
From: PUC

Sent: Monday, July 16, 2018 9:49 AM

To: [REDACTED]

Subject: EL18-026

Mr. Tieche:

Thank you for your message regarding the Prevailing Wind siting permit request, docket EL18-026.

Your message and my response will be posted in the open docket so my fellow commissioners and others may read them. Here is a link to the docket, <http://www.puc.sd.gov/Dockets/Electric/2018/EL18-026.aspx>, and a link to the Siting Guide which helps explain the commission's processing of such dockets, <http://www.puc.sd.gov/commission/Publication/sitinghandout.pdf>.

I appreciate you sharing your view.

Kristie Fiegen, Chairperson
South Dakota Public Utilities Commission
www.puc.sd.gov

001724

From: Albert Tieche [REDACTED]
Sent: Sunday, July 15, 2018 7:25 PM
To: PUC-PUC <PUC@state.sd.us>
Cc: jhpowers@hcinet.net
Subject: [EXT] Comments for Prevailing Winds Docket E1 18-026

To Whom it May Concern,

For the past decade I have been part of a group that travels to Charles Mix County to hunt pheasants in the Wagner/Avon area. Our group usually includes 8 to 10 people coming from various states. Our guide and host this past decade has been [REDACTED]. We have been pleased to watch [REDACTED] build a thriving business over the last decade catering to pheasant hunting groups like our all season long. [REDACTED] has arranged for us to hunt on his land and also on land owned by several other people over the years.

In the last few years, as the windmills have been constructed, the areas we can hunt have been reduced. What was once a bucolic view with quiet surroundings has become dotted with windmills which completely change the view and nature of the area by both day and night. The associated noise also has changed the quiet relaxing nature of the area.

Our group has become aware that the installation of windmills is expanding in the area we hunt, removing more of the habitat we hunt and spoiling the view. This is a very big negative factor for us and may cause us to cease coming to the Wagner/Avon area. There are other areas of the upper Midwest with good pheasant hunting. We can easily change our destination.

Our group pays for hunting and lodging, purchases hunting licenses, buys groceries and gasoline locally, goes to local restaurants for breakfast and dinner, and visits local taverns. Each of us typically spends between \$1500 and \$2000 per trip to the area, each year. With 8 to 10 people, that comes to between \$12,000 and \$20,000 from our group alone each year. And there are groups coming in before us and after us for the entire hunting season. The season starts in late October and lasts through the first week of January, spanning about 13 weeks and other groups hunt the areas we hunt each week of the season. That brings the total economic impact of pheasant hunting just this small area to somewhere between \$156,000 and \$260,000 per year. That may well be lost in the immediate future.

I urge you to stop any further windmill construction in the area.

Sincerely,
Albert Tieche

[REDACTED]
Madison, TN 37115
[REDACTED]

From: Gregg Hubner [REDACTED]

Sent: Friday, July 13, 2018 6:07 PM

To: PUC-PUC <PUC@state.sd.us>

Subject: [EXT] one more

Please post the attached public comments on the Prevailing Winds EL18-026 docket

--

Gregg C. Hubner

[REDACTED]
Avon, SD 57315

001726

From: Gregg Hubner [REDACTED]
Sent: Monday, July 16, 2018 10:07 AM
To: PUC-PUC <PUC@state.sd.us>
Subject: [EXT] sorry, I have a change

You just sent me an e mail that you were posting my PW comments #4. I got this e mail at 9:52 am. Please accept the attachment as a revision of that and put the revision on the docket rather than the first one. There was something I missed in the very first part of it, THANKS.

-- Docket EL-18 026 Prevailing Winds

Gregg C. [REDACTED] Avon, SD 57315

001727

The project will pose a threat of serious injury to the economic conditions of inhabitants or expected inhabitants in the siting area.

Below are the sales tax receipts from the South Dakota Dept of Revenue for the municipal tax collected by Tripp, SD. From 2009 through 2017.

Calendar Year	Taxable Sales	Tax Collected
2009	5409868	108239
2010	4363280	125031
2011	6259241	125291
2012	5803449	116069
2013	5880795	117828
2014	6699445	134093
2015	5866484	117427
2016	6324521	126607
2017	5048835	101038

Tripp is the town nearest to the Beethoven Wind Farm, which was developed by B&H Wind, the same group that started Prevailing Winds. They claim to be all South Dakota investors (160) but that is not true. They started building it in December of 2013. The Beethoven Wind Farm went on line in May of 15. You will see there was a little bump in 2014 during construction, but after that tax revenues dropped to a number in 2017 **below** every year on the chart. Since the building of the Beethoven Wind Farm in 2014, Tripp has lost its grocery store 2 or 3 times, and now it is open again. The school voted for an opt out in May of 2017, 3 years after the wind farm was built. In the spring of 2018, Tripp's old people's home, the Good Samaritan Center, shut the doors. Tripp had 60-70 more jobs before the Beethoven project, Tripp had more sales tax revenue before Beethoven, and the Tripp School District has not received enough money from Beethoven to even prevent an opt out.

Also I would talk about building permits. Oak Hollow Township in Hutchinson County has all the Beethoven Wind Farm turbines in that county. I have the copies of all the building permits in Oak Hollow Township from 2012 through 2017. There were **no** permits for homes in that time period. On the other hand, Avon Township had **4** new homes built in that same time period. If you look at the outlay of the turbines, and you look at Oak Hollow Township you see about 13 inhabited residences in Oak Hollow Township and approximately 57 inhabited residences in Avon Township. The point I am trying to make is that Avon Township has had a very robust building climate because of its proximity to Avon and its businesses and school. If building permits for houses stop completely or are curtailed in a dramatic way, this is negative to the local economy.

Although the applicant and Jeff Haverly from the Governor's Office of Economic Development continually remind us of the "economic vitality" and "economic boom" to the local economies, this is as usual, always just a projection. The figures above prove that in the case of Beethoven, **THERE WAS AN ECONOMIC DECLINE FOR TRIPP.**

They also talk about jobs. In Avon they have a building owned by a local Prevailing Winds investor. There are 5 or 6 people there working for GE doing the maintenance on the Beethoven Farm for Northwestern. But these jobs also created an economic decline for the simple reason, this whole Beethoven Project raised the rates of Northwestern customers 15 ½%. Then the PUC added on 9 million dollars a year to force the rate payers to pay for the Beethoven Wind Farm. I know this spreads out over all Northwestern Customers, but on a local economic basis, all our older people on fixed incomes got hurt. They are paying higher utility bills, they are paying for the wind farm itself, they are paying for the maintenance people's wages, and the rent and taxes on building. The rate payers are paying for everything. To my knowledge, there is only one of the 5 or 6 employees that lives in Avon. The rest live elsewhere.

So, somebody please tell me where the economic benefits to a small town are? Show me some numbers in INCREASED sales tax receipts. Show me more homes built within wind farms. Tripp is a ghost town and Avon will be one too if you surround it with wind turbines, because people NEVER move into a wind farm. THEY MOVE OUT. So, for these reasons, I believe this permit should be denied because it will cause a total net economic loss for the Avon area, as proven by the Beethoven Wind Farm and the Tripp Community. These are facts, not projections or estimates as the wind developers use to sell these projects to the community.

Gregg Hubner



Avon, SD 57315

From: Michael Bollweg [<mailto:tumbleweed@venturecomm.net>]

Sent: Monday, July 16, 2018 11:33 AM

To: PUC-PUC <PUC@state.sd.us>; PUC-DOCKET FILINGS <PUCDocketFilings@state.sd.us>

Subject: [EXT] Existing Docket Filing - EL18-026

Docket Number: EL18-026 Last Name: Bollweg First Name: Michael Company: Bollweg Farms Address: 20210 322nd Ave City: Harrold State: SD Zip: 57536 Phone: 6058753440 Fax: Email: tumbleweed@venturecomm.net Comments: Attached are two PDFs. One includes written comments and corresponding exhibits. The second includes permission letters to reprint the 3 exhibits. Please include in Docket EL18-026. Thank you.

001730

From: PUC

Sent: Monday, July 16, 2018 3:08 PM

To: 'tumbleweed@venturecomm.net' <tumbleweed@venturecomm.net>

Subject: EL18-026

Mr. Bollweg,

Your comments with attachments and my response will be posted under Comments and Responses in the Prevailing Wind docket, EL18-026.

Please note that informal comments such as this should be emailed to PUC@state.sd.us versus Docket Filings. The PUC's Siting Guide on our website's home page provides guidance on the submission of comments and the processing of siting dockets such as this, <http://puc.sd.gov/commission/Publication/sitinghandout.pdf>.

Thank you for sharing your concerns.

Kristie Fiegen, Chairperson
South Dakota Public Utilities Commission
www.puc.sd.gov

001731

From: Michael Bollweg [mailto:tumbleweed@venturecomm.net]

Sent: Tuesday, July 17, 2018 8:24 AM

To: PUC-PUC <PUC@state.sd.us>

Cc: tumbleweed@sbtc.net

Subject: [EXT] Existing Docket Filing - EL18-026

Docket Number: EL18-026 Last Name: Bollweg First Name: Michael Company: Bollweg Farms Address: 20210 322nd Ave City: Harrold State: SD Zip: 57536 Phone: 6058753440 Fax: Email: tumbleweed@venturecomm.net Comments: Please see the corrected attachment via a PDF including a cover letter and corresponding exhibits. The attachments included on the 16th of July were previous comments sent on 3 July. Please include in Docket EL18-026. Thank you.

001732

Public Utilities Commission
Capitol Building, 1st floor
500 E. Capitol Ave.
Pierre, SD 57501-5070

RE: Docket EL18-026

Madam Chairperson, South Dakota Public Utilities Commissioners and Support Staff:

I am writing to provide additional comments and share my concerns with regard to the Prevailing Wind Park Project (PWPP) proposal to erect 61 industrial wind turbines, associated infrastructure, and transmission poles within the three county region of Bon Homme County, Charles Mix County and Hutchinson County.

Recently scientists and agronomists are beginning to understand and recognize the potential of negative effects to cropland, grassland, and soil health that exists within the footprint and surrounding areas of an industrial wind turbine plant.

Negative Impacts on Vegetation and Soil Health

Representatives of Prevailing Winds have stated the project's wind turbines will not pose a threat to vegetation which is simply biased and not accurate. Included are "before and after" infrared satellite imagery maps (LandSat imagery) of 4 industrial wind turbines erected on prairie lands in Hyde County that show a much more significant area impacted on a "per turbine" basis.

EXHIBIT 1. The yellow to red colors represent a reduction in photosynthesis. As you can see, the grass and plant health negatively impacted covers approximately 20-25 acres on a 75 acre parcel even 13 years later. This encompasses a much greater area than just the access roads erected. Besides access road infrastructure's "edge effect" on crop production and severe compaction issues, there is a negative impact on grass areas where turbulence from the turbine channels dryer air down, moist air upward resulting in a drying effect to occur. In regions of the country that receive 25-30 or more inches of rainfall such as Iowa, this drying effect could be considered beneficial by preventing or slowing down plant disease impacts by keeping the leaves of corn and beans dryer. This would reduce the disease potential due to spores requiring a wetter "host". However in arid regions where annual rainfall struggles to top 17", the drying effect becomes counterproductive to crop health.

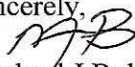
To support the "drying effect" and negative impact industrial wind turbines pose on soil, grasslands and cropland, I have included the following article by Mr. Patrick Miller in UAS Magazine: {Kevin A. Adkins & Adrian Sescu (2017) Observations of relative humidity in the near-wake of a wind turbine using an instrumented unmanned aerial system, International Journal of Green Energy, 14:10, 845-860, DOI: 10.1080/15435075.2017.1334661} **EXHIBIT 2**

This 2017 study was conducted by Embry-Riddle Aeronautics University utilizing a drone by Kevin Adkins, assistant professor of aeronautical science and director of Embry-Riddle's Gaetz Aerospace Institute. He flew a drone into wind turbine wakes to measure differences in relative humidity levels. He and his colleague Adrian Sescu of Mississippi State University published their research findings in the International Journal of Green Energy. What they discovered was humidity at the plant level can decrease as much as 3 percent and that amount can be magnified as the concentration of wind turbines increases.

A third supplement I've attached **EXHIBIT 3** further supports the negative impact concerns on vegetation. Dr. Craig Idso – founder and former president of CO2 Science and current chairman of the Center for the Study of Carbon Dioxide and Global Change, wrote a Paper Reviewed article published in the August 2017 CO2 Science. Six Chinese scientists (Tang et al. 2017) compiled climate-related data over the span of 2003-2014 within the footprint of an industrial wind plant facility in northern China. Their report revealed wind turbines elevated both day and nighttime temperatures which they said "suppressed soil moisture and enhanced water stress in the study area". As a result, vegetative growth and the productivity of the surrounding vegetation (Approximately 53% grassland – 45% crop land) decreased.

Please accept this scientific material as additional evidence that must be taken into serious consideration before "Big Wind" completely dots the South Dakota landscape by way of their prowess ability to sell these projects as if they won't have any negative impacts and implications.

Sincerely,



Michael J Bollweg
Agronomist – '96 Graduate SDSU
Bollweg Farms
Tumbleweed Lodge
Harrold, SD 57536

001733

EXHIBIT 1-1
2003
4 TURBINES
HYDE COUNTY



EXHIBIT 1-2

9 JULY 2001

PRE-TURBINE

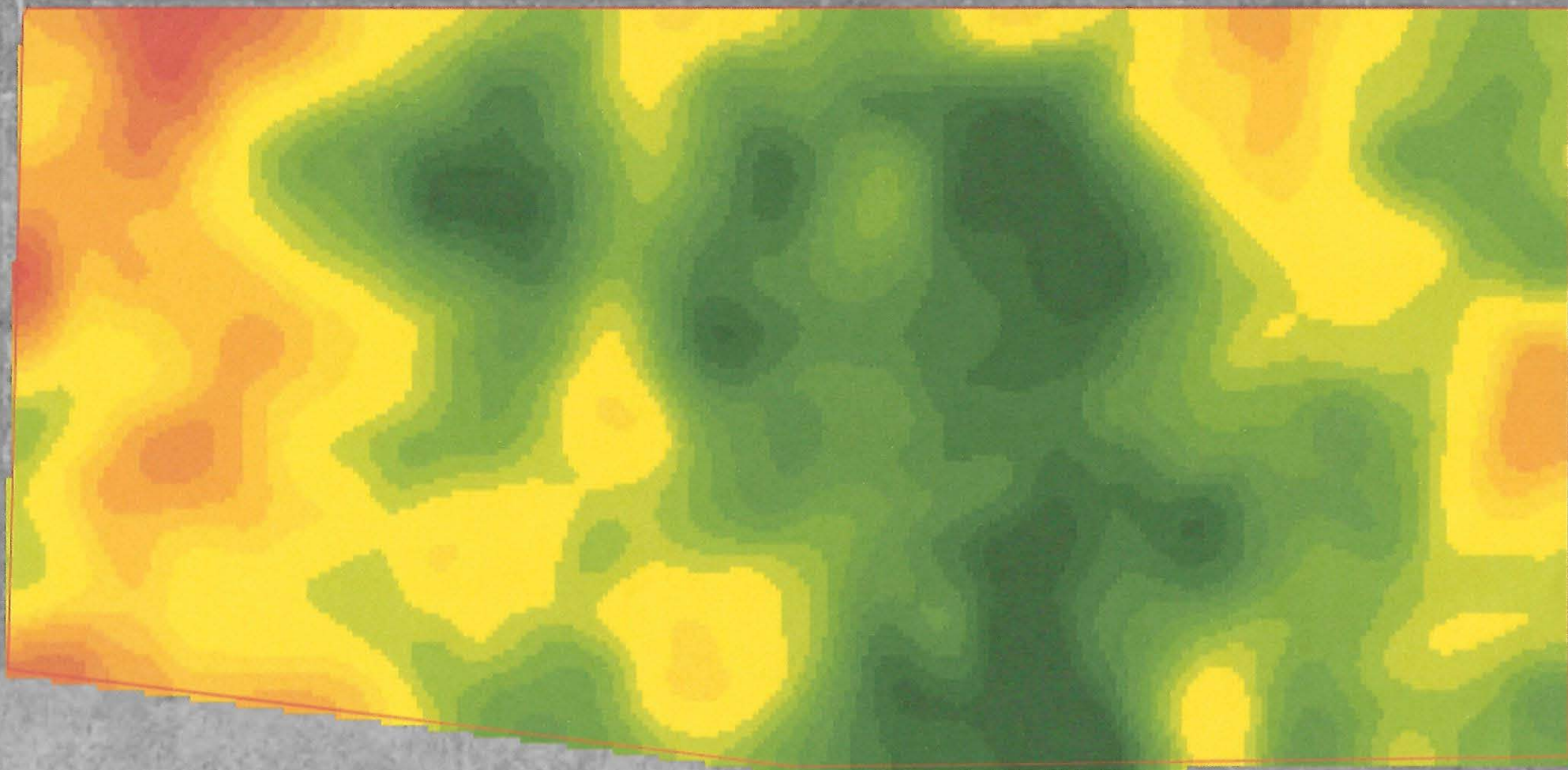


EXHIBIT 1-3
31 July 2003
POST TURBINE

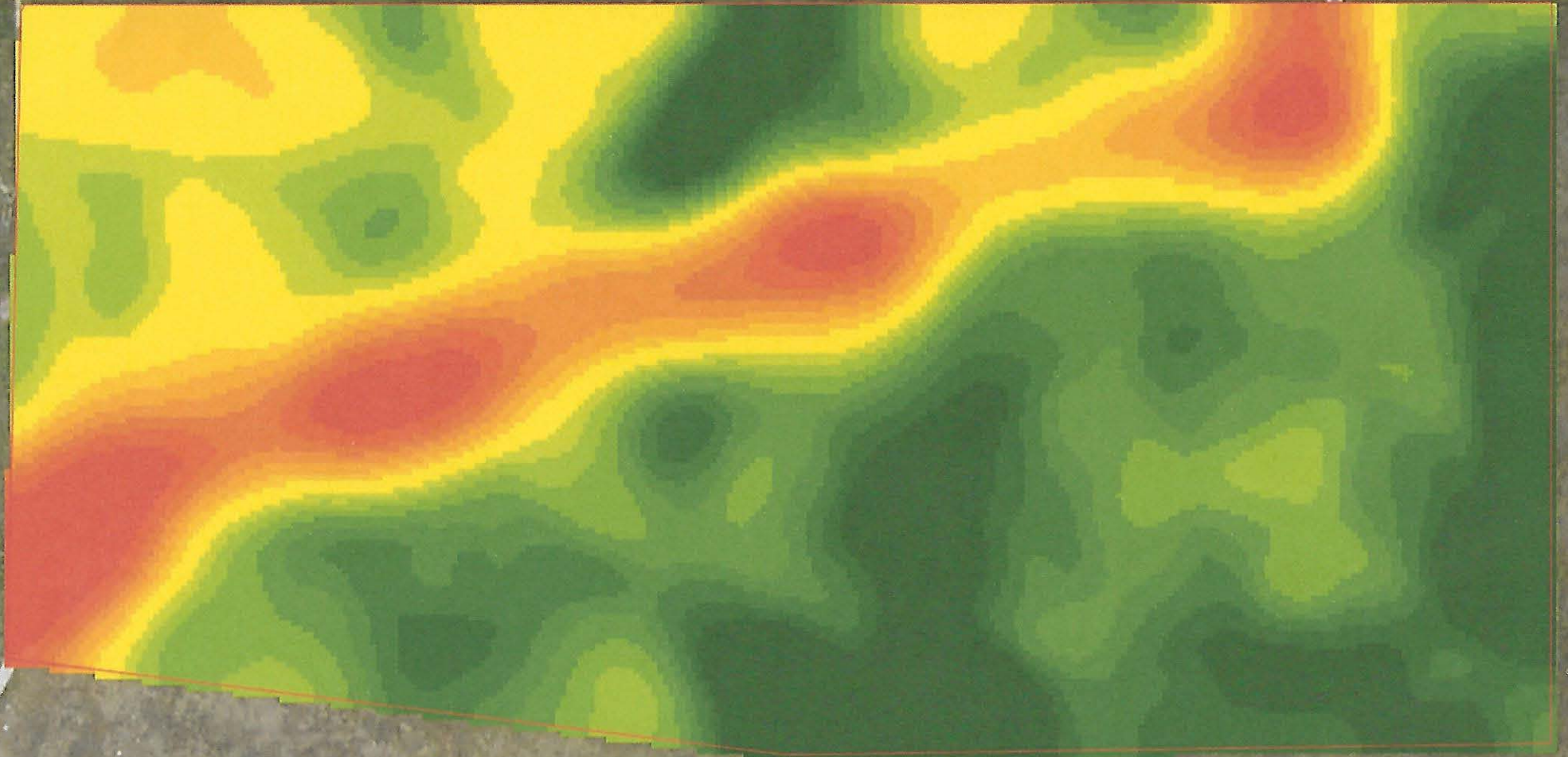


EXHIBIT 1-4
5 July 2011
POST TURBINE

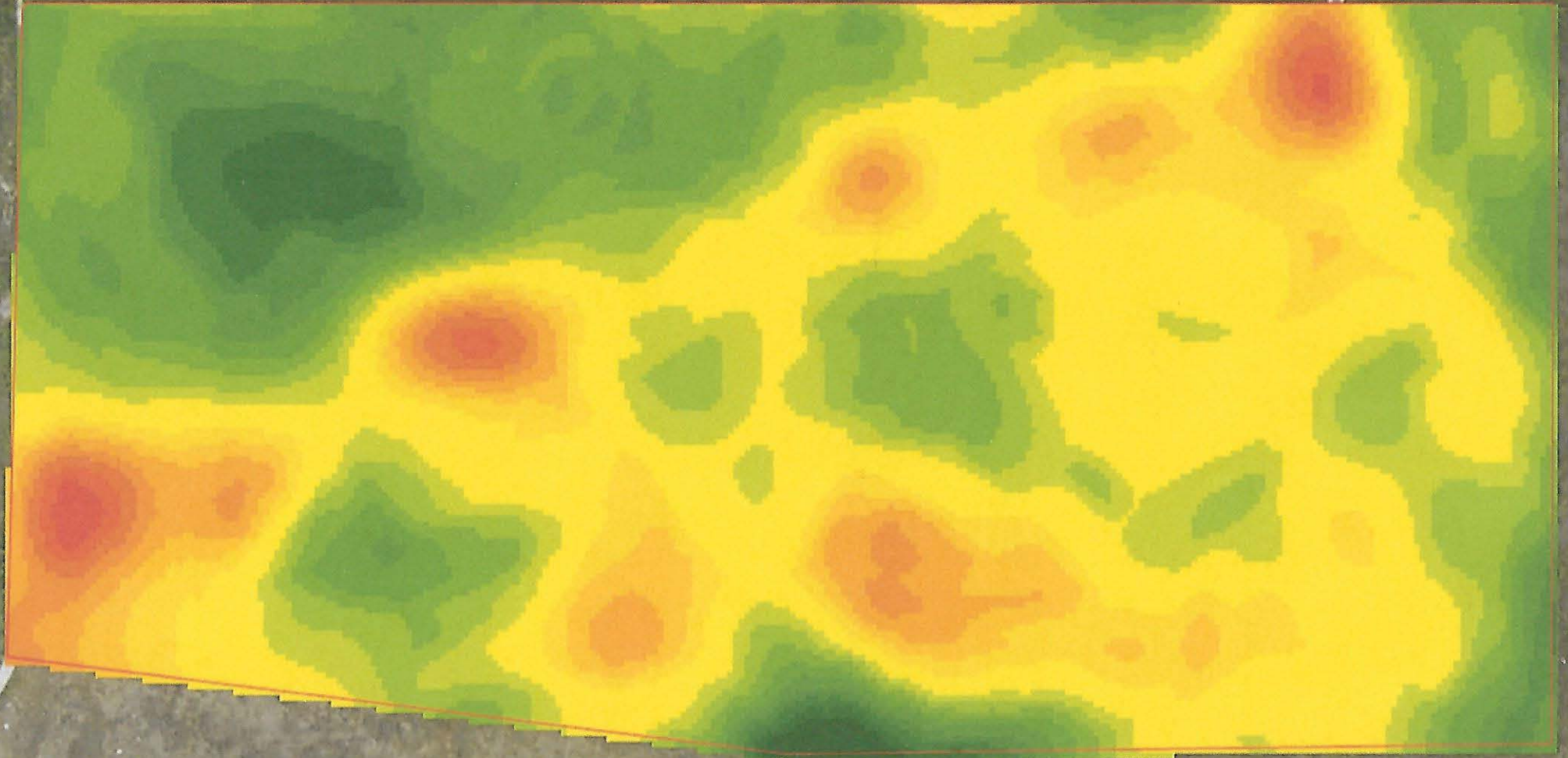


EXHIBIT 1-5
18 July 2016
POST TURBINE

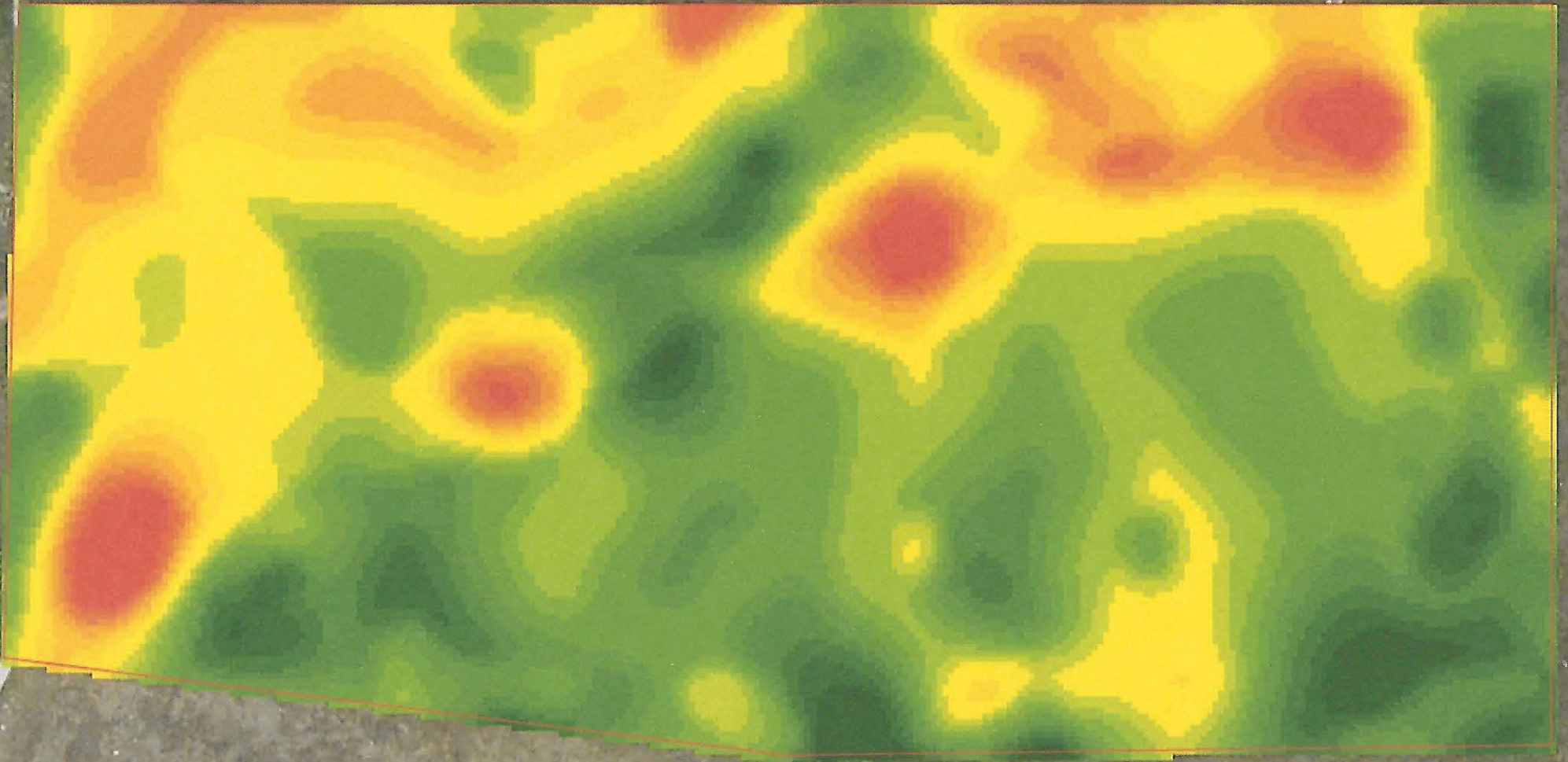




EXHIBIT 2

Drone measures effect of wind turbines on farmland

By Patrick C. Miller | September 27, 2017

Embry-Riddle Aeronautics University used a small unmanned aircraft system (UAS) to study the effects of wind turbines on farmland beneath them and found that they can impact soil, crops and livestock.

Farmers can earn extra income by allowing wind turbines to be placed in their fields. Based on data collected from the UAS, researchers discovered that depending on weather conditions, the spinning blades can positively or negatively impact crop yields. For example, a wind turbine might inhibit crop disease during wet weather or it could speed moisture loss during a drought.

Kevin Adkins, an assistant professor of aeronautical science and director of Embry-Riddle's Gaetz Aerospace Institute in St. Lucie County, Florida, flew a drone into wind turbine wakes to measure differences in relative humidity levels. He and his colleague Adrian Sescu of Mississippi State University published their research findings in the International Journal of Green Energy.

They found that below the hub of a single spinning wind turbine, relative humidity can decrease by as much as 3 percent downwind while humidity increases above the hub. The researchers concluded that this impact is magnified within a broader turbine array. "This occurs as drier air is mixed downward and moister air is mixed upward," they wrote.

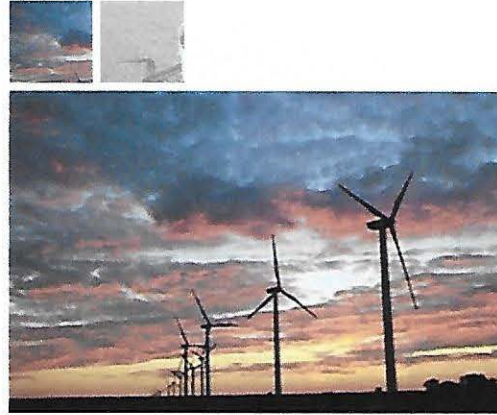
The research was conducted at two Midwestern wind farms. An instrument-equipped quadcopter was flown into two different wind-turbine wakes where it hovered at key points to collect upstream and downstream data. The hub of one turbine was 305 feet above a field of winter wheat. The second turbine had a hub height of 262 feet. Baseline meteorological conditions were assessed.

The quadcopter was equipped with GPS and a suite of instruments to capture temperature and relative humidity levels. Following a prescribed flight path over a four-day period, it made a series of sweeps through the wind turbines' wake zone.

After analyzing the data, Adkins and Sescu found that the descending blades were delivering drier air downward, while the ascending blades were displacing moister air upward—away from the surface of crop fields. They believe this could have significant implications for crops, soil and livestock.

"For farmers, reduced relative humidity over fields could have an impact on their crop productivity," Adkins said. "It's my hope that farmers will take this new information and utilize it, leveraging their specialized knowledge."

Most prior investigations of wind-turbine impacts on near-surface meteorology have been based on computer modeling, Adkins said. "The implementation of the unmanned aerial system provides proof of concept for a platform that can also be used for the measurement of other atmospheric parameters with high spatial resolution," the researchers wrote.



Using a small UAS to collect data, researchers have found that wind turbines can have an impact on the farmland beneath them.

PHOTO: U.S. DEPARTMENT OF ENERGY

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Another Reason to Reject Wind Farms

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Paper Reviewed

Tang, B., Wu, D., Zhao, X., Zhou, T., Zhao, W. and Wei, H. 2017. The observed impacts of wind farms on local vegetation growth in northern China. *Remote Sensing* 9: 332, doi:10.3390/rs9040332.

There are a number of legitimate reasons for opposing wind farms; (1) they kill birds, bats and other animals, (2) they create undesirable ambient noise, (3) they blight the landscape and (4) the power they generate is far more costly per kilowatt hour than that obtained from conventional fossil fuels. Now, however, thanks to the studious research of six Chinese scientists (Tang *et al.*, 2017), we can add a fifth reason for avoiding wind farms -- *they reduce the productivity of surrounding vegetation.*

In reaching this conclusion, Tang *et al.* used remotely-sensed imaging data, including leaf area index (LAI), normalized difference vegetation index (NDVI), an enhanced vegetation index (EVI), gross primary production (GPP) and net primary production (NPP), coupled with other climate-related data (temperature, soil moisture, evapotranspiration, albedo and wind) over the period 2003-2014, to analyze the effects of a recently built wind farm on summer (Jun-Aug) vegetative growth in the Bashang region of northern China. Located in the Hebei province, the Bashang study area (40.9-41.5°N, 113.9-114.7°E) witnessed a total of 1747 wind turbines constructed between the period 2005 and 2011. Land cover in Bashang primarily consists of grassland and crops, which account for 53.4 and 44.7 percent, respectively, of the total cover. Thus, using the remotely-sensed and climate data described above, Tang *et al.* set out to determine whether the wind farm construction in Bashang exerted any influence on the growth and productivity of the region's summer vegetation.

And what did their analysis reveal?

In describing their findings, Tang *et al.* report that construction of the wind turbines elevated both day (by 0.45-0.65°C) and night (by 0.15-0.18°C) temperatures, which increase, they say, "suppressed soil moisture and enhanced water stress in the study area." As a result, local vegetative growth and productivity decreased (see Figure 1). More specifically, they calculated an approximate 14.5, 14.8 and 8.9 percent decrease in LAI, EVI and NDVI over the period of study, as well as "an inhibiting [wind farm] effect of 8.9% on summer GPP and 4.0% on annual NPP." Consequently, these several findings led Tang *et al.* to conclude that their research "provides significant observational evidence that wind farms can inhibit the growth and productivity of the underlying vegetation." And thus we have yet another reason to question the wisdom of policy makers who are seemingly rushing to install more and more of these bird-killing, noise-polluting, eyesore-viewing, cost-prohibiting and vegetative-decreasing low power producing energy sources. It doesn't make any sense, does it?

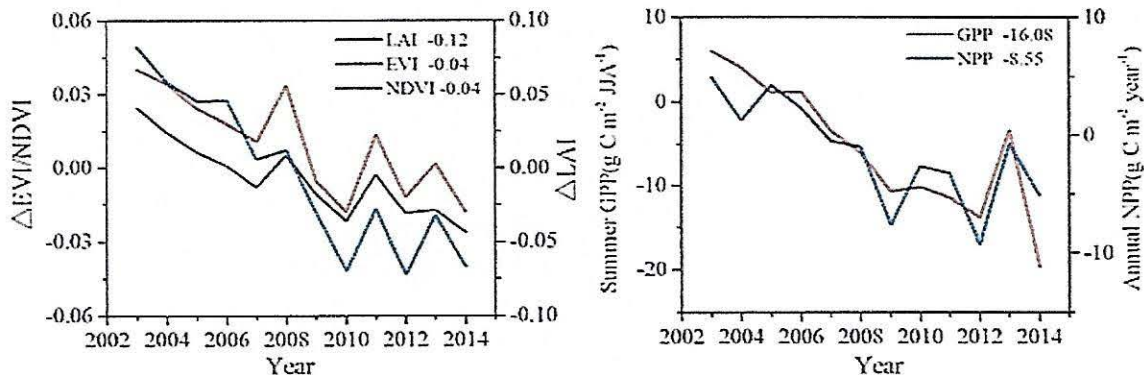


Figure 1. Inter-annual variations of area mean vegetation index differences (left panel) and GPP and NPP (right panel) differences between wind farm pixels and nearby non-wind farm pixels for the period 2003-2014. The insert numbers are the area mean VI, GPP, and NPP differences between the post- and pre-turbine construction periods (2012-2014 minus 2003-2005). Source: Tang *et al.* (2017).

Posted 29 August 2017

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