Milam County

David L. Barkemeyer
County Judge
102 South Fannin Ave.
Cameron.Texas 76520

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At a meeting of the Commissioner's Court of Milam County, Texas held at Cameron, Texas on June 8, 2015:

RESOLUTION OPPOSING THE CREATION OF A LITTLE RIVER OFF-CHANNEL RESERVOIR

WHEREAS, the Brazos G. Water Planning Group and/or the Brazos H. Regional Water Planning Group, appointed by the Texas Water Development Board, is/are proposing a plan to divert water from the Little River or Brazos River and construct an "Off-Channel Reservoir" that would flood 4,343 acres of private land in the area between Texas Highway 79 and FM 2095 near Gause in Milam County, Texas, to export the water to other Counties, and

WHEREAS, this devastating action would take historical land, impact agriculture, remove wild life and take away precious natural resources including farms and ranches that have been owned and operated by Milam County families for generations, and

WHEREAS, on October 18, 2004 the National Trails System Act was amended by the United States Congress to designate El Camino Real De Los Tejas as a National Historic Trail, and

WHEREAS, this National Historic Trail crosses properties that have been designated as sites for construction of the Little River Off-Channel Reservoir, and

WHEREAS, this Reservoir would also flood and destroy the Pin Oak Cemetery which dates to the 19th Century and has been designated a Historic Cemetery by the Texas Historical Commission, and

WHEREAS, construction of the Little River Off-Channel Reservoir would have harmful biological impacts upon existing and endangered and threatened species of concern for Milam County, and

WHEREAS, this proposed project would lead to the destruction of significant parts of Farm Road 2095 and prevent direct access for the Gause and Hanover communities to and from Cameron, Texas, and,

WHEREAS, creation of this Reservoir would have an adverse effect upon the tax bases of the Gause Independent School District, the Milano Independent School District and of Milam County, Texas, and,

WHEREAS, a significant portion of valuable agricultural land would be covered that is protected under the Federal Farmland Protection Policy Act, and,

WHEREAS, the proposed reservoir would provide no significant economic or recreational value for Milam County,

NOW, THEREFORE, IT IS HEREBY RESOLVED by the Commissioner's Court of Milam County, Texas that it opposes the creation of the Little River Off-Channel Reservoir and urges the Brazos G. Regional Water Planning Group and/or Brazos H. Regional Water Planning Group proposals be amended to delete this particular project from their plans or from further consideration.

David Barkemeyer, Milam County Judge

Richard "Opey" Watkins, Commissioner, Pct 1

Donald Shuffield, Commissioner, Pct 2

John Fisher, Commissioner, Pct 3

Jeff Muegge, Commissioner, Pct 4

At a meeting of the Gause Independent School District School Board held at Gause, Texas on June 9th, 2015:

RESOLUTION OPPOSING THE CREATION OF
A LITTLE RIVER OFF-CHANNEL RESERVOIR

WHEREAS, the Brazos G. Regional Water Planning Group and/or the Brazos H. Regional Water Planning Group, appointed by the Texas Water Development Board, is/are proposing a plan to divert water from the Little River or Brazos River and construct an "Off-Channel Reservoir" that would flood 4,343 acres of private land in the area between Texas Highway 79 and FM 2095 near Gause in Milam County, Texas, to export the water to other Counties, and

WHEREAS, this devastating action would take historical land, impact agriculture, remove wild life and take away precious natural resources including farms and ranches that have been owned and operated by Milam County families for generations, and

WHEREAS, on October 18, 2004 the National Trails System Act was amended by the United States Congress to designate El Camino Real De Los Tejas as a National Historic Trail, and

WHEREAS, this National Historic Trail crosses properties that have been designated as sites for construction of the Little River Off-Channel Reservoir, and

WHEREAS, this Reservoir would also flood and destroy the Pin Oak Cemetery which dates to the 19th Century and has been designated a Historic Cemetery by the Texas Historical Commission, and

WHEREAS, construction of the Little River Off-Channel Reservoir would have harmful biological impacts upon existing and endangered and threatened species of concern for Milam County, and

WHEREAS, this proposed project would lead to the destruction of significant parts of Farm Road 2095 and prevent direct access for the Gause and Hanover communities to and from Cameron, Texas, and

WHEREAS, creation of this Reservoir would have a adverse effect upon the tax bases of the Gause Independent School District, the Milano Independent School District and of Milam County, Texas.

NOW, THEREFORE, IT IS HEREBY RESOLVED by the Commissioners Court of Milam County, Texas that it opposes the creation of the Little River Off-Channel Reservoir and urges the Brazos G. Regional Water Planning Group and/or Brazos H. Regional Water Planning Group proposals be amended to delete this particular project from their plans or from further consideration.

APPROVED THIS 9th DAY OF JUNE, 2015.

Bill Jones
President

Linda Hoppe
Vice President

Kathy Turner
Secretary

Henry Bonorden
Member

Melanie Rasco
Member

Judy Roper
Member

Tammy Smith
Member

At a meeting of the Milano City Council held at Milano, Texas on June 15, 2015:

RESOLUTION OPPOSING THE CREATION OF
A LITTLE RIVER OFF-CHANNEL RESERVOIR

WHEREAS, the Brazos G. Regional Water Planning Group and/or the Brazos H. Regional Water Planning Group, appointed by the Texas Water Development Board, is/are proposing a plan to divert water from the Little River or Brazos River and construct an "Off-Channel Reservoir" that would flood 4,343 acres of private land in the area between Texas Highway 79 and FM 2095 near Gause in Milam County, Texas, to export the water to other Counties, and

WHEREAS, this devastating action would take historical land, impact agriculture, remove wild life and take away precious natural resources including farms and ranches that have been owned and operated by Milam County families for generations, and

WHEREAS, on October 18, 2004 the National Trails System Act was amended by the United States Congress to designate El Camino Real De Los Tejas as a National Historic Trail, and

WHEREAS, this National Historic Trail crosses properties that have been designated as sites for construction of the Little River Off-Channel Reservoir, and

WHEREAS, this Reservoir would also flood and destroy the Pin Oak Cemetery which dates to the 19th Century and has been designated a Historic Cemetery by the Texas Historical Commission, and

WHEREAS, construction of the Little River Off-Channel Reservoir would have harmful biological impacts upon existing and endangered and threatened species of concern for Milam County, and

WHEREAS, this proposed project would lead to the destruction of significant parts of Farm Road 2095 and prevent direct access for the Gause and Hanover communities to and from Cameron, Texas, and

WHEREAS, creation of this Reservoir would have a adverse effect upon the tax bases of the Gause Independent School District, the Milano Independent School District and of Milam County, Texas.

NOW, THEREFORE, IT IS HEREBY RESOLVED by the Milano City Council of Milano, Texas that it opposes the creation of the Little River Off-Channel Reservoir and urges the Brazos G. Regional Water Planning Group and/or Brazos H. Regional Water Planning Group proposals be amended to delete this particular project from their plans or from further consideration.

APPROVED THIS 15 DAY OF JUNE, 2015.

Billy Barnett
Mayor

Carol Newman
Mayor Pro Tem

Connie Seelke
Alderwoman

David Gunnels Jr.
Alderman

Henry Dykes
Alderman

Rodney Gage
Alderman

Board of Directors
George Altgelt
Maureen Brown
Linda Curtis-Sparks
Gary Dunnam
Chief Rufus Davis
Lucile Estell
Joy Graham
John Kisalus
Duke Lyons
Henry Mayo
Carl Mica
Irene Ramos
Christopher Talbot
Maureen Winn
Sarah Zenaida Gould

Executive Director
Steven Gonzales

Contact
P.O. Box 41286
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78704
P: 512-850-9073
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June 20, 2015

Brazos G Regional Water Planning Group
Attn: Mr. Wayne Wilson, Chairman
4600 Cobbs Drive
Waco, Texas 76714

Subject: Proposed Little River Off-Channel Reservoir's Effect on El Camino Real de los Tejas National Historic Trail

Dear Chairman Wilson and Commissioners

This letter serves as notice to the Brazos G Regional Water Planning Group about El Camino Real de los Tejas National Historic Trail Association's opposition to the proposed Little River Off-Channel Reservoir in Milam County, Texas.

El Camino Real de los Tejas means "The Royal Road of the Tejas Indians." Historically, the road connected Mexico City to Los Adaes, the first capital of Texas. This allowed Spanish influence to spread into the province. The road also allowed Anglo settlers to head west into Texas in the 1800s, and it was a major artery of trade and culture. The trail created the cultural diversity of Texas that we know today.

On October 18, 2004, El Camino Real de los Tejas was designated as a National Historic Trail and part of the National Trails System. This makes El Camino Real part of a unique group of trails that have been deemed "nationally significant" by the US Congress. So if you can imagine all of the history of our country, only nineteen events have been deemed "nationally significant," and this trail that led to the founding of Texas is one of them!

El Camino Real de los Tejas National Historic Trail Association is an advocacy group that seeks to protect the historic integrity of the trail, to educate the public about its significance, and to promote resource development, interpretation, and tourism along its path.

We work closely with the National Park Service, Texas Historic Commission, Texas Parks and Wildlife Department, the Texas Department of Transportation and others to identify, protect, and develop the trail.

The proposed Little River Off-Channel Reservoir would inundate a stretch of El Camino Réal de los Tejas National Historic Trail in Milam County, in the vicinity of Gause, Texas. This action would forever alter a nationally significant roadway and destroy an elemental part of our state's history. The Camino Real led to the founding of Texas. In fact, it is easy to say that we would not be calling Texas "Texas" without it.

Therefore, our association, along with the citizens and elected representatives of Milam County, ask that you reconsider this proposed inundation, as we hope that you will see that

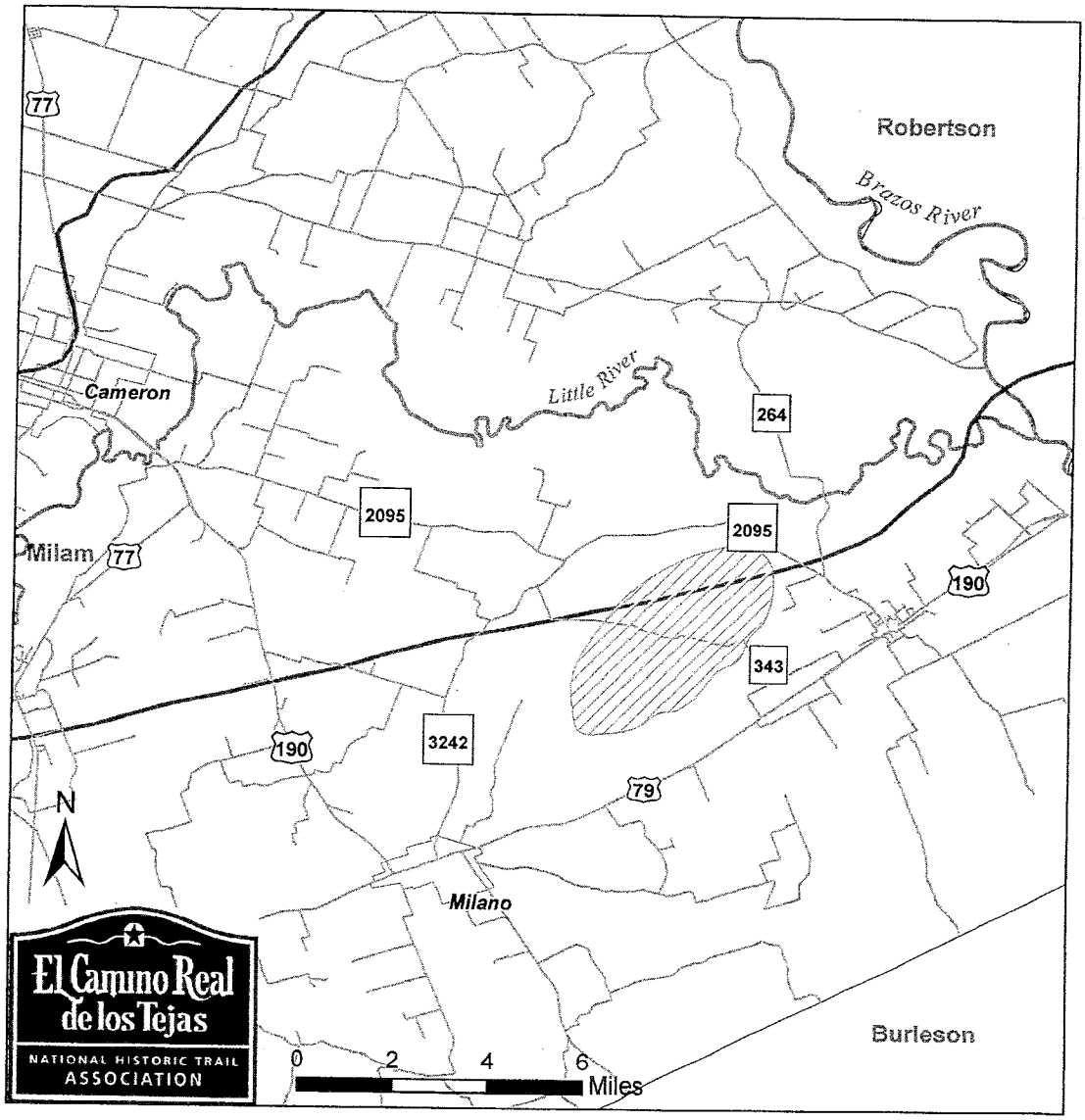
the project will do great harm to this irreplaceabale historic resource.

I thank you for your time and I ask that you not allow the road that led to the founding of Texas to be forgotten.

Thank you,

Steven Gonzales
Executive Director

Proposed Little River Reservoir in Milam County, Texas



Legend

- El Camino Real de los Tejas NHT
- Roads
- Major Waterways
- Proposed Off-Channel Reservoir
- Major Cities
- Milam County

Source:
Spatial extent of proposed reservoir taken from image on Cameron Herald online article on 24 April 2015.
http://www.cameronherald.com/news/article_cff74554-e4ec-11e4-aa1d-4f6cbcde1e14.html

Map by Nathan Garza
24 April 2015

Fallacies of MODFLOW Modeling

By T. Barret Lyne, PhD.

The most widely used model for estimating ground-water flow is MODFLOW. It is a computer program that estimates and implies certain characteristics about groundwater flow based upon theoretical equations processing real data. The real data have been historically underfunded and are consequently intermittently and unreliably collected and recorded by humans since the first water wells were dug by hand. Consequently, results obtained out of MODFLOW are - and can only be - as good as the theoretical mathematical equations and the sketchy real data collected, recorded, and entered. Research into the verification and validation of the MODFLOW modeling program has begun to show the less than reliable site specific comparisons of the modeling calculations with the real-world hydrogeological water flow because of the following four variables: 1) irregular spatiotemporal infiltration and redistribution patterns, 2) limitations of the basic water flow equations, 3) poor understanding of surface water to ground-water connections, and 4) inadequate MODFLOW validation procedures.

1. Water infiltration and redistribution are highly irregular and unpredictable by location and over time. Infiltration and redistribution quantities and rates depend upon the geological materials such as sand, silt, clay, organic matter, mineral content, and parent rock composition. All of these components and their infinite number of mixtures and variable states of condition have differing porosity, and hydraulic conductivity, which may vary in both space and time. Soils are highly variable by orders and within orders as are the layers and compositions of soil profiles. Some highly variable soil orders and profiles vary in soil matrix, water constituents, and physical and chemical characteristics every few inches as well as over time. Hydrogeological conditions can also vary with biological and mechanical perturbations such as geomorphological and bio-pore fast-track water shunting aberrations over time and locations. Examples of geomorphological fast-tracks for shunting water are finger funnel infiltrations, soil particle sizes and corresponding pore spaces of layered materials. Additionally, water may be shunted through these soil characteristics by fissures, cracks, streams, caves, and faults. Biological fast-track shunting of water may also occur by such dynamic variables as animal boroughs, ant colonies, and tree root channels. Another example is the loss of organic material content of soils and around individual soil particles by anthropogenic impacts of pollution, fire and other abuse. Consequently, the only consistent thing about soil and geology is that they consistently undergo change and they have irregular spatiotemporal infiltration and redistribution patterns of water.

2. Darcy's Law has generally described soil water redistribution flow rate as a linear flow across a cross-sectional area over time as a function of soil specific conductivity since 1856. The Green-and-Ampt Model in 1911 and Richards' equation in 1931, to combine the conservation of mass, modified Darcy's equation.

These very old mathematical models are the foundation of all water flow models including MODFLOW. However, these equations are based upon linear flow of water and the movement of water and chemicals through soils is not always linear. Modelers, however, make the assumption that when applied to saturated conditions, water racing through the multidirectional and chemically variable pore spaces is a summation of total water flow through the matrix. It is not! The water moving through the pore spaces and around the soil particles chemical charge based surfaces moves at differing rates. It also moves in an infinite number of directions or not at all because of the surface chemistry of the soil matrix acting upon the chemical and physical properties of the soil solution, "water". Scientists have used Differential Calculus as a study of change to view difficult problems as solvable until proven otherwise. They use derivatives to predict speed, acceleration, vectors, slopes, and other quantities. These differentials are regarded as infinite predictions of change – but they are just that, estimated predictions of unknown changes in real life quantities. Consequently, even with multiple alterations of Darcy's and Richards' equations with Differential Calculus, their mathematical formulas have limits on what they can estimate, predict, and imply about reality. That is where the validation of a model, like MODFLOW, with a specific location, having infinitesimal unknown characteristics, becomes questionable. The weaknesses and unreliable or lack of MODFLOW validation to real life situations has been proven by scientists, such as J. L. Osiensky and R. E. Williams (1997).

3. With the current knowledge of soil science and geology, it is now prudent to say the validation of model-calculated estimates and model-implied predictions in groundwater flow modeling may not actually represent real life groundwater flow. Equipped with the current knowledge of the complex mechanics of the chemical, physical, and biological properties of soils and geomorphology, it is very difficult and expensive, if not impossible, to validate the implicit predictions of water flow models for every specific location. The Department of Energy has designed and packaged eight test cases to verify and validate MODFLOW upon installation. On one hand, verification of the basic math formulas can reasonably be demonstrated – the basic addition, subtraction, multiplication, and division of the math formulas have been tried and tested for over 100 years. However, on the other hand, the meager eight packaged verification/validation exercises do not necessarily validate the modeling results for every location on earth with constant changes over time. DOE can package eight verification/validation test runs for software installation testing to show the software and hardware driven modeling codes are working in a computer system, but those eight tests do not make an all-encompassing, all-inclusive global modular model of real-life groundwater flow at any and every location on planet earth at any and all times. Research has now shown that to make estimates and predictions on pumping, storing, and transporting huge quantities of groundwater from one area to another based upon groundwater flow models such as MODFLOW is risky and irresponsible. The unknown parameters and constant changes in soils, soil solutions, and geomorphology are just too vast!

4. Scientists continue to have an incomplete understanding of surface water to groundwater connections. However, significant political and scientific progress has been made in this area. In 2006, Supreme Court Justice Kennedy redefined Surface Water to Groundwater connections, in Rapanos vs. U.S., 126 S.Ct. 2208 (S.Ct. 2006), to be the cumulative effect of hydrological and geological connections upon the chemical, physical, and biological integrity of navigable waters. Justice Kennedy explained that the cumulative effect of multiple discrete small subsurface hydrogeological connections constituted a "Significant Nexus." (Kusler , Parenteau, and Thomas, 2007) Although the results of this Supreme Court Opinion has continued to be applied to wetlands of the Clean Water Act Jurisdiction, this definition proclaims the presence of surface water to groundwater connections may exist and form nexuses below the surface as multiple discrete small subsurface hydrogeological connections. These are especially prominent and important in the southern clay pan Post Oak Savannah soils of our region. The importance of these clay pans , their associated perched water tables, and their discrete connections to springs, streams, ephemeral attributes, and the surface water is the maintenance of a Udic soil moisture. A specific and known Udic soil moisture content range is required for a specific time interval during the growing seasons for certain plant species to establish specific symbiotic relationships with mycorrhizal fungi for seed germination and plant growth. Significant nexuses as described by Justice Kennedy are of paramount importance in our ecosystem and agriculture.

Conclusion

In conclusion, Darcy's Law and Richards' Equation have limits on their useful implications of water flow behavior in the soils and geology of Earth's crust. These equations were proven in laboratories with known soil mixtures in confined linear flow glass models with known physical, chemical, and biological properties of the matrix, water, and ambient conditions. With tests over time, they were verified and proven to be valid to known porosities, known matrix chemistry, conductivity, and known water chemistry.

Likewise, the water flow models have similar limits. In 1997, J. L. Osiensky and R. E. Williams showed MODFLOW simulations would produce accurate results for the specific conditions simulated with preconditioned conjugate-gradient 2 (PCG2) methods, or with the strongly implicit procedure (SIP) if the proper combination of SIP matrix solution parameters is chosen by the user. That is to say, if we have known parameters, controlled conditions, and can minimize the unknown variables in a perfect world. However, they also showed accurate results could not be obtained with slice successive over relaxation (SSOR) with any of the combinations of matrix solution parameters used in their investigation.

Water managers have to know their limits and the limits of caned water models. Not to realize and accept the limitations of MODFLOW, is reckless and irresponsible management of our soil and water resources.

Bibliography

Kusler, J., P. Parenteau, E. A. Thomas. Significant Nexus and Clean Water Act Jurisdiction. Discussion Paper, Association of State Wetland Managers, Inc. March 5, 2007.

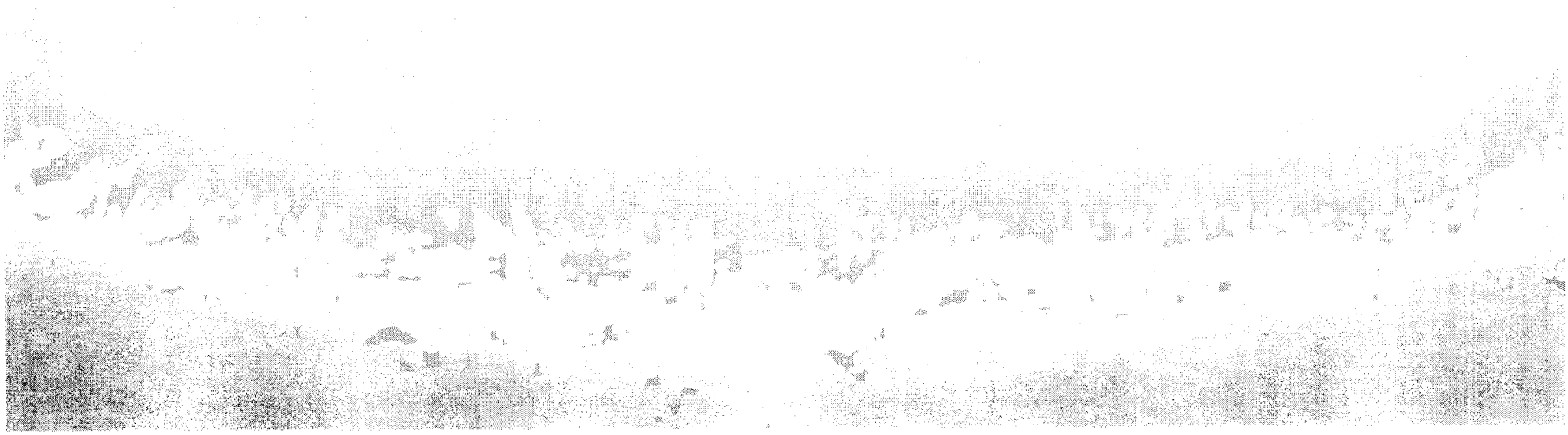
J. L. Osiensky and R. E. Williams (1997). Potential Inaccuracies in MODFLOW Simulations Involving the SIP and SSOR Methods for Matrix Solution Groundwater, 35: 229-232. Doi: 10.1111/j.1745-6584. 1997.tb00079.x

http://soilandwater.bee.cornell.edu/papers.htm

http://soilandwater.bee.cornell.edu/Research/pfweb/papers.htm

Fallacies of MODFLOW Modeling

By T. Barret Lyne, PhD.



Fallacies of MODFLOW

1. Water infiltration and redistribution
   a) irregular and unpredictable
   b) In space
   c) Over time

2. Darcy's Law
   a) Linear flow over time as function of conductivity
   b) Cross sectional area over time
   c) Modified by differential calculus with derivatives

3. Model verification and validation do not relate to real life ground water flow
   a) How do you verify infinity derivatives of the unknown
   b) How do you validate constantly changing soil and geology
   c) DOE provides an 8 test package to verify and validate at installation

4. Surface water to groundwater connections
   a) May be unseen cumulative numerous small discrete connections
   b) Defined by Justice Kennedy, U.S. Supreme Court, 2006
   c) Evolved in the southern clay pan Post Oak Savannah soil system with, and supports, the Navasota Ladies'-tresses orchid *(Spiranthes parksii)* and other mycorrhizal dependent plants in agri-business.

Germinating Navasota Ladies'- tresses *(Spiranthes parksii)* seed with mycorrhizal symbiosis – a bioindicator species for:

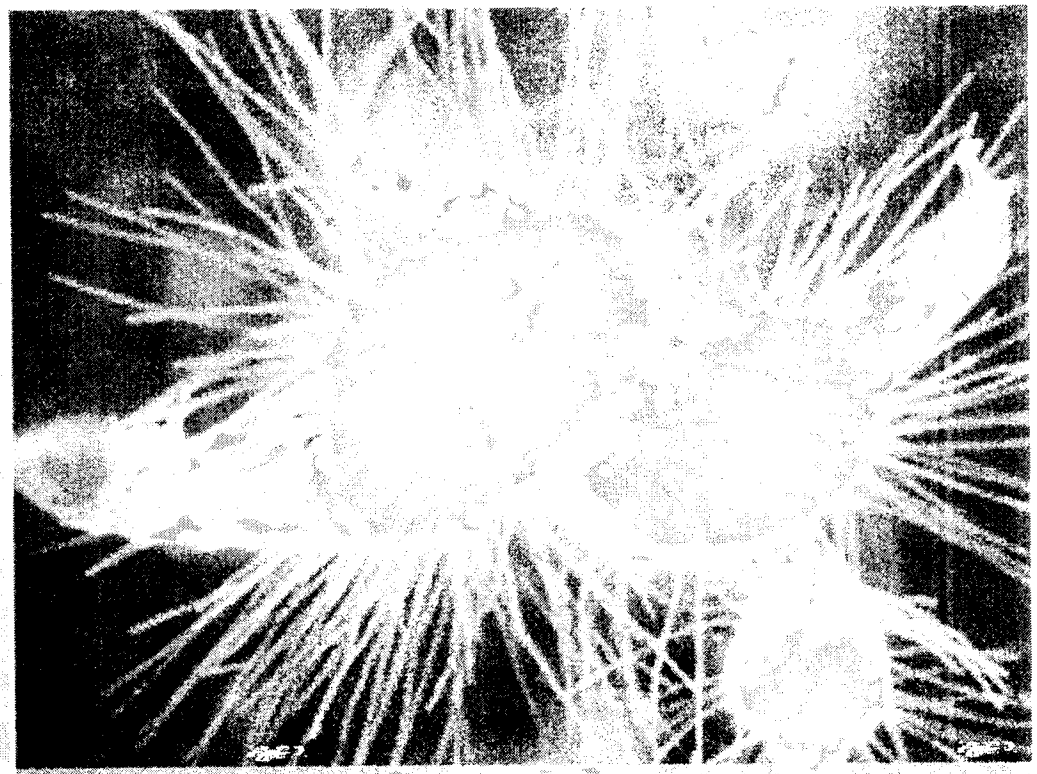


Figure 2. Advance stage *M.media* protocorms.

Fungi and water, over time for:
Clover
Wheat
Legumes
Oak trees
Pine trees
Christmas trees
Blueberries
85% of vascular land plants

Pollution
Habitat Destruction
Environmental Health
Public Health
Public Safety

Just say NO to SAWS, channelization, Little River-OCR, and flooding our land.

Thank you for saving our land and water. T. Barret Lyne, PhD.