

# CO2 Flux



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## Motivation

Our Clients, Dr. Richardson and Dr. Carbone, are researchers in the Ecology department at Northern Arizona University. Currently, their equipment setup is inefficient and cumbersome. Our aim is to provide a solution that has the same functionality combined with ease and mobility.

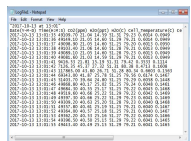


Fig 1: Old Data Output

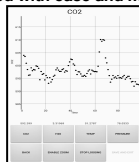
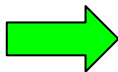


Fig 2: New Data Output

## Technologies



Android OS



Android GraphView



CO2 Flux



LI-840A Analyzer



Email

## Outcome

We consolidated all of the features for our clients' needs into one compact and convenient mobile application.

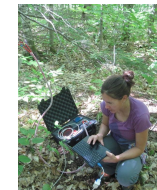


Fig 3: Old setup

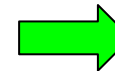


Fig 3: New setup

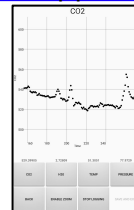
## Solution Overview

Solution	Key Feature
Android Mobile Application	Mobile Android Device
Android USBSerial Library	Connection from LI-840A to Device
Android GraphView Library	Real Time Data Streaming
Data Management	Scientific MetaData Template
Apache Common Math Library	Data Review and Statistical Analysis
Email Functionality	Built in Email Application Support

## Challenges and Resolutions

Feasibility of a connection from LI-840A to our application	Serial data streaming to the application proved to be viable
Android application development learning curve for the team	Many hours of researching, practicing, and testing went into this application to ensure this learning curve is not an issue
Overall application design	Throughout implementation we have had to change the design of our application to meet the clients' requirements

## Our Application



## Testing

### Unit testing

- Testing main functions of application with dummy data

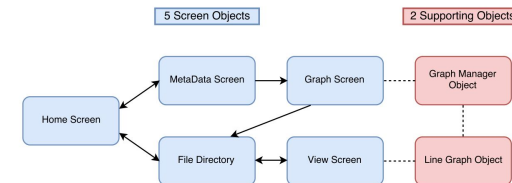
### Integration testing

- Testing user interface interactions with dummy data to ensure it handles data correctly

### Usability testing

- Testing done by users to ensure user interface and user experience is the highest quality

## Architecture



## Future Work

As our clients continue to use our application for their research, some possible changes to be made in the future may include:

- Compatibility with other gas analyzers
- User interface and user experience improvements
- Additional statistics