

# Robin Wilson

MRC Early Career Fellow

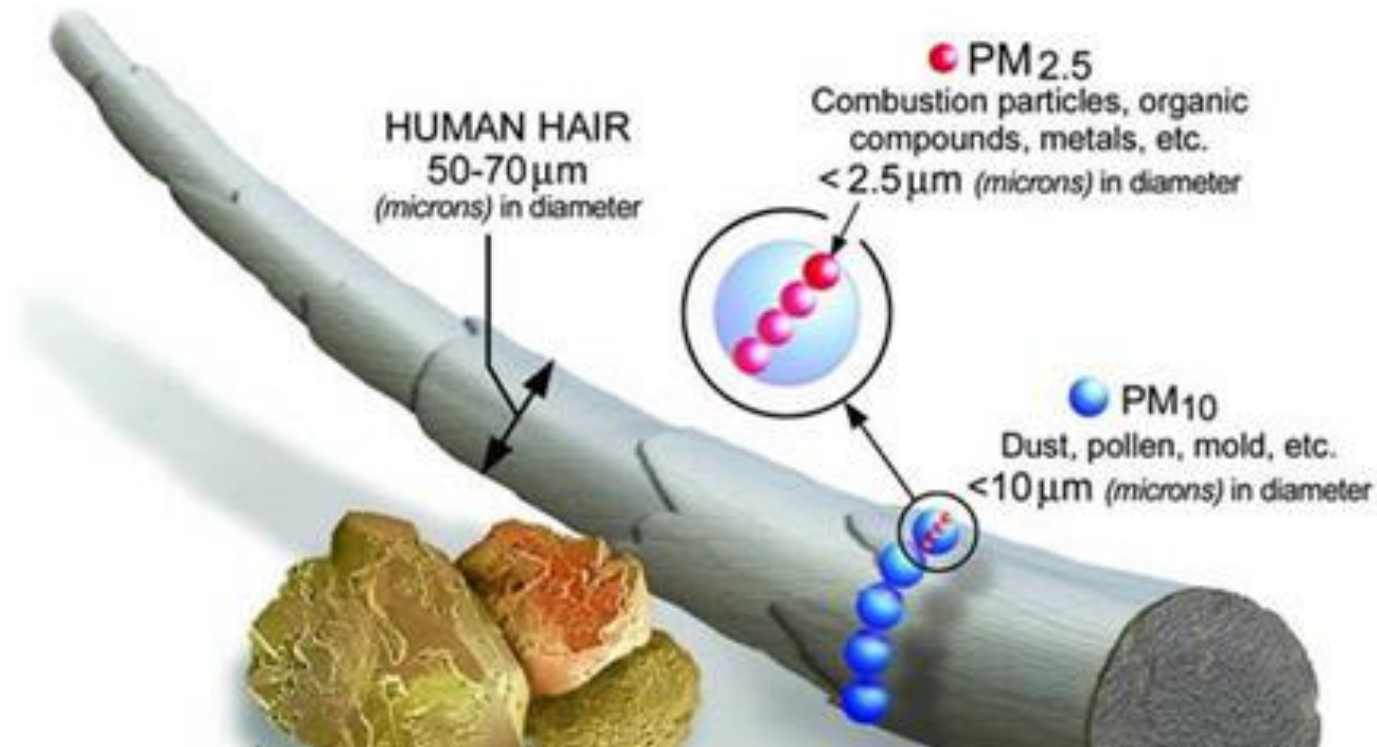






**Beijing – Jan 2013**

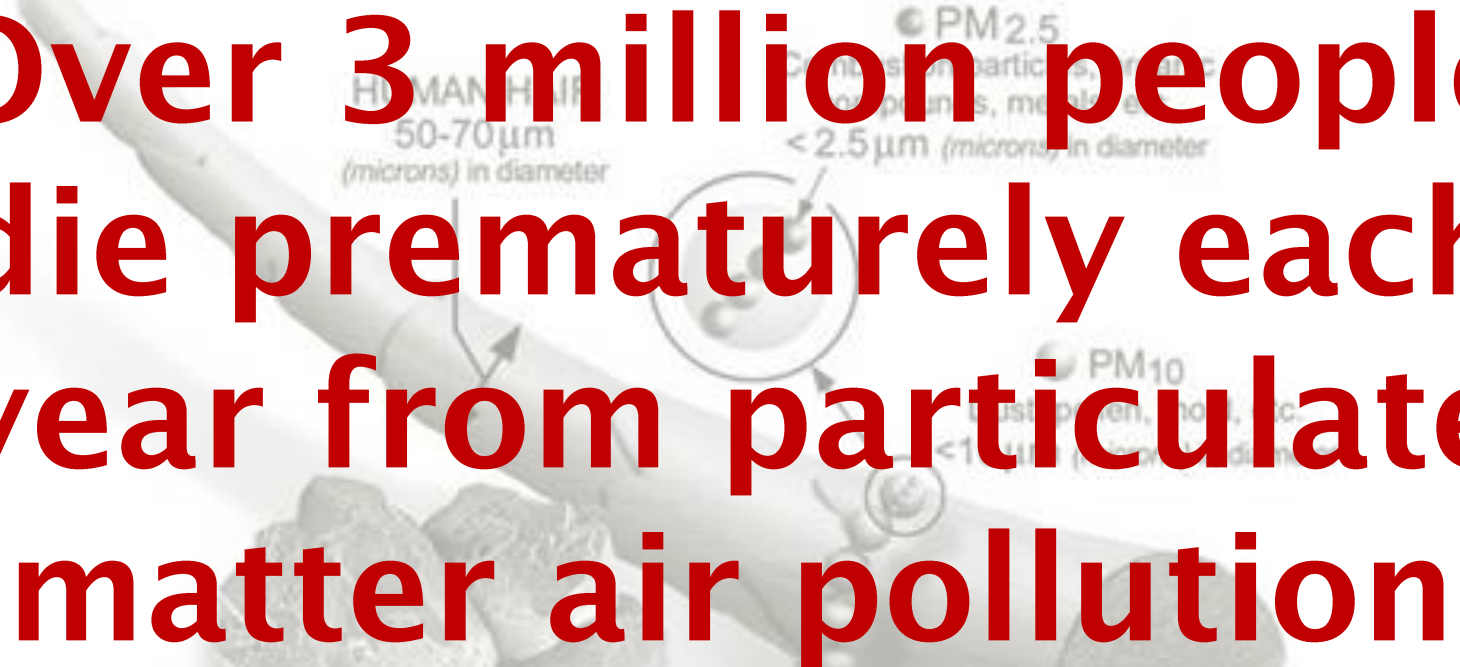
# Particulate Matter is very dangerous



## **Causes major health problems:**

Cardiovascular disease, lung cancer, heart attacks, bronchitis, asthma...

Particulate Matter is very dangerous



**Over 3 million people die prematurely each year from particulate matter air pollution**

Causes major health problems:

Cardiovascular disease, lung cancer, heart attacks, bronchitis, asthma...

**We need data!**

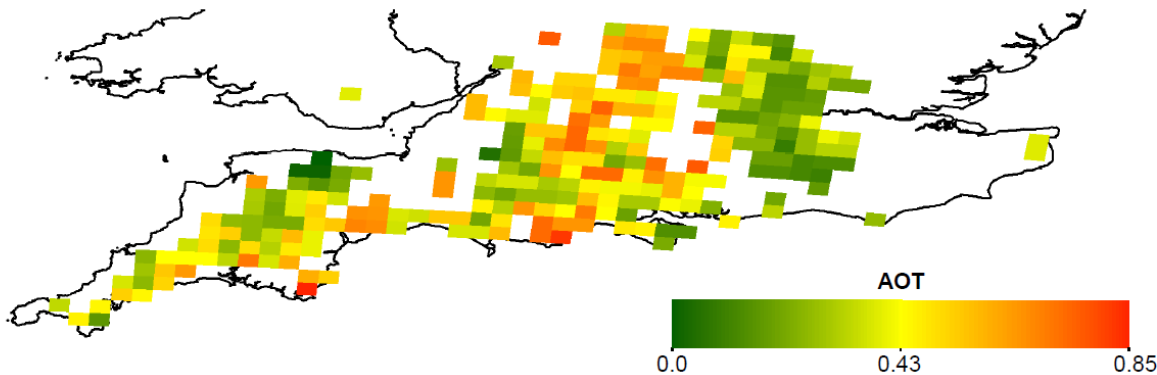
# We need data!

- Ground-based monitoring is very expensive



# We need data!

- Ground-based monitoring is very expensive
- Satellite data is a lot cheaper
  - Global, but... very low resolution

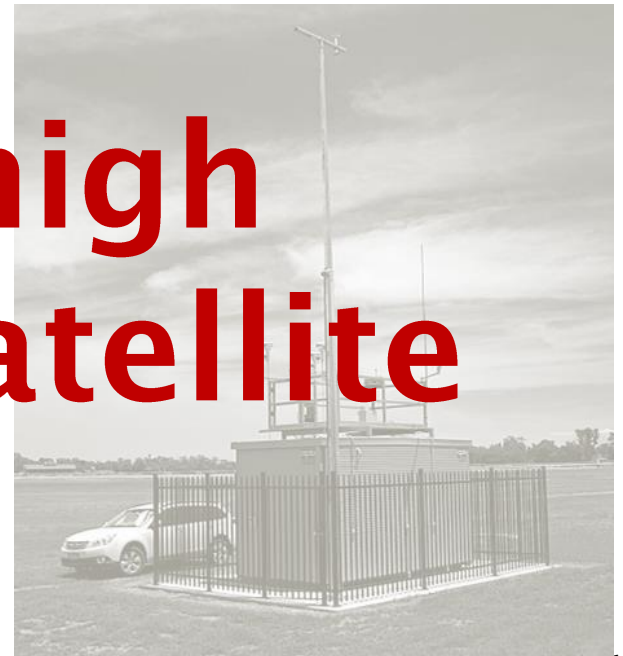




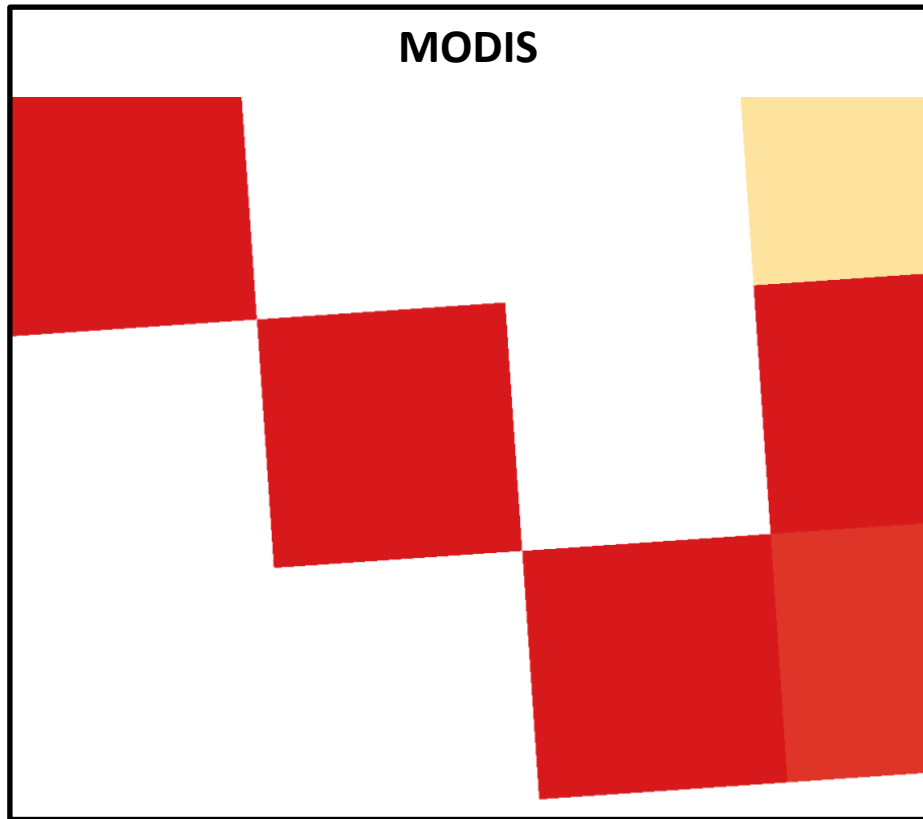
# We need data!

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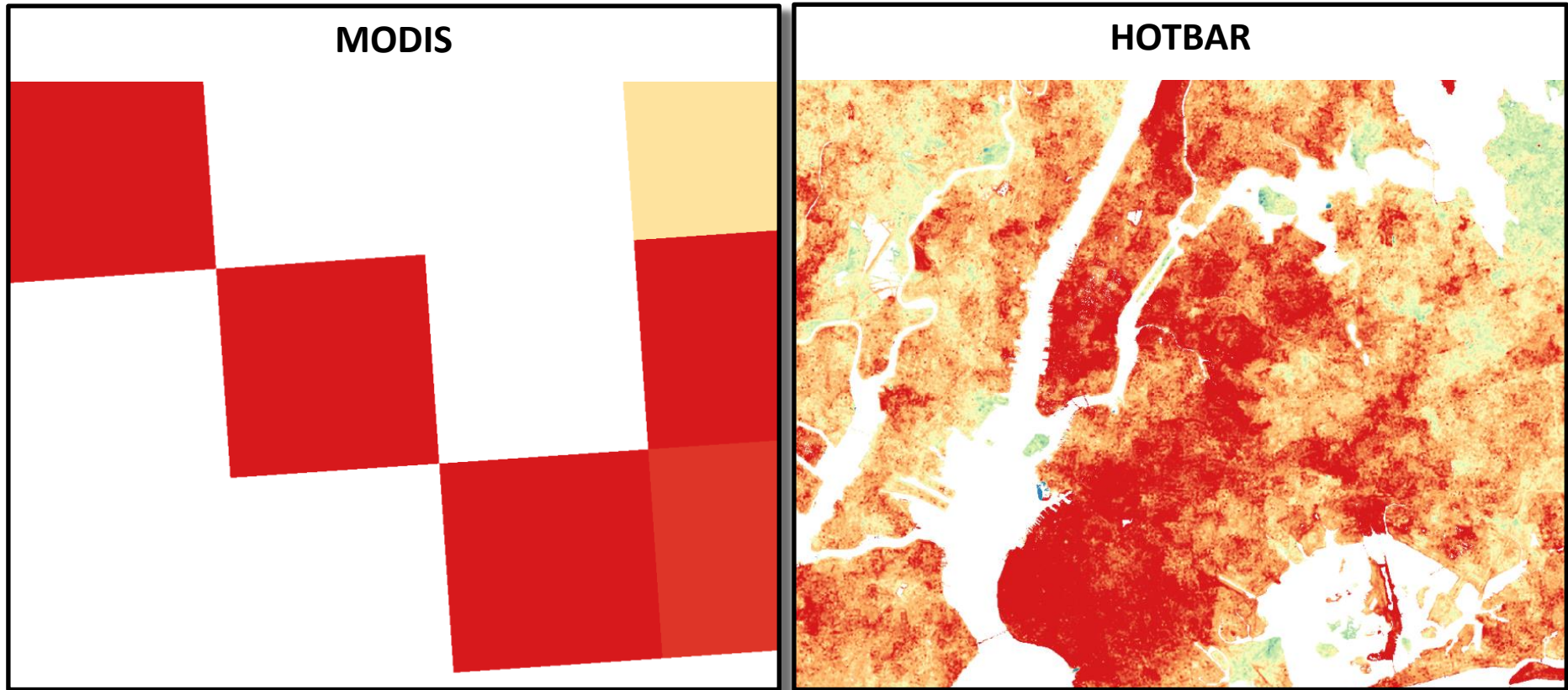
**We need high  
resolution satellite  
data**



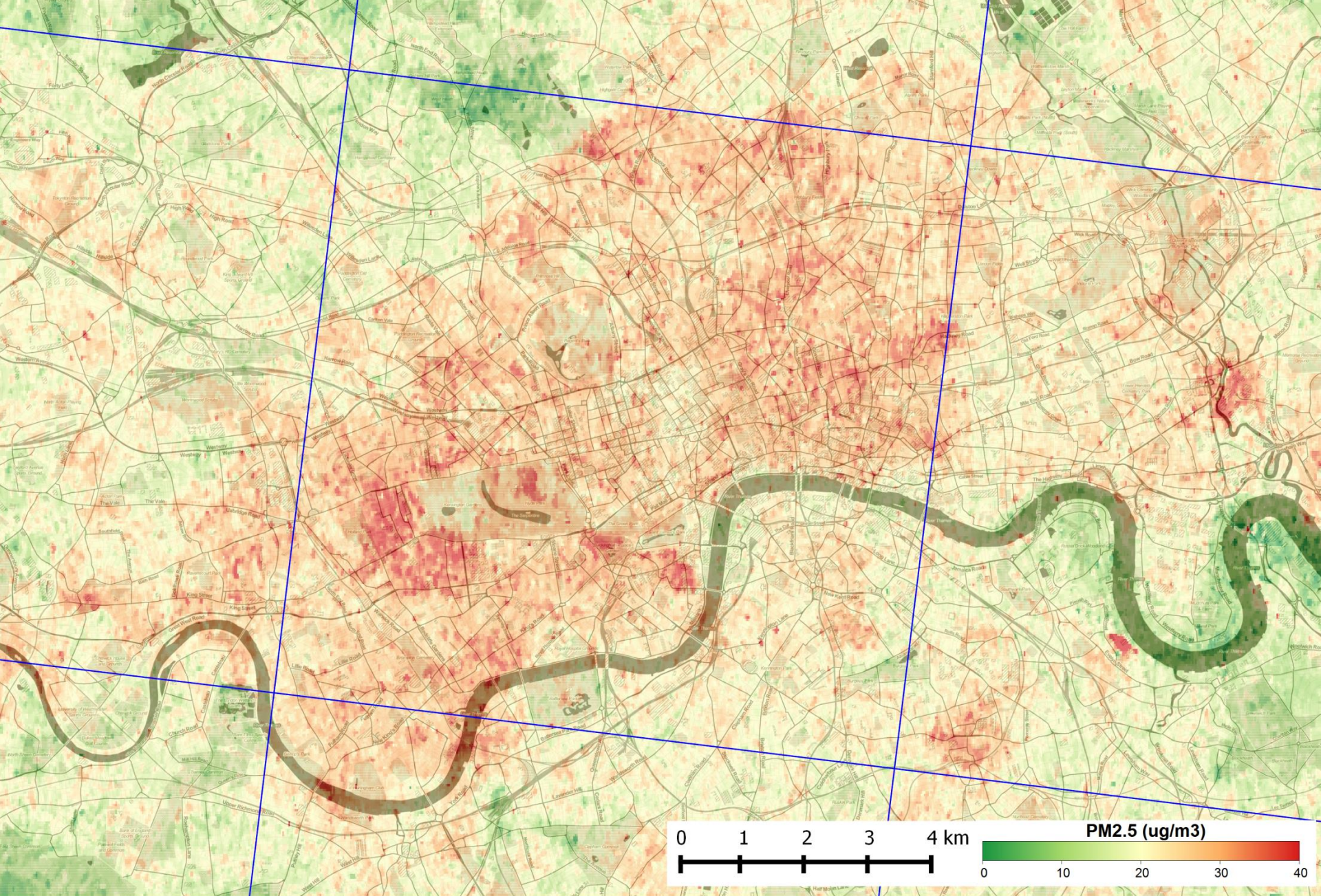
# HOTBAR



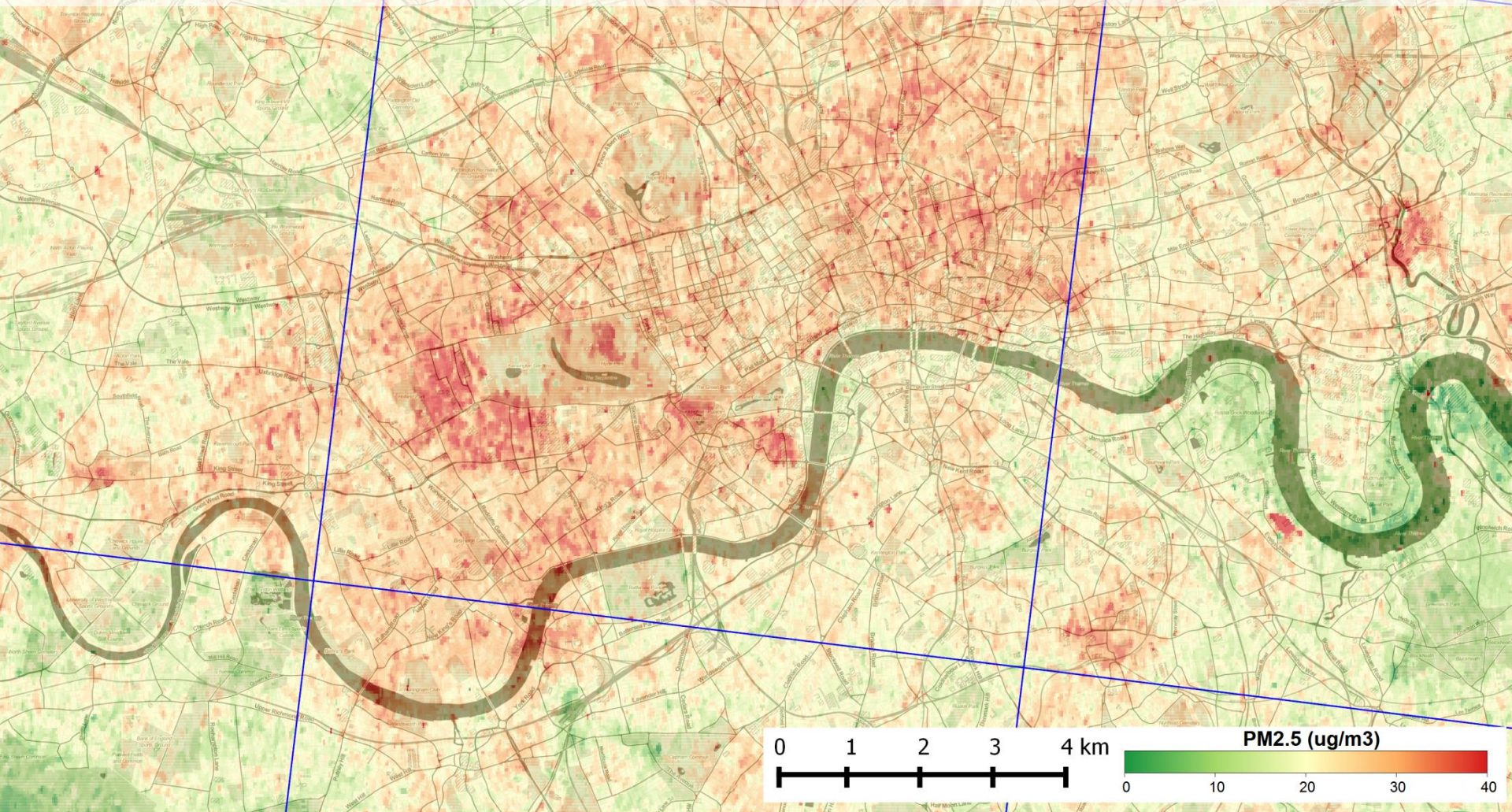
# HOTBAR



**Over 100,000 times the detail**

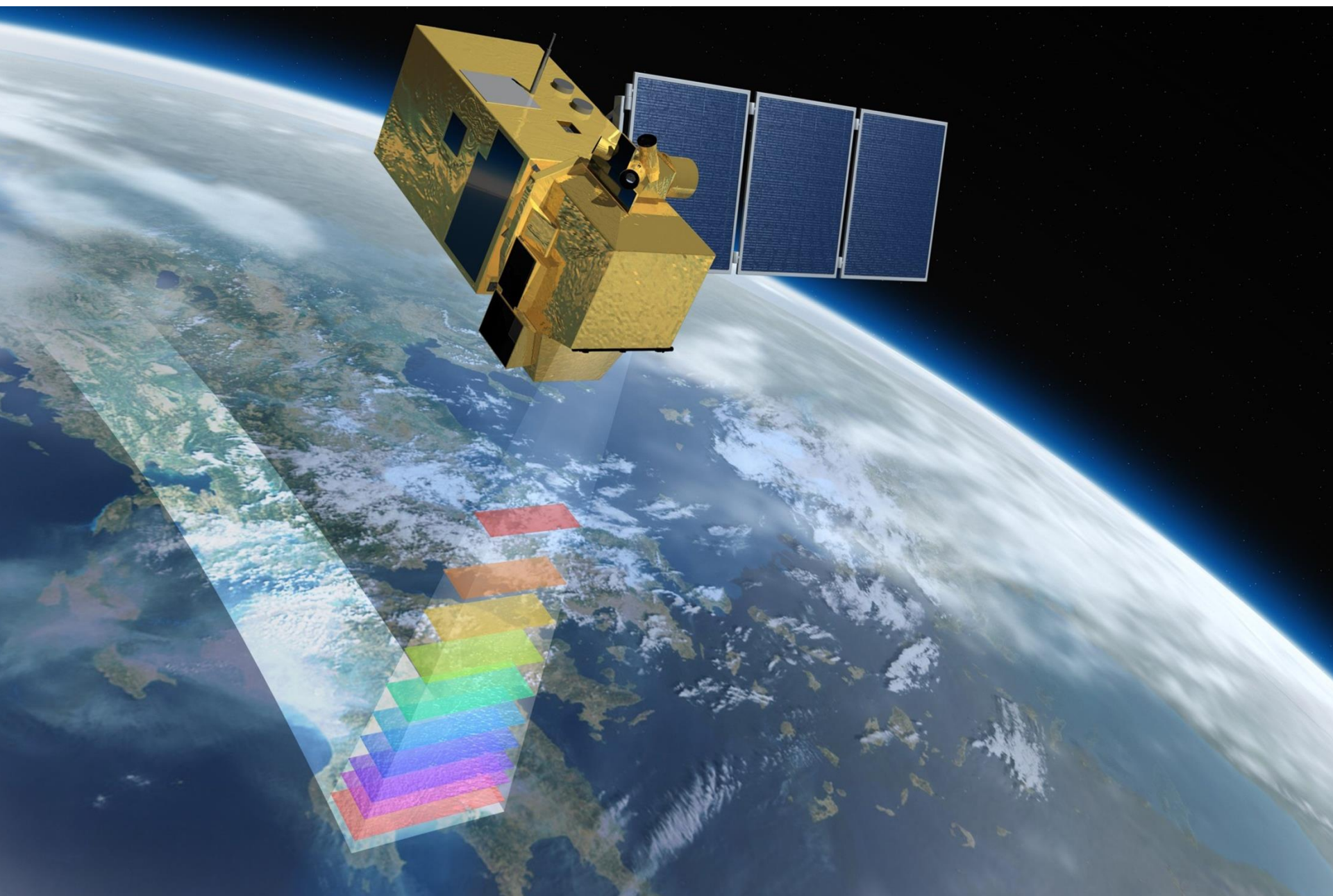


**Vision:** Accurate high spatial & temporal resolution air quality measurements



**Extend, Validate, Apply**

# Extend



# Extend

- **New satellites**



# Extend

- **New satellites**
  - **Improved, automated algorithm**
- 
- A satellite is shown in orbit above the Earth. The satellite has a central body and several large solar panels. A grid of semi-transparent squares is overlaid on the Earth's surface, suggesting a data grid or a specific geographic area of interest. The background shows the curvature of the Earth and the bright light of the sun.



# Extend

A satellite is shown in orbit above the Earth's surface. The satellite has a central body and several large solar panels extending from it. The Earth's surface is visible below, showing clouds and landmasses. The background is a dark, starry space.

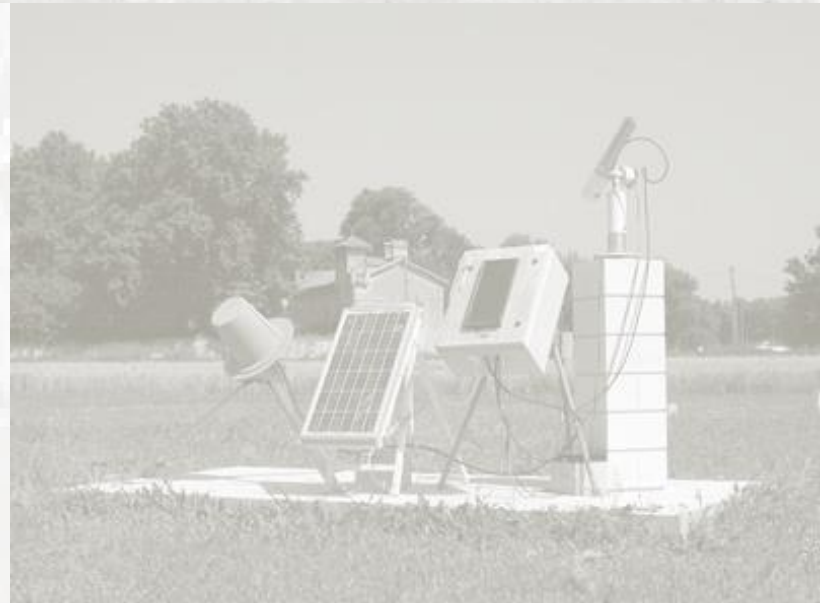
- **New satellites**
- **Improved, automated algorithm**
- **Aerosol modelling (van Donkelaar)**

# Validate



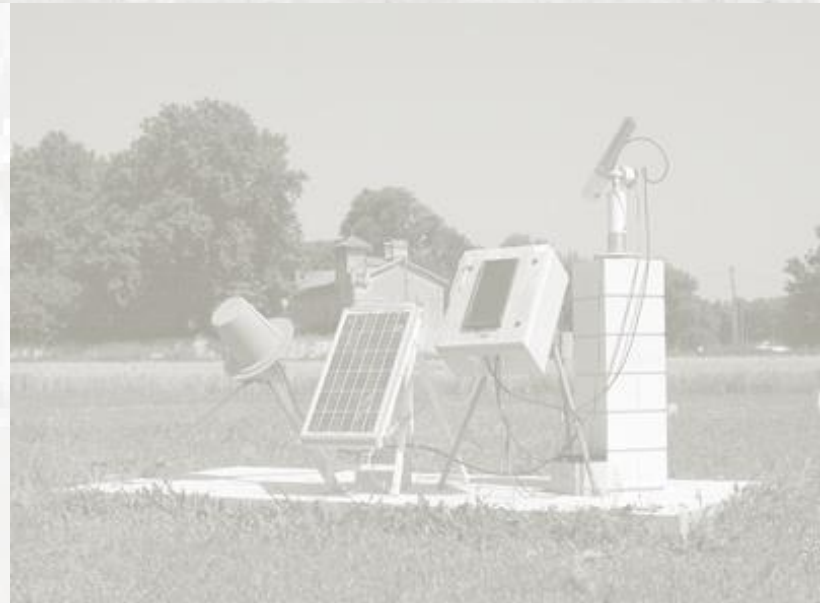
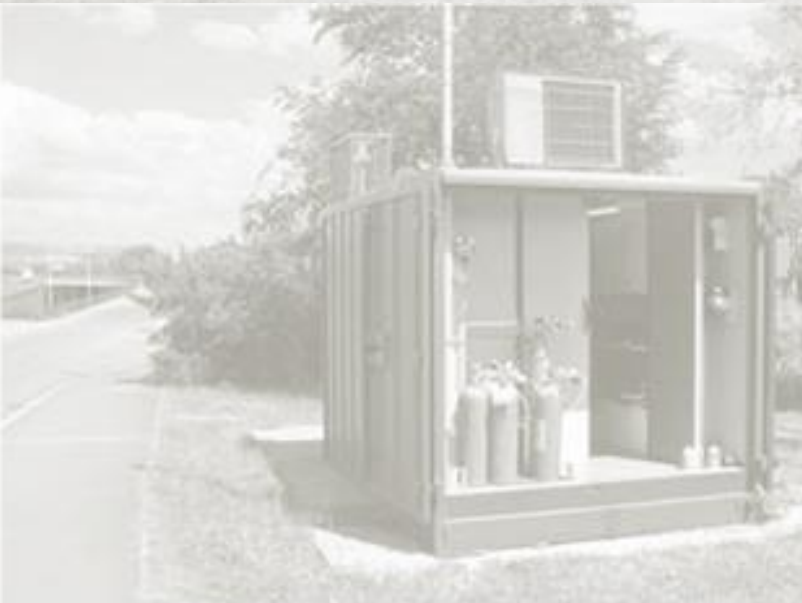
# Validate

- **Ground-based measurements**



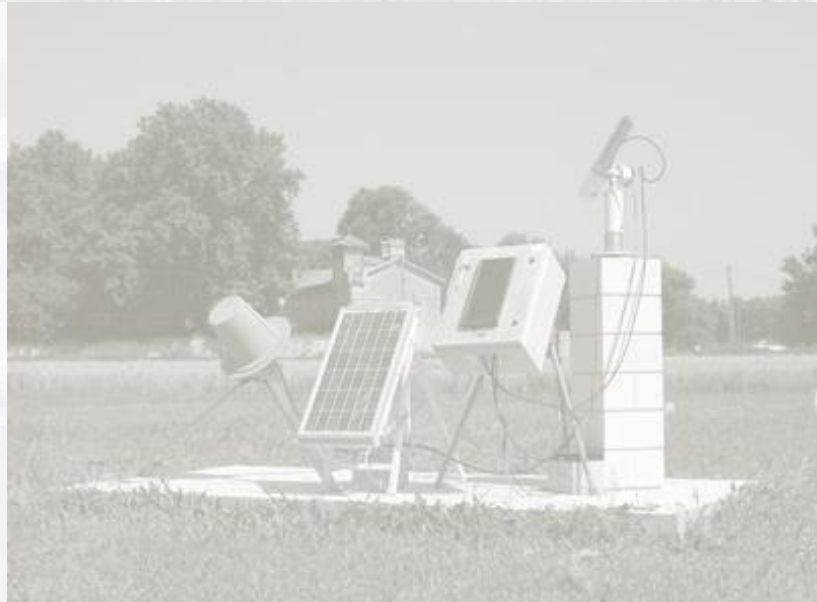
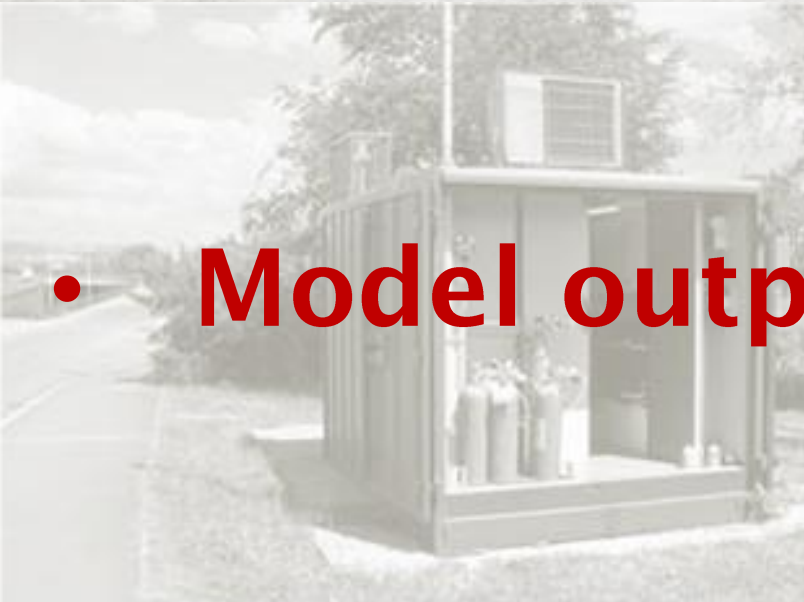
# Validate

- **Ground-based measurements**
- **Other satellite measurements**



# Validate

- **Ground-based measurements**
- **Other satellite measurements**
- **Model outputs**



# Apply



# Apply

- **Focus on LMICs**



# Apply

- **Focus on LMICs**
  - **Focus on applications that require high spatial detail**
- 
- A grayscale photograph of a group of people, primarily women, sitting on the floor in a classroom or community meeting. They are looking towards the front of the room. In the background, a chalkboard is visible with some text written on it. The overall scene suggests an educational or community gathering.



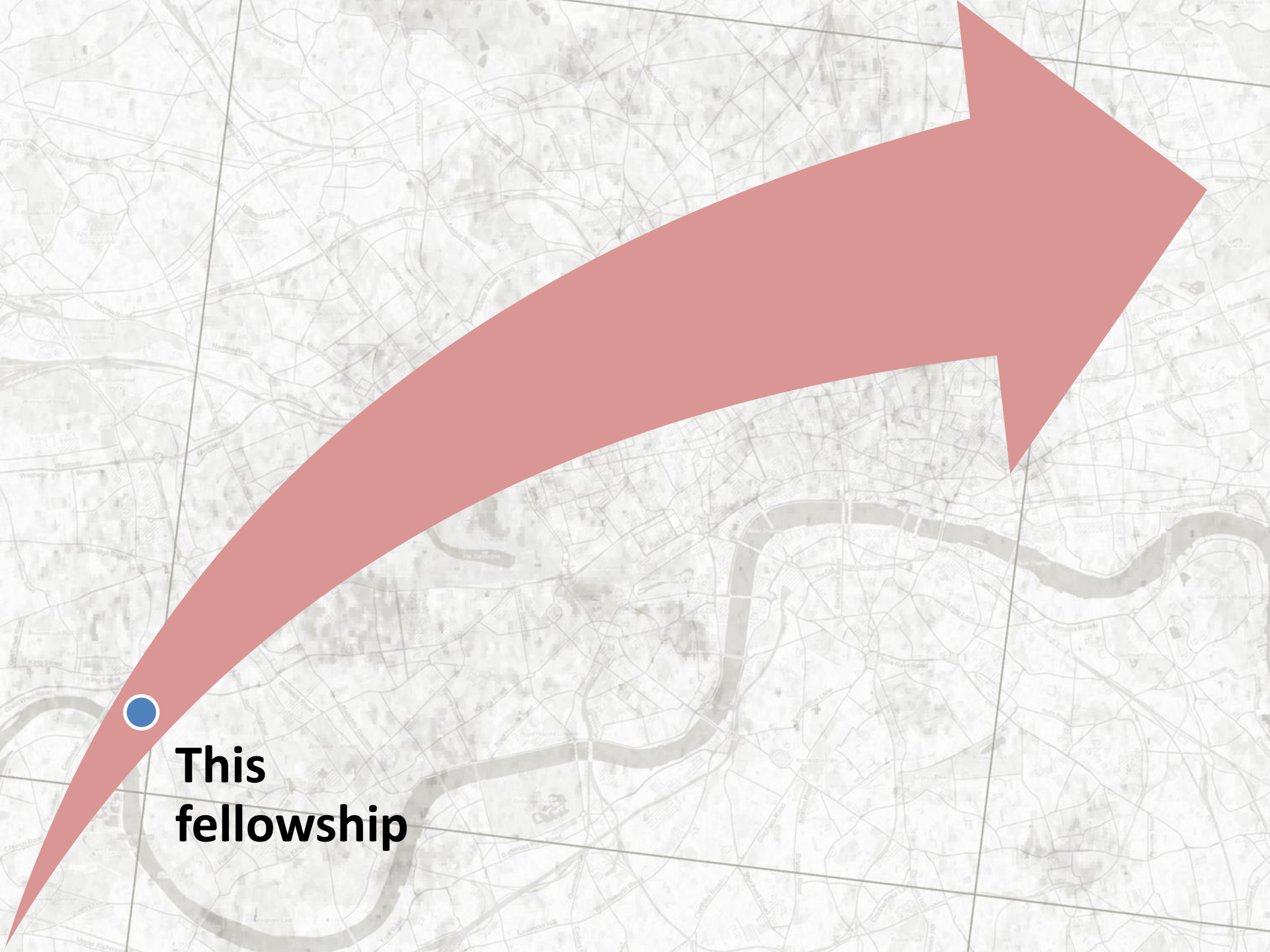
# Apply

- **Focus on LMICs**
  - **Focus on applications that require high spatial detail**
  - **Driven by collaborators within the centre**
- 
- A grayscale photograph of a diverse group of people, including men and women of various ages, sitting on the floor in a classroom or meeting. They are looking towards the right side of the frame. In the background, a chalkboard is visible with some faint writing on it. The overall atmosphere is one of a collaborative learning or working environment.

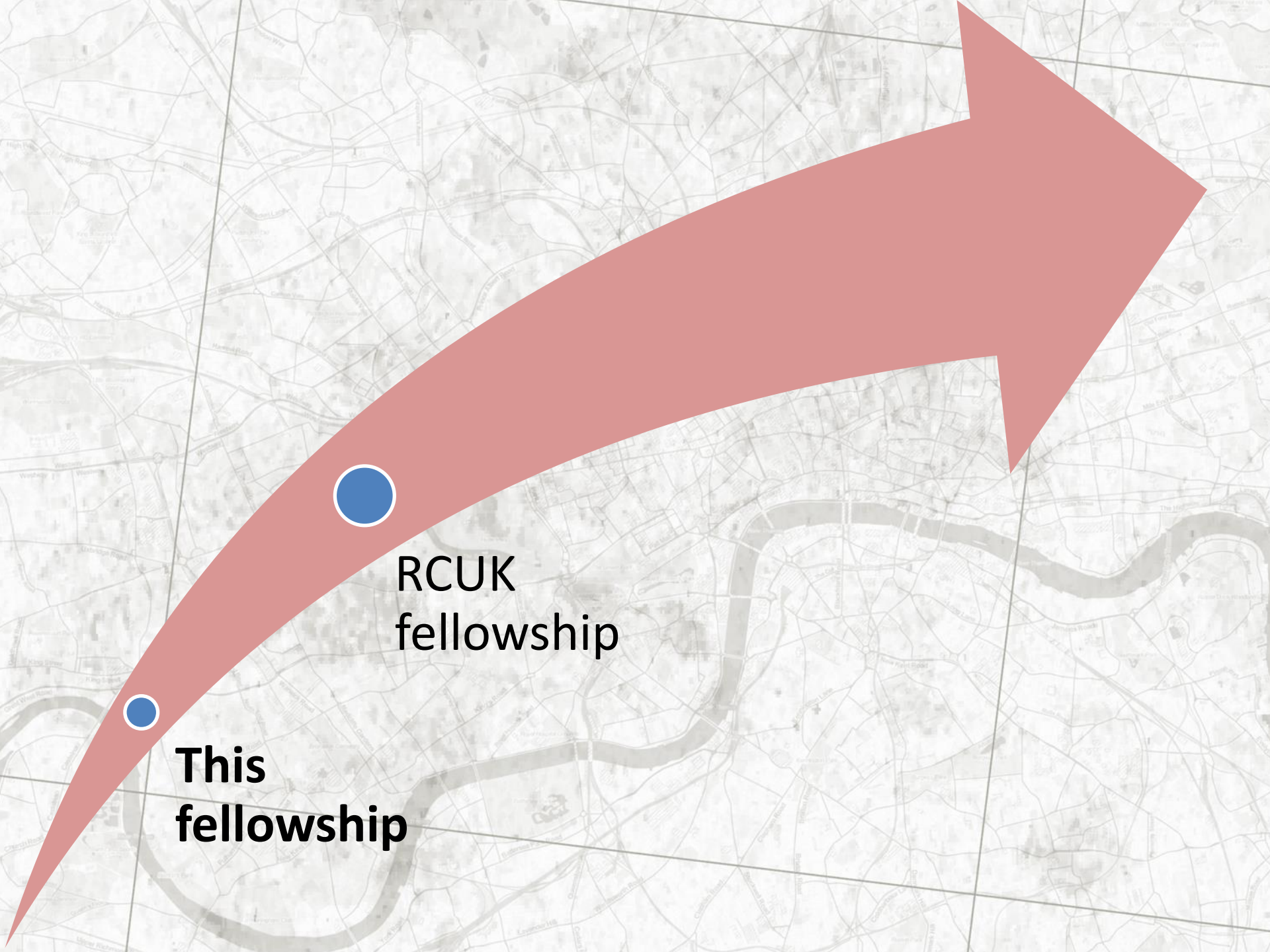


***My  
collaborators***



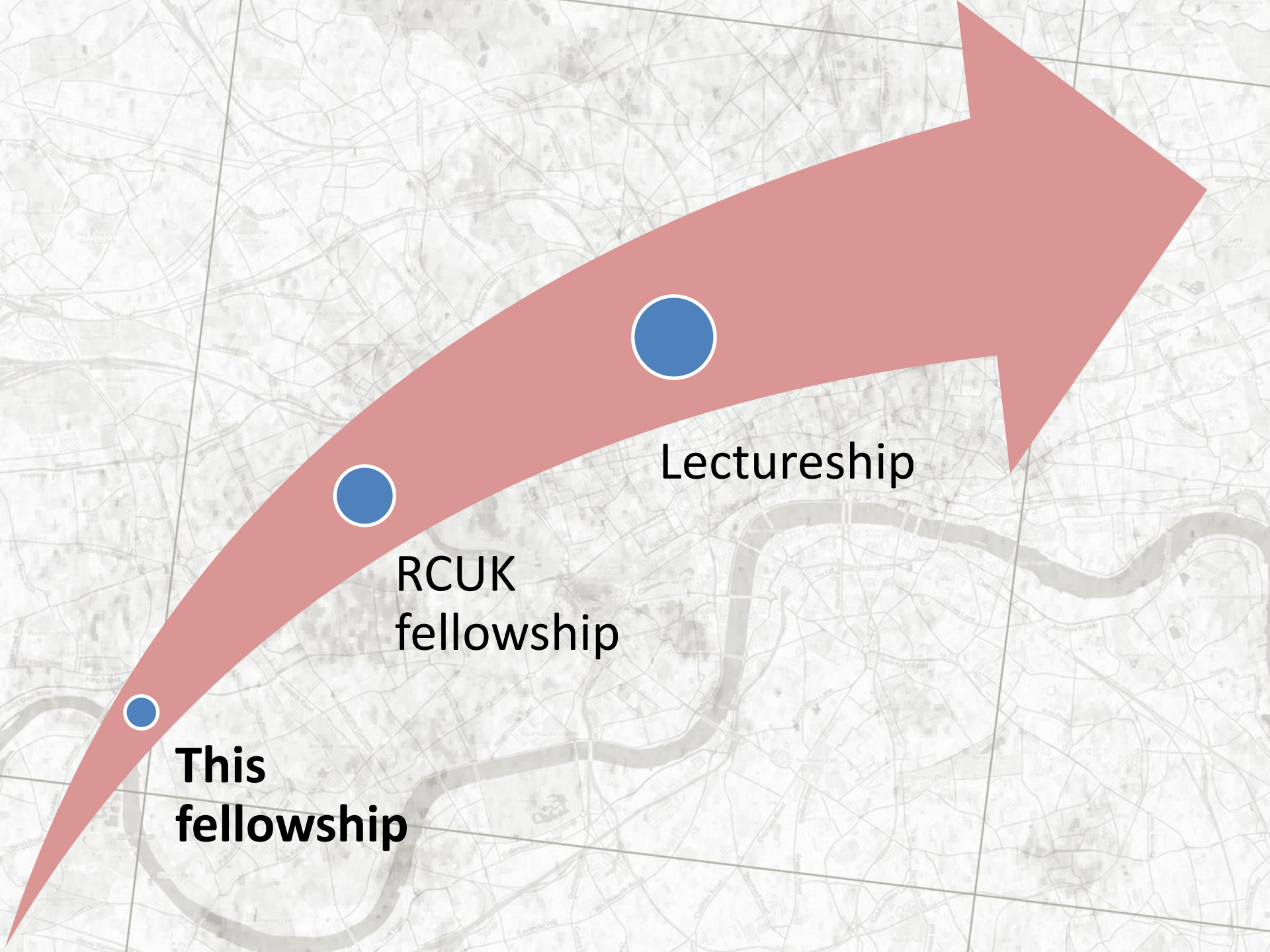


**This  
fellowship**



**This  
fellowship**

**RCUK  
fellowship**



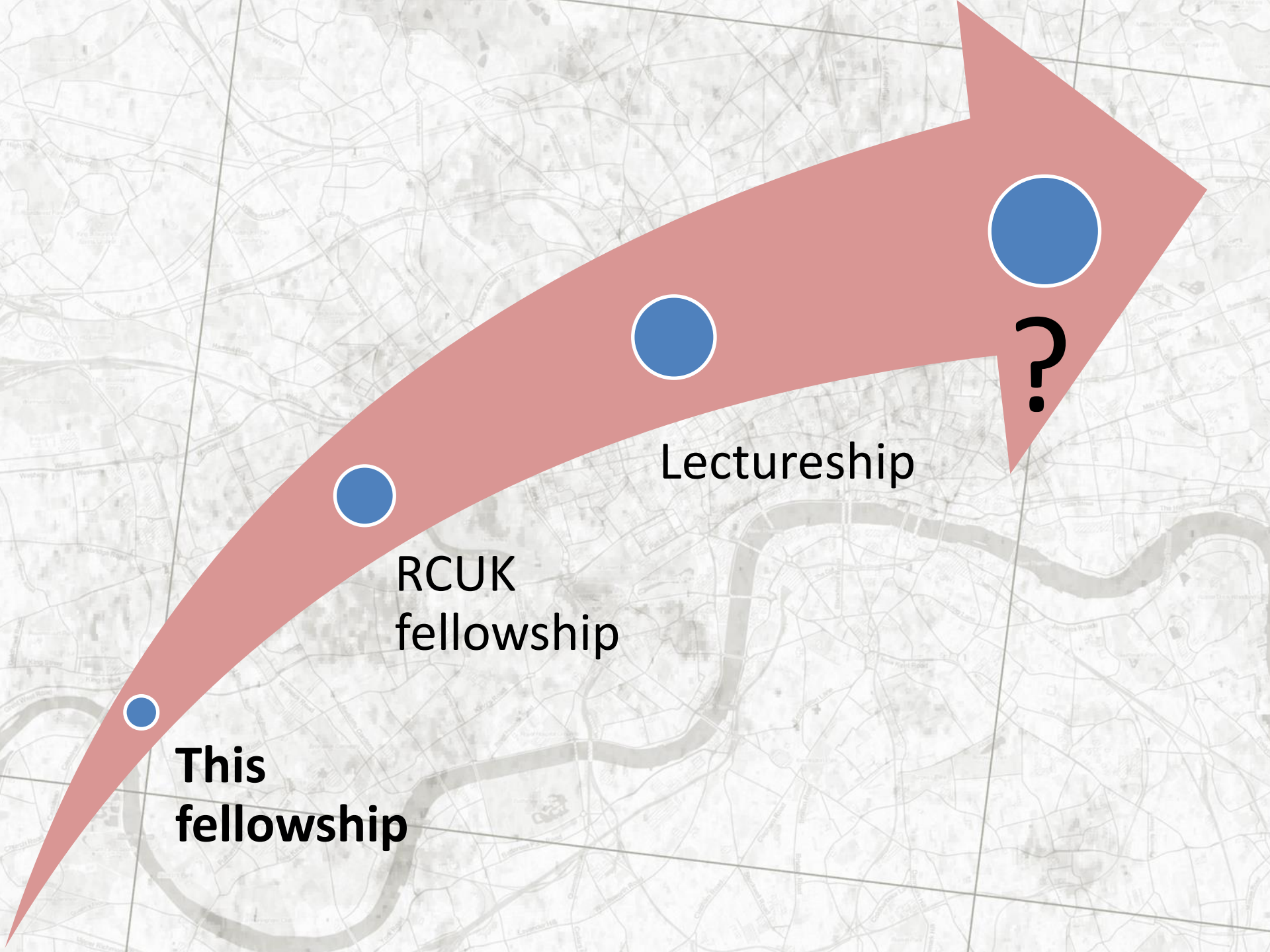
**This  
fellowship**



**RCUK  
fellowship**



**Lectureship**

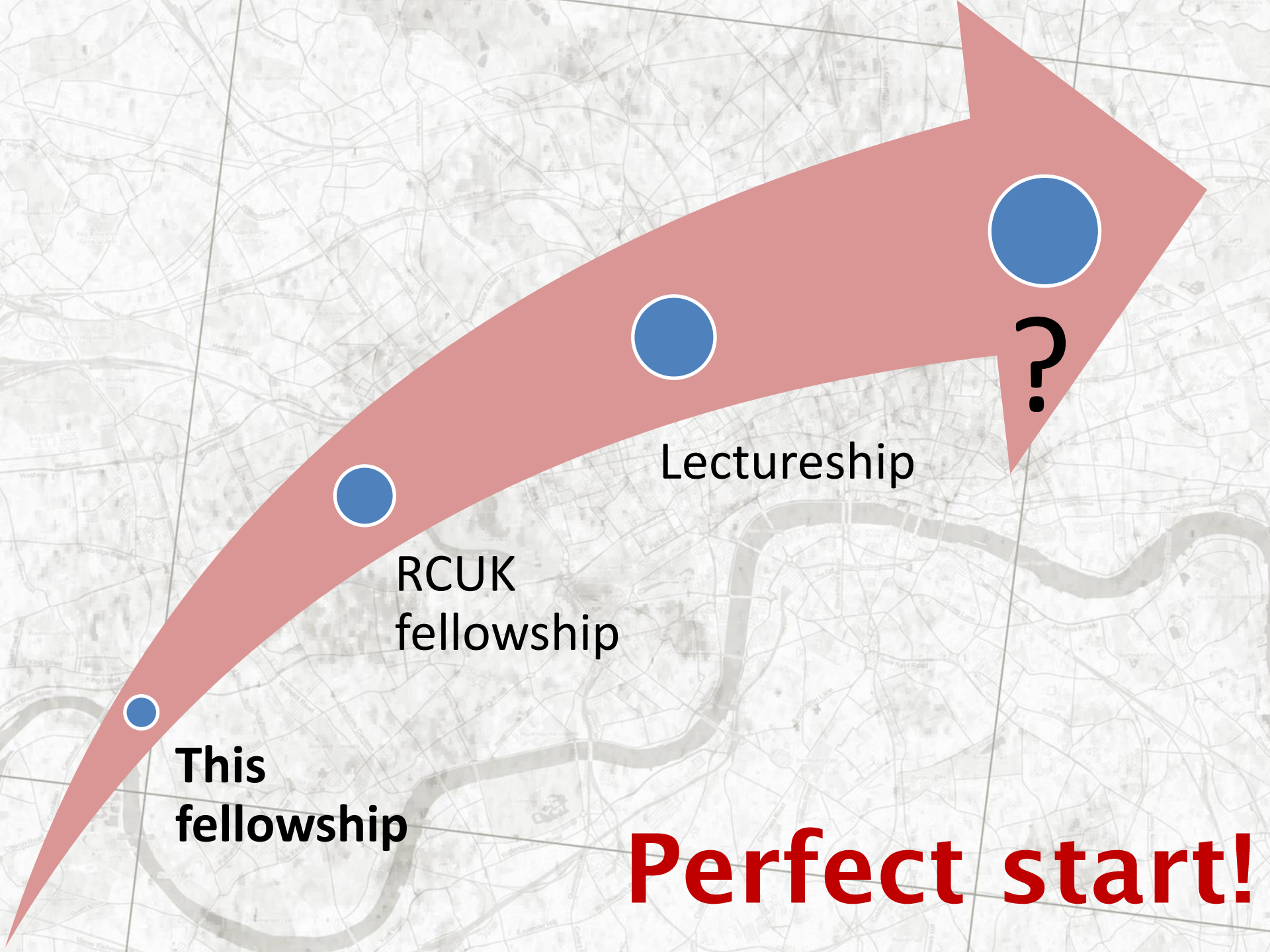


**This  
fellowship**

**RCUK  
fellowship**

**Lectureship**





**This  
fellowship**

**RCUK  
fellowship**

**Lectureship**



**?**

**Perfect start!**



# Opportunity to be at the forefront of a revolutionary method in exposure assessment



**Extend, Validate, Apply**