



# NEXT-GEN BIODIVERSITY MONITORING WITH DRONES AND AI



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## Objective

The standard practice for biodiversity monitoring utilizes a “boots on the ground” approach. This means inaccessible and fragile ecosystems can be challenging to survey. This project enabled ecologists to use a next-gen method for measuring biodiversity. The program makes it easy to monitor a wide variety of ecosystems, including ones where physical access is limited.

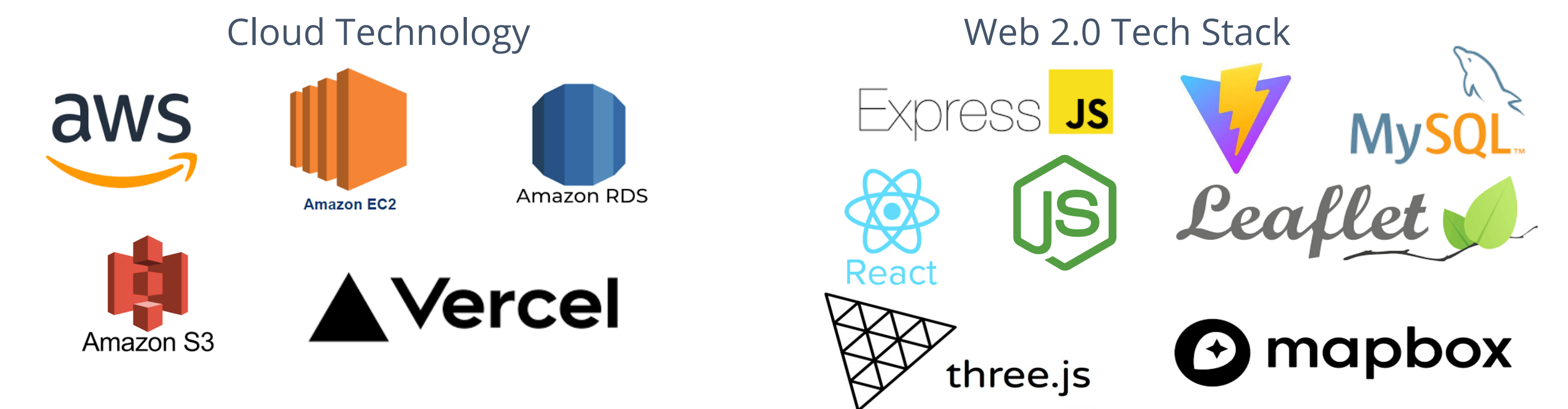
The ecologist's workflow:

- Capture drone images of an ecosystem
- Upload them to this site and click “run”
- Add annotations to any point in the image
- Receive real world coordinates for each annotation

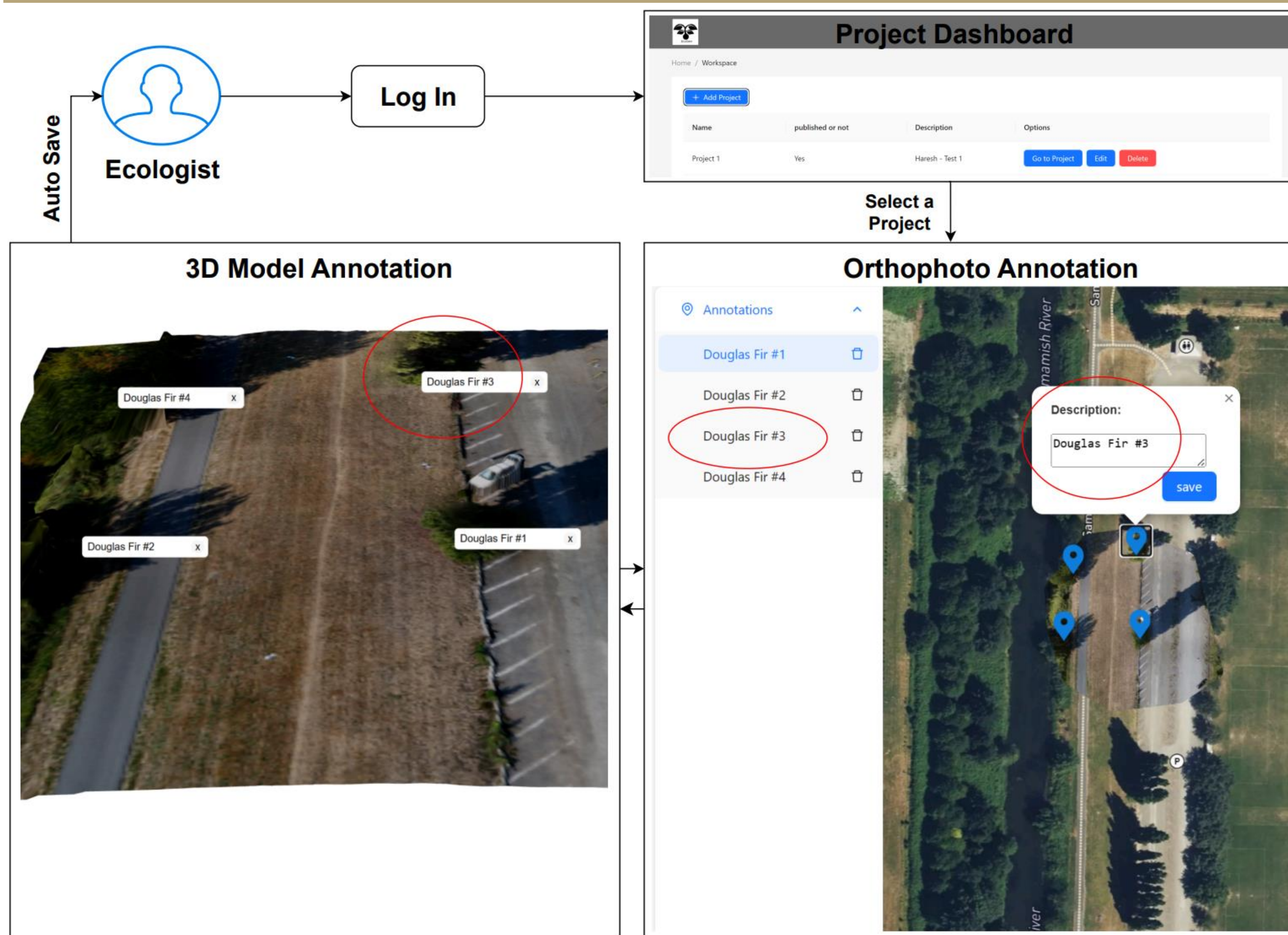
## Requirements

- User authentication
- Create, edit, and delete projects
- Support the upload of large batches of images
- Generate 2D and 3D models from uploaded images
- Allow annotations in 2D and 3D
- Generate real world coordinates for each annotation
- Provide a smooth and intuitive interface

## Tech Stack



## Results

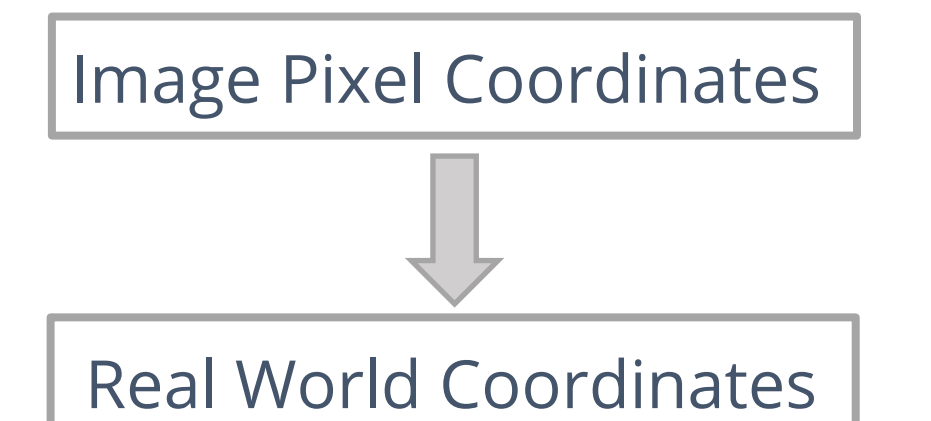


## Coordinate Projection

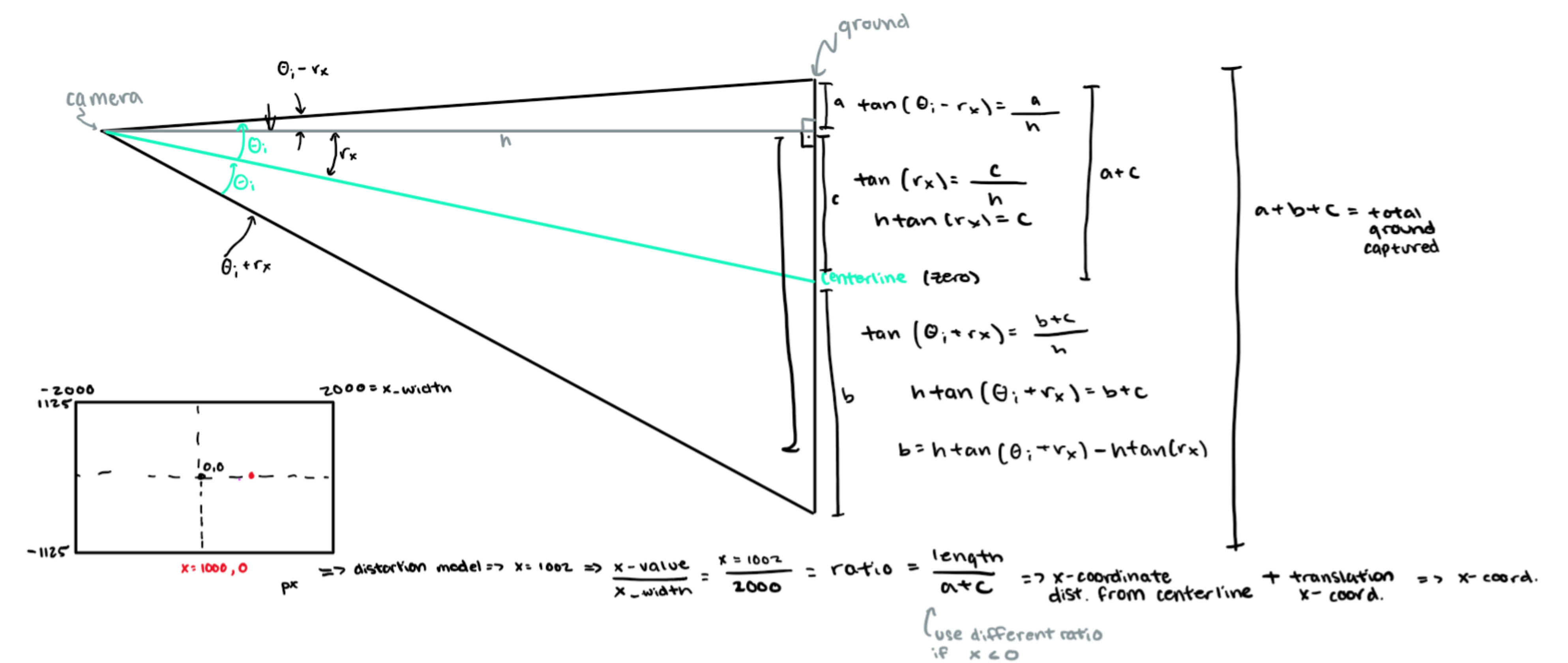
Purpose: to provide real coordinates for each annotation made on the image.

Data given by the drone during image capture:

- Coordinate location (image center)
- Height
- Rotation along x, y, z axis
- Image distortion parameters (consistent across images)



The diagram below shows an example of the calculations made based on these parameters.



## Future Work

- This project would benefit from the following additions:
- Ability to share projects between users
  - Auto-annotation via few-shot learning
  - FAQ/Contact Us interface
  - Batch upload of images

## References

Documentation of frameworks and libraries:



Team member profiles:

