

Remote Monitoring and Control of Irrigation Pumps for Energy, Water, Labor and Cost Savings

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We irrigate most of our crops in the Arkansas Delta

- Rice: 1.5 million acres - all irrigated**
- Corn: 350,000 acres – 80% irrigated**
- Cotton: 1 million acres - 75% irrigated**
- Soybeans: 3 million acres - 62% irrigated**
 - Milo: 250,000 acres – 50% irrigated**

4.5 million irrigated acres – 74% of total acres

Arkansas producers operate over 50,000 irrigation pumps





Many producers have 20 or more pumping units....some very remote

Challenges

- **Time, labor and expense required for monitoring the operation of pumping units.**
- **Potential for loosing valuable pumping time.**
- **Potential for pumping unnecessarily.**



Addressing Challenges

Remotely Monitor Irrigation Pump Operation

Transmitter



Sensor

**Monitors
water flow**



**Sends signal(s)
cell phone, pager, computer**

AUDIOVOX



Inbox(1/50)

TEXT MESSAGE

system@nmrx.com -

Unit Serial # = -

YMD 1 Absence of
Water

FR 000-000-0000

Menu

Ok

Erase

Sensor Installation

- Cut hole in pump discharge pipe.
- Weld in nipple.
- Add threaded coupler.
- Thread in Sensor Assembly.
- Wiring to Transmitter then to power unit or electric panel.





Equipment also has option to allow remote shut down of the Irrigation Power Unit or Electric Well through internet address.



Sensor



Transmitter

Mississippi system for remote monitoring and on and off control of electric pumps located 87 miles from agency headquarters.



Investment?

- **Equipment installation cost**
- **Monthly cost for signal**
(no yearly contract, < \$1/day)

NOTE: 1st year signal cost included with installation.



Sensor



Transmitter

Example of Savings

Direct Savings:

40 miles round trip to check 10 pumps

Average 10 mpg @ \$2.20/ gal fuel cost

4 gals x \$2.20/gal = \$8.80 per trip

3.5 labor & truck hours to make trip and service engines

@\$10/hr....3.5 hrs x \$10/hr = \$35 per trip

\$8.80 + \$35 = \$43.80 per trip

60 days of pumping on rice saving 1 trip per day

60 trips x \$43.80/trip = **\$2628/season**

System equipment cost recovered in 3 seasons

Indirect Savings:

Value of 3.5 hrs of spraying

80 ac/hr x 3.5 hrs = 280 ac @ \$5/ac application savings

280 ac x \$5/ac = **\$1400/day**

Spraying on farmers schedule with desirable conditions!!

Pump Monitor Experience

- **Reduces trips to check pumps:
Saves 1 trip per day or 3 trips in 2 days**
- **If know pump is down, better able to get needed parts etc. and reduce down time**
- **Reduces problems caused by losing head of water and taking longer to get field covered**
- **Limit unnecessary pumping**

Pump Monitor Experience

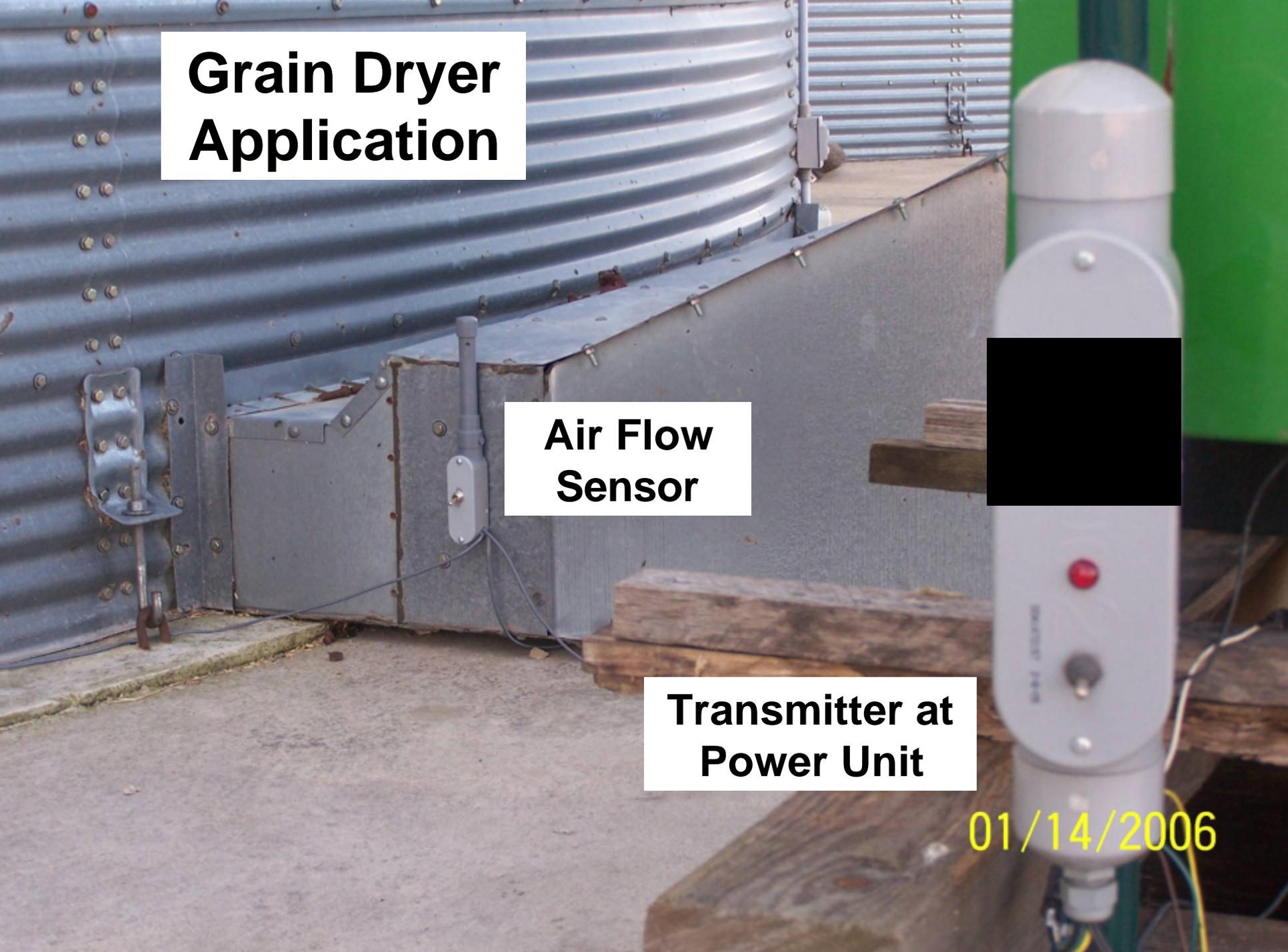
- **Get air sensor and use same transmitter at grain bins to monitor fan operation**
- **Expansion potential....already added fuel sensor to know when fuel tank is low**

Grain Dryer Application

Air Flow
Sensor

Transmitter at
Power Unit

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Fuel Tank Application Depth Sensor



Rice Field

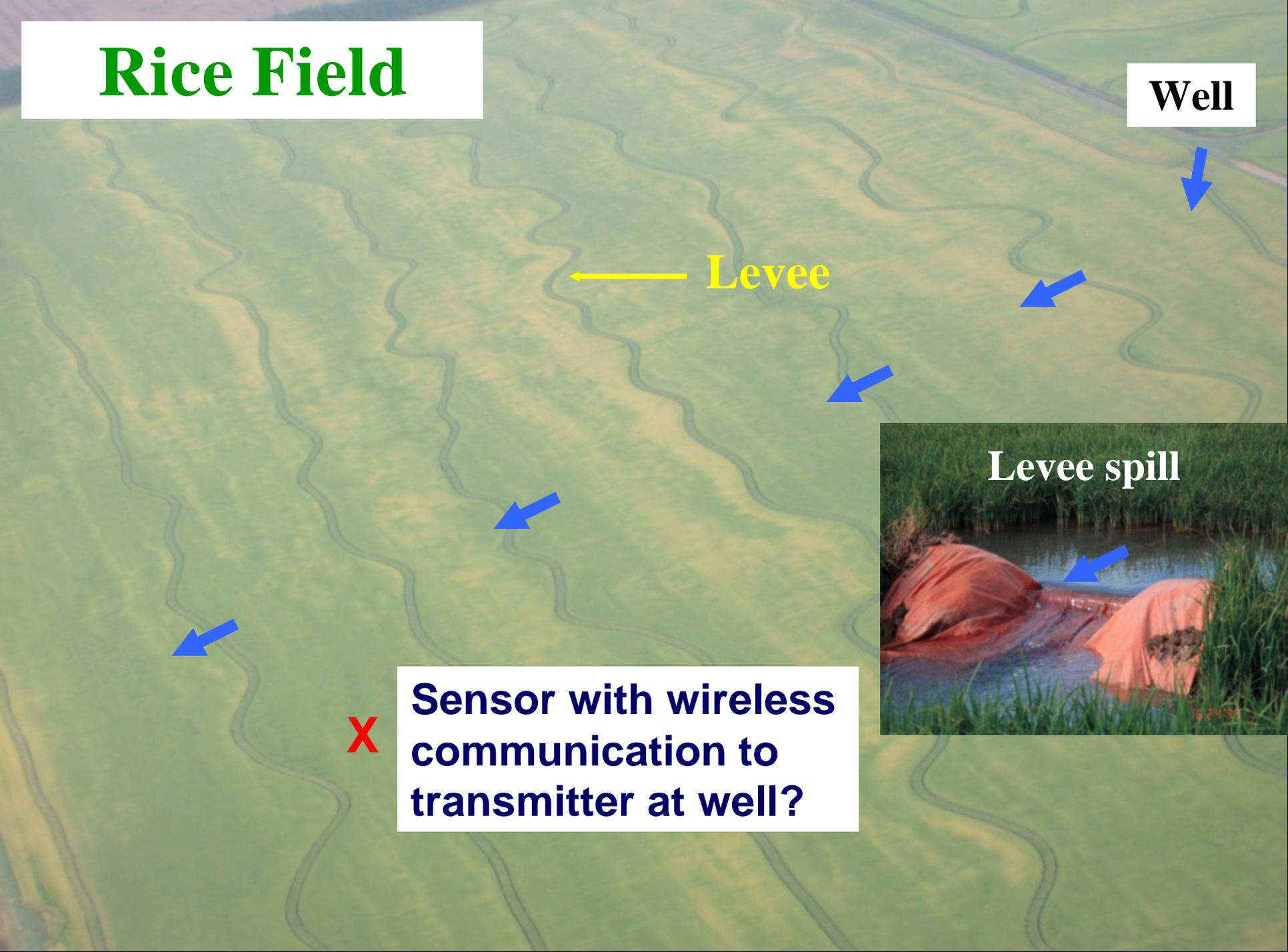
Well

Levee

Levee spill

X

Sensor with wireless communication to transmitter at well?



Summary

- **Application of remote monitoring and control technology to pumping and other agricultural operations makes sense.**
- **Cell phone use is common place on farms.**
- **System transmitter has adequate power (approx. 2 watts) for remote areas.**
- **Most producers initially purchase only a couple units but soon order more.....
gain confidence, see benefits, justify cost**

Producer comment

“It’s like having someone standing at the pump and it’s hard to put a value on the peace of mind that gives you”

Acknowledgments



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