

# INTERACTIONS WITH NON-HUMANS

*Explore interactive scenarios centered around earthworms as non-human users and utilize speculative design methods.*

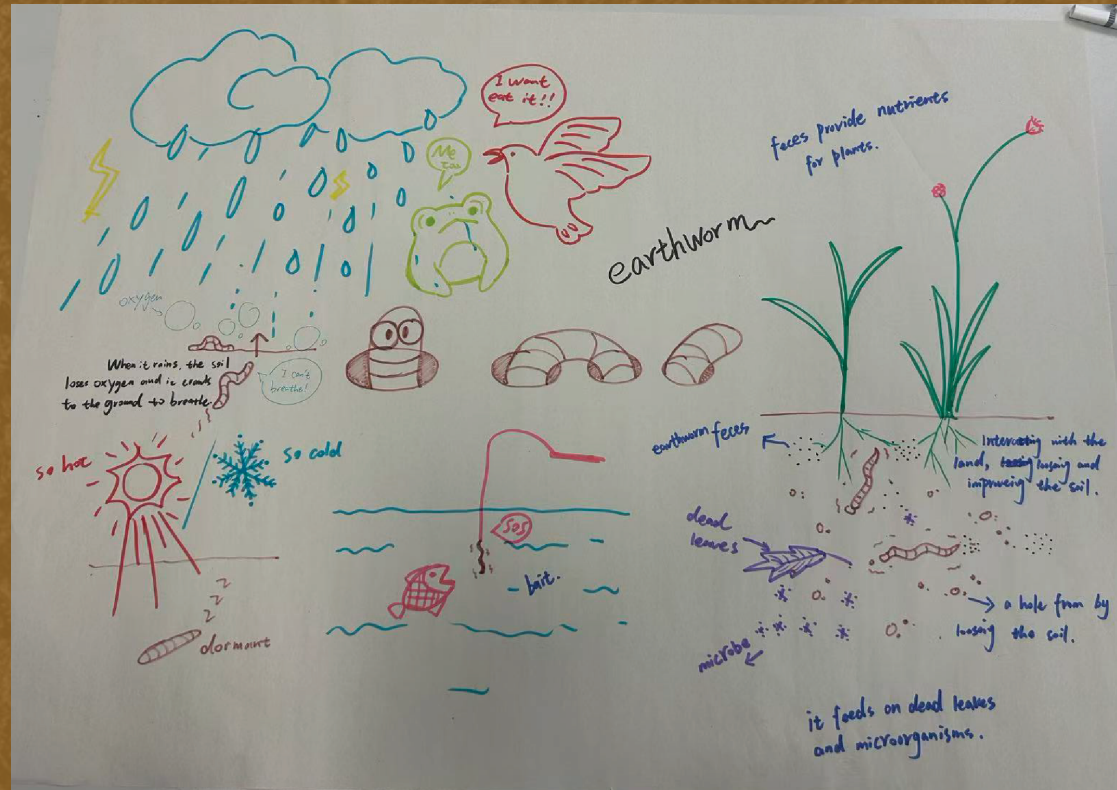
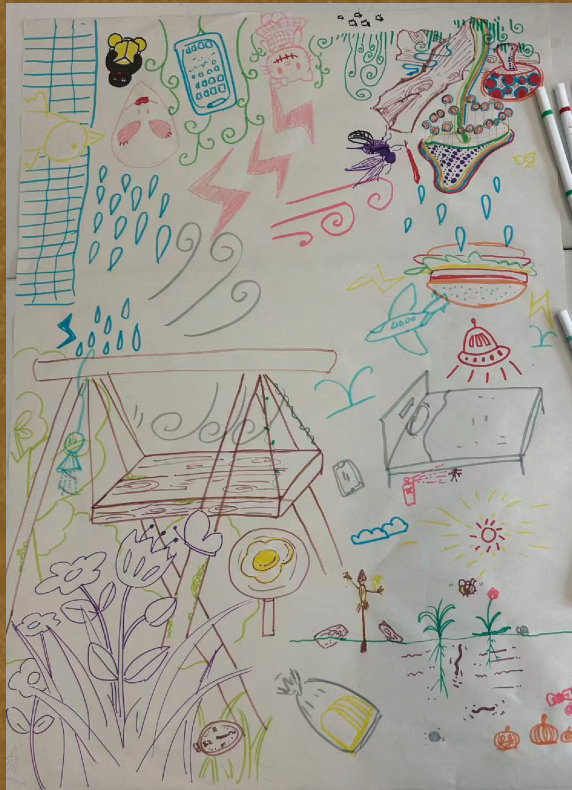
## PROJECT 4





# PROCESS

In class, the teacher leads us to search for non-human users that belong to our own research. First, let's draw the non-human users we want to draw, and then find the non-human users we want to further explore, their activities, interactions with humans, etc., and ask us to think: Who are the users (non-human)? How do they live? What do they need? What are you afraid of? How will it interact with humans, the environment, or technology? These design issues.



I chose earthworms as my non-human users through painting.



# RESEARCH

## NON HUMAN USER PROFILE - EARTHWORM

### How do earthworms move?

Advancing in soil through peristalsis and expansion relies on the softness and moisture of the soil to reduce friction. They do not plan their path, but constantly adjust their direction based on humidity gradients, soil resistance, and safety. When the soil becomes too dry or hard, earthworms' mobility decreases, and they may even be forced to stay in place or die.

### What are the core needs of earthworms?

Moderate soil moisture: A moist environment helps with skin respiration and smooth movement

Soft and uncompacted soil structure: easy to drill holes and loosen soil

Adequate organic matter, such as humus and debris from dead leaves, is its main source of food

Stable and low interference environment: avoid frequent flipping, trampling, and drastic changes

### What is a day like for earthworms?

In urban environments, a earthworm's day is full of risks: it may be trapped in compacted, dry soil layers, unable to find a safe path, and can only passively withstand environmental changes.

| environment factors                                                                                   | earthworm reaction                                                                                      | emotion                                                                                           |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|  dry soil          |  ↓ slow              |  Sad           |
|  Too wet           |  ↑ up                |  stress        |
|  high temperature |  fast deep drilling |  overheated    |
|  moderate        |  stable            |  comfortable |
|  vibration soil  |  quick twist       |  scared      |
|  wet             |  active            |  happy       |



# ANALYZE

## People:



Humidity sensing:  
directly sensing whether the  
environment is suitable through  
the skin

Tactile feedback:  
Determine whether the soil is soft  
and safe

Dependence on Darkness:  
Avoiding Light as a Survival Strategy

The need for stability:  
maintaining a sense of security by  
reducing interference

## Activities:



Continuously moving and drilling  
holes in the soil

Swallowing organic matter  
and participating in soil  
decomposition and cycling

Change the movement path  
when encountering dry or  
dangerous areas

Reduce activity or even enter a state  
of death under unsuitable conditions



# ANALYZE

## Contexts:



● The soil is covered with cement and asphalt, forming a hardened surface

● Frequent trampling and flipping caused by human activities

● Urban pollution changes soil composition

● Green spaces are cut into scattered and discontinuous ecological fragments

## Technologies:



● Sprinkler systems, gardening tools, urban infrastructure (mostly serving humans)



# CREATE

Through studying the ecological behavior of earthworms, soil moisture, and urban hardened surfaces, I constructed a speculative design scenario using earthworms as non-human users. This project envisions a "humidity cloud map system" through a 2D hand drawn animation to visualize the moisture distribution of underground soil and explore how the environment would change if cities began to respond to the survival logic of earthworms.

In this speculative scenario, the narrative takes the perception of earthworms as the core starting point. And for earthworms, the world is not made up of "space" and "direction", but rather a series of humidity gradients and danger signals.

The humidity cloud map is the core speculative technical concept in this project. Earthworms do not "see" cloud images, but their movement path naturally tends towards moist areas, forming a spatial logic generated by non-human behavior in reverse.

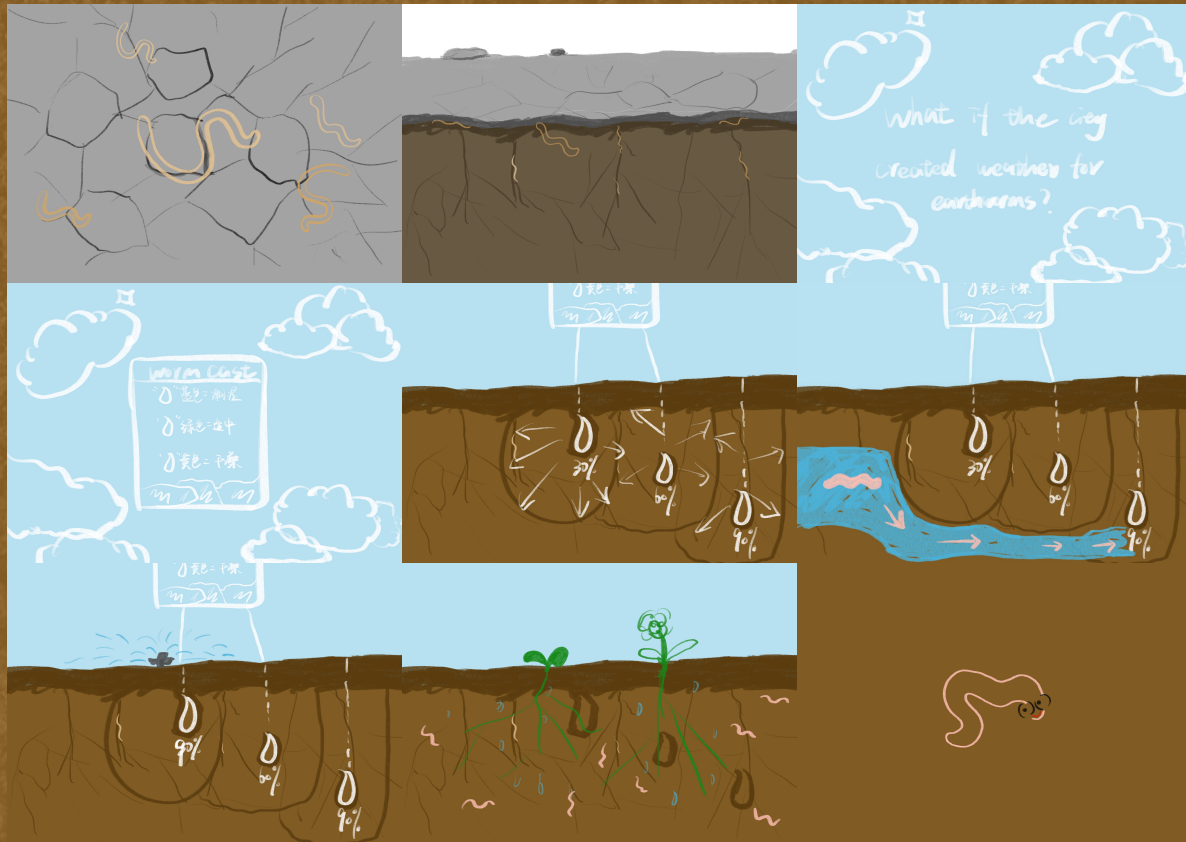




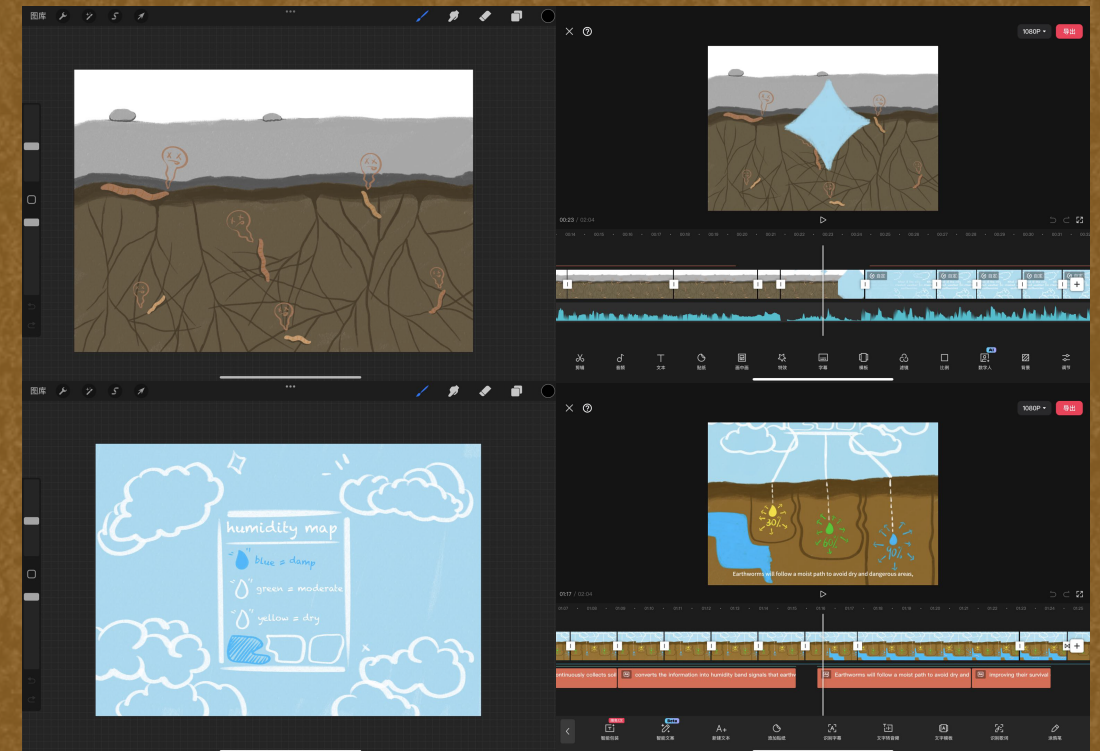
# CREATE

I divided the animation into three parts. The first part introduces the problem of soil damage caused by human activities. The second part introduces the future concept of a humidity cloud map system. The third part discusses the modified application and ecological impact.

## Sketch:



## Process:

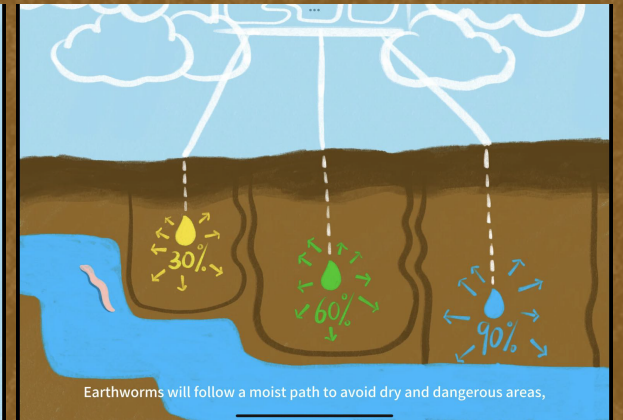
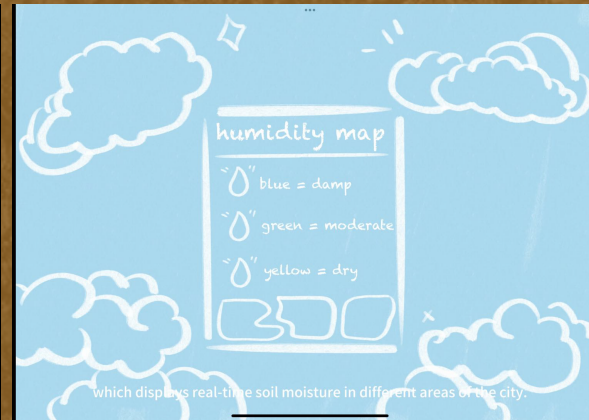
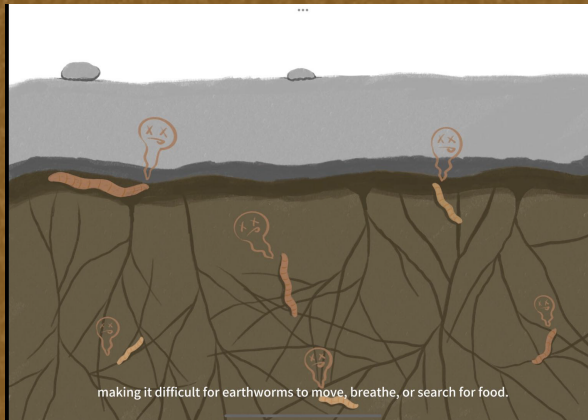


I used Procreate and Jianying software to complete it.



# OUTCOME

This video constructs a speculative interactive narrative experience from the perspective of earthworms. The work revolves around the impact of soil moisture changes in urban environments on the survival of earthworms. Through a series of hand drawn animated scenes, it presents the movement, selection, and adaptation process of earthworms between dry, compacted, and humid areas. I use soft colors to distinguish different humidity states, and construct a visual system between "data visualization" and "ecological narrative" through symbolic cloud maps, arrows, and numerical values.



Video link:  
<https://www.youtube.com/watch?v=ynG3Ce0cVXM>