TITLE Waste Not, Want Not; Capturing Methane to Make Energy

FORMAT Web Articles

PUB. DATE 2015

ABSTRACT / KEY DETAILS

This article details the process of converting hog waste into energy by breaking down bacteria in hog waste to create biogas. This fuel is burned to create electricity to power the hog farm, with surplus electricity being sold back to local electric companies. If all hog farms in NC did this, it could power 24,000 homes; however, many farmers are reluctant to convert their farms to this new technology. Conversion to the new technology can be costly to build and maintain, even with the availability of grants. The article also considers how farmer culture can factor into decisions about waste-toenergy systems. Many NC hog growers are ideologically conservative and may be unwilling to apply for government grants. Mike Williams, Director of the Animal and Poultry Waste Management Center at NCSU, explains: "I have had producers tell me, 'If I'm participating in a project that is incentivized by the government at all, that's a hard thing for me to discuss with my family around my dinner table". Some farmers also fear change in the hog industry that could lead to new growth; currently, the limited supply makes hog farming permits extremely valuable, giving farmers the agency to ask for higher prices if they chose to sell.

WHOLE H	HOG - PIG-POW ×	
€ → C	🔒 Secure https://wholehognc.unc 🚯 🍳 🛧 🥞	💹 🗶 🖽 🔼 🗄
👯 Apps 💷	Courses – Blackboard [Online Tutorials Can	>> Other bookmarks
WHOLE	HOG	= ^
Wast	te Not, Want Not	
A farmer ho	olds out for wide adoption of methane capture	
By Jess Clark &	S Dree Deacon	
Tom Butler's bus over, and you'll s Behind them are	siness card has the words "Power in the Poop" printed across the creme see an aerial photo of his farm: 10 narrow hog houses in a near row alon e three huge, mint-green tarps that Butler uses to cover his "hog lagoon of gallons of hog feces and urine from his 6,000-plus herd.	a sandy dirt road.
Butler's lagoons	s generate electricity for his farm operations, hence the striking tagline o	n his business card.
preventing the re	ered his lagoons back in 2008 "to get rich off of carbon credits," he said. release of carbon dioxide emissions, farmers earn credits that they can in hit more CO2 than they are permitted to release into the air.	
lagoons, pumpin plummeted, Buti	stood to earn \$180,000 in one year from selling carbon credits, just by co ng off the methane and burning it in a bright, blue flame. When the mark ler's covered lagons – while they controlled door and greenhouse gas ing an income from carbon credits. In the end, Butler received only one \$	et for carbon credits missions – were virtually
off, he applied fo	alized he could turn the methane captured from his lagoons into electrici for grants from the Farm Bureau and the North Carolina Green Business F ded equipment. His system was up and running by the end of 2011.	
Capturing M By Grayson Men	dethane to Make Energy	
by orayson men		
	44	•

CUFS 100 Library Assignment

AUTHOR CREDENTIALS

Jess Clark is a journalist and master's student at the School of Journalism and Mass Communication at UNC Chapel Hill; Dree Deacon is a rising senior in the UNC School of Journalism and Mass Communication pursuing a BA in Business Journalism with a minor in Social and Economic Justice. The work they did was part of the Whole Hog project, which "aims to shed light on the energy dynamics within the hog industry in North Carolina," exploring the "complex set of relationships among those with an economic, environmental, cultural and political stake in the industry." ("About," Whole Hog)

HOW DID WE FIND IT?

We found this article by doing a Google search for [hog farm industry north Carolina], where we discovered the Whole Hog webpages, which provide investigative journalism considering multiple aspects of the NC hog farming industry.

CITATION

Clark, Jess and Dree Deacon. "Waste Not, Want Not." Whole Hog, 2015, wholehognc.unc.edu/energy.html.

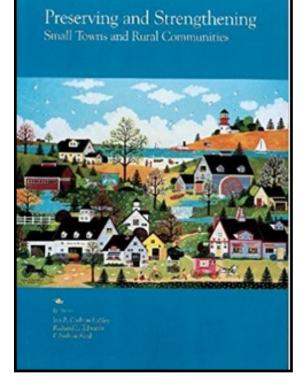
TITLE Preserving and Strengthening Small Towns and Rural Communities

FORMAT Book

PUB. DATE 1999

ABSTRACT / KEY DETAILS

This book defines the specific needs of the small town and rural populations of the United States and Canada from the familial, societal, economic, agency, and empowerment perspectives. It recognizes the diverse range of cultural and ethnic groups, including African Americans, American Indians, and Canadian First Nations People. Addresses the traditional way of life found in rural communities and offers approaches to enhance it. Assembles the research and experiences of leading practitioners in the rural environment. Chapter 5, titled "Squeals and deals : the impact of corporate hog farming on rural communities" deals specifically with hog farming and rural communities.



CUFS 100 Library Assignment

AUTHOR CREDENTIALS

The authors of this book are, Iris B. Carlton-Laney, Richard L. Edwards , and P. Nelson Reid. Iris Carlton-LaNey currently works at the School of Social Work, University of North Carolina at Chapel Hill. Iris does research in Developmental Psychology, Health Psychology and Clinical Psychology

HOW DID WE FIND IT?

From library homepage (library.campbell.edu) we clicked on the **B**ooks & Media tab and did a keyword search for ["hog farming" AND rural]

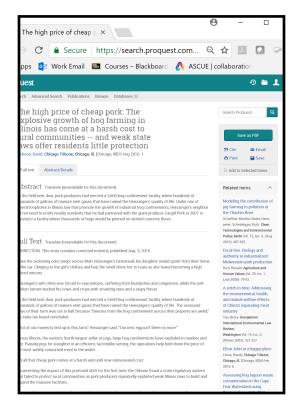
CITATION

Carlton-LaNey, Iris, Edwards, Richard L. (Vice President for Academic Affairs), and P. N. Reid. *Preserving and Strengthening Small Towns and Rural Communities*. NASW Press, Washington, D.C, 1999.

- **TITLE** The high price of cheap pork: The explosive growth of hog farming in Illinois has come at a harsh cost to rural communities -- and weak state laws offer residents little protection.
- FORMAT Newspaper article
- **PUB. DATE** 2016

ABSTRACT / KEY DETAILS

On the field next door, pork producers had erected a 3,600-hog confinement facility, where hundreds of thousands of gallons of manure emit gases that have ruined the Heissingers' quality of life. Under one of several loopholes in Illinois law that promote the growth of industrial hog confinements, Heissinger's neighbor did not need to notify nearby residents that he had partnered with the giant producer Cargill Pork in 2007 to construct a facility where thousands of hogs would be penned on slotted concrete floors.



CUFS 100 Library Assignment

SOURCE CARD 3

AUTHOR CREDENTIALS

David Jackson has been a Chicago Tribune investigative reporter since 1991, except for a year at The Washington Post, where he shared the 1999 Pulitzer Prize for public service for articles about citizens shot by police. At the Tribune, he was a Pulitzer finalist 4 times.

HOW DID WE FIND IT?

From library homepage (library.campbell.edu) we searched OneSearch using the search string ["hog farming" AND water]. From the results screen, we used the filters and chose newspaper as Content Type and chose the last 3 years as our date range.

CITATION

Jackson, David. "The High Price of Cheap Pork." *Chicago Tribune*, Aug 03, 2016, pp. 1, *eLibrary; ProQuest Central*, <u>http://proxy.campbell.edu/login?url=https://search.proquest.com/docview/1808328155?accountid=9858</u>.

TITLE Hog & Pig Farming in the US

FORMAT Industry Report

PUB. DATE 2017

ABSTRACT / KEY DETAILS

There has been a dramatic shift from small-scale production toward vertically integrated factory farms or large, single-phase specialized farms. The number of hog farms has declined by more than 70% over the past 15 years. A USDA report states, "Once dominated by small operations that practiced crop and hog farming, the industry has become increasingly concentrated among large operations that produce hogs on several different sites. Further, large operations that specialize in a single phase of production have replaced farrow-to-finish operations that performed all phases of production." Farms with over 5,000 pigs are expected to account for over 88.0% of industry revenue in 2017. IBISWorld forecasts industry concentration to continue through 2022.

Major producers compete on a vastly different basis than independent farmers. Major producers are involved in all points of the production chain, from feed production to farming, processing and retailing. *Independent farmers compete largely on price*. Farmers that become contractors also compete in the proximity of their farms to the major processor they contract with.

It is getting harder to start a small hog farm, or remain independent. Major barriers to entry include: 1) Regulations governing the industry, 2) the ...

IBISWorld

WHERE KNOWLEDGE IS POWER

In the mud: Revenue is declining due to falling prices of inputs and other meats

his report was provided to Campbell University (2128147169)

IBISWorld Industry Report 11221 Hog & Pig Farming in the US

2 About this Industry	16 International Trade	32 Key Statistics
2 Industry Definition	18 Business Locations	32 Industry Data
2 Main Activities		32 Annual Change
2 Similar Industries	20 Competitive Landscape	32 Key Ratios
2 Additional Resources	20 Market Share Concentration	33 Industry Financial Ratios
	20 Key Success Factors	
3 Industry at a Glance	21 Cost Structure Benchmarks	34 Jargon & Glossary
	22 Basis of Competition	
4 Industry Performance	23 Barriers to Entry	
4 Executive Summary	24 Industry Globalization	
4 Key External Drivers		
6 Current Performance	25 Major Companies	
8 Industry Outlook	25 Smithfield Foods Inc.	
10 Industry Life Cycle		
	27 Operating Conditions	
12 Products & Markets	27 Capital Intensity	
12 Supply Chain	28 Technology & Systems	
12 Products & Services	29 Revenue Volatility	
14 Demand Determinants	29 Regulation & Policy	
14 Major Markets	30 Industry Assistance	
www.ibisworld.com	1 1-800-330-3772 in	fo@ibisworld.com

CUFS 100 Library Assignment

SOURCE CARD 4

... purchase costs of capital equipment and feed, and 3) the difficulty in securing contracts with downstream processors. Additionally, the industry has experienced a rise in globalization. Smithfield Foods Inc., was recently acquired by China-based WH Group. The deal, estimated at \$4.7 billion, is one of the largest Chinese takeovers of a US company.

Complying with regulations and ordinances currently favor the major producers. The industry is regulated by all levels of government: Environmental Protection Agency (EPA) regulations include water-pollution regulations set out under the 1972 Clean Water Act. *Enforcement of EPA regulations varies among states, and many states only pursue enforcement following citizen complaints.* In most states, the board of health grants piggery permits. For start-up hog farms, county zoning policies also impact location decisions.

Small hog farmers may benefit from American customers pushing back. Animal welfare is increasingly gaining importance for large and independent producers. ... It has also opened the market for smaller farmers to compete with larger operators on the grounds of animal welfare {also non GMO, and no additives]. For example, some smaller producers have turned to organic production

AUTHOR CREDENTIALS

Jack Curran is an IBISWorld analysist. He aggregates data from publicly available sources which b=he supplements with calls on industry contacts and non-public sources, in-house data and economic modeling, and the his knowledge of industry. IBISWorld reports are collected by many university and corporate libraries.

HOW DID WE FIND IT?

From the library homepage (library.campbell.edu) we did a "Databases" search for [IBISWorld]. On the IBISWorld homepage, we searched for ["hog farm"] in the IBISWorld search box.

CITATION

Curran, Jack. Hog & Pig Farming in the US. IBISWorld, Feb., 2017. http://proxy.campbell.edu/login?url=http://www.ibisworld.com

- TITLE Student engagement with local water and watersheds
- **FORMAT** Primary research, straw poll: an unofficial vote that is taken to discover what people think about an idea or problem

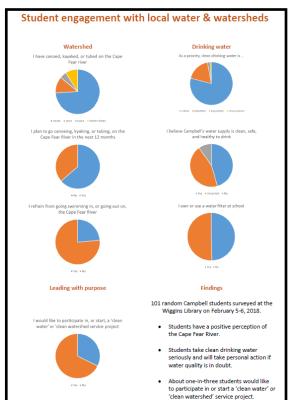
PUB. DATE 2017

ABSTRACT / KEY DETAILS

The purpose of this poll is to ascertain the level of engagement Campbell students' have with the issue of clean drinking water and the care and use of the local watershed that provides water for the campus.

Methodology: Personally request random students selected from every floor and the Starbucks coffee shop at the Wiggins Library to complete a print survey about 'water and watersheds.' The survey was conducted on February 4-5, 2018.

Discussion: The table presents a summary of key data. Interestingly, none of the 'I refrain' comments about swimming in or going out on the Cape Fear River cited water quality. Comments included 'can't swim,' 'scary,' 'don't live near the river,' and 'snakes.'



CUFS 100 Library Assignment

Paper survey of Campbell students seated in Wiggins Library & Starbucks on 2/5-6/2018	Yes	No
I have canoed, kayaked, or tubed, on the Cape Fear River one or more times	26%	74%
I plan to go canoeing, kayaking, or tubing, on the Cape Fear River in the next 12 months	36%	64%
I refrain from going swimming in, or going out on, the Cape Fear River	24%	76%
As a priority, clean drinking water is critical or important	97%	3%
I believe Campbell's water supply is clean, safe, and healthy to drink	46%	54%
I own or use a water filter at school	49%	51%
I would like to participate in, or start, a 'clean water' or 'clean water shed' service project	32%	68%

Findings:

- Campbell students take water quality seriously and spend the money to filter water they have doubts about.
- Campbell students have a positive perception of the quality of Cape Fear River.
- A large portion of Campbell students would support a service project about 'clean water' or a 'clean watershed.'

AUTHOR CREDENTIALS

The author is an interested person who was curious to discover if his fellow students thought clean drinking water was an important issue and how Campbell students interacted with the local ecosystem that provides the campus water supply.

HOW DID WE FIND IT?

As primary research, the survey was created, collected, and analyzed by the author.

TITLE Hog Hell: CAFO Farming is an Environmental and Public Health Disaster

FORMAT Sierra magazine article. (Sierra Club http://www.sierraclub.org)

PUB. DATE 2017

ABSTRACT / KEY DETAILS

The article begins with the author's trip to a concentrated animal feeding operation (CAFO) in Duplin County, NC with Kemp Burdette, a member of the Cape Fear River Alliance. A confrontation with CAFO operators ensues. The industrial takeover of hog framing in NC was engineered by Wendell Murphy, owner of Murphy Family Farms. He was elected to the NC House in 1983, and the NC Senate in 1988. In the late 1980s people became aware of ecological, economic, and human harm done from CAFO's due to high levels of hog waste in ground water and surface water. In 2002 Devon Hall, from Duplin County, founded the Rural Empowerment Association for Community Help (REACH). Hall partnered with Steve Wing, a public health professor from UNC. Wing studied air-quality in neighborhoods within a mile of the CAFOs, later known as the Duplin Health Awareness Project. His tests expanded to water quality and a project with Waterkeeper that was manned by Riverkeepers. Wing made reports to the Department of Environmental Quality (DEQ), and Hall recruited community organizers. Their effort resulted in a moratorium on future hog farms in 2007 by the NC Legislature.



CUFS 100 Library Assignment

SOURCE CARD 6

William Tom Butler a CAFO contract farmer who owns Butler Farms {in Harnett County] states that most contract farmers are not pleased with the status quo "We have a contract that's not worth the paper it's printed on." Butler is a very responsible hog farmer, he covers his waste lagoons and captures the gases to produce alternative energy.

In 2003 Dr. Michael Mallin, a biologist from UNCW began studying the impact of CAFOs on the aquifer near Stocking Head Creek in Duplin County and found it to be polluted. "The DEQ admits that there are intakes for municipal water systems on area rivers, which means that even if locals aren't using well water, they can still be bathing in, cooking with, and drinking water tainted with hog waste." DEQs budget has been gutted by anti-regulation legislators. In 2014 REACH, Waterkeeper Alliance, and the NC Environmental Justice Network, supported by Earth Justice filed a Title VI case with EPA's Office of Civil Rights, alleging that the state's lax regulation decimates against people of color.

AUTHOR CREDENTIALS

"Adam Skolnick is an award winning journalist, he lives in Malibu, California. Photographer Lia Barrett is a North Carolina Native.

HOW DID WE FIND IT?

From the library homepage (library.campbell.edu) we did a "Databases" search for [Academic Search Complete]. On the Academic Search Complete page, we searched for [cafo AND "North Carolina"].

CITATION

Skolnick, Adam and Barrett, Lia. "Hog Hell." Sierra, vol. 102, no. 2, Mar/Apr2017, pp. 28-33. EBSCOhost, proxy.campbell.edu/login? url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=121448130&site=ehost-live.

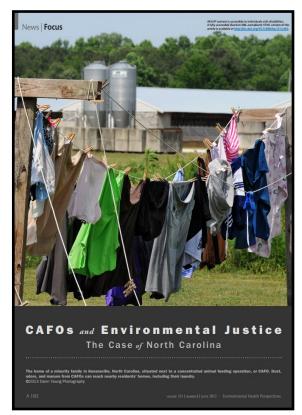
TITLE CAFOs and Environmental Justice: The Case of North Carolina.

FORMAT Journal article. Superintendent of Documents, National Archives and Records Administration, Washington DC http://ehp.niehs.nih.gov/

PUB. DATE 2013

ABSTRACT / KEY DETAILS

The clustering of North Carolina's hog concentrated animal feeding operations (CAFOs) in low-income, minority communities ... has raised concerns of environmental injustice and environmental racism. Several studies show that this may not be intentional discrimination, but a result of following 'the path of least resistance' in choosing sites. This nevertheless results in environmental injustice if minority populations are disproportionally affected, no matter the reason. In 2000 ECU sociology professor Bob Edwards studied Eastern NC counties and found that even when controlling for regional differences, counties with larger minority populations were home to greater concentrations of hog waste. Edwards also reported that large hog operations forced small farmers out of business. For centuries farms were sustainable, the waste from animals helped grow the next year's crops. Then, starting in the 1970s, the hog industry in NC changed rapidly when Wendell Murphy applied the CAFO model. After he was elected to the NC legislature he passed pro CAFO legislation know as "Murphy's Laws." In 1982, all but one NC counties had a BOD, and SS concentrations were 534, 77, and 109 mg/L, respectively, from the aerobic unit of the current treatment system. ...



CUFS 100 Library Assignment

SOURCE CARD 7

... The following two treatment processes were suggested to meet the swine wastewater discharge limitations (COD: 600 mg/L, BOD: 80 mg/L, SS: 150 mg/L): (1) conventional three-stage treatment scheme followed by the modified FWS wetland (with or without plants) with a 2-day HRT [effluent concentrations for COD, BOD, and SS were 327, 39, and 58 mg/L, respectively (with plants)], and (2) replacement of the aerobic unit in the current treatment scheme with the modified FWS wetland with a 7-day HRT (effluent concentrations for COD, BOD, and SS were 327, 39, and 58 mg/L, respectively (with plants)], and (2) replacement of the aerobic unit in the current treatment scheme with the modified FWS wetland with a 7-day HRT (effluent concentrations for COD, BOD, and SS were 327, 67, and 30 mg/L, respectively).

AUTHOR CREDENTIALS

Wendee Nicole, based in Houston, TX has written for *Nature, Scientific American, National Wildlife,* and other magazines.

HOW DID WE FIND IT?

From the library homepage (library.campbell.edu) we did a "Databases" search for [Academic Search Complete]. On the Academic Search Complete page, we searched for [cafo AND "North Carolina"].

CITATION

Nicole, Wendee. "CAFOs and Environmental Justice: The Case of North Carolina". Environmental Health Perspectives (Online); Research Triangle Park Vol. 121, Iss. 6, (Jun 2013): A182. <u>http://dx.doi.org/10.1289/ehp.121-a182</u> perma link http:// proxy.campbell.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=88195383&site=ehostlive

TITLE Use of a Constructed Wetland for Post-Treatment of Swine Wastewater

FORMAT Journal article.

PUB. DATE 2008

ABSTRACT / KEY DETAILS

The three-stage treatment scheme (solid separation followed by anaerobic and aerobic treatment) has been applied by most hog farms in Taiwan for wastewater treatment. The objective of this study was to examine the efficacy of using a modified free water surface (FWS) constructed wetland to polish the treated swine wastewater. The FWS wetland was installed on a hog farm to conduct the treatability study. The floating plant (Pistia stratiotes L.) was grown in the wetland system and small gravels were used as the media. In the first part of this study, effluent after the aerobic treatment unit was pumped into the system for posttreatment at two different hydraulic retention times (HRTs) (2 and 4 days). In the second part of this study, effluent after the anaerobic treatment unit was pumped into the system for treatment, and the system was operated at 5- and 7-day HRTs. Influent and effluent samples were analyzed for water quality parameters including chemical oxygen demand (COD), biochemical oxygen demand (BOD), and suspended solid (SS). The results show that averaged COD, BOD, and SS concentrations were 1,104, 319, and 185 mg/L, respectively, from the anaerobic unit, and averaged COD, commercial hog farm, by 1997 95% of NC hog farms were located in the eastern counties of the costa plain. ...

Use of a Constructed Wetland for Post-Treatment of
Swine Wastewater
S.W. Chen, ¹ C.M. Kao, ^{2,*} C.R. Jou, ³ Y.T. Fu, ⁴ and Y.I. Chang ¹
¹ Pepartment of Chemical Engineering Tanghai University Taichung, Taiwan, Republic of China ² Institute of Enricommental Engineering National San Yar-Sen University Kaohiang, Taiwan, Republic of China ⁹ Department of Safery Health and Enricommental Engineering National Kaohiang Tiriu University of Science and Technology Kaohiang Tiriu University of Science and Technology Kaohiang Taiwan, Republic of China
ABSTRACT
The three-stage treatment scheme (solid ergamiton followed by unaerobic and aerobic treatment) has been ap- pliced by most beginns in Taiwan for watewater treatment. The objective of this study, was to examine the efficacy of using a modified free water surface (PWS) constructed wetland to polish the treated wine water- water. The FWS wetland was installed on a long farm to conduct the treatment of the objective of this study, efficient after the accretion treatment. The objective of this study, effluent after the accretion terminent unit was pumped in the system for postructament at two dif- ferent hydraulic retention times (HETs) (2 and 4 days). In the second part of this study, effluent after the accre- obic treatment unit was pumped in tho two system for the system was operated at 5 - and 7-day HRTs. Influent and effluent samples were analyzed for water quality parameters including chemical at 5- and 7-day. In the system was operated in the system for the system was operated at 5 - and 7-day aged COD, BOD, and SS concentrations were 1,104, 319, and 188 mg/L, respectively, from the ancerbic unit of the current treatment system. The following two treatment processes were suggested to meet the swite wastewater discharge limitations (COD: 600 mg/L, BDD: 80 mg/L, SS: 150 mg/L; (1) correctional HRT [ef- lephacement of the archive the current treatment chemere with the modified FWS wetland with a 2-day HRT [effluent concentrations were 2, dors, dors, and 30 mg/L, respectively).

Volume 25, Number 3 D Mary Ann Liebert,

Key words: constructed wetland; swine wastewater; floating plant; Pistia stratiotes L.

nal Sun Yat-Sen University, Kaohsiung, Taiwan, R.O.C. Phone *Corresponding author: Institute of Environmental Engineering, Nation: +886-7-525-4413; Fax: +886-7-525-4449; E-mail: jkao@mail.nsysu.edu

407

CUFS 100 Library Assignment

SOURCE CARD 8

... Lagoons in which the hog waste is stored contains pathogens, antimicrobials, insecticides, and other pharmaceuticals that pollute watersheds across the coastal plain. Even without spills, untreated waste in lagoons can seep into ground water. Emissions also have adverse effects on health and quality of life. UNC professor Steve Wings study "Community Health Effects of Industrial Hog Operations" documented health symptoms associated with hydrogen sulfide produced from hog waste. In 2013 a report by Jillian Fry at the Johns Hopkins Center for a Livable Future found that regulations and laws need to catch up with the rapid development of CAFOs. The [NC] Swine Farm Environmental Performance Standards Act made a moratorium on new hog operations permanent in 2007 and incorporated environmentally superior technologies (ESTs). Super Soil System (now called Tera Blue) is an EST recently developed by Smithfield Foods, Inc., under agreement with the NC Attorney General. ESTs could be the future of hog farming, one project id Google and Duke University partnered with Duke Energy to capture methane from hog waste at Loyd Raye Farms in Yadkin County using an anaerobic digester.

AUTHOR CREDENTIALS

The authors are all researchers interested in environmental protection and environmental and chemical engineering. They work at Tunghai University, National Sun Yat-sen University, and National Kaohsiung First University of Science and Technology.

HOW DID WE FIND IT?

From library homepage (library.campbell.edu) we searched OneSearch using the search string ["hog farms" AND waste AND water]

CITATION

Chang, Y. "Use of a constructed wetland for post-treatment of swine wastewater." Environmental Engineering Science, 25.3, 2008, pp. 407-418. https://doi.org/10.1089/ees.2007.0004.

TITLE	Assessing hog lagoon waste contamination in the Cape Fear pyrosequencing	r Watershed using <i>Bacteroidetes</i> 16 S rRNA gene
FORMAT	Journal article.	April Microbial Bioschael (2015) 99:7243-7293 DOI 10.1007/002554015-0784-x METHODS AND PROTOCOLS
PUB. DATE	2015	Assessing hog lagoon waste contamination in the Cape Fear Watershed using <i>Bacteroidetes</i> 16S rRNA gene pyrosequencing
ABSTRACT / KEY DETAILS		Ann M. Arfken ^{1,2} - Bongkeun Song ^{1,2,3,4} - Michael A. Mallin ^{1,2}

Hog lagoons can be major sources of waste and nutrient contamination to watersheds adjacent to pig farms. Fecal source tracking methods targeting Bacteroidetes 16S rRNA genes in pig fecal matter may underestimate or fail to detect hog lagoon contamination in riverine environments. In order to detect hog lagoon wastewater contamination in the Cape Fear Watershed, where a large number of hog farms are present, we conducted pyrosequencing analyses of *Bacteroidetes*16S rRNA genes in hog lagoon waste and identified new hog lagoon-specific marker sequences. Additional pyrosequencing analyses of Bacteroidetes 16S rRNA genes were conducted with surface water samples collected at 4 sites during 5 months in the Cape Fear Watershed. Using an operational taxonomic unit (OTU) identity cutoff value of 97 %, these newly identified hog lagoon markers were found in 3 of the river samples, while only 1 sample contained the pig fecal marker. In the sample containing the pig fecal marker, there was a relatively high percentage (14.1 %) of the hog lagoon ...

	8	
Ar	ın M. Arfken ^{1,2} • Bongkeun Song ^{1,2,3,4} • Michael A. Mall	n ¹²
	ceived: 21 April 2015/Revised: 15 June 2015/Accepted: 18 June 2015 Springer-Verlag Berlin Heidelberg 2015	/Published online: 19 July 2015
nur Fo rR det ort Ca pro Ba tifi py we du ati the	wtraet Hog lagoons can be major sources of waste and irreit comminution to watersheds adjacent to pig farms, cal source tracking methods targeting discretification of XA geness in pig ficeal matter may underestimate or fail to exit to hig layout contamination in riverient environments. Its per Fare Watershot, where a large number of hog farms are created, we conducted pprosequencing analysiss of convolted at 165 rRNA geness in hog lagoon waste and iden- one have hig layon-specific matter exegures. Additional sosqueering analyses of <i>Bacteroiders</i> 165 rRNA genes re conducted with surface water samples collected at a site ming 5 months in the Cape Fere Watershot. Using an oper- onal taxonomic unit (OTU) jointry condrivature of for Vane of 97 S, see newly identified hog lagoon markers were found in 3 of river samples, while only 1 sample contained the pig feaso.	markers and a low pig fecal marker relative abundance (0.4 % in the <i>Backerolders</i> 105 rRNA gene sequences. Th suggests that log lagoon continuination must be samewho significant in order for pig fecal markers to be detected, an low levels of four lagoon contantiation cannot be detected to be setting to the lagoon contantiation cannot be detected markers in the setting of the detection capacity for lagoon water contamination, and in conjunctions with a pig for marker, provide a more comprehensive and accurate detectio of hog lagoon waste contamination in succeptible watershed Keyworth Microbial source tracking · <i>Bacteroldetes</i> · Fecal Polition
	rker. In the sample containing the pig fecal marker, there is a relatively high percentage (14.1 %) of the hog lagoon	Introduction
do	etronic supplementary material The online version of this article \pm 10.1007/500253-015-6784-x) contains applementary material, ch is available to authorized users.	Fecal contamination of water bodies imposes serious risks t human health and aquatic ecosystems. Fecal matter may ha bor pathogenic microbes such as <i>Citrobacter freundi</i> <i>Enterocytozoon bieneusi</i> , and some strains of <i>Escherichica</i> or door markets.
8	Bongkeun Song songb@vims.edu	that may contaminate drinking water supplies (Meays et a 2004). Fecal waste is also rich in nitrogen and phosphoru which may lead to eutrophication of nearby lakes and rive (Mallin and Cahoon 2003). Current standard practices of th
	University of North Carolina Wilmington, 601 S. College Rd, Wilmington, NC, USA	Environmental Protection Agency (EPA) rely on enumeration and cultivation of fecal indicators to monitor contamination
	Center for Marine Sciences, University of North Carolina Wilmington, Wilmington, NC, USA	recreational and public water sources (EPA 2003). Fecal ind cator bacteria include total fecal coliforms, <i>E. coli</i> , and feca
	Department of Life Science, Dongguk University-Seoul, Seoul 100-715, South Korea	enterococci (Okabe et al. 2007). Unfortunately, these enume ation methods do not allow for identification of the contam
	Present address: Department of Biological Sciences, Virginia Institute of Marine Science, College of William & Mary, Gloucester	nation source (Field et al. 2003; Scott et al. 2002). In addition fecal contaminants such as enterococci and E. coli are able to

🙆 Spring

CUFS 100 Library Assignment

SOURCE CARD 9

... markers and a low pig fecal marker relative abundance of 0.4 % in the *Bacteroidetes* 16S rRNA gene sequences. This suggests that hog lagoon contamination must be somewhat significant in order for pig fecal markers to be detected, and low levels of hog lagoon contamination cannot be detected targeting only pig-specific fecal markers. Thus, new hog lagoon markers have a better detection capacity for lagoon waste contamination, and in conjunction with a pig fecal marker, provide a more comprehensive and accurate detection of hog lagoon waste contamination in susceptible watersheds.

AUTHOR CREDENTIALS

Ann Arfkin and BK Song are researchers at the Virginia Institute of Marine Science. Prior to coming to The Virginia Institute of Marine Science Worked at UNC Wilmington. Ann recently defended her PHD in Marine Science.

Michael A. Mallin is a PhD. In Marine and Estuarine Ecology and is interested in land use and how it can contribute to water pollution.

HOW DID WE FIND IT?

From library homepage (library.campbell.edu) we searched OneSearch using the search string ["hog farms" AND waste AND water]

CITATION

Arfken, Ann M. and all. "Assessing hog lagoon waste contamination in the Cape Fear Watershed using Bacteroidetes 16SrRNA gene pyrosequencing." *Applied Microbiology and Biotechnology*, 99.17, 9/2015, pp. 7283-7293, https://doi.org/10.1007/s00253-015-6784-x.

TITLE Intensive hog farming operations and self-reported health among nearby rural residents in Ottawa, Canada

FORMAT Scholarly journal article.

PUB. DATE 2009

ABSTRACT / KEY DETAILS

A survey was administered to a random sample of residents from seven rural communities in the eastern part of Ottawa, Canada. The authors analyzed self-reported questionnaire data obtained from 723 adults and 285 children/ adolescents. health-related quality of life (HRQOL) was assessed using a survey instrument, while data were also collected for sociodemographic characteristics, the prevalence of selected health conditions, and lifestyle related behaviours (e.g., smoking) of participants. Variations in self-reported health according to the residential distance to the hog farm were evaluated using statstical analysis.

For the most part, the prevalence of selected health conditions among adults and children was not associated with how far they lived from the farm. No associations were observed with migraines, respiratory conditions (asthma, rhinitis, sinusitis, and chronic bronchitis), and allergies. However, a higher prevalence of depression was noted among those who lived within 3 km of the farm relative to those who lived more than 9 km away. Furthermore, individuals who lived closer to the hog farm were more likely to worry about environmental issues such as water quality, outdoor and indoor smells, and air pollution.

BMC Public Health	O BioMed Central
	pen Access
Intensive hog farming operations and self-reported health an	nong
nearby rural residents in Ottawa, Canada	
Paul J Villeneuve*1, Amira Ali2, Laurel Challacombe1 and Sophie Heb	ert ²
Address: ¹ Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario M5T 3M7, Canada and ² Ottawa Public Healt Constellation Crescent Ottawa, Ontario K2C 6/8, Canada	th.100
Email: Paul I Villeneuve* - paul villeneuve@utoronto.cx; Amira Ali - amira.ali@ottawa.cx; Laurel Challacombe - Lchalkcombe@uto Sophie Hebert - sophiehden@hotmail.com * Corresponding author	ronto.ca;
Published: 10 September 2009 Received: 4 July 2008 8/MC Public Health 2009, 9:330 doi:10.1186/1471-2458-9:330 Accepted: 10 September 2009	
This article is available from: http://www.biomedcentral.com/1471-2458/9/330	
© 2009 Villensove et al loonse BioMed Concel Ltd. This is an Open Access strick distribution dure the terms of the Creative Commons Attribution License (<u>http://creative.commons.org/licen</u> which permits unrestricted use, distribution, and reproduction in ary medium, provided the original work is properly cited.	<u>ses/by/2.0</u>).
Abstract Background: In 2004, log farming operations were introduced in the village of Sardfeld in the extern part of Ottawa, Canda. This study evaluates the health-related gasling of life (HRQOL), and the prevalence of respiratory conditions among adults and children who level in proximity to this form.	
Methods: A cross-sectional survey was administered to a random sample of residents from seven rural communities in the eastern part of Ottawa, Canda, We analyzed self-eported questionnaire data obtained from 723 addust and 285 childmatodelescents. HROC Was assested using the SF- 36 survey instrument, while data were also collected for sociodemographic characteristics, the prevalence of selected health conditions, and lifestyle related behaviour (e.g., smoking) of participants. Variations in self-reported health according to the residential distance to the hog farm were evaluated using logicit regression and analysis of variance methods.	
Results: For the most part, the prevalence of elected health conditions among shults and children was not associated with how for the lyiel for form the farm. No associations were observed with migrainer, respiratory conditions (atoma, rhintis, simulisti, and chronic bronchisti), and allergiss. However, a higher prevance of deprestion was noted among bout work low dw withs all and in the farm relative to those who lived more than 9 km away (odds ratio = 2.01, 95% CI = 1.11, 3.65). Furthermore, individual who lived closer to the IHF were more likely to worry about environmental issues such as water quality, outdoor and indoor smells, and all pollution. This kwell of worry about the lower HROQL scores for individuals who level coster to the farm. It was also observed that the prevalence of depression was much higher among those who indicated a concerne about environmental issues (1823) when compared to those who indicated a concerne about environmental issues (1823).	
Conclusion: While our finding suggest that living in close proximity to an IHF may advessely affect HRQOL these should be interpreted cautiously due to a lack of direct measures of environmental exposures, and possible blases inherent in the use of self-reported health measures.	
P gage number not for class	age 1 of 10

CUFS 100 Library Assignment

SOURCE CARD 10

This level of worry also contributed to lower HRQOL scores for individuals who lived closer to the farm. It was also observed that the prevalence of depression was much higher among those who indicated a concern about environmental issues (18.2%) when compared to those who did not (8.0%).

AUTHOR CREDENTIALS

Paul Villeneuve has a Ph.D. in Public Health and is an accredited professional statistician. Amira Ali is an epidemiologist in Ottawa, Canada. Laurel Challacombe is a public health researcher.

HOW DID WE FIND IT?

From library homepage (library.campbell.edu) we searched OneSearch using the search string ["hog farm" AND environment]

CITATION

Villeneuve, Paul J., et al. "Intensive Hog Farming Operations and Self-Reported Health among Nearby Rural Residents in Ottawa, Canada." BMC Public Health, vol. 9, no. 1, 2009, p. 330.

- TITLE Surface-water quality in agricultural watersheds of the North Carolina Coastal Plain associated with concentrated animal feeding operations
- FORMAT Government report
- **PUB. DATE** 2015

ABSTRACT / KEY DETAILS

The effects of concentrated animal feeding operations (CAFOs) on water quality were investigated at 54 agricultural stream sites throughout the North Carolina Coastal Plain during 2012 and 2013. Three general watershed land-use types were examined during the study, including 18 background watersheds with no active CAFOs (BK sites), 18 watersheds with one or more active swine CAFOs but no poultry CAFOs (SW sites), and 18 watersheds with at least one active swine CAFO and one active dry-litter poultry CAFO (SP sites).

Water-quality differences were noted for the SW and SP land-use groups relative to the BK group. Median values of specific conductance, several major ions (magnesium, sodium, potassium, and chloride), and nitrogen fractions (ammonia plus organic nitrogen, ammonia, nitrate plus nitrite, total nitrogen, and δ 15N of nitrate plus nitrite) were higher for the SW and SP groups compared to the BK group. No significant differences in water temperature, dissolved oxygen, calcium, total organic nitrogen, orthophosphate, total ...

Science for a changing work

Prepared in cooperation with the North Carolina Department of Environment and Natural Resources, Division of Water Resources

Surface-Water Quality in Agricultural Watersheds of the North Carolina Coastal Plain Associated with Concentrated Animal Feeding Operations



Scientific Investigations Report 2015–5080

I.S. Department of the Interio I.S. Geological Survey

CUFS 100 Library Assignment

SOURCE CARD 11

... phosphorus, or δ 180 of nitrate plus nitrite were noted among the land-use groups. When compared on the basis of land-use type, there was an overall measurable effect of CAFO waste manures on stream water quality for the SW and SP watershed groups. Measurable effects of CAFO waste manures on stream water quality were most evident in those SW and SP watersheds having lower percentages of wetlands combined with higher swine barn densities and (or) higher total acres available for applying waste manure at the swine CAFOs.

AUTHOR CREDENTIALS

Stephen L. Harden is a hydrologist at the South Atlantic Water Science Center, and has been an employee of the government's US Geological Survey since 1991.

HOW DID WE FIND IT?

We found this article by doing a Google search for [government reports hog farming North Carolina].

CITATION

Harden, Stephen L. "Surface-Water Quality in Agricultural Watersheds of the North Carolina Coastal Plain Associated with Concentrated Animal Feeding Operations." pubs.usgs.gov/sir/2015/5080/pdf/sir2015-5080.pdf. TITLE Farmers Test Ways to Protect Water: Fertilizer Runoff Gets Share of Blame for Algae

FORMAT Newspaper Article

PUB. DATE 2016

ABSTRACT / KEY DETAILS

This newspaper article printed in *The Blade*, an Ohio newspaper, describes the situation of a number of family farms using hog manure to fertilize their fields of corn, soybeans, and wheat. Problematically, phosphorus is washing off of these fields, covered in manure or industrial fertilizer, and is effecting northwest Ohio's water quality. The Stateler farm is one of three in southern and northern Hardin counties to implement new practices designed to reduce nutrient runoff from their fields, including phosphorus which feeds algae growth in nearby Lake Erie. These demonstration farms are part of a larger research project on water runoff led by the U.S. Department of Agriculture. This five year project is an attempt to reduce nutrient erosion and improve water quality. Farmers and activists are both skeptical of the efficacy of the new practices. Soil erosion has been reduced, but to date, levels of dissolved phosphorous running off fields have not. Further research is warranted, but if effective, the hope is that farmers will voluntarily adopt these practices. Farmers test ways to protect water NOLAN ROSENKRANS . The Blade ; Toledo, Ohio [Toledo, Ohio]04 July 2016: A 1.

Proquest document in

ABSTRACT



CUFS 100 Library Assignment

AUTHOR CREDENTIALS

Nolan Rosenkrans is a 34 year-old staff writer for Toledo *Blade*, a Pulitzer Prize winning publication in 2004. He specializes in education reporting. Rosenkrans is a member of the Toledo Newspaper Guild and is president of the local guild unit and co-chair of the union negotiating team. He studied English and Journalism at Temple University.

HOW DID WE FIND IT?

From library homepage (library.campbell.edu) we searched OneSearch using the search string ["hog farming" AND watersheds]. We used the "newspaper article" limiter and filtered by date (newest to oldest).

CITATION

Rosenkrans, Nolan. "Farmers Test Ways to Protect Water." *The Blade*, Jul 04, 2016, *ProQuest Central*, http://proxy.campbell.edu/ login?url=https://search.proquest.com/docview/1805204370?accountid=9858.

SOURCE CARD 13

- TITLE Pigs in Space: Determining the Environmental Justice Landscape of Swine Concentrated Animal Feeding **Operations** (CAFOs) in Iowa
- FORMAT Journal Article
- PUB. DATE 2016

ABSTRACT / KEY DETAILS

The research study described in this journal article was designed to uncover if the same relationship with traditional environmental justice (EJ) variables such as low income and minority populations observed in other concentrated animal feeding operation (CAFO) studies exist with the swine CAFO densities in lowa. Spatial regression techniques were used to determine the relationships of high swine concentrations to these environmental justice variables. The researchers found that while CAFOs do cluster in certain regions and watersheds of Iowa, these high densities of swine are not associated with traditional EJ populations of low income and minority populations. While this is good, it is the researchers' determination that the negative impacts of intensive swine production require a more complex appraisal. Populations exposed to the risks of swine production "bear the burden" of the environmental injustice of growing pork not only for the United States but also the world.

sean-young@uiowa.edu (S		va, Iowa, IA 52242, USA;
 Correspondence: margaret Academic Editors: Jayajit Chal 	carnel@uiowa.edu; Tel.: +1-319-335-0154 kraborty, Sara E. Grineski and Timothy W. Co ted: 22 August 2016; Published: 25 August 20	
understand if the same relation income and minority popular studies exists in the relation optical clustering of sovine C to determine the relationship swine CAPOs do cluster in nore complex appriable. Th used in swine production i suggest that a more ilteral presence and location of an 4t the same time, we sugge connouic factors that creats the Upper Michaest is also high quality data in the an	of lowe in pork preduction for the U.S. is isomaby with traditional environmental j biomaky with traditional environmental j and powth aware. CAPO dematter in lowes AROs in ortain parts of the state and us all populations of low income and min- injustice in the negative impacts of inter- e clustering of wine production in water- n public waterways, the clustering of ma fligurature "downstream" approach tibiotics used in animal production in the tibiotics used in animal production in the post a more "upperlumn" understanding an amore "upperlumn" understanding much and guestive "downstream" approach tibiotics used in animal production in the public waterways, the clustering of m spin a more "upperlumn" understanding much and the upperlumn and downstream lysis of these upstream and downstream	unifse (EI) variables such as low immal leveling operation (CARC, We examined the potential for 4 optial argeneous technique (Variables, We found that while here high densities of source are notify non-(effnicity, Instead, the heeds, the presence of antibiotic wave suppliment of their finding in public wave presence of antibiotic in public wave source of the source in public wave source of the source of the structural political and sevene preduction in lowa and sevene preduction in lowa and fixed or publicly accessible ann EI questions.
At the same time, we sugg economic factors that creat the Upper Midwest is also c high quality data in the ana Keywords: environmental j 1. Introduction	gest a more "upstream" understanding e an environmentally unjust landscape o rucial. Finally, we highlight the importar lysis of these upstream and downstream	of the structural, political an swine production in Iowa an trole of publicly accessible an EJ questions. ng operation (CAPO); Iowa

on. Res. Public Health 2016, 13, 849; doi:10.339

CUFS 100 Library Assignment

AUTHOR CREDENTIALS

Dr. Margaret Carrel teaches in the Department of Geographical and Sustainability Sciences at the University of Iowa along with author, Eric Tate. Author Sean Young was an advisee of Dr. Margaret Carrel while earning his PhD at the University of Iowa and has served as an adjunct instructor in the Department of Geographical and Sustainability Sciences at that institution.

HOW DID WE FIND IT?

From library homepage (library.campbell.edu) we searched OneSearch using the search string ["hog farming" AND watersheds]. We limited to "journal articles," selected the limiter "peer-review,' and sorted by date (newest to oldest).

CITATION

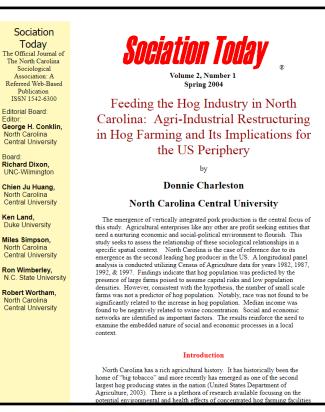
Carrel, Margaret, Sean G. Young, and Eric Tate. "Pigs in Space: Determining the Environmental Justice Landscape of Swine Concentrated Animal Feeding Operations (CAFOs) in Iowa." International Journal of Environmental Research and Public Health, vol. 13, no. 9, 2016, pp. 1-19, Agricultural & Environmental Science Database; ProQuest Central, http:// proxy.campbell.edu/login?url=https://search.proquest.com/docview/1817564263?accountid=9858, doi:http:// dx.doi.org/10.3390/ijerph13090849.

- TITLE Feeding the Hog Industry in North Carolina: Agri-Industrial Restructuring in Hog Farming and Its Implications for the US Periphery
- FORMAT Research journal article

PUB. DATE 2004

ABSTRACT / KEY DETAILS

NC is the focus of this article, since it is the second leading hog producer in the US. A study was done to see what factors are used to determine the location of large scale Hog farms. This article is both a quantitative and qualitative analysis of the rise of industrial hog farming and its impact on North Carolina's local economies.



CUFS 100 Library Assignment

SOURCE CARD 14

AUTHOR CREDENTIALS

Donnie is the Economic Policy Manager at NCSU Institute for Emerging Issues. In his work he collaborates with national, state, and local leaders from industry, government, and nonprofit organizations.

HOW DID WE FIND IT?

From library homepage (library.campbell.edu) we searched OneSearch using the search string ["hog farming" AND "North Carolina"]

CITATION

Charleston, Donnie. "Feeding the Hog Industry in North Carolina: Agri-Industrial Restructuring in Hog Farming and its Implications for the US Periphery." *Sociation Today*, vol. 2, no. 1, 2004. <u>http://www.ncsociology.org/sociationtoday/v21/</u> <u>hog.htm</u>. Accessed 19 Dec. 2017.

TECHNICIAN

- TITLE Opinion: Hog waste: Nastier than Ever
- FORMAT Opinion piece from online NC State University student newspaper

PUB. DATE 2017

ABSTRACT / KEY DETAILS

This article is about the hog waste in NC and how rural NC residents are having to deal with how hog waste disposal is affecting their everyday life as well as their health. This article talks about the recent HB 467 that was passed, which limits the damages residents can collect from hog farmers.

-	mon				
SC	OTUS re	ejection of vo have been			ouldn't
	According to the Unit-	Circuit Court of Appeals. This decision	presidential primary elect		ate-issued ID in order to vote
6.	ed States Constitution,	was contested by former Republican Gov.	originally from Colora-		in last year's primaries while
19	the right to vote in our democracy in order to	Pat McCrory, who publicly supported the law when it passed in 2013.	do, explained the ardu- ous process of acquiring	"It does not	avoiding an absentee ballot As college students, it is
100	elect our country's lead-	Although the Supreme Court's refusal	a valid ID in order to	mean that we	our job to educate ourselver
Bertiliki.	ers is an inalienable right afforded to all citizens of	to hear the appeal to reinstate the law is a vastly positive step toward voter equality	exercise his inalienable right as a citizen to vote.		and take action within our democracy — our voter
Dholakia	this country. That there	and voting rights, North Carolina's Repub-	He pointed out that for	can become	decide our own future. A
Opinios Editor	is still a debate about	lican lawmakers have already stated that	low income citizero, and	complacent	voter ID law, whether it's the
ticularly man	access to this right, par- d on by the very people who	the fight is not over. Their continued de- sire to restrict access to voting is telling of	even full-time students, the process of getting an	in the face of	one we had, reinstated, or a newly written one, endan-
often tout the	Constitution when enact-	deeper issues within our state legislature.	ID could mean the loss	other threats to	gers our ability as students.
	criminatory bills and laws,	The official reasoning behind the origi-	of at least an entire day's		and as citizens, to make de-
	redence to the fact that our re rapidly moving backward,	nal voter ID law was that the law would en- sure thorough protection from in-person	pay, or missing at least an entire day of classes.	our democracy,	cisions about and have a say in our government, and our
than forward.		voter fraud - a problem that the GOP	NC State welcomes	and our right	opportunities as contribut-
	May 15, the Supreme Court	apparently felt was enough of a threat to	approximately 10 per-	to exercise our	ing members of society.
	States announced that it re- eal to reinstate North Caro-	their political standings. According to the Washington Post and other publications,	cent of our students from outside the state,		The Supreme Court's de cision is a positive one, and
	ly controversial voter idea-	however, in-person voter fraud is, in fact,	according to College	vote."	a big victory in the fight for
tification law,	which required all voters to	a phantom threat; absentee ballots pose	Portraits. That means		voting rights, but it does no
	approved form of ID at the the number of early voting	a greater threat of fraudulent votes, and even then, many cases of fraud are often	that approximately 10 percent of our students are		mean that we can become t in the face of other threats to
	inated same-day registration.	even then, many cases of traud are often accidental cases.	U.S. territories other than b		t in the tace of other threats to racy, and our right to energise
The law, whi	ich disproportionately tar-	In February 2016, Logan Graham	Pres not assuming that all of	those students our vote.	racht ann con right of controls
	ters in North Carolina, was fown in July 2016, by the 4th	chronicled his experience of getting an approved, state-issued ID to vote in the	are U.S. citizens, but surely are, meaning that they w		
	Hogy	waste. It's r	astier	than ex	ver
	0	waste: It's r			
0	Peop is back on the ta-	sized swimming pools. The containment	of living with the stink from	North Careli- HB 467 p	revents people from recovering
0	Peop is back on the ta- ble. Six months ago, the Technician ran ducling	sized swimming pools. The containment of these pools to guarantee that they do not overflow or contaminate nearby water ways	of living with the stink from na's hog farms. Obviously, so to be done to protect the h	North Caroli-HB 467 p mething needs damages li calth of North pain and s	revents people from recovering to those for health care bills and affering. It effectively legalizer
0	Peop is back on the ta- ble. Six months ago, the Technician ran ducling columns over how to deal	sized swimming pools. The containment of these pools to guarantee that they do not overflow or contaminate nearby waterways has proven difficult.	of living with the stink from na's hog farms. Obviously, so to be done to protect the h Carolina residents and the	North Careli- HB 467 p mething needs damages li calth of North pain and s state's environ- the discrim	revents people from recovering to those for health care bills and affering. It effectively legalizer ination against residents on the
2	Foop is back on the ta- ble. Six months ago, the Technician ran ducling columns over how to deal with hog waste in North	sized swimming pools. The containment of these pools to guarantee that they do not overflow or contaminate nearby waterways has proven difficult. It is not just major storms like Hurricane	of living with the stink from na's hog farms. Obviously, so to be done to protect the h Carolina residents and the mental resources.	North Careli- Imething needs calth of North state's environ- basis of th	revents people from recovering to those for health care bills and affering. It effectively legalizer instion against residents on the instico of residency, an idea
	Peop is back on the ta- ble. Six months ago, the Technician ran ducling columns over how to deal	sized swimming pools. The containment of these pools to guarantee that they do not overflow or contaminate nearby water ways has proven clifficult. It is not just major storms like Hurricane Matthew that impose a threat for residents of eastern North Carolian, where most bag	of living with the stink from nak log farms. Obviously, as to be done to protect the h Carolina residents and the r mental resources. In the original duel issued cian, Aaron Sanchez called	North Careli- mething needs calth of North state's environ- thy the Techni- that not on talk of North basis of the by the Techni- that not on talk or not out talky corra	revents people from recovering ke thuse for health care bills and differing. It effectively legalizer ination against residents on the circhoice of residency, an idea dy lacks logic but is fundamen- ta a it assumes people have ful
Villegas	Foop is back on the ta- ble. Six months ago, the Technician ran ducling columns over how to deal with hog waste in North Carolina. Accordingly, students exposed the io- cial, environmental and	sized swimming pools. The containment of these pools to guarantee that they do not overflow or contaminate nearby water ways has proven difficult. It is not just major atoms file Hurricane Matthew that impose a thread for residents of eastern North Carollan, where most hog operations are located. It is accommon pres-	of living with the stink from maximg farms. Obviously, so to be done to protect the h Carolina residents and the mental resources. In the original duel issued class, Aaron Sanchez called on farm activity in the name	North Careli- Interthing noods calth of Noeth tate's environ- basis of the by the Techni- tra environ- tor a robuction of works of the the for a robuction of works of the the the technic of the technic tare of works occurs of the technic tare of the technic of the technic of the technic tare of the technic of the technic of the technic technic of the technic of the technic of the technic technic of the technic of the technic of the technic of the technic technic of the technic of the technic of the technic of the technic technic of the technic of the technic of the technic of the technic technic of the technic of the technic of the technic of the technic technic of technic of the technic of technic of the technic of the technic of tec	revents people from recovering to those for health care bills and affering. It effectively legalizes intotion against residency, an idea dy lacks logic but is fundamen- pl as it assumes people have ful mobility — a myth about th
	Poop is back on the ta- ble. Six months ago, the Technician ran ducting columns over how to deal with hog waste in North Canolina. Accordingly, students exposed the so- cial, environmental and economic challenges con-	sized swimming pools. The containment of these pools to guarantee that they do not overflow or contaminate nearby water ways has proven difficult. It is not just major storms like Hourisane Matthew that impose a threast for residents of ceatern North Carolian, where most hop operations are located. It is a common pre- tice for farm operators to empty their ceas-	of living with the stink from ash hog farms. Obviously, so to be done to protect the h Carolina residents and the mental resources. In the original duel issued cian, Aaron Sancher called on farm activity in the name and environmental health.	North Caroli- mething sods ealth of North state's environ- basis of th that nortices to for a reduction for a reduction to file yourn sofwile ravolad mugasi and s that no the basis of th that no the that no tha	vevents people from recovering ke those for health care bills and affering. It effectively legalizes inntion against residents on the it choice of residency, an idea it placks logic but in fundamen- pt as it assumes people have ful 'mobility — a myth about the from that has long hean heard to result that has long heard heard to the motion of the second second second from that has long heard heard to the second s
Villegas Contributor	Foop is back on the ta- ble. Six months ago, the Technician ran ducling columns over how to deal with hog waste in North Carolina. Accordingly, students exposed the io- cial, environmental and	sized swimming pools. The containment of these pools to guarantee that they do not coreffore or containing to marky waterways has proven difficult. It is no exject any or down like tharmicane Matthew that impose a throat for resident department of corelia, where most hag operations are located. It is a comman par- ies for fram operators to compt their com- pools by spreying the liquid waste as cop- prisitizen, according to the lark Seve Wing.	of living with the stink from naithog farms. Obviously, at to be done to protect the h Carolian excitents and then mental resources. In the original dust immediate clan, Aaron Sanchez called on farm activity in the name and environmental health, more government regulat farming activities to proce	t North Caroli- mething needs calls of North tath's of North tath's mini- for a reduction of of current one current on of current on set eventors.	revents people from recovering to those for beaths care bills and affering. It effectively legalize inization against readients on the trie choice of residency, an idea by Lacka logic bat in fundament of an it assumes people have ful mobility — a myth about the mobility — a myth about the mobility — a myth about the mobility and the stances of understand the issue. Deeply addents on this issue. Deeply
Villegas Contributor farming and h Carolina.	Poop is back on the ta- ble. Six months ago, the Technician ran dueting column sover how to deal with hog waste in North Carolina. Accordingly, students exposed the so- cial, environmental and recommic challenges con- cerning the issue of hog- log waste disposal in North	sized swimming pools. The containment of these pools to guarantee that they do not coreflow or containniate marky water ways has proven difficult. It is not just and guar downlike blarricase Matthew that inspose a thread for evidence detactors North Acaditas, where month buy eye for first experiments to anyopy their speech of the experiments on anyopy their speech by speeping the liquid water as comp forthlikes, according to the late Steev Wing, an associate produces or deploymenting of	of living with the stink from nah hog farms. Obviously, so to be done to protect the h Carolian residents and the s mental resources. In the original duel issued cian, Aaron Sancher called on farm activity in the name and environmental health, more government regulat farming activities to pros- mentally source processors.	torth Caroli- imething needs callh of Noeth tate's environ- toff or a reduction of while I invoked ion of current mote environ- note environ- tor for a set of the tate's environ- tor of current torthe torthe the discrim- table I invoked ion of current torthe to	revents people from recovering ke thuse line health care bills and afferings. It effectively legalize instation against residents on the tire choice of residency, an ide by Jacks logic bat in fundament of an it manmes people have ful mobility — a myth about the fream that bas long been husted mician published the stances or students on this insue. Despite in their opinions on how a
Villegas Contributor farming and h Carolina. Hog farming	Peop is back on the ta- ble. Six months ago, the Technician ran during columns overhower deal with hog waste in North Candina. Accordingly, students exposed the so- cial, environmental and consumic challenges con- cerning the issue of hog yearts disposed in North	sthed swimming pools. The containment of these pools is parameter that they do not coreflew or containing a non-pool water ways has proven difficult. We approximate the state of the state distribution that impose a threat few real-outs of eastern North Carolia, where most hops operations are located. It is a common prac- tice for flavo operators to empty their con- pools by specifying the bigaid states as com- pools by specific the bigaid states as com- binstitution as the bigaid states as com- pools by specific the bigaid states as com- binstitution as the bigaid states as com- binstitution as the bigaid states as composition as the bigaid states as com- binstitution as the bigaid states as composition as the bigaid states as com- bigaid states as the bigaid states as the bigaid states as com- bigaid states as the bigaid states as the	of Diving with the stink from miking farms. Obviously, as to be done to protect the bu- canelina residents and the mental resources. In the original deel issued class, Aaron Sancher called on farm activity in the name and environmental health, more government regulat framing activities to prov- mentally sound precisions. So	North Careli mething seeds calh of North turk environ- for a reduction of of web environ- to of of carenet on of carenet mote environ- sucher took that	revents people from recovering to those for health care bills and affering. It effectively legalite initiation against residents on the iri choice of residency, as ide by tacks logic bert is fundament of a it anumers people have tall inician published the stances or mobility — a mybilshed the stances or culents on this issue. Despite in their opinions on how to no collents and the instances along in their opinions on how to
Villegas Contributor farming and h Carolina. Hog farming dustry in the U	Poop is back on the ta- ble. Six months ago, the Technician ran dueting column sover how to deal with hog waste in North Carolina. Accordingly, students exposed the so- cial, environmental and recommic challenges con- cerning the issue of hog- log waste disposal in North	sized swimming pools. The containment of these pools to guarantee that they do not coreflow or containniate marky water ways has proven difficult. It is not just and guar downlike blarricase Matthew that inspose a thread for evidence detactors North Acaditas, where month buy eye for first experiments to anyopy their speech of the experiments on anyopy their speech by speeping the liquid water as comp forthlikes, according to the late Steev Wing, an associate produces or deploymenting of	of living with the stink from nah hog farms. Obviously, so to be done to protect the h Carolian residents and the s mental resources. In the original duel issued cian, Aaron Sancher called on farm activity in the name and environmental health, more government regulat farming activities to pros- mentally source processors.	North Caroli- mething seeds calls of North Laskie services for a reduction of video scola of video scola of video scola of of carolation of ca	revents people from recovering to thuse the bachhoczer bills and affering. It effectively legalize disation against evaluation of the tir their of residency, as ide by tack ingic bar is includances at a it anazores people have tall the ream that has long been basted theream that has long been basted the transmitted in the stances or students on this insue. Deeply in their optimises on how is the comflict, students aboved. Student
Villegas Contributor farming and h Carolina. Hog farming dustry in the U dollars in tax re North Carolin	Peop is back on the ta- ble. Six months ago, the Technician ran dueling column over how to deal with hog waste in North Canolina. Accordingly, students caponed the to- centing the issue of hog op watter disposal in North gis a renth-billion dealtr in S. and generates millions of seremut that fait the economy as it the second-langent hog	sized swimming pools. The containment of these pools to guarantee that they do not confirm or extensibility analysis and the confirment extensibility and the confirmed R is not given may need to be a subscription of easiers. North Carolina, where must be operations are located in a common poor- pools by querying the liquid numeric account finding, an auxoing the blanc Stee William, an auxoing reporting the liquid numeric account finding, and the liquid numeric account finding, and the liquid numeric account of the liquid numeric and the line Stee William, an auxoing the liquid numeric account finding, and the liquid numeric account of the liquid numeric account of the line Stee William and and and the liquid numeric account of an autoint profession of pools.	effiving with the stick finer on hope forms. Obviously, so to be done to protect the h Carolina residents and the mental resources. In the original deal issued class, Aaron Sanchere allde on farm activity in the name and crevinonsential health, more government regulat farming activities to pro- mentally sound percision. So position that North Carolin moble to responsibly dispo- because the rate produces	North Caroli- mething seeds calls of North Lack environ- for a reduction of a reduction of a reduction of a reduction of a reduction of divider social freedom of advider social freedom of advider social freedom of advider social freedom of advider social freedom of advider social freedom of advider social freedom of advices freedom of carrent No: Statis e of log waste soo mach of it, sore saving those	revents people from recovering to thuse for badth care bills and forcing. It offectively legalizes innation against residents on the irreduced production of the second production of the second production of the second second production of the mobility $-a$ myth about the resonant the second production of the mobility $-a$ myth about the resonant the second production of the mobility of the second second second mobility of the second second second mobility of the second second second mobility of the second second second to the second second second second to the second second second second d in their advocatory for social resonant affaits and common
Villegas Contributor farming and h Carolina. Hog farming dustry in the U dustry in the U Addam in tax re North Carolin farming state i	Peop is back on the ta- ble. Six months ago, the Trchmician ran duelling columns over how to deal with long wates in North Carolina. Accordingly, students exposed the so- centing the issue of hong ong wates disposal in North is, and generates millions of the construct, and like on the .5.3, and generates millions of the construct, and is home	sized ovienning pools. The containment of these pools by garantee that they do not how powers of these. The point of the supercent offices, a strength of realistic attractions of the strength of the strengt	of living with the stink floer ma's long farms. Obviously, or to be done to protect the h Caneilon residents and the mental reasources. The the original deal ismed- ential concentration of the one of the state of the one of the state of the state of the mental protection. The mental protection of the mental protection o	North Caroli- mething reads adamages 102 adamages 102 adamages 102 adamages 102 adamages 102 adamages 102 adamages thatick environ- tatick environ- tor a reduction of or a reduction of a reduction and environ- tick it involved a mescurrent nor maxch of its. NC States a sens-current nor same unrendy agrossich i toor, agrig that nors, agring that mity decking inty decking inty decking inty decking inty decking inty decking inty decking inty decking inty decking inty inty decking inty decking inty inty decking inty inty decking inty inty decking inty inty inty inty inty inty inty inty	recents people from recovering to thuse the backh care bills and friends. It officiantly that the second second instation against residents on the inchica gainst residents on the first inchica gainst residents on the first mobility — a myth about the remotility — a myth about the remotility and the stances or linear that has long/here husted incitan published the stances or addents on this issue. Despit is in their applicable the stances or linear their stances of the stances of the coefficient states aboved. Stadent remotes the stances of the state of the stances of in their aboved. Stadent remotes the stances of the state of the remotes of rights and commu- perent while balances gecommis-
Villegas Contributor farming and h Carolina. Hing farming dustry in the U dollars in tax re dollars in tax re forming state i to more than	Peop is back on the ta- ble. Six months ago, the Technician ran dueling column over how to deal with hog waste in North Canolina. Accordingly, students caponed the to- centing the issue of hog op watter disposal in North gis a renth-billion dealtr in S. and generates millions of seremut that fait the economy as it the second-langent hog	sized swimming pools. The containment of these pools to guarantee that they do not confirm or extensibility analysis and the confirment extensibility and the confirmed R is not given may need to be a subscription of easiers. North Carolina, where must be operations are located in a common poor- pools by querying the liquid numeric account finding, an auxoing the blanc Stee William, an auxoing reporting the liquid numeric account finding, and the liquid numeric account finding, and the liquid numeric account of the liquid numeric and the line Stee William, an auxoing the liquid numeric account finding, and the liquid numeric account of the liquid numeric account of the line Stee William and and and the liquid numeric account of an autoint profession of pools.	effiving with the stick finer on hope forms. Obviously, so to be done to protect the h Carolina residents and the mental resources. In the original deal issued class, Aaron Sanchere allde on farm activity in the name and crevinonsential health, more government regulat farming activities to pro- mentally sound percision. So position that North Carolin moble to responsibly dispo- because the rate produces	North Careli- mething reads and how five the table of North Table in the second table in the second table	recents people from recovering to thuse the backh care bills and friends. It officiantly that the second second instation against residents on the inchica gainst residents on the first inchica gainst residents on the first mobility — a myth about the remotility — a myth about the remotility and the stances or linear that has long/here husted incitan published the stances or addents on this issue. Despit is in their applicable the stances or linear their stances of the stances of the coefficient states aboved. Stadent remotes the stances of the state of the stances of in their aboved. Stadent remotes the stances of the state of the remotes of rights and commu- perent while balances gecommis-
Villegas Contidutor farming and h Carolina. Hog farming dustry in the U dollars in tax re North Carolin farming state i to more than We also learn We also learn	Peop is back on the ta- ble. Size months ago, the Technician era an duelling cohumn over how to deal cohumn over how to deal Canolina. A countingly, students exposed the so- centing the issues of hog og wante disposal in North 15. and generates millions of the country, and is horse remut that fuel the conserva- in is the second-length hog of the country and is horse of the country and the sources.	and evinening posh. The containment of these poshes parasets the first phase in the posterior of the transmission parameters of the posterior distance that is possed and the posterior results for the transmission of the posterior of the posterior of the posterior methods and the posterior of the posterior posterior methods and the posterior of the posterior of the method and the posterior of posterior of posterior comment and and both hands of the methods and the method and both hands of the methods of the posterior of posterior comment and and both hands of the methods of the posterior comment and and both hands of the methods of the posterior comment and and both hands of the methods of the posterior of posterior comment and and both hands of the methods of the posterior of posterior comment and a both hands of the posterior of pos	of living with the stack from rule lag intern. Obviously, we be done to protect the h Cardian serializes and the Cardian serializes and the cardian serial seconds. In the original dual issues of a series of the second second second on farm sciencity in the same and environmental health, more government regulations to promise that block the cardian method on a second second second method block of the second block of second second second second block of second second second second wide is defined as in the head wide is defined as in the head method block of the second	North Carolis HII 647 [mething root of North States and States (mething root of North States (http://www.states.com/ basis of the states (http://www.states.com/ states (http://www.states.com/ states.com/ states.com/ states.com/ states.com/ states.com/ distances.com/ dist	revents people fram recovering to those the bashin care balls and fidening. It effectively heighten directing the reflectively heighten of the second second second second of the second second second second of the second second second second second second second second second second second second second second in their approximation second seco
Villegas Contributor farming and h Carolina. Hog farming dustry in the U dollars in tax re dollars in tax farming state i to more than operations an We also learm scale not only p	People back on the table. Size mention age, the ble. Size mention age, the table size method age cohomo even how check of the table size of the table cohomo even how check of the table size of the construction of the table size of the table size of the table size of table size of the table size of the table size of table size of table size of table size of table size and table size of table size of table size of table size and table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table size of table	since low similar low similar goods. The containance of the second contribute or containant exactly water ways have proven diffusion. It is not space or semilar to be trained to the second s	offliving with the stink from noi long times. Obviously, as to be done to protect the flo Candina residents and they candina residents and they candina resident and they done that the stink flow the family and activities to pro- motion the stink flow the flow and corresponding during the family and precision. Specific the standards to responsible draps because the state produces the state flow and the stink flow and the strength canding the state produces the state produces the state of the state produces the state of the state produces the state produces the state produces the state of the state produces the state produces the state produces the state of the state produces the state produces the state produces the state produces the state of the state produces th	North Carolis menting roots a damage in the start of environmenting roots of the North in the data in and a trate is environ. In the data by the Total is the data in the data with the north is the data in the data of virtual root of the other of the data data of the horizon of the data and the data of the data of the data data of the data of the data of the data data of the data of the data of the data data of the data of the data of the data data of the data of the data of the data data of the data of the data of the data data of the data of the data of the data data of the data of the data of the data data of the data of the data of the data data of the data of the data of the data of the data data of the data of the data of the data of the data data of the data of the data of the data of the data data of the data of the data of the data of the data of the data data of the data of the data of the data of the data of the data data of the data of the data of the data of the data of the data data of the data of	revents people fram recovering the those for both or relivations of the first $ _{1}$. It definition is a statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical terms that have gave broken the transmost statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical di n their aphietonic statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical statistical di normanical statistica and communication et al. Combined statistical statistic
Villegas Contributor farming and h Carolina. Hug farming dustry in the U dollars in tex re North Carolin farming state i to more than operations an We also learn scale not only g it also produce	Peop is back on the ta- ble. Size must has get, the technism care due ting column over how model columns over how model columns over how model controls. A constitution, tatlents capsed the size oversing the sizes of long or must is billions of the size 33. and generates millions of 2.169 generates millions of 2.169 generates millions of 2.169 generates millions of the construct, and is home 2.169 generates millions of the size of the size of the preduce to generate of the size of the preduce to generate of the size of the size of the size of the size of the size of the size of the size of the size of the size of the size of the size of the size of the size of the size of the size of the size o	and a down sing path, it To continuous control one containator activity is hard control one containator activity in the sec- tore of the second sec	of living with the stink from nu has given. Obviously, as the door is protect the for Canditar evidence and the control of the Canditar evidence and the control of the forming a calculation to control of the mainter the Neth Candit multitude the control of the contr	North Carolin H1 4637 (Marchael Carolin a daraged a dar	sevents people from recovering the those for heads are solving as the first of the solution of
Wilegas Contributor farming and h Carolina. Hog farming destry in the U dollars in tax re North Carolin farming state is to more than operations ass We also learm scale not only p it also produce fact, pools of ill Handling so	People tacks on the ta- ble Sciences and the science of the scienc	start lowing path, The continuous path of the second path of the seco	of living with the stink from mixing arms. Obviously, and constitute evaluation with the neutral execution with the metal execution. In the second cian, Arrow Sander and the metal execution of the second cian, Arrow Sander and the second execution of the second cian, areas and and the second metal the second practices. Sander and execution of the second barries of the second second second barries of the second	North Carolin H14457 (Internething 2004 darapped (darapped (h14457) (nevents people fram recovering the those for back has reliable and the state of the state of the state of the state in the state of the
Villegas Contributer farming and h Carolina. Hog forming dustry in the U dollars in tax re dollars in tax re More also learn scale not only g it also produces fast, pools of it Handling so itserally adity.	Peop is back on the ta- ble. Size muschin age, the rechtinking rate adulting technisking rate adulting technisking rate adulting with the second second second with the guarantic in Neural Constitution. Accounting and the second secon	and evinening posh. The containment of these poshs parasets that they have the present difficult posts and parasets the present difficult posts and parasets the present difficult difficult posts and parasets the present difficult difficult posts and parasets and parasets and parasets posts and parasets and parasets and parasets and parasets posts and parasets and parasets and parasets and parasets and parasets and parasets and parasets and parasets parasets and parasets and parasets and parasets parasets and parasets and parasets and parasets parasets and parasets and parasets and parasets parasets and parasets and parasets parasets and parasets parasets and parasets parasets and parasets parasets parasets and parasets parasets and parasets parasets parasets parasets parasets and parasets parasets and parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets paras	of Thring with the stink from noh long terms. Obviously, at the down is presented the for- cent of assessment of the Control assessment of the control aspense in the control assessment of the control assessment of the control aspense in the control assessment of the control ass	North Carolin 118 4637 (merthing cost of how the how	revents people frum recovering the those for both as the bids as the bids as the bids and bids are bids as the bids and bids and bids and the bids of the bids and bids and bids and bids and bids multiple of the bids and bids and bids and bids and bids multiple of the bids and and bids and and bids and bids
Villegas Contributer farming and h Carolina. Hog forming dustry in the U dollars in taxer North Carolin farming state i to more than operations an We also learn we also learn the also produce fact, pools off Handling us iterally a dirty produce 15 pp	People thack on the tar- ble. Size mean barge of the target of tar	sind evidening posh. The containment of these posts of a provide the first photon property of the provide the first photon property in the start angue meres this life intriases the negative start photon provide the start photon of the start photon provide the start photon operation are briefly characteristic photon further start photon photon photon photon for the start photon photon photon for the start photon photon photon start briefly characteristic photon starts (trajectory of photon) photon starts (trajectory of photon) photon starts (trajectory of photon). The start briefly characteristic photon photon of photon starts (trajectory of photon) photon starts (trajectory of photon). The start briefly photon starts (trajectory of photon) and the starts (trajec- tory operations) in starts (trajectory of photon cryptopote) and and the bacterist with the start briefly and and the bacterist photon starts (trajectory of photon). The start photon starts (trajectory of photon) and the starts (trajec- tory operation starts and the bacterist photon). The start photon photon starts are also between the start photon photon starts photon and the starts (trajectory of photon) and the bacterist photon and the starts (trajectory of photon) and the starts (trajectory of photon). The starts (trajectory of photon) and the starts (trajectory of photon) and and the starts (trajectory of photon) and the starts (trajectory of photon) and are starts as the start (trajectory of photon) and the starts (trajectory of photon) and are starts as the start (trajectory of photon) and the starts (trajectory of photon) and are starts as the start (trajectory of photon) and are starts as the	offliring with the stink from nub log streng. Obviously, as the dates is protect the h scetal enserver. It is the certal enserver. It is the same data, streng streng streng streng data, streng streng streng streng data, streng streng streng streng merging streng	North Carolin Interneting could be deragen at the second be observed to the second be deragen at the second be deragen	nevents people fram recovering the three the base between the three three the three
Villegat Contributer farming and b Carolina. Hog farming destry in the U dollars in tax or North Carolin farming state is to more than operations as we also learn scale not only p it also produce fact, pools of it Handling us interally a dirty produces 15 ps result, events, every ps	Peop is back on the ta- ble. Size muschin age, the rechtinking rate adulting technisking rate adulting technisking rate adulting with the second second second with the guarantic in Neural Constitution. Accounting and the second secon	and evinening posh. The containment of these poshs parasets that they have the present difficult posts and parasets the present difficult posts and parasets the present difficult difficult posts and parasets the present difficult difficult posts and parasets and parasets and parasets posts and parasets and parasets and parasets and parasets posts and parasets and parasets and parasets and parasets and parasets and parasets and parasets and parasets parasets and parasets and parasets and parasets parasets and parasets and parasets and parasets parasets and parasets and parasets and parasets parasets and parasets and parasets parasets and parasets parasets and parasets parasets and parasets parasets parasets and parasets parasets and parasets parasets parasets parasets parasets and parasets parasets and parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets parasets paras	of Thring with the stink from noh long terms. Obviously, at the down is presented the for- cent of assessment of the Control assessment of the control aspense in the control assessment of the control assessment of the control aspense in the control assessment of the control ass	North Carolin 1114 6457 (strengthing roots) a damagna for strengthing roots of the strengthing roots of the strengthin	sevents people frum recovering the those for book for the dash as not blass as the blass of the dash as not blass as the dash as the dash as the dash as the dash as the dash as the dash as the dash as a strain of the dash as the dash
Villegas Contributer farming and b Carolina. Hog farming dustry in the U dollars in taxer of dollars in taxer of dollars in taxer of the more than operations and operations and operation and factor and the product of the factor and the product of preducts 15 ppreducts 15 ppreducts 15 ppre- teets b, every per 10 billion gall arriter are to operation and the preduct of the pre- tor and the pre- tor a	Noop is back on the ta- ble. See mean back, no the ta- ble. See mean back on the table of the table of the table of table of table of table of table with the guarant is lower that table of table with the guarant is lower table of table of table or construct challenges con- cerning the issues of table of table guarant chapseal in North More and See See and See See See See See See See See See See	atom lower parts in the contrast of the source of the sou	of Thring with the stink from nucleog internet. Obviously, and control and the state of the state of the state of the state of the neutral encourses. In the state of the neutral encourses. In the state of encourses were able to the paratise for her state probability to grad a head the state of the scenario of the	Natura Carolis Carolis d'International Carolis de Torona La carlo de Torona Santa d'International Santa d'Int	nevents people fram recovering the those for back has reliable and the state of the state of the state of the state in the state of the

Opinion

CUFS 100 Library Assignment

SOURCE CARD 15

AUTHOR CREDENTIALS

Laura Villegas is a PhD candidate at NC State University for Agriculture and Resource Economics

HOW DID WE FIND IT?

We found this article by doing a Google search for [NC Hog Farmers Opinion]

CITATION

Villegas, Laura. "Hog waste: Nastier than ever." *Technician, NC State University,* May 18, 2017. Retrieved from <u>http://</u> www.technicianonline.com/opinion/article e134971a-3bdc-11e7-a32e-e368cf8828c0.html. Accessed 19 Dec. 2017.

Exposing Fields of

News Release

elds of Filth: Landmark F aps Feces-Laden Hog and

🚯 💟 🙆 🙆 🙆 🚳 🚺 SIGN

CONSUMER GUIDES

TITLE Exposing Fields of Filth: Landmark Report Maps Feces-Laden Hog and Chicken Operations in North Carolina

Know your environmen Protect your health.

XPOSING FIELDS

KEY ISSUES

RESEARCH

Landmark Report Maps Feces-Laden Hog and Chicken Operations in North

NEWS

FILTH

EXPOSING FIELDS OF FILTH

TUESDAY JUNE 21 2016

Carolina

2012 al

ABOUT US

FORMAT Web Document, Article

PUB. DATE 2016

ABSTRACT / KEY DETAILS

The EWG report on hog farming provides statistical information about the scope of hog farming waste in NC and its human impact, such as the infographic below. They also provide information about their data collection and methodology.

4,145 WASTE PITS MAKING UP 6,848 ACRES OF NORTH CAROLINA'S COUNTRYSIDE



SOURCE CARD 16

CUFS 100 Library Assignment

AUTHOR CREDENTIALS

According to their website, the Environmental Working Group is a "non-profit, non-partisan organization dedicated to protecting human health and the environment." (About Us, <u>www.ewg.org/about-us</u>). EWG conducts research related to public and environmental health and educates consumers through reports, online databases, mobile apps, and communications campaigns (About Us, <u>www.ewg.org/about-us</u>). The group is transparent about funding and post annual reports online.

HOW DID WE FIND IT?

We found this article by doing a Google search for [NC hog farming social justice], where we found a link to the North Carolina Environmental Justice Network. From this page, we discovered key advocacy groups, such as Waterkeeper Alliance and Cape Fear River Watch. Having learned these key players, we were able to find this report by Waterkeeper Alliance, in collaboration with the Environmental Working Group.

CITATION

"Exposing Fields of Filth: Landmark Report Maps Feces-Laden Hog and Chicken Operations in North Carolina." *Environmental Working Group,* June 21, 2016. Retrieved from https://www.ewg.org/research/exposing-fields-filth#.Wny3Ba5KuUk. Accessed 19 Dec. 2017.