

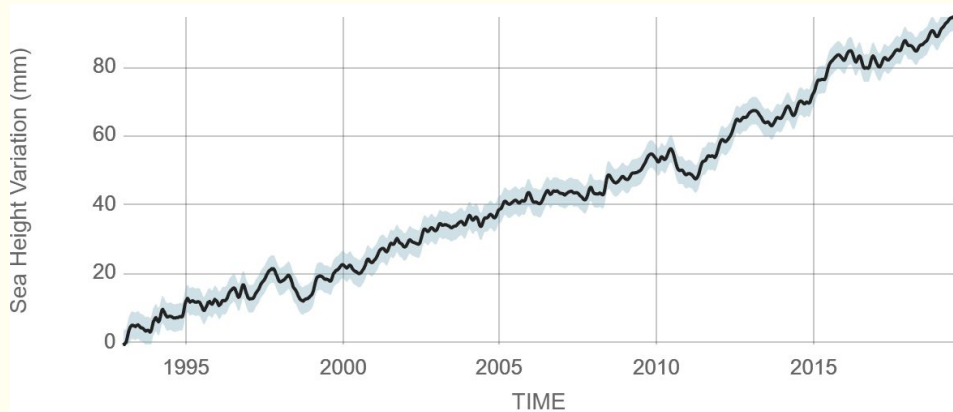
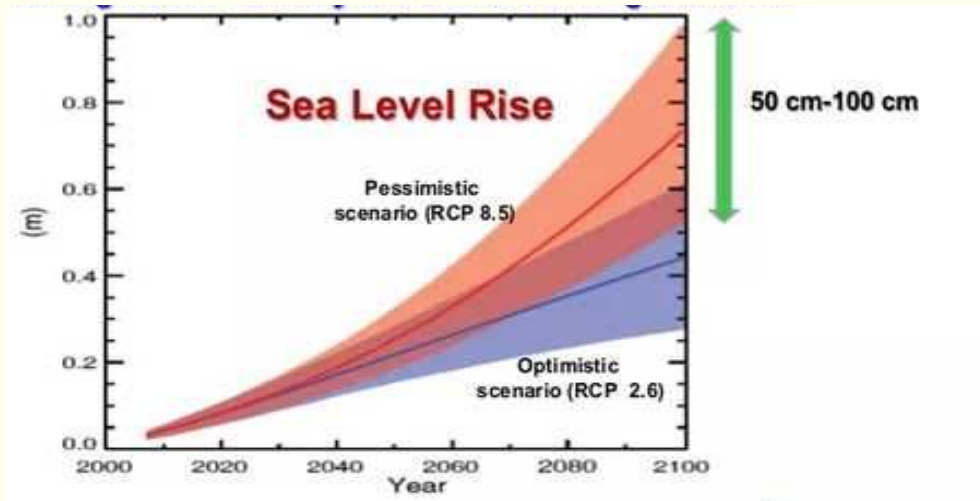
TIDE AND TIME

Earth's Oceans / Rising Water



THE PROBLEM

Sea get too big



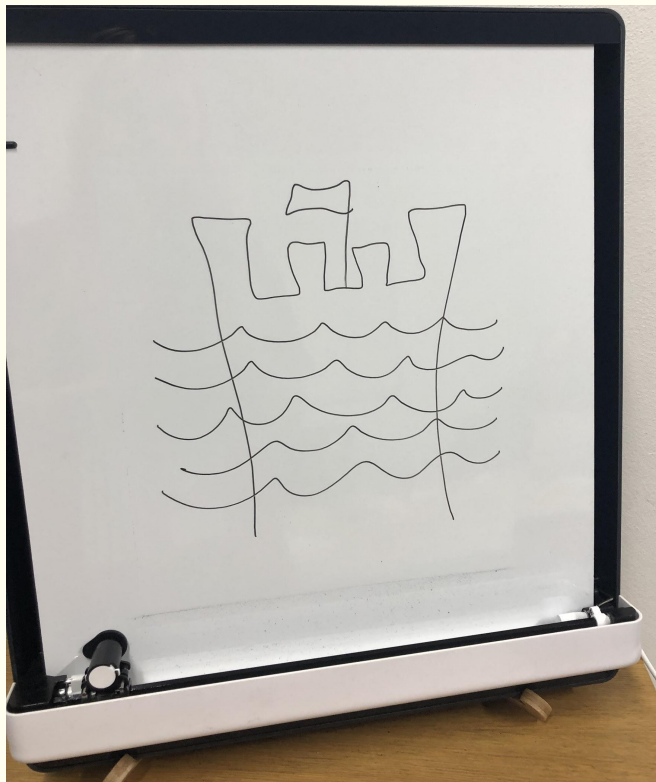
Source: climate.nasa.gov

RATE OF CHANGE

↑ 3.3
millimeters per year



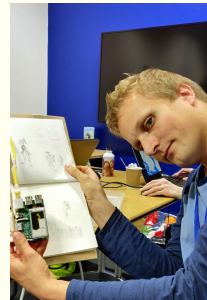
CONCEPT



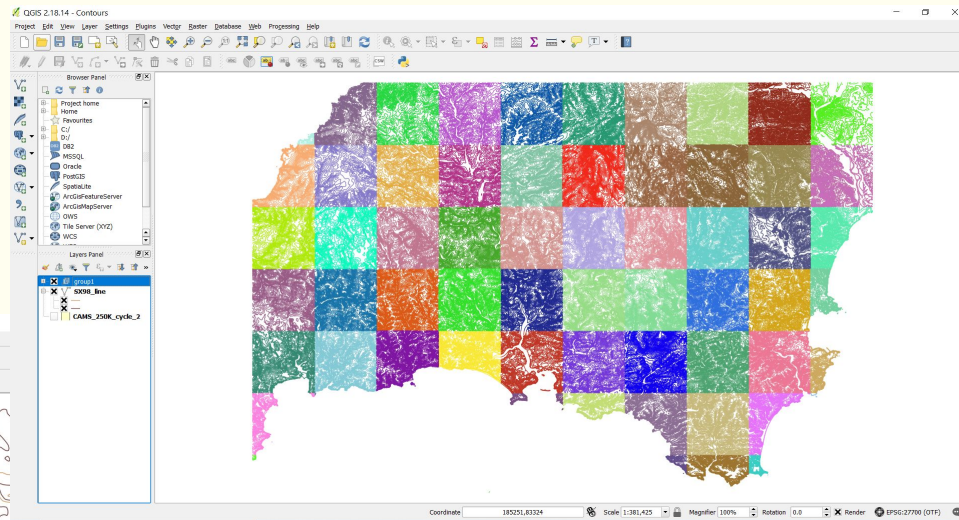
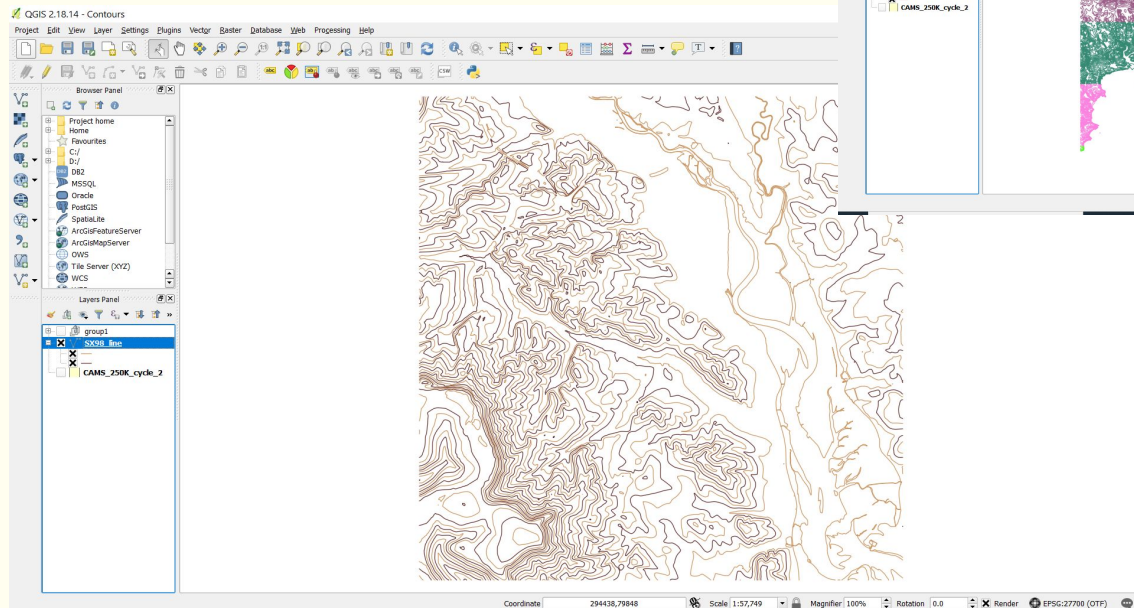
THE TEAM

Clare Bryden, Peter Kellagher
Nick Wade, Andy Wood, Harriet Wood

Thanks also to Jack (whitelisting),
Trevor (hotspot) and Laura (data chat)



ACTUAL DATA



ACTUAL DATA

Iris / Cartopy

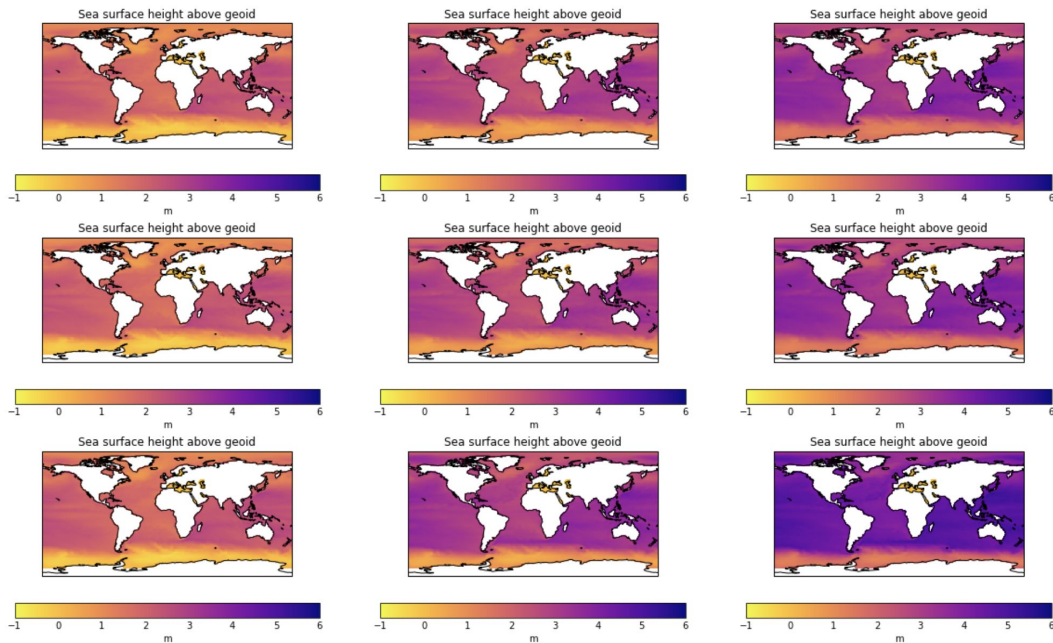
sea surface
height

anomalies under
stringent,
current, worst
case climate
policy

every 100 years

```
plt.show()
```

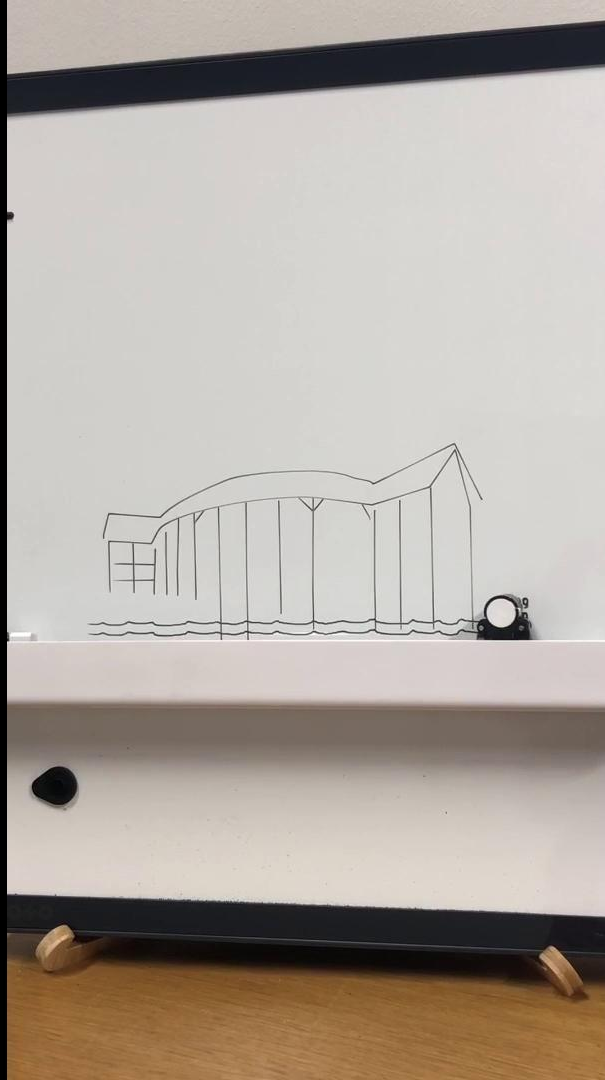
Sea Surface Height, RCP2.6 in 2099 2199 2299
RCP4.5
RCP8.5



```
In [309]: # London
location_constraint = iris.Constraint(
    latitude = lambda cell: lon_lat - lat_res <= cell <= lon_lat + lat_res,
```


THE GLOBE

RCP8.5 'worst case'
scenario, averaged
over 2 deg lat-long
square



'Location', '2018',
'2099', '2199', '2299'

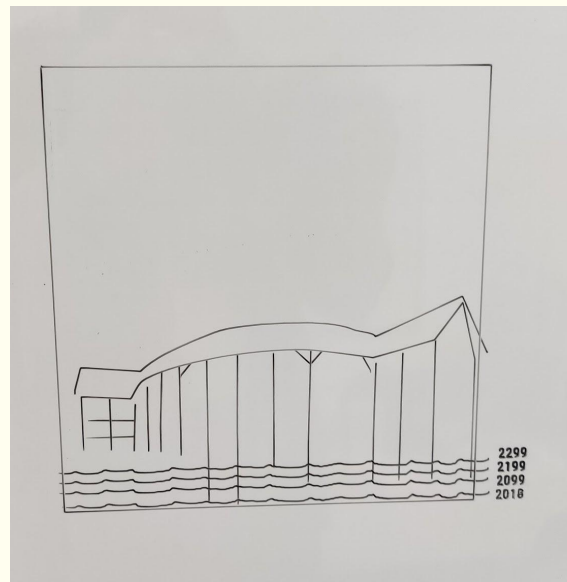
'Thames Estuary',
0.00768565,
1.71223205,
2.9450562 ,
4.14300942

THE GLOBE

2018 observations NASA sea level change portal (measures project)

future RCP8.5 'worst case' scenario, averaged over 2 deg lat-long square

Average height, doesn't account for waves or surges



| 'Location', | '2018', | '2099', | '2199', | '2299' |
|-------------------|---------|---------|---------|--------|
| 'Thames Estuary', | 0.008, | 1.712, | 2.945, | 4.143 |

FLOOD PLAIN

Combine sea level data with contour maps to produce flood risk visualisations

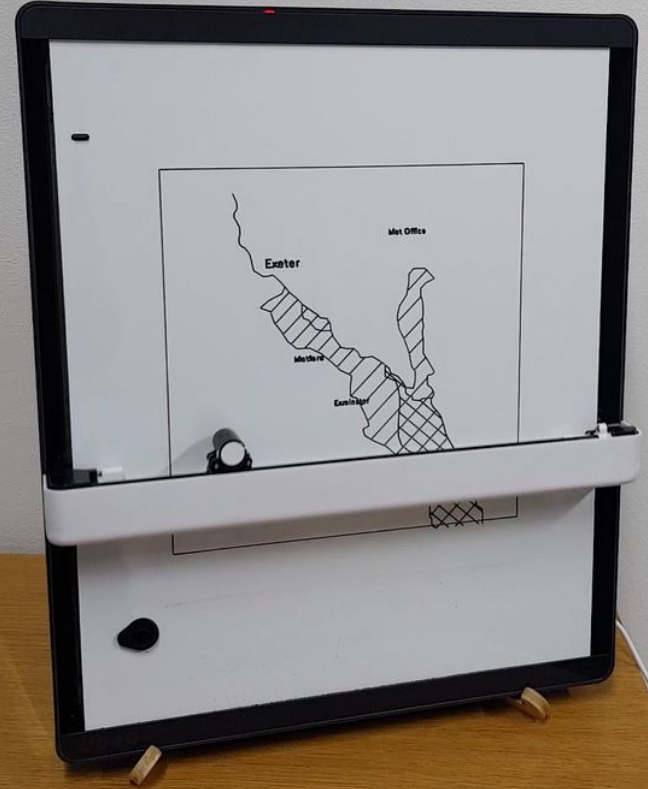
Process SVGs for Joto in Affinity Designer

Next: Custom G-code!

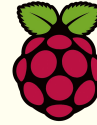
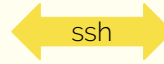


<https://contours.axismaps.com>

<http://flood.firetree.net/>



CODE

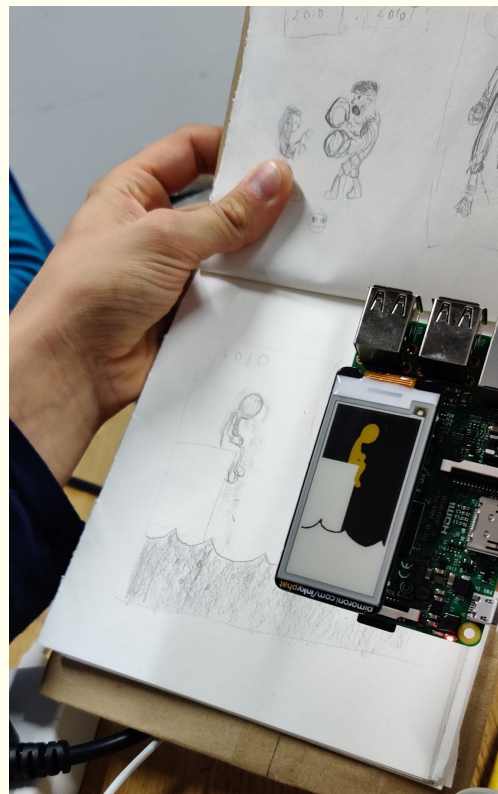
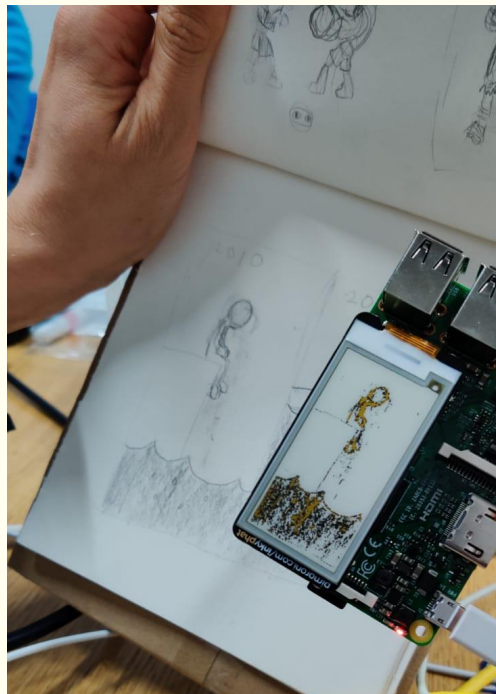
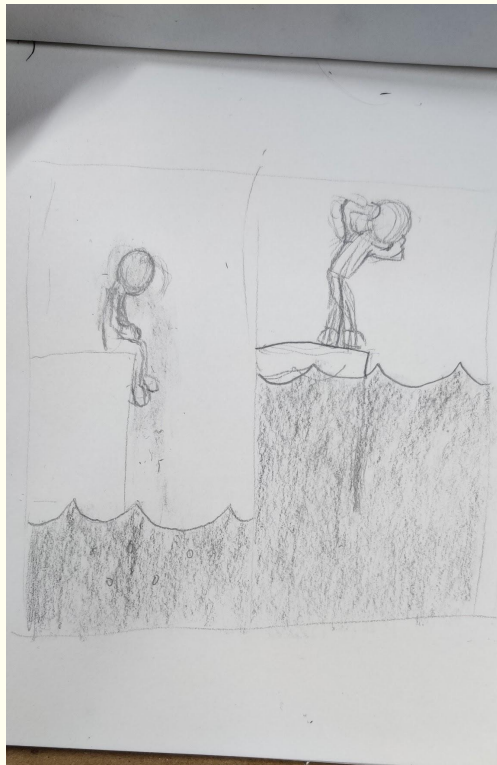


insiders - remote development extension

```
def get_tides():  
    print('getting tides')  
    headers = {  
        # Request headers  
        'Ocp-Apim-Subscription-Key': 'key',  
    }  
  
    params = urllib.urlencode({  
        # Request parameters  
        'duration': '1',  
    })  
  
    try:  
        print('trying api')  
        conn = httpLib.HTTPSConnection('admiraltyapi.azure-api.net')  
        conn.request("GET", "/uktidalapi/api/V1/Stations/0027/TidalEvents?%s" % params, None, headers)  
        print('making connection')  
        response = conn.getResponse()  
        print(response.status)  
        data = response.read()  
        print(data)  
        tides = json.loads(data)  
  
        print(tides[1]["EventType"][:-5])  
        print(tides[1]["DateTime"][11:16])  
        print(tides[1]["Height"])
```



INKY MAN



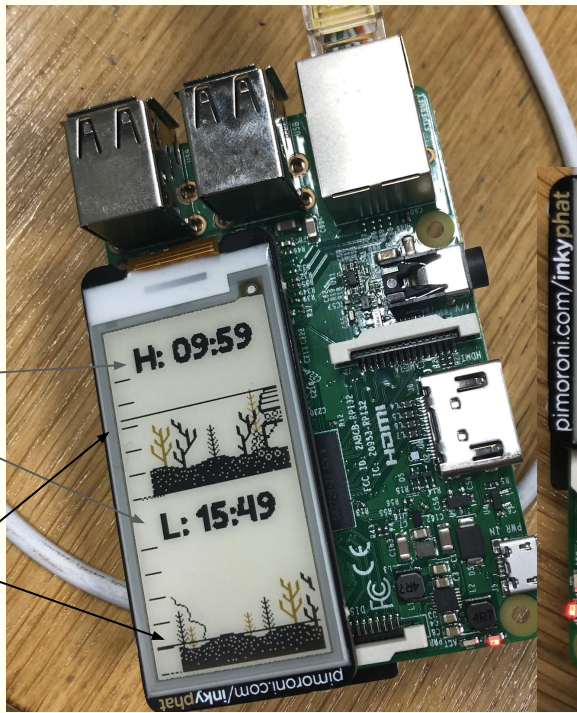
GLITCH



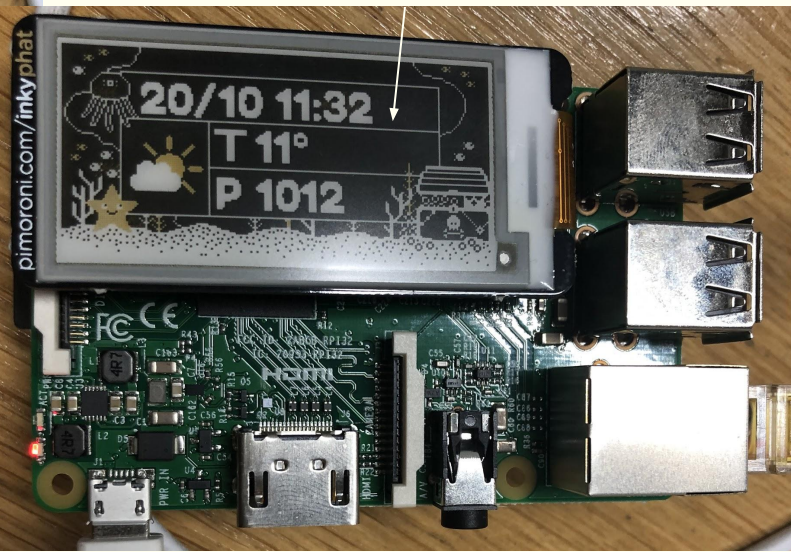
USEFUL APPLICATION

High and Low
tide times for
today
(Admiralty API
from UKHO)

Height of tide at
high and low
[scale: 1 line = 1
metre]



Weather conditions for today
(Darksky API)
[temperature & pressure]



JOTO AND INKY

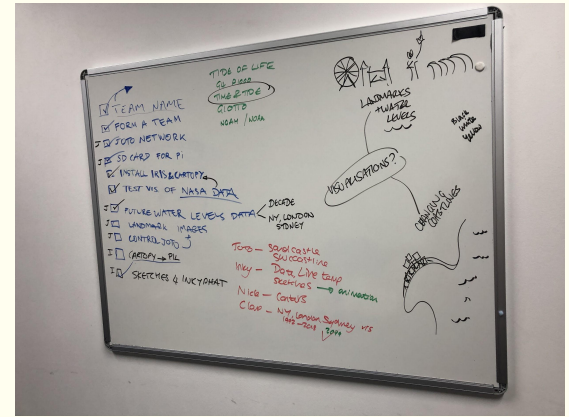
Compelling info in new forms

Low power draw (compared to electronic display)

Display keeps changing to encourage engagement (compared to static display)

Innovative 'glitch forward' approach

Interrupting media viewers with disrupting depictions of environmental change



THANK YOU!

Space Apps Exeter 2019

