

Real Time Animal Movement

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Real Time Animal Movement

- **Project Development**
 - Conception
 - Tags
 - Tracking System
- **Technical Capabilities**
- **Future Developments**



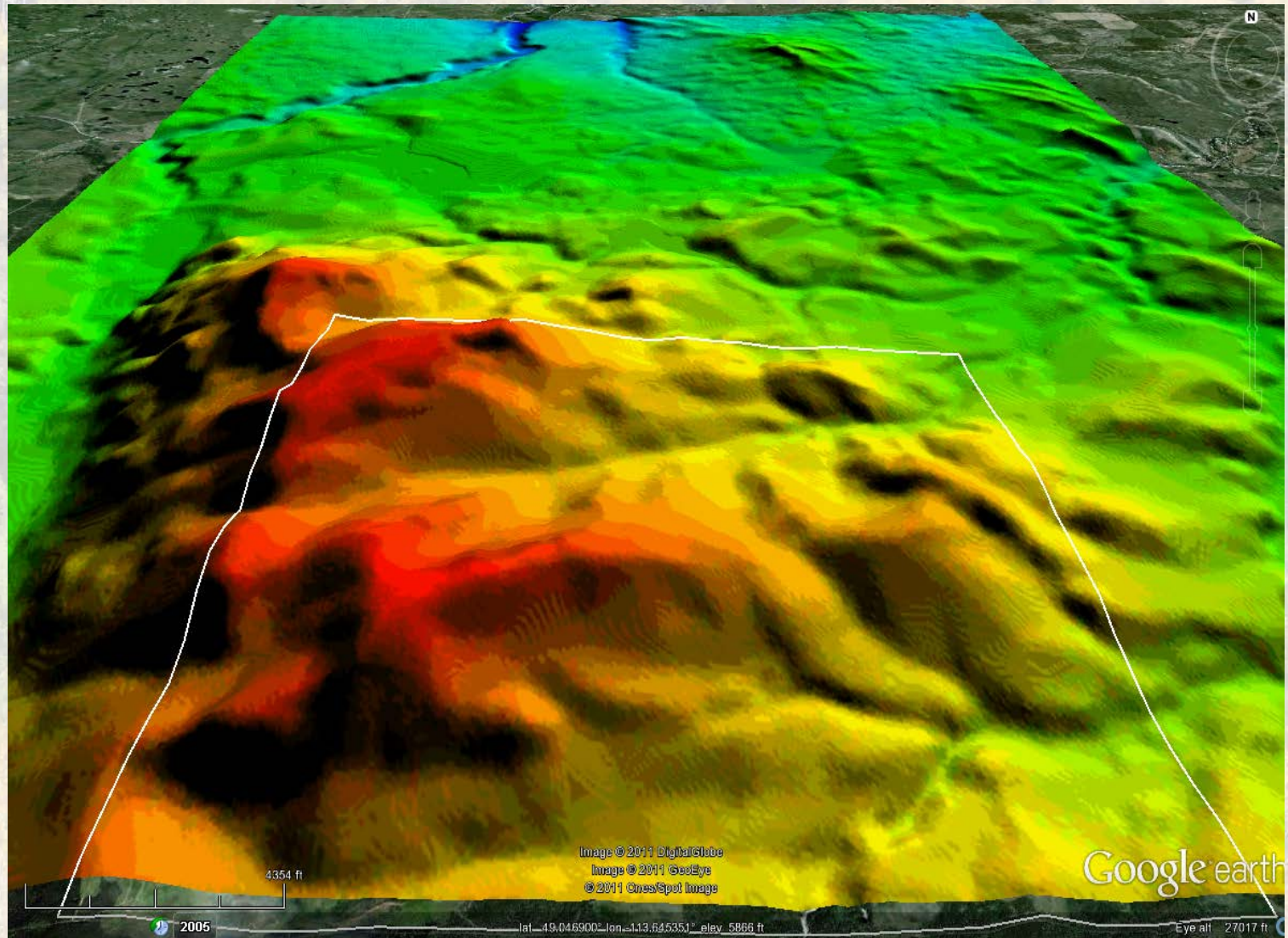


“can we track animal movement in real time using new technologies?”

- **GPS**
- **ARFID tags**
- **Google Earth**
- **Wireless communication**
- **Triangulation**
- **Nano SAR**

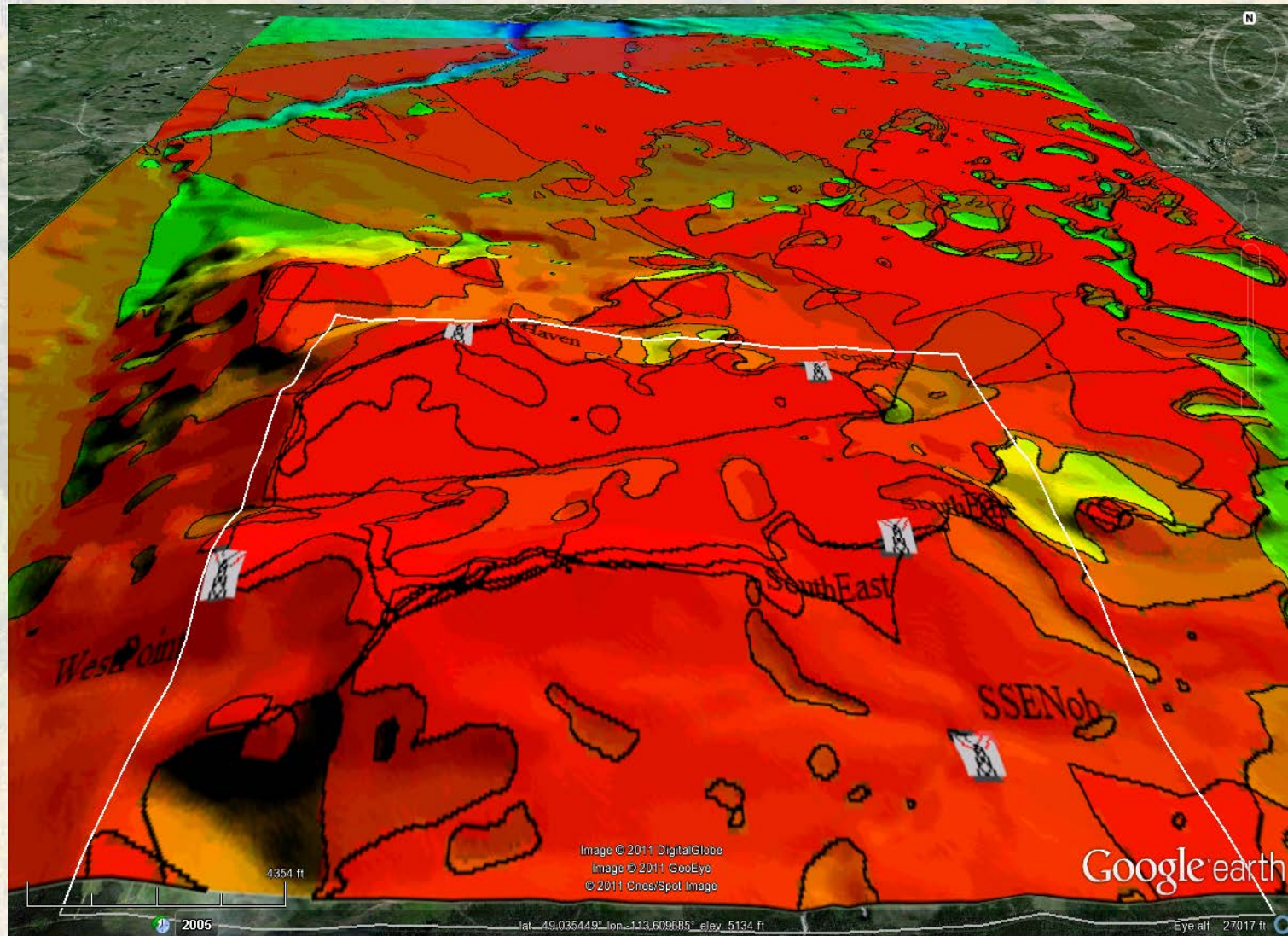
Pole Haven Community Pasture

Elevation Map



Tower Locations

Triangulation Coverage





Passive RFID Tags

Destron ARFID rTag

134.2 KHz 2006

South Fork ARFID E tag

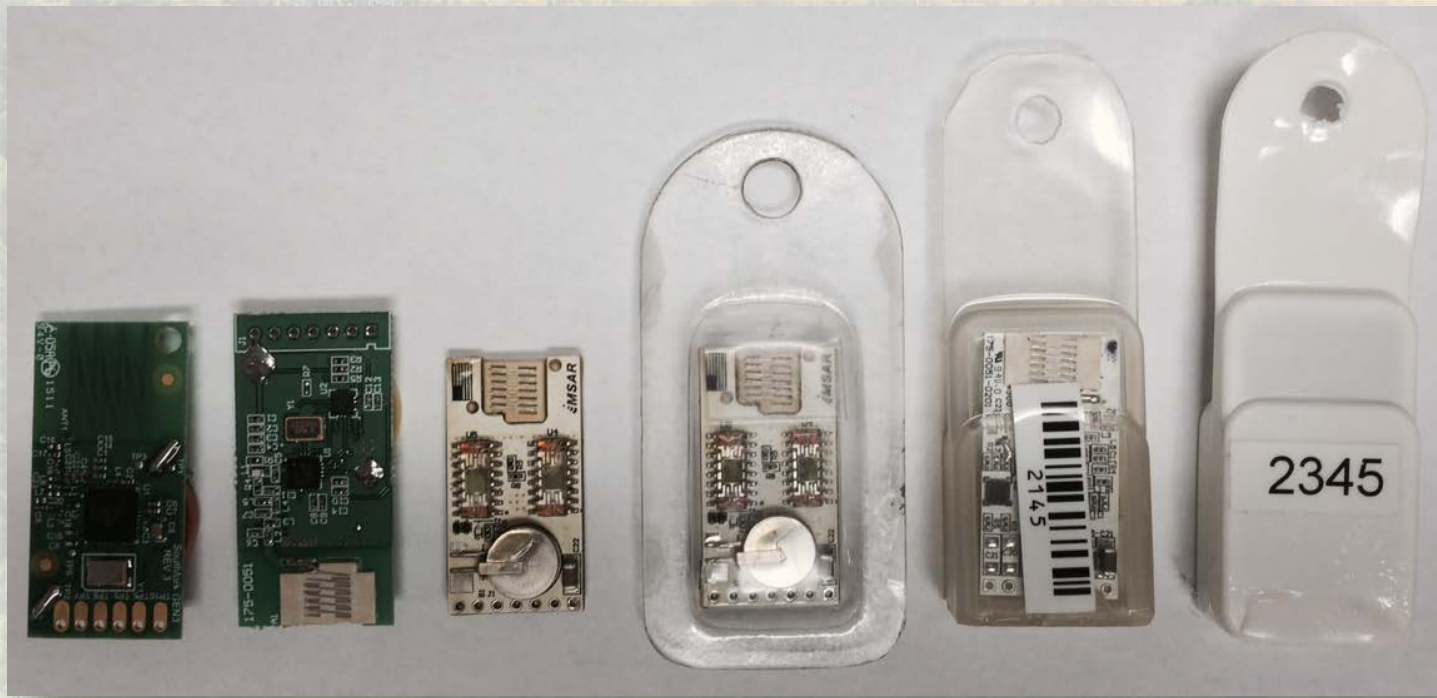
2.4 GHz 2009

Fort Supply ARFID

915 MHz 2010

South Fork ARFID 915MHz 2011

2.4 GHz 2010



ARFID South Fork

ARFID TagSmyth 2012

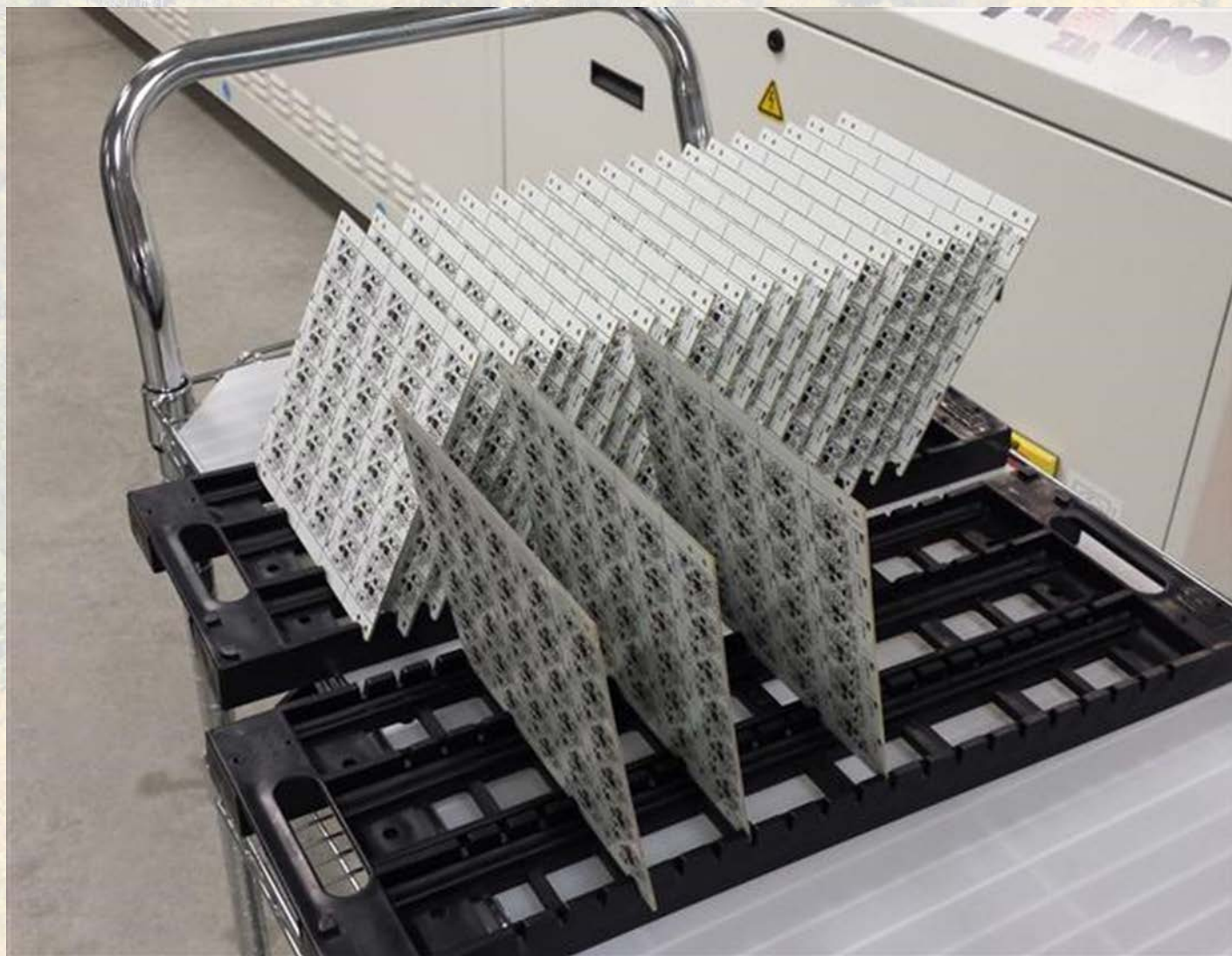
ARFID TagSmyth Solar Panels 2013

ARFID TagSmyth Monitoring 2014

ARFID Tag

- 900 MHz
- Pings every minute (adjustable)
- Long range > 5 Miles LOS
- Low maintenance
- Solar Powered
- Low power – sleep mode, Charged – wakes up
- Tracking mode ping every second
- Low Frequency wakeup proximity detection









- Cow with an ARFID tag on the back of left ear

Tracking Systems

1. Tower System

Uses
Triangulation
For
Animal
Location and tracking
24/7



Tracking Systems

2. RangeTRACKER

Used to
locate
animals
in remote areas



Tracking Systems

3. Mobil Mapper

Used in
remote areas
on ATV, truck, air craft
to locate and map
animal location



Tracking Systems

4. Surveillance

Used to identify
livestock exiting
premise



1. Tower System

**3+ Towers - Triangulate Position
Animal locations Mapped
on Secured Website**

**24/7 Monitoring With Alerts for Animals:
Non-moving
Out-of-premises**

**> 5 Mile Read Range LOS
Solar Powered for Remote Locations**



**ARFID Tag Pings
at constant rate**

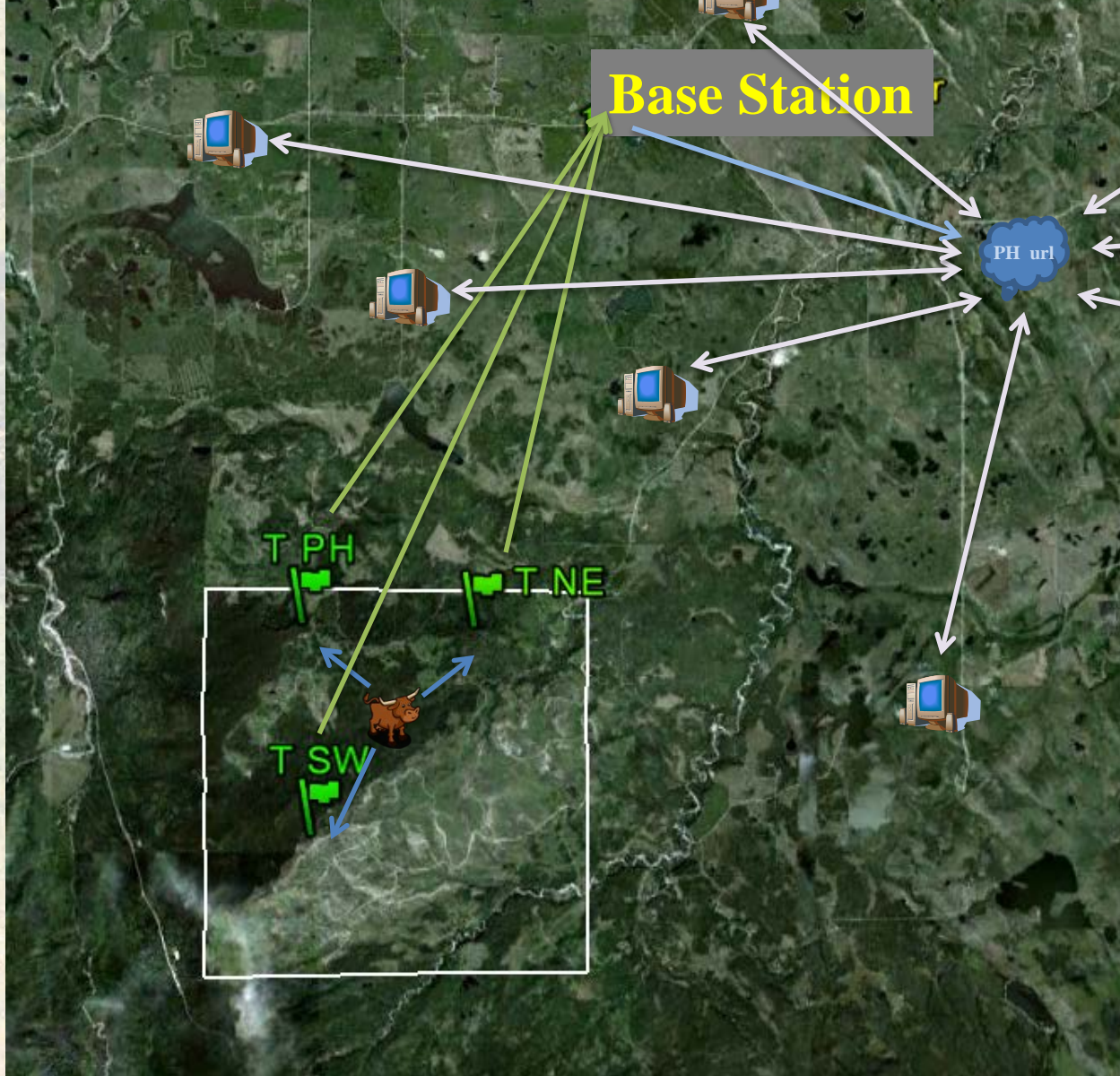
**Signal received by tower
receive**

**Signal relayed by radio
to base station**

**Base station calculates
triangulation location**

Base post on website

**Animal location
accessible by
livestock producer
on internet**

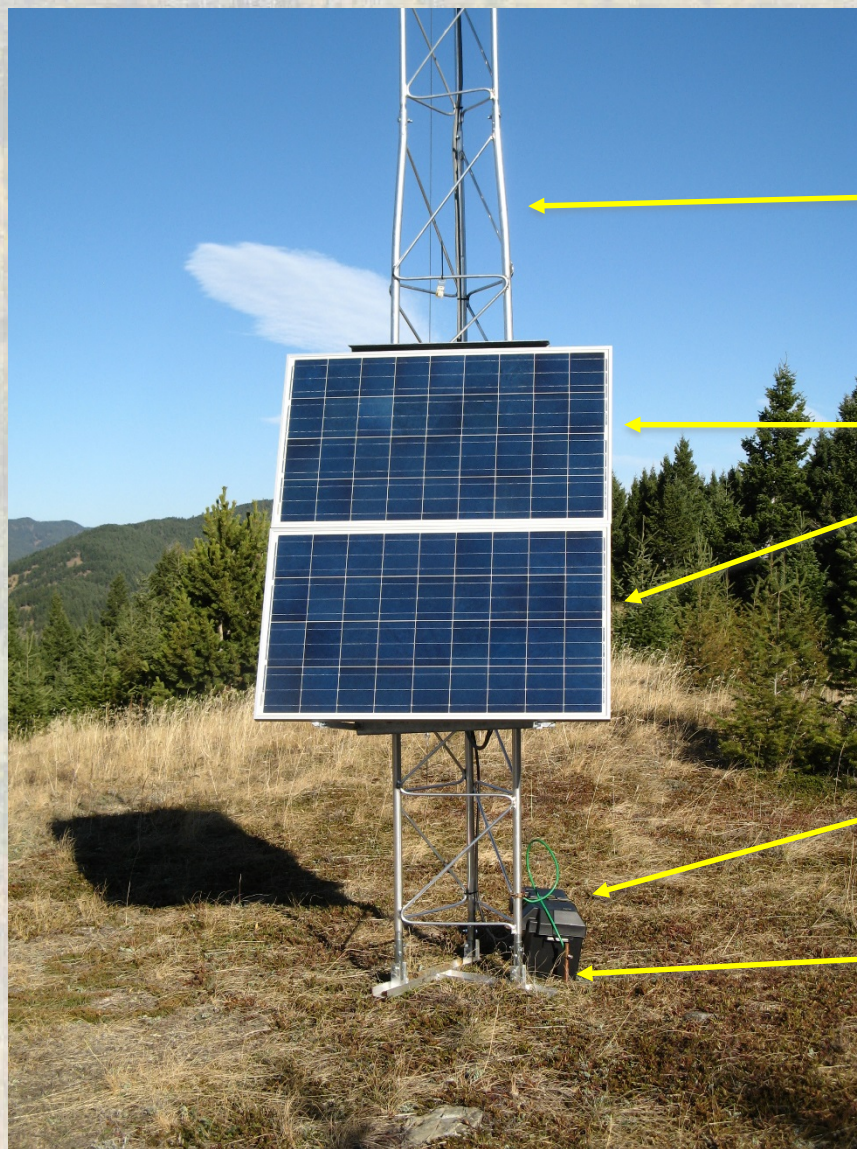






Waldron
towers





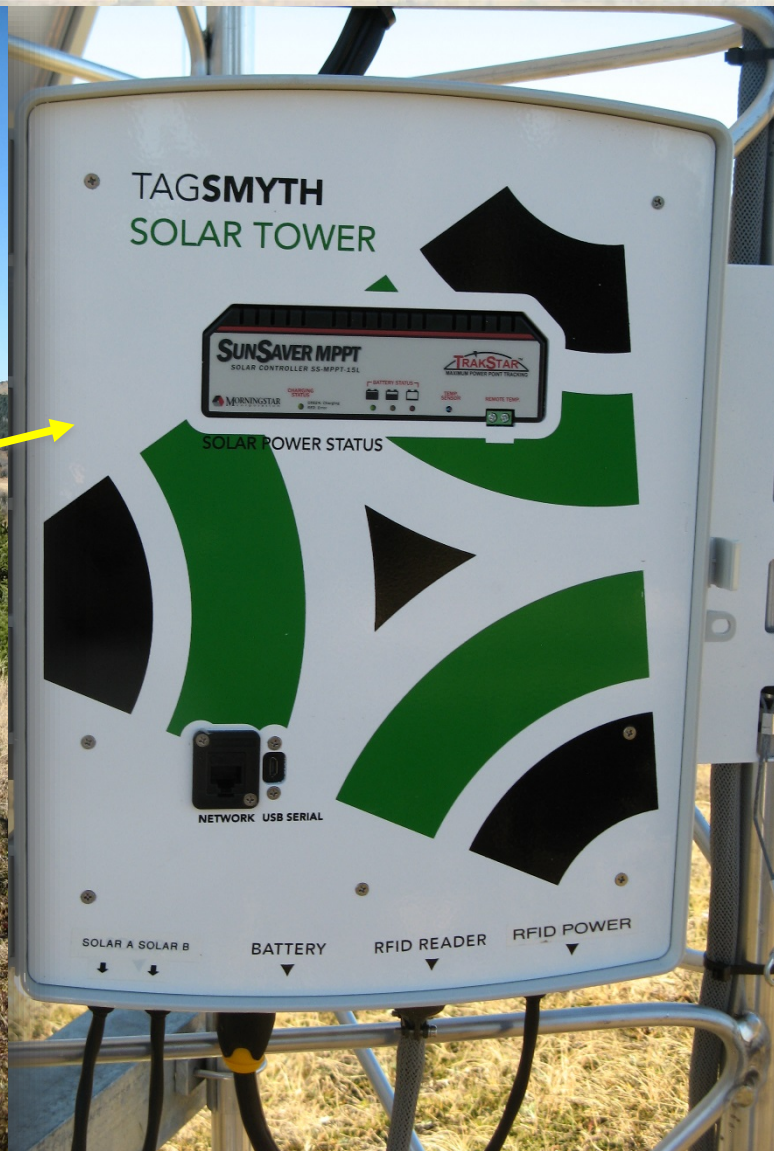
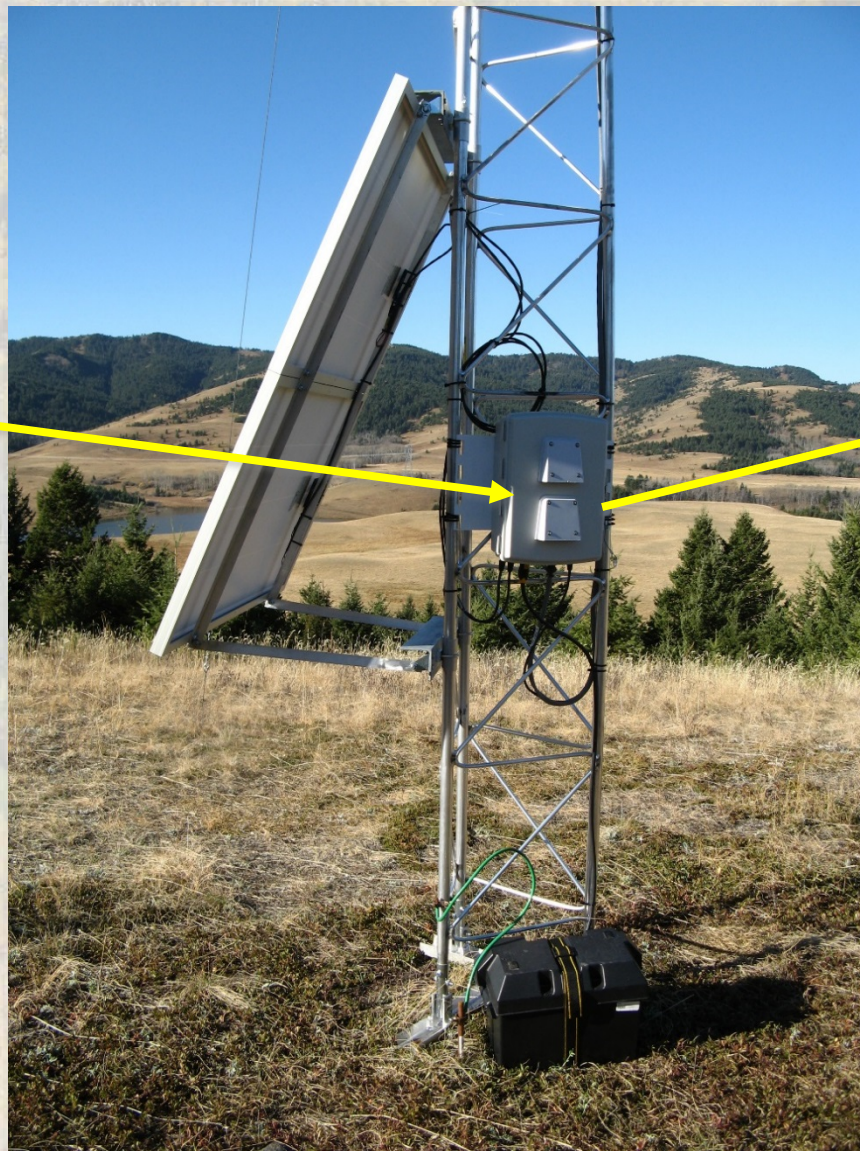
**30' Lattice
Tower**

**Solar Panels
mounted
on Tower**

Battery

**8' Ground
Rod**

Tower Control Panel





**360° Omni
Antenna**

GPS Module

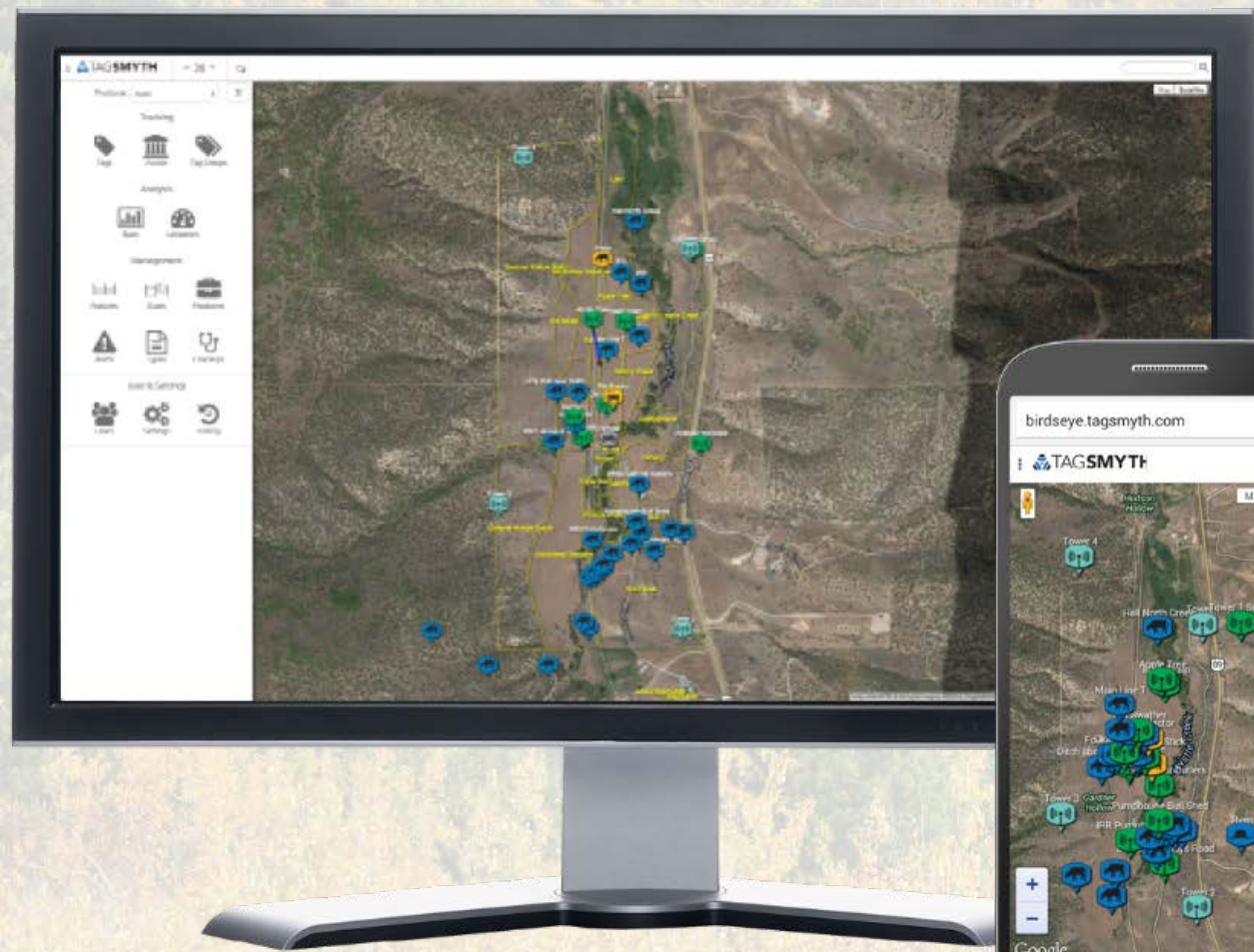
Data Radio

ARFID Receiver

Base Receiver

- Receives tag signals from ARFID receivers
- Processes tag reads and calculates animal positions
- Uploads Data to Producer website





Tracking System

has Web
based
Interface

A landscape photograph showing rolling hills covered in golden-brown grass. In the middle ground, a calm lake is nestled between the hills. The background features more hills partially obscured by a thick layer of fog or low clouds. Two tall, thin utility poles are visible on the distant hills. The overall atmosphere is misty and serene.

Livestock at Waldron October 2014

Producer: Waldron



Tracking



Tags



Cows



Tag Groups

Analysis



Stats



Utilization

Management



Pastures



Gates



Producers



Alerts



Types



Checkups

User & Settings



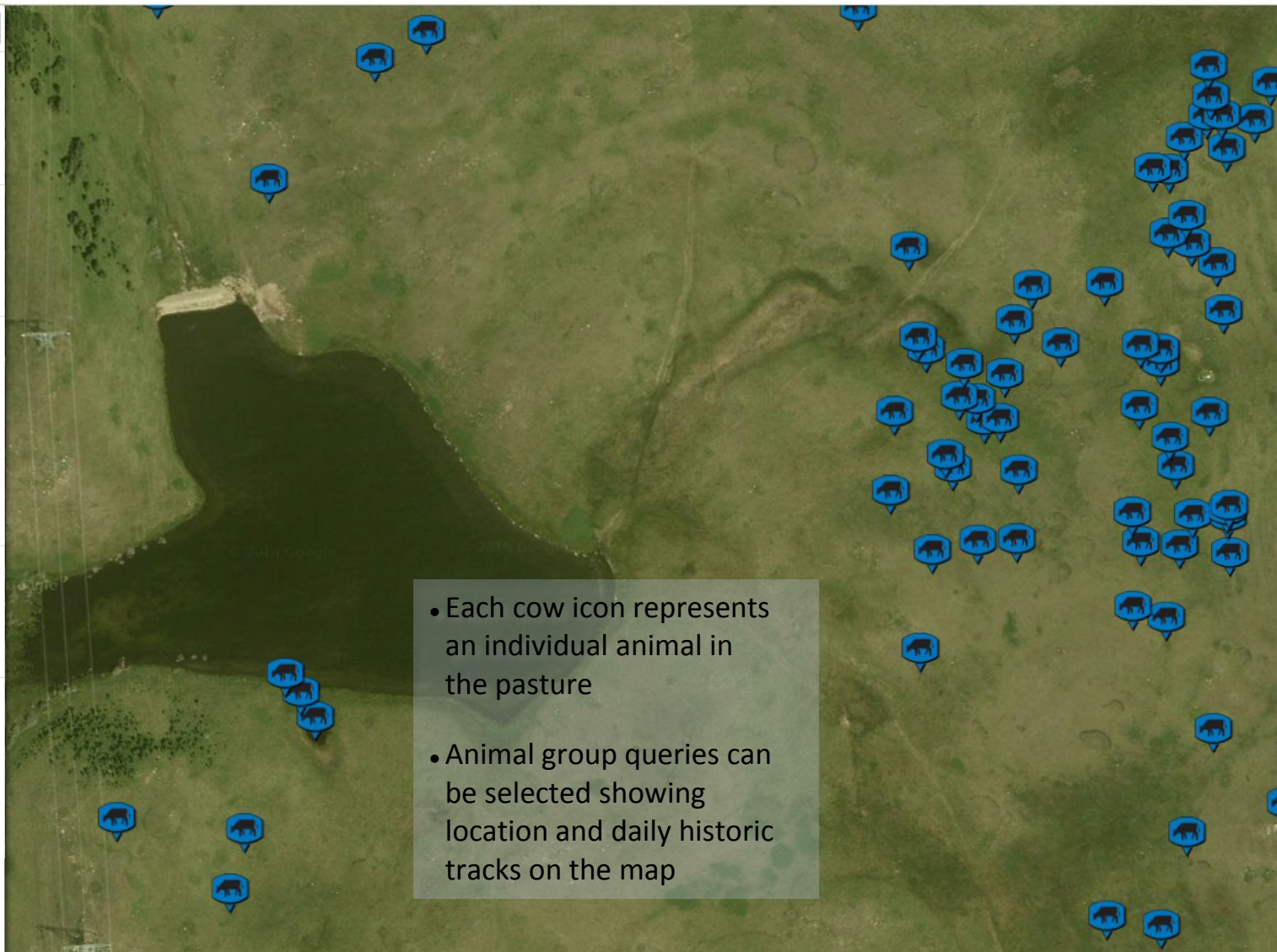
Users

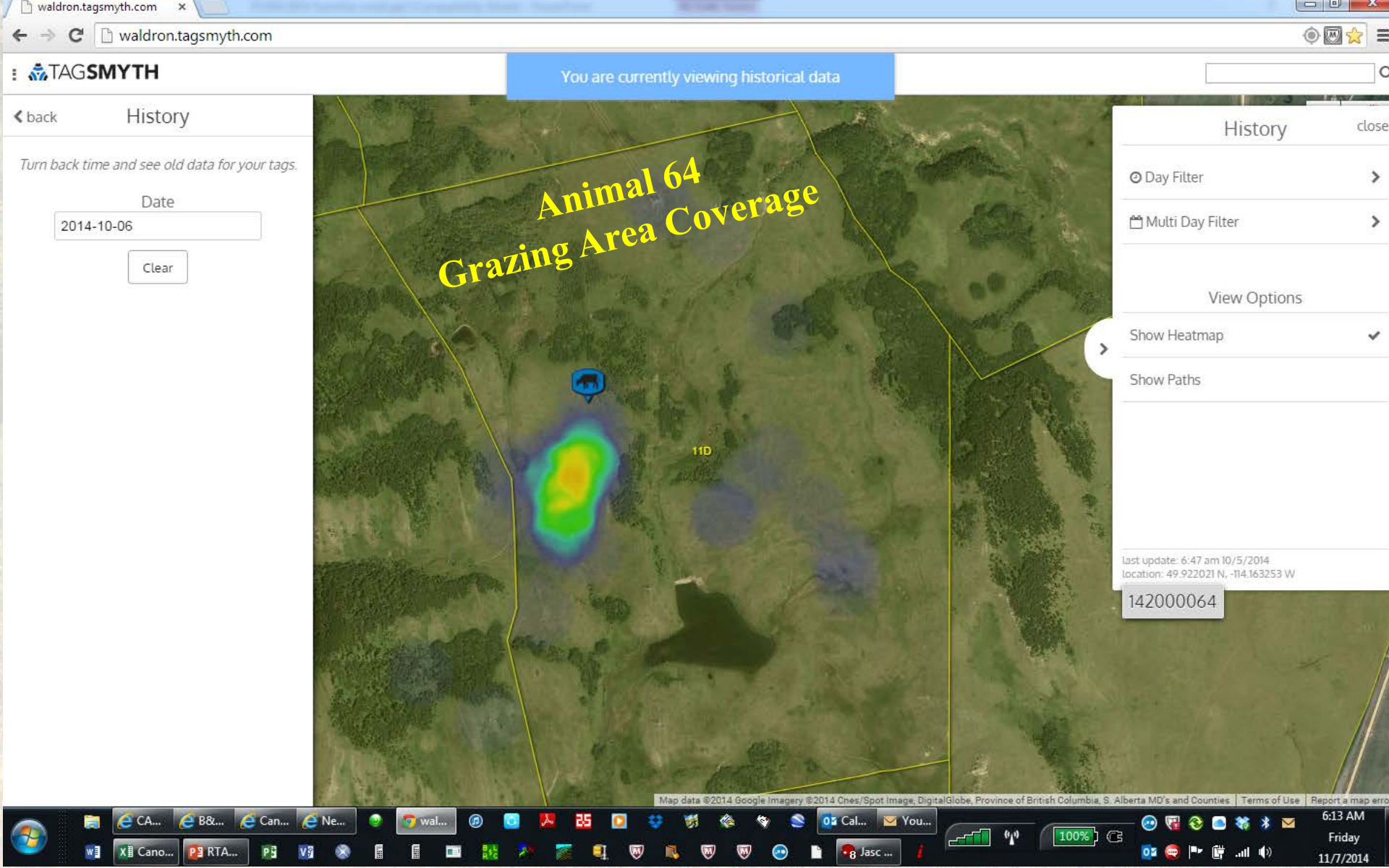


Settings



History





2. Handheld Reader

- Directional Antenna
- >5 Mile Range
direct line of site
- Audio indicator for
signal strength
- Data Upload to PC
- Rechargeable Battery

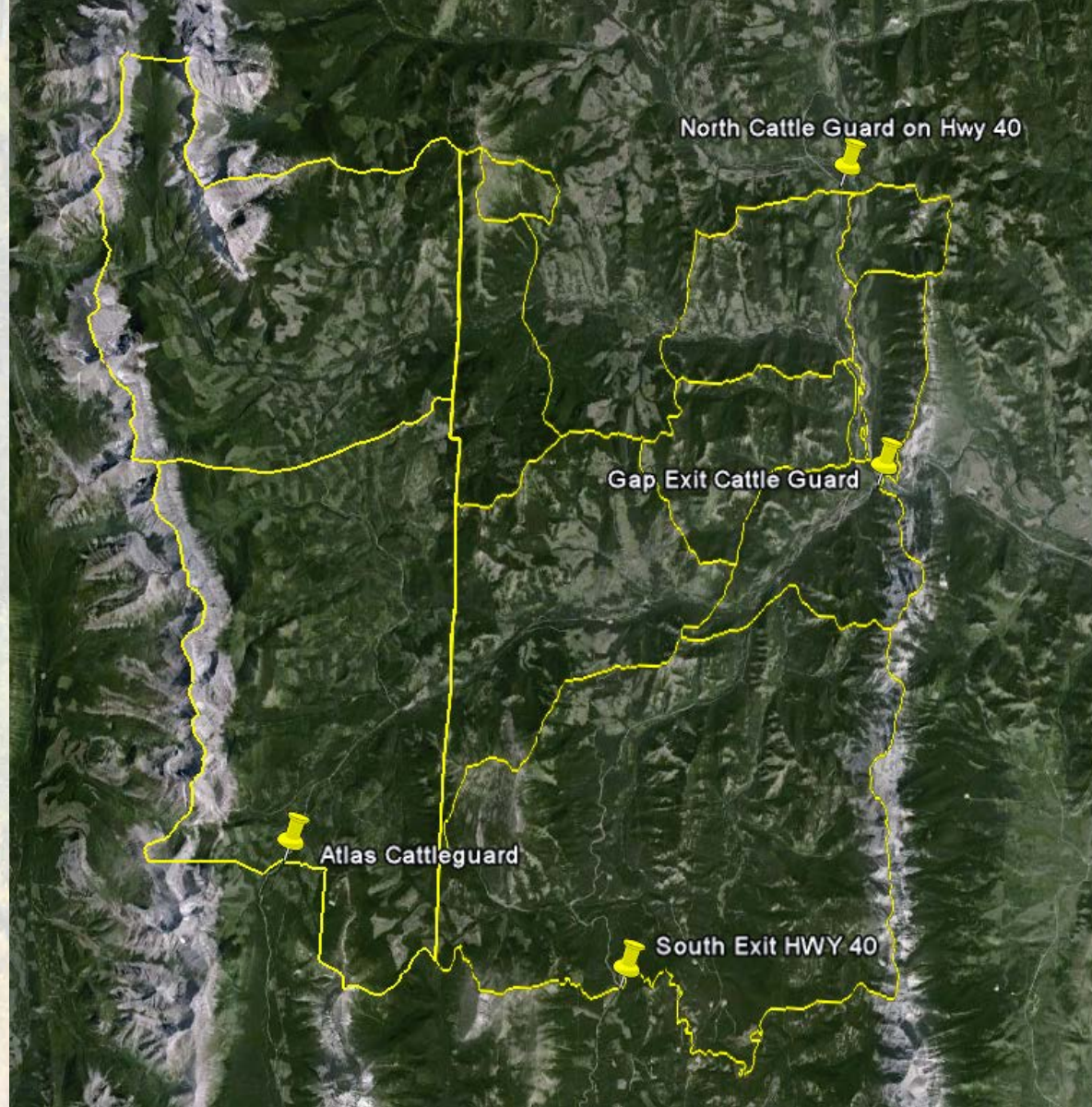


North Fork Grazing Allotment

**7 Miles
W of
Waldron**

**12 X 14
Miles**

**Tag 1300
Animals**



3. Mobile Mapper

- Uses GPS, NanoSAR, and other Sensors technologies
- Mounts on Truck/Quad/Aircraft
- Detects Angle to animal
- Location of animals displayed on Tablet w/ Google map
- Data Uploaded to PC



4. Livestock Surveillance

ARFID tags provided surveillance and tracking capabilities for transport of animals to slaughter facilities





Unloading
at Bouvry
packing
plant
Fort
Macleod

CFIA Canadian Food Inspection Agency



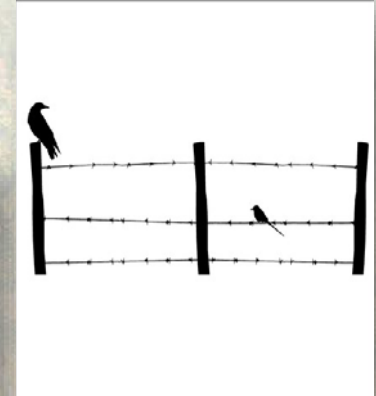
Capabilities

- **Identify the Locating of livestock**



Capabilities

- Identify the Locating of livestock
- Identify when
 - gates are left open
 - fences are down
 - animals are sick
 - there is predation
 - rustling



Future Developments

Surveillance and Tracking

Improved Tag Readability and Retention

RangeTRACKER released 9/11/15

MobileMapper released 1/20/16

Improved Tag location Accuracy

from 300 ft to 30 ft

Animal Health, Predation

Open Gates, Downed Fences

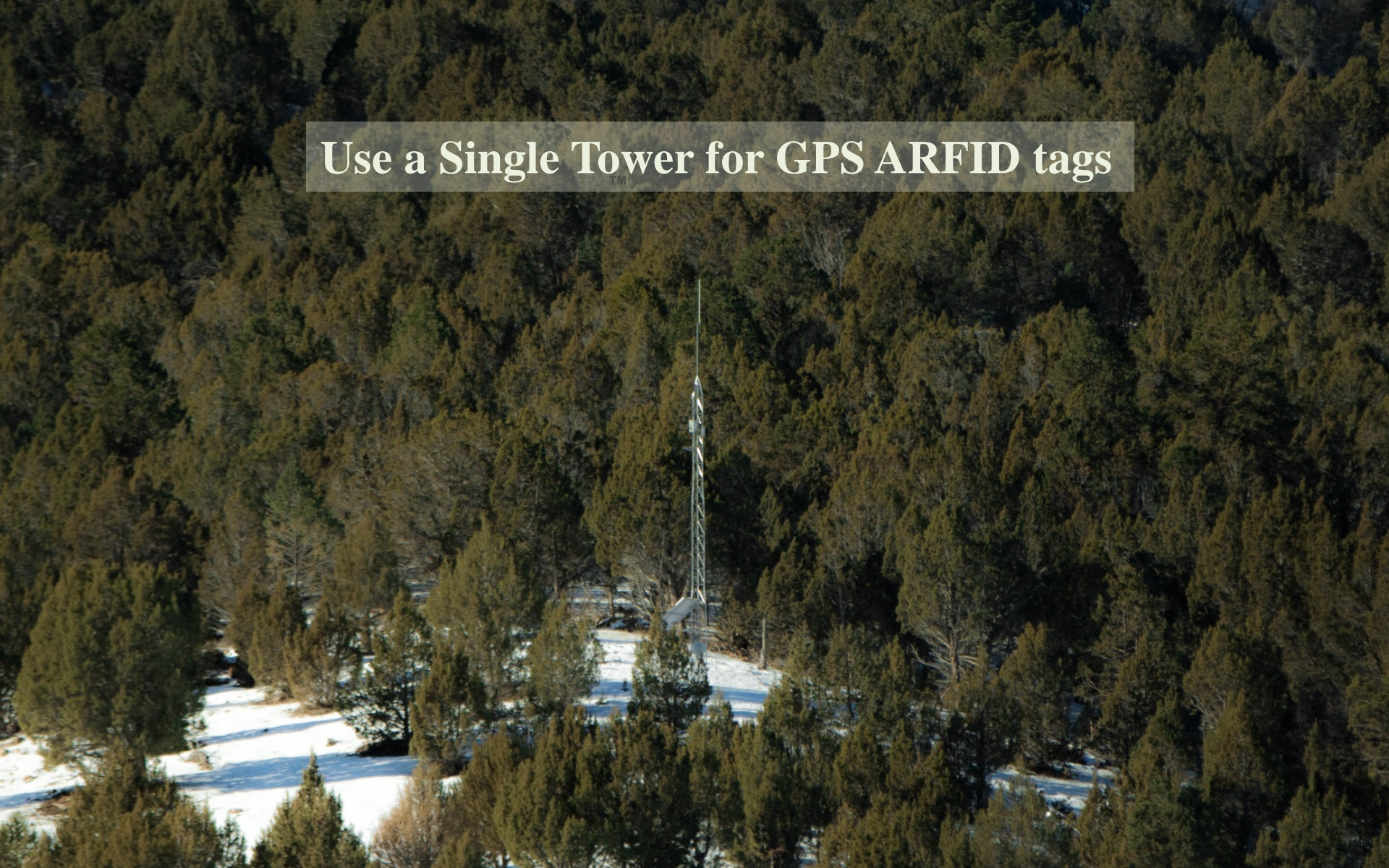
Rustling

Producer Alerts

GPS ARFID tag for valuable assets



Use a Single Tower for GPS ARFID tags



TagSmyth research cowherd



Funding Sources

SAIT

Allflex

TagSmyth

Southfork

AF, LIS

Traceability Growing Forward

Waldron, North Fork, Pole Haven Grazing Associations

Environment Sustainable Resources Development

Waterton Bio Sphere Ass. Carnivore Working Group

National Sciences & Engineering Research Council of Canada

Real Time

Animal Movement

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