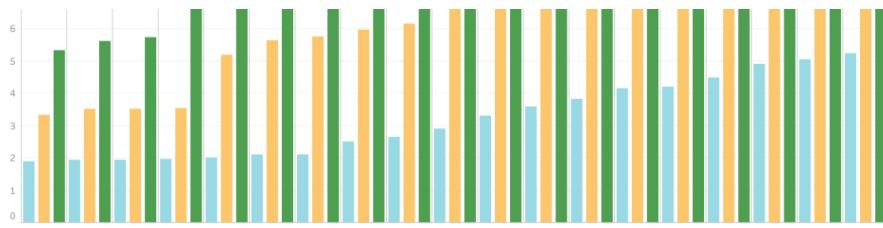
Q2: Is human growth affecting non-human populations and temperature?



In x axis the human population, y axis for non-human populations and temperature as color variance, we can see that they are all correlated in an increasing rate.

Q3: Are vertebrates,invertebrates and plants affected in a different manner?





Contrasted with assessed species of non-humans, plants is the living being the most studied, followed by vertebrates and finally invertebrates

Conclusions

- There is a clear increasing trend in human population and keeps growing over the years at a quite similar percentage. The accumulated increase percentage since 1996 until now is 28'5%
- It seems that it was not until 2010 that temperature increasing was a lot more accused, reaching almost 1 degree of difference. It might seem like nothing to us but it is in fact.
- It seems that overall, the most threatened species are plants, then vertebrates and then invertebrates. We hypothesised that plants would be the most affected ones.
- We can see that the threatened species increase over the years but the index diminishes starting on the year 2002 indicating that each year more species have been assessed.
- We can see that the three variables that we analysed are evolving together in a similar trend (We cannot say that they are directly correlated since there are many other variables that we should control to obtain certain conclusions, in the sense that temperature increase of water boiling most likely would also show as having a correlation). So, for the first hypothesis and the second one we can say that the data follows a similar increasing trend