Communication Paper Takeaway:

* Communication Protocol will probably be LoRaWAN or NB-IoT
* Really depends on the data that is being collected and transmitted

Waterlogging article:

* Costs approx $50M a year
* Issue for productivity
* Quite a complex problem, really still didn’t fully understand it
* There are existing solutions

John Deere Website:

* APIs available but not really specific e.g. weather station asset, environment etc.
* Need to clarify with Atif what he wants us to focus on here, is it an example JSON payload?

<https://developer.deere.com/dev-docs/assets#type-table>

A screenshot of a computer

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A screenshot of a computer

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My Research

Article supporting usefulness of satellite soil moisture monitoring: <https://www.mdpi.com/2072-4292/14/16/3971>

Other estimates/sources for soil moisture:

1. Since 2021 - <https://www.tern.org.au/news-smips-soil-moisture/>; I think it’s ML derived fusion (Data assimilation) model. <https://shiny.esoil.io/SMIPS/>

A map of australia with blue and white colors

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1. <https://awo.bom.gov.au/products/historical/soilMoisture-rootZone/5,-27.489,134.231/nat,-25.609,134.362/r/d/2024-08-01>

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1. <https://ausenv.tern.org.au/aex/#/2023/Soil_moisture/Region/Actual/Local_Government%20Areas/bar,options/-31.86/116.54/8/none/Roadmap/Opaque>

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Appparently capacitative soil moisture sensors are better because of galvanic effect?

<https://forum.arduino.cc/t/looking-for-a-proof-that-soil-moisture-sensors-can-be-reliable/662749>

Found some resources for capacitative sensor:

How do capacitative sensors work? https://hackaday.com/2021/05/17/soil-moisture-sensors-how-do-they-work/

Useful resource in explaining the technical details (calculations) <https://www.biomaker.org/block-catalogue/2021/12/17/soil-moisture-sensor-aideepen-v12>

Actual resources to buy capacitative soil moisture sensors:

<https://core-electronics.com.au/catalogsearch/result/?q=Capacitive%20Soil%20Moisture%20Sensor>

<https://core-electronics.com.au/capacitive-soil-moisture-sensor-corrosion-resistant.html>

<https://core-electronics.com.au/sensors/soil-moisture.html> - IP68 but expensive @ $50

<https://core-electronics.com.au/gravity-analog-waterproof-capacitive-soil-moisture-sensor.html> - Waterproof @ $31.50

Need to do further research if client agrees into whether we need any type of middle component/interface to connect to the microcontroller?

Do we need to also record soil temperature?

<https://typeset.io/questions/what-the-effects-of-soil-temperature-on-soil-compaction-3vdq7ggioy>

Microcontroller: GPS module inbuilt into TTGO T-Beam: <https://www.lilygo.cc/products/t-beam-v1-1-esp32-lora-module>, advanced power management

Housing for components, microcontroller:

<https://www.matterhackers.com/articles/the-best-3d-printing-filament-for-outdoor-use>

Can we simulate UV resistant housing?- I have a 3D printer with PLA+ which is not UV resistant but has a higher resistivity to the elements

Testing Difficulty: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10007478/>