tinyML® for Good

Tiny technology for the world's biggest challenges

Groundwater Wells: The Untapped Edge Use Case

Doug Standley - Niolabs

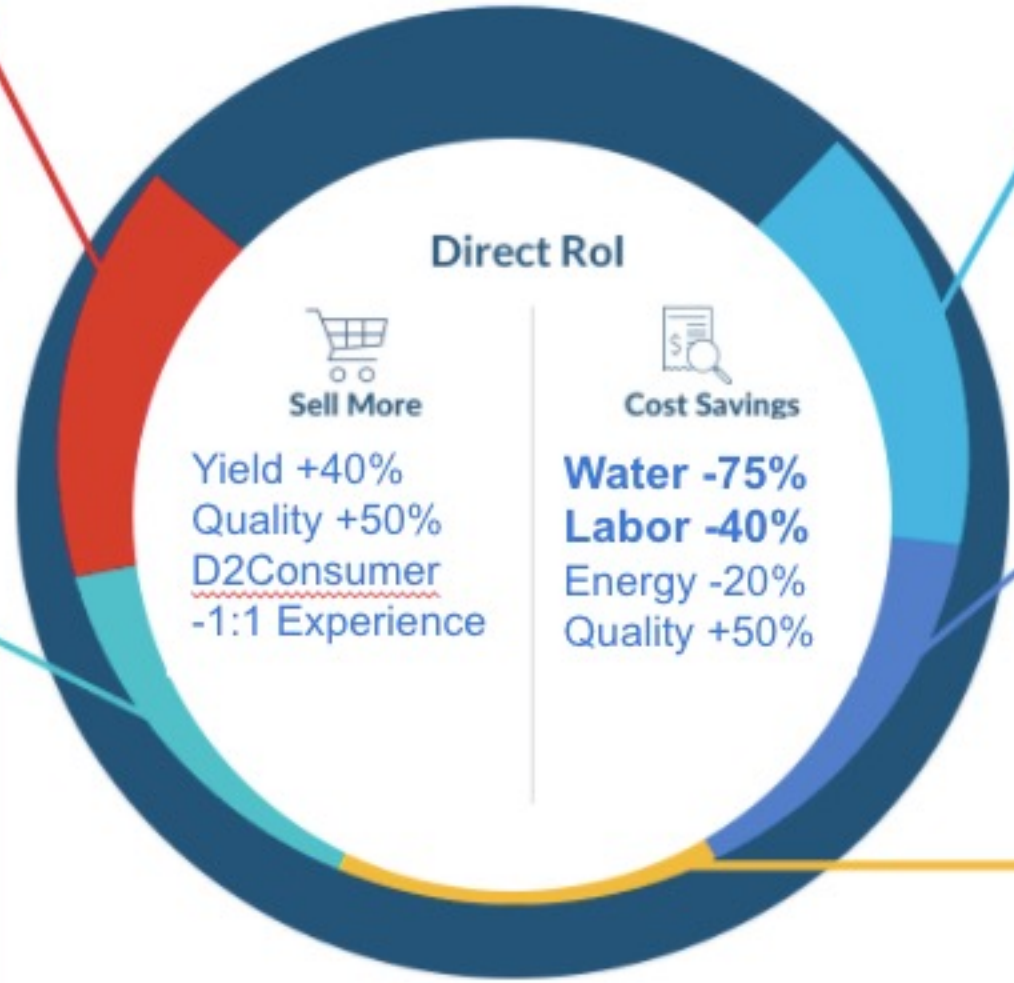
www.tinyML.org


0.050 GPM
Water applied
0.210 GPM
Water applied
0.031 GPM
Est. time remaining
3 hours


Asmundson Family Vineyard
Asmundson Famil...
6701 South Zarpara La...
Willcox, AZ 85643
32.12°N, 109.72°W
2D

Deep Sky Vineyard: Quantified Results

powered by nio



Customer Engagement

* 90% Pivot from Wholesale Only to Direct to Consumer
* Tasting Room Experience

Targeted Marketing

* 1:1 Consumer Loyalty
* Distribution to Retail

New Business Services from data observations

* 100% Reactive to 100% Proactive, Predictive, Automated
* Lower risk creating investment confidence to shift From wholesale to D2C

Build Better Products

* Precision Quality
* Vertical Integration Into Brand Experience

Enhance Brand

* DSV now a designate
* Business Model Pivot
* High-touch Experience

Groundwater Wells: The Untapped Edge Use Case

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Problem Statement:

- It is widely known that agriculture's current usage fresh water is unsustainable (~70% usage & ~70% waste)
- Today, agriculture water usage is widely unmonitored
- Specific to groundwater wells (50% source for agriculture): ~39-million wells worldwide 6-20% at risk of going dry*
    - Arizona Use Case: 250k statewide
        - Lack of regulation & technical solution

* Jasechko et al, Science 372 (2021)

tinyML solution:

- Niolabs have successfully demonstrated edge to cloud application and high-impact results over the past 5-years.
- Incorporation of TinyML within the Gen.2 solution architecture helps drive repeatable, scalable advancements and user adoption.
  - Incorporate a well specific demonstration application within the total farm
- Leveraging distributed computing, niolabs' have demonstrated improved: conservation, yield, and quality

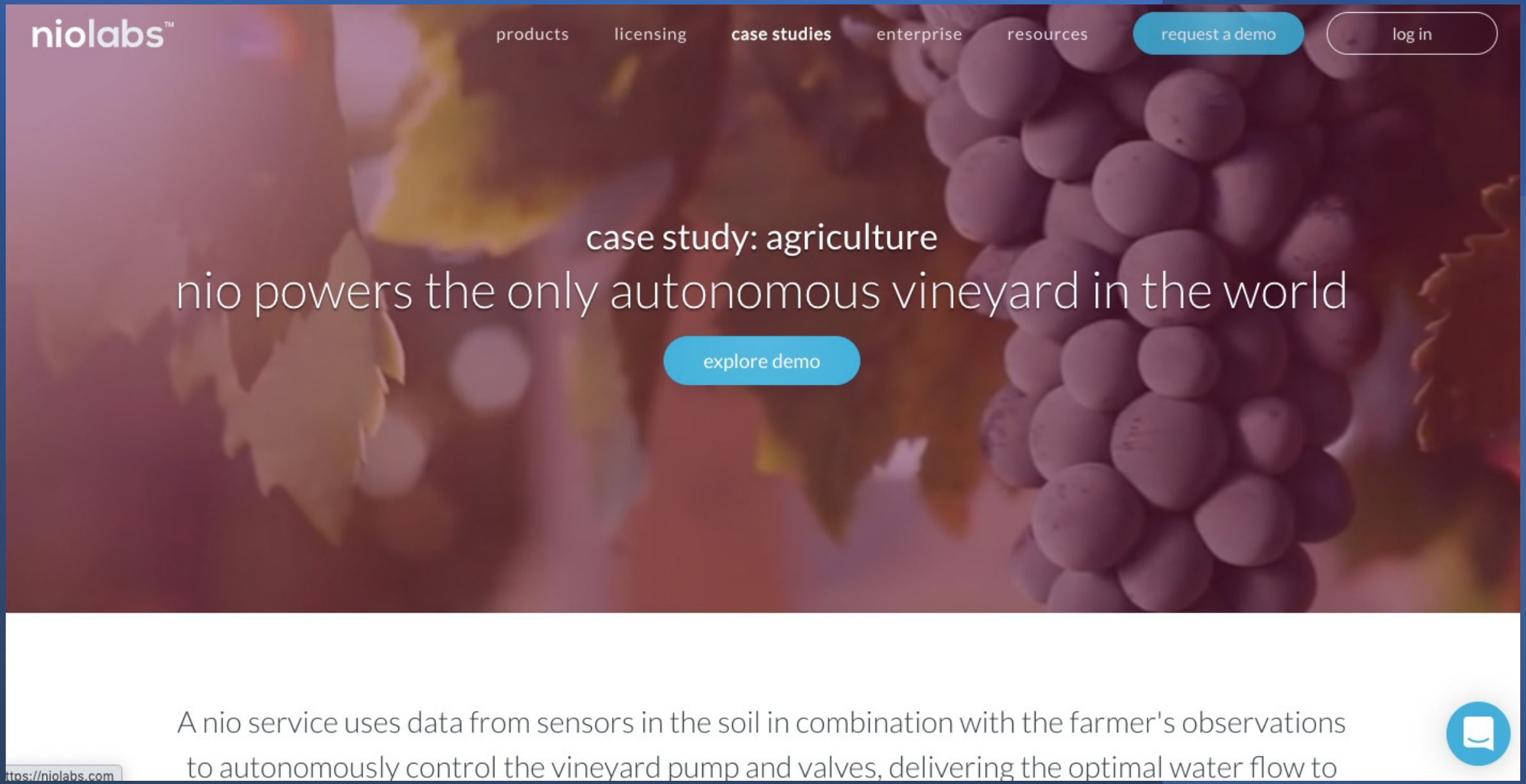
* niolabs: Deep Sky Vineyards https://niolabs.com/case-studies/agriculture

Impact:

- ~10% loss of available fresh water globally
- There are no alternative sources for replacement fresh water once wells go dry
- Loss of food production, impact on nutrition quality, and loss of available drinking water + economic loss
- Mass flywheel impact on broad sustainability matters far beyond the agriculture sector

Call to Action:

- niolabs will complete a Gen.2 re-architecture March 2022
- The goal is to deploy a repeatable solution for the digitalization of a total farm and feature a well specific solution product and service.
- niolabs seeks assistance and support from the TinyML community to provide deep SME and application support within the reference Gen2 solution architecture and Gen.2 farm research application.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case studies
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resources
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case study: agriculture
nio powers the only autonomous vineyard in the world
explore demo
A nio service uses data from sensors in the soil in combination with the farmer's observations
to autonomously control the vineyard pump and valves, delivering the optimal water flow to