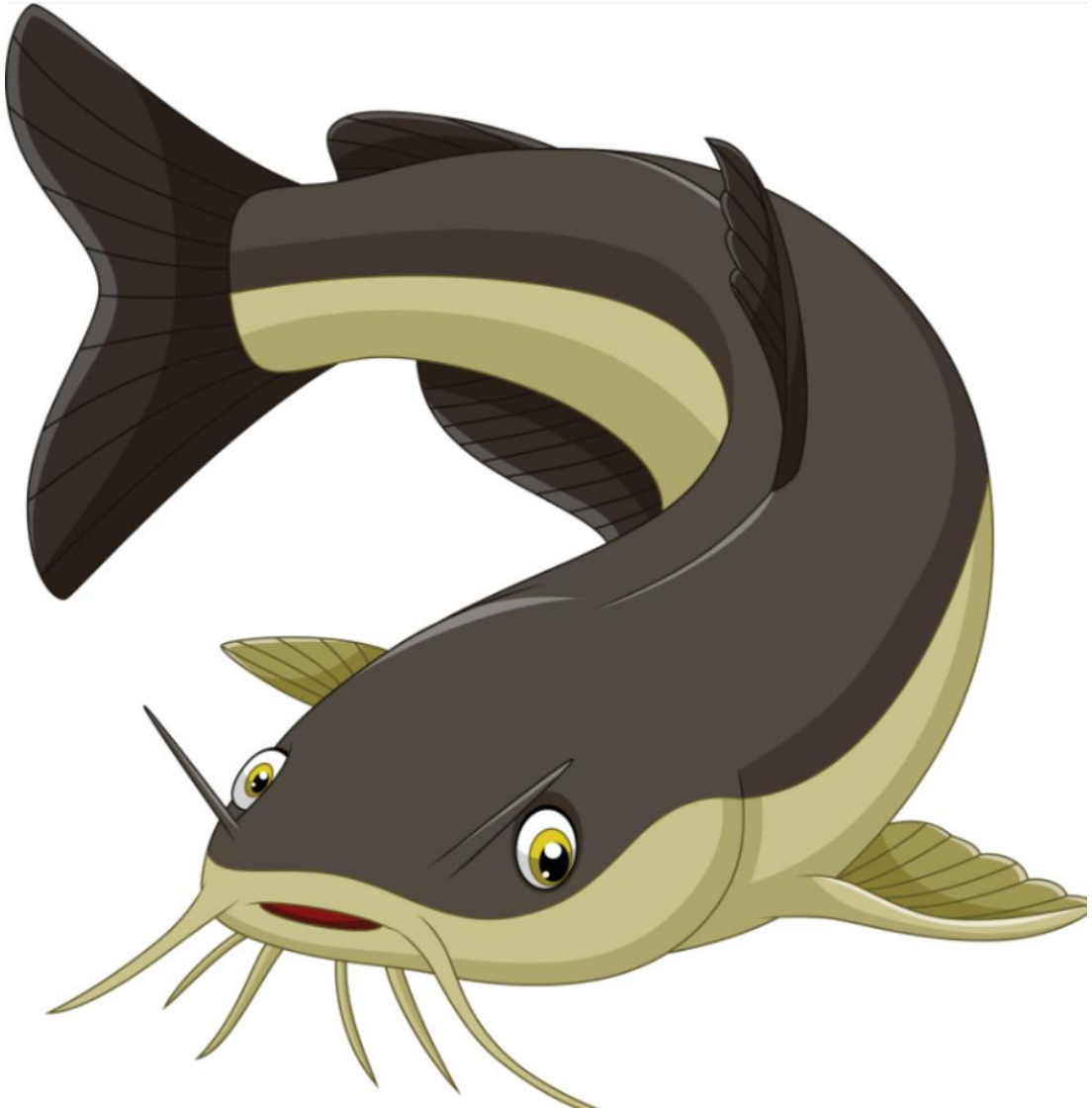

Texas
Region 5


Aquaculture

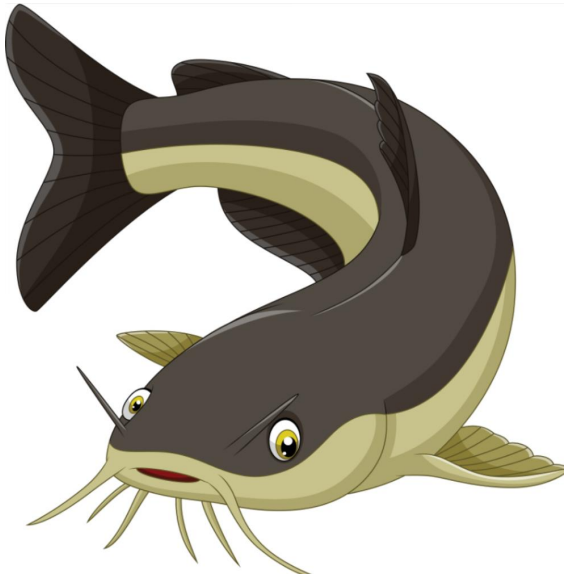
Catfish

Catfish, a longtime staple for Texas fish production, has experienced a recent decline in pricing and popularity, causing producers to look at other options.



Catfish Prices Down

Catfish prices were around 93 cents per pound compared to the high of $1.35 per pound two years ago. As a result, discerning U.S. consumers are buying less catfish as household wealth and expendable income increase and because other options in the market are perceived as higher quality. Those include salmon, redfish and hybrid striped bass, which are a cross between white and striped bass



Switching Fish

Poor prices and consumer trends have some catfish producers switching at least a portion of production to other species like redfish and hybrid striped bass, which bring higher prices – $3-$3.30 per pound and $3.30-$3.60 per pound respectively – and are experiencing increased demand.

Too many Catfish

Catfish production densities in Texas are around 12,000 pounds of fish per acre compared to 6,500 pounds of hybrid striped bass per acre and up to 8,000 pounds of redfish per acre

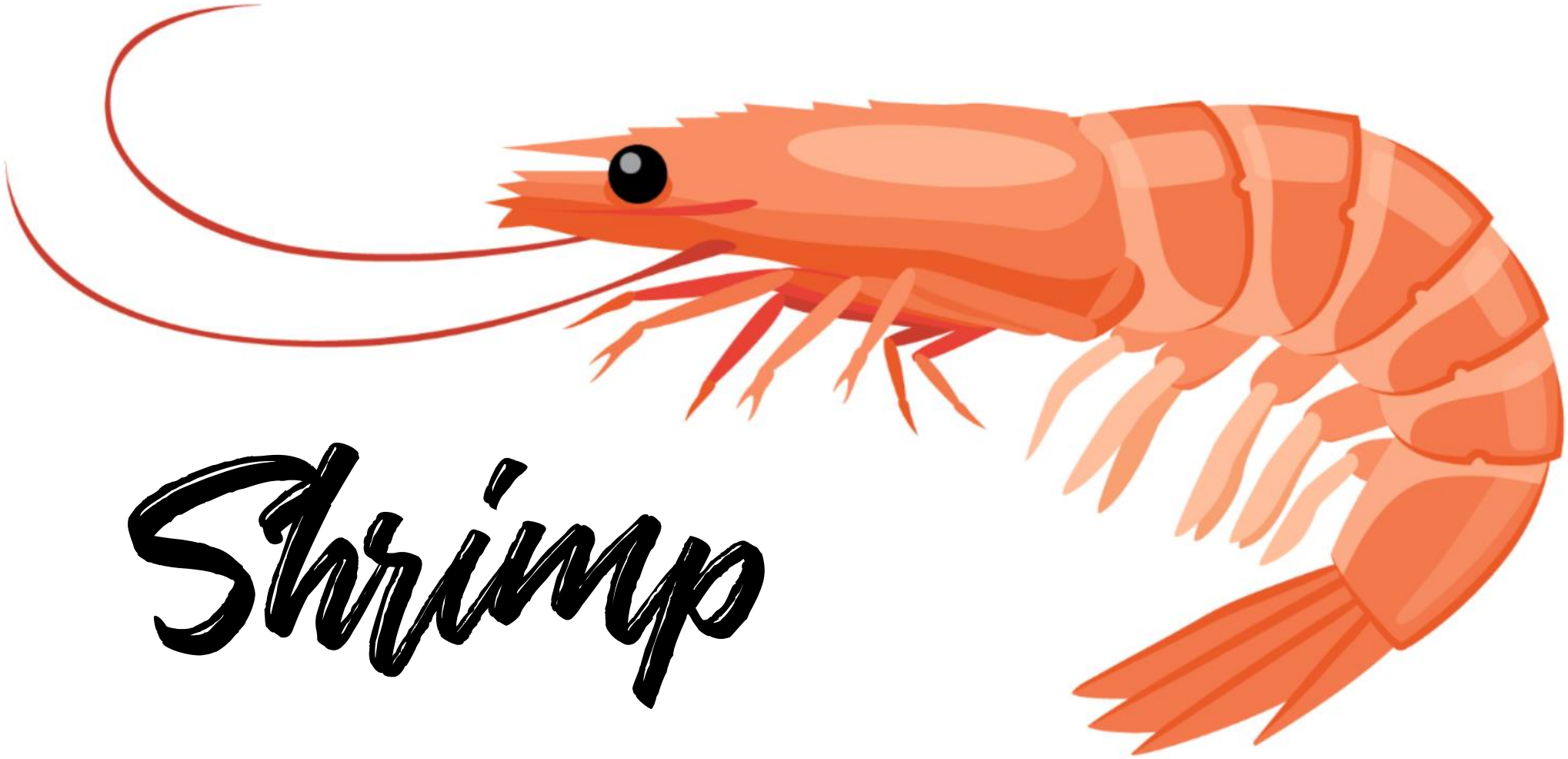
We're Number One

Texas is the No. 1 producer of redfish and hybrid striped bass, including around 98 percent of the nation's redfish production and more than half of hybrid striped bass. Established producers continue to expand their capacity to meet demand.

By comparison, Texas ranks No. 4 in U.S. catfish production with 18.9 million pounds per year.

No Reason to Slow Down

Redfish and bass producers are getting a premium price for their product, many farms are looking to expand, and some restaurants are operating their own farms just to ensure they can supply their consumer demand. Right now they are serving niche markets, so there is room and reason to expand.



Shrimp

Harvey and Shrimp

Harvey devastated not only Galveston Bay's marine life but also the tight-knit group of predominantly Vietnamese and Mexican immigrants who ply the normally bountiful waters for a living. It's grueling work that supports a multimillion-dollar seafood industry.

Pushed further out in the Gulf

In a normal year, commercial fishing and seafood processing in the bay would account for more than $66 million in direct income. But trillions of gallons of freshwater runoff pushed shrimp, fish and crab populations further out into the Gulf and wiped out the prolific local oyster crop.

Even if there were anything left to catch, the Texas Department of State Health Services temporarily closed the bay to commercial fishing, leaving many unemployed.

Money in my Pocket

Earnings can vary. Those who own an oyster harvesting boat can make about $5,000 a month during the peak season in the fall. For shrimpers late August and mid-September should be prime catching weeks.

Trouble on the Shrimp Farm

Shrimp remains the most popular seafood among Americans, with each person consuming an average of over 4 lbs. annually, over 1 lb. more than the second most pc

Not Quite Booming

Yet a closer look shows that behind these tantalizing statistics is an industry marked by low shrimp prices, intense competition against imports, tighter regulations and high mortality rates, to name a few.

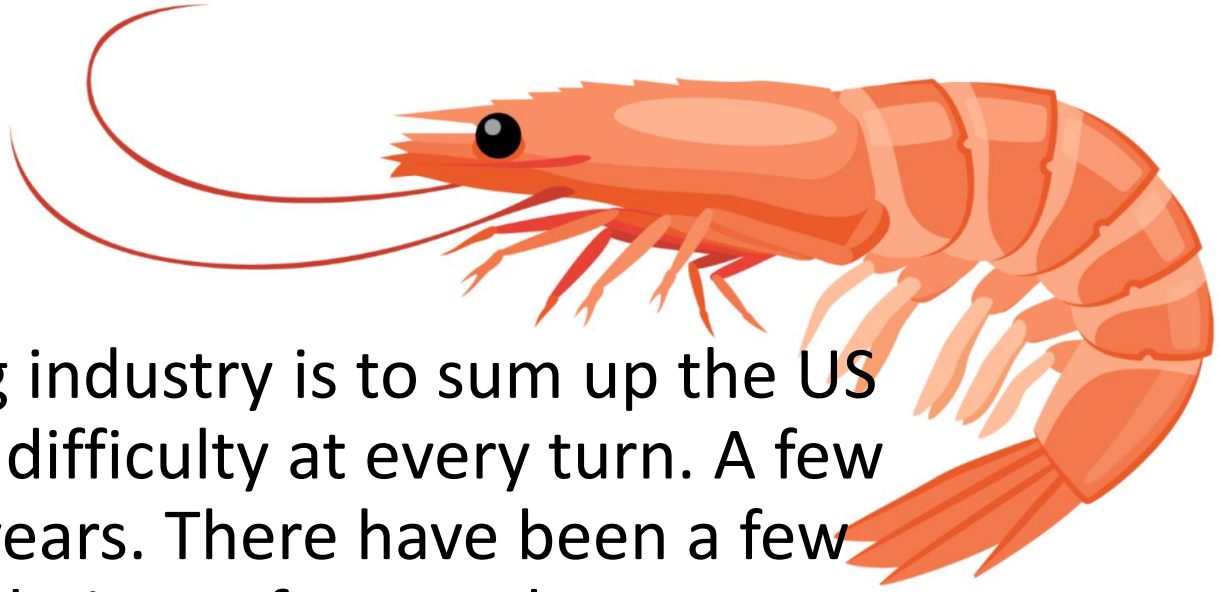
The US imported 1.5 billion lbs. of shrimp in 2017, or over 90 percent of total domestic consumption.

We're Number one in Shrimp

Texas is the country's largest producer of farmed shrimp, producing roughly 3.2 million lbs. in 2017. Alabama is a distant second, producing a scant 304,572 lbs. that year.

But that production has declined, from a 2003 peak of 9 million pounds valued at about $18 million to between 2.5 million and 2.9 million pounds per year. Texas shrimp farms in 2016 generated revenue of about $8.3 million.

Tangled in Red Tape



“To sum up the Texas shrimp farming industry is to sum up the US industry — it is struggling and facing difficulty at every turn. A few things have changed in the last few years. There have been a few changes in the federal and state regulations of aquaculture. Regulations on all aquaculture, not just shrimp, are getting more cumbersome over time, and there seems to be no reversal of that trend forthcoming.”

-- Granvil Treece, Texas Aquaculture Association board member and aquaculture consultant at Treece and Associates

Low Survival Rates

Low survival rates, meanwhile, have put farmers on a wait-and-see stance when it comes to the bottom-line results. In Texas, the 2017 survival rates of stocked shrimps ranged from 4 to 68 percent. On average, farmers see survival rates of 56 percent.

Just Enough to Get By

Two farms in Texas have shut down since 2017. “Most small farms make just enough to get by. I know several farmers who want to retire and have put up their farms for sale.”

Why does this cost more?

The lack of awareness among US consumers is also working against the industry. They do not fully understand why locally farmed shrimp is more expensive than shrimp from India, Indonesia, Ecuador and Thailand, the leading exporters to the US.

Can't the government help?

The US government has provided assistance "on very rare occasions" to aquaculture producers.

One of them was the USDA Trade Adjustment Assistance Program. It only lasted a few years and was terminated.

USDA Marine Shrimp Farming

Another was the USDA Marine Shrimp Farming Program at the Oceanic Institute in Hawaii. The program was an integrated multi-state research consortium that developed and transferred “technologies, products, and services necessary for domestic shrimp farming industry to become competitive in the world market.”

Congress terminated the program in 2011. After the program was discontinued the Oceanic Institute sold the technology and shrimp bloodlines, paid for by US taxpayers, to China.

The Kobe Beef of Shrimp

After 18 years and $35.4 million in development, the founders of NaturalShrimp are convinced shrimp lot No. 180 at the company's remote Medina County fish-tank complex is their aquaculture pay dirt.

NATURALSHRIMP

Always Fresh • Always Natural

Growing Shrimp on Land

NaturalShrimp is one of the companies trying to prove you don’t need a big body of natural saltwater like the Gulf of Mexico to raise shrimp — that they can grow to commercial proportions in specialized tanks on land. The business’s aim is to deliver fresh shrimp to restaurants and markets far from the sea.

NATURALSHRIMP
Always Fresh • Always Natural

Most likely to Survive

Survival rates at the NaturalShrimp facility are beating expectations and could wind up being well above the 50-percent rate considered notable in the industry. For the first time, workers haven't had to wade through the tanks with buckets, fishing out floaters.

Seeking Replication

The next step is to restock after harvest and add three more 65,000-gallon indoor tanks to the complex. From there, the company will attempt to replicate the process in places far from seawater but a less than a half-day's drive from metro areas teeming with markets clamoring for chemical-free, never-frozen shrimp.

Or salmon, sea bass, lobster, clams or oysters.

How They Do It

They’ve succeeded thanks to a pricey system of pumps, filters and a proprietary device that, after the latest round of tinkering, is in its fifth iteration. It essentially uses selective electrical currents to destroy the bacteria and break up the effluent ammonia that so far have destroyed crop after crop of shrimp — and globally made shrimp farming a shaky proposition.

Kills the Bacteria

“It basically singes (shrimp-killing bacteria) and disintegrates it so it’s not able to spread,” said Peter Letizia, CEO of Florida-based F&T Water Solutions, which partnered with NaturalShrimp to develop the technology.

A World Wide Struggle

Aquaculture farms have taken hits from young shrimp not surviving the transport or acclimating to man-made environments. Fewer than half make it to market.

It’s the same for farms around the world. And even when the larvae take, shrimp in all producing countries have frequently succumbed to disease outbreaks. There also are concerns about aquaculture operations damaging estuaries and contaminating natural fisheries with toxic outflows.

Shrimp Struggles

A 1999 disease outbreak in Ecuador nearly wiped out that nation's shrimp farm indust as well as some 100,000 jobs. Mexico in 2016 suffered devastating losses to disease and premature harvest.

Beefing up Defenses

All aqua-farming companies to date have had no defense against shrimp viral diseases. NaturalShrimp, however, is able to completely eliminate all viral pathogens.

Asian aqua-farmers cannot do anything against viral diseases but they have been using antibiotics to prevent bacterial outbreaks. Antibiotics that are used in aqua-farming have dangerous side effects and some are known carcinogens.

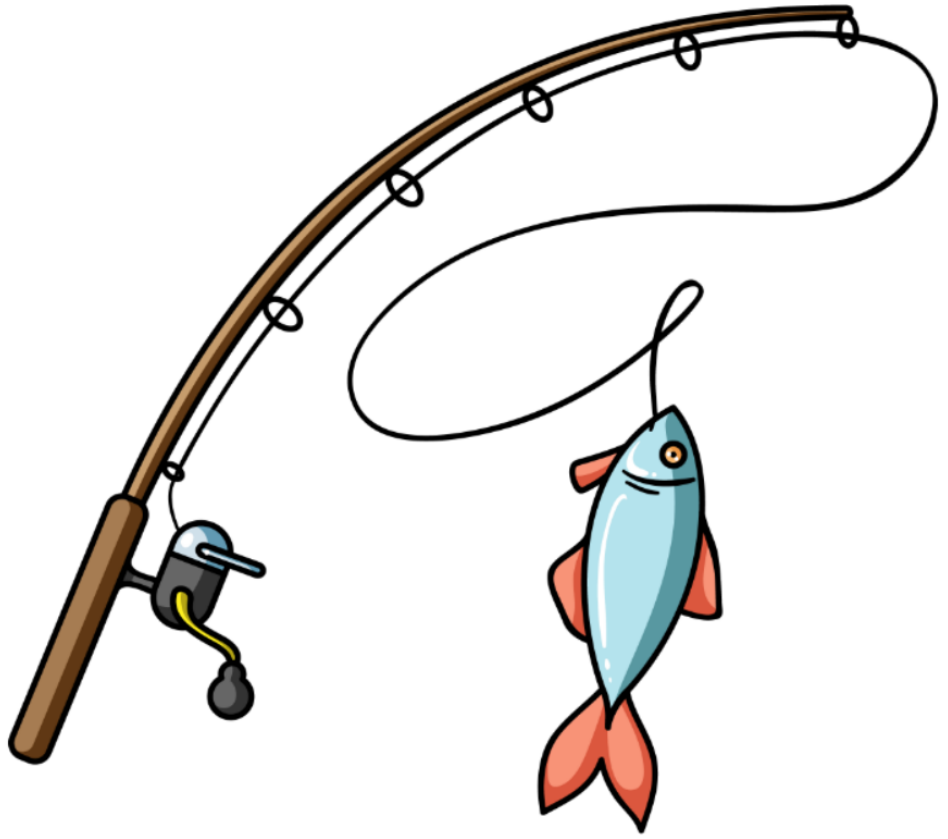
Most Widely Served Seafood

"Shrimp is the most widely served seafood in the US and, in fact, is the most traded seafood in the world. According to the Food and Ag Org of the United Nations, the number of fish and crustaceans, such as shrimp, in the world's oceans are steadily declining. There is only a finite amount of fish and shrimp in the oceans and they are being depleted faster than they can be replenished. The amount of ocean-caught seafood leveled off in the 1990s, and the amount of ocean harvested fish has been slowly declining since then.

"Aquaculture will increasingly become the way to meet the demand for fish and crustaceans, as long as a way is found to reliably raise seafood by aquaculture," Mr. Schaefer

Be Careful What You Fish for

Texas law classifies all marine shrimp other than three species native to Gulf of Mexico waters as “harmful or potentially harmful” and prohibits introducing them or any part of them into state-controlled waters.



What's your bait?

Simply casting a hook baited with a non-native shrimp — even one long dead and frozen — into a bay, river or other public waterway is a violation of Texas law and could garner a Class C misdemeanor citation from a Texas game warden. Worse, it threatens to set loose two viruses deadly to shrimp, crawfish and other crustaceans into the ecosystem.

Killer Shrimp

The prohibition on introducing non-native shrimp into Texas waters has two aims: preventing introduction of live alien species of shrimp into Texas marine waters, where they could become invasive species competing with native shrimp, and preventing the introduction of diseases carried by non-native shrimp.

Both have the potential to devastate native crustaceans. And the second threat does not require the shrimp to be alive when it hits the water. Freezing doesn’t destroy the viruses. The risk they pose to live shrimp is still there.

Shrimp is Stable For Now

For the 2019 Gulf of Mexico shrimping season, industry members expect the market for their wild product to remain stable for at least the first half of the year while they keep an eye on the effects of farm-raised imports from Asia.

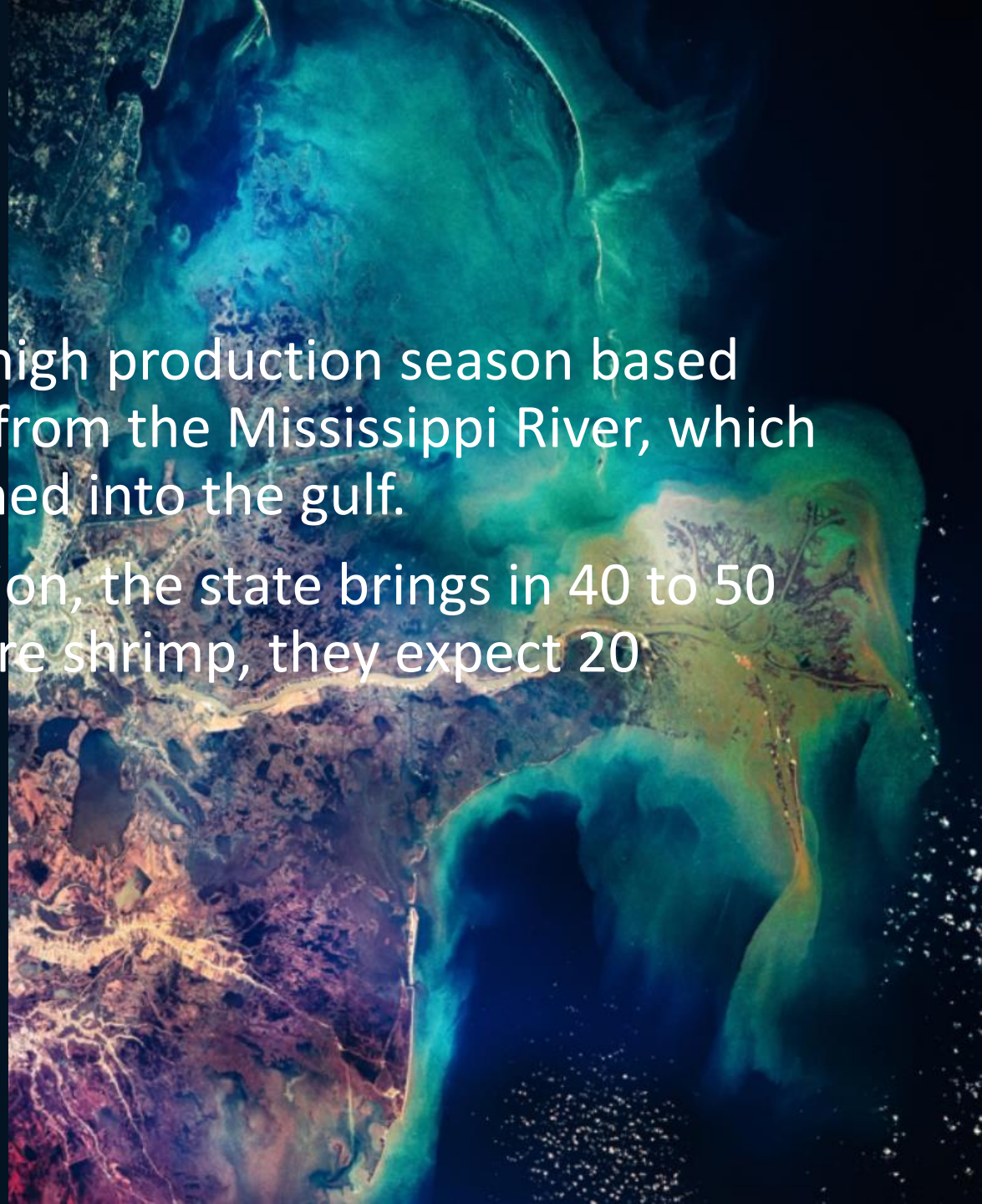
Significant Increase

In January 2019, 2.4 million pounds of shrimp were landed by commercial fishermen in the Gulf of Mexico. This was a significant increase from the 1.9 million pounds of shrimp harvested in January 2018, but still well below the prior seventeen-year historical average for January of 4.0 million pounds

Looking at less

Experts say they are not anticipating a high production season based on research related to freshwater flow from the Mississippi River, which could mean premature shrimp are flushed into the gulf.

According to the Texas Shrimp Association, the state brings in 40 to 50 million pounds of shrimp with premature shrimp, they expect 20 percent less this year.



Labor Woes

The Texas shrimp industry is facing a shortage of workers due to a federal cap on H-2B immigrant worker visas, and it could cost the industry millions of dollars.

Staying Docked

In 2018 about 20% of the Texas Shrimp fleet stayed in Port from a lack of workers. This year 8 to 10 percent of the state's shrimp boats are still tied up at docks.

Let me off!

The shrimp industry relies on seasonal foreign workers to staff their boats because it's hard to find American workers with the experience and even the desire to do this type of work.

"That U.S. Citizen that has never been on a fishing vessel before that wants off the boat immediately, we have to turn that boat around, travel all the way back to the dock and lift the person off the boat."

Man Overboard

According to the Texas Shrimp Association – for the 2017 Shrimping Season, 64 percent of American citizens hired wanted to get off the boat within 2 days.

You're staying away from your family for 30 to 45 days. It's a tough sell. According to industry experts finding U.S. citizens willing to crew shrimp boats is next to impossible, and the few that are willing often have no experience. That creates a dangerous situation because commercial fishing is extremely hazardous

Survey Says

A survey of shrimp fleet owners conducted in the last few years found that 96 percent of inexperienced season workers wanted off the boat in the first week, while 64 percent never finished their first 30-day trip. Shrimp boat owners can’t keep crew members at sea against their will, though bringing them back to shore can cost thousands of dollars in lost production and fuel.

More Visas Please

Congress has approved an extra 30,000 migrant workers to fill the much-needed demand for people to work the shrimping season, but it looks like there may be a shrimp shortage this year.

Despite having the necessary workers, Congress's solution is a one-time fix meaning, next year they'll be advocating for legislative change.

Might be too Late

The head of the Texas Shrimp Association said it's unclear how much a Trump administration decision allowing another 30,000 foreign seasonal workers into the United States this year will help the state's shrimpers.

The domestic seafood industry relies heavily on the H-2B program to fill positions, though the strong economy is making it harder than usual for employers to find enough workers.

Wait and See

“We still don’t know for sure if 30,000 is going to be enough, especially in our industry because our season falls so late in the year,” she said. “Usually we get the bottom of the barrel, so to speak, the last ones available. We’re just hoping that the 30,000 is going to be enough.”

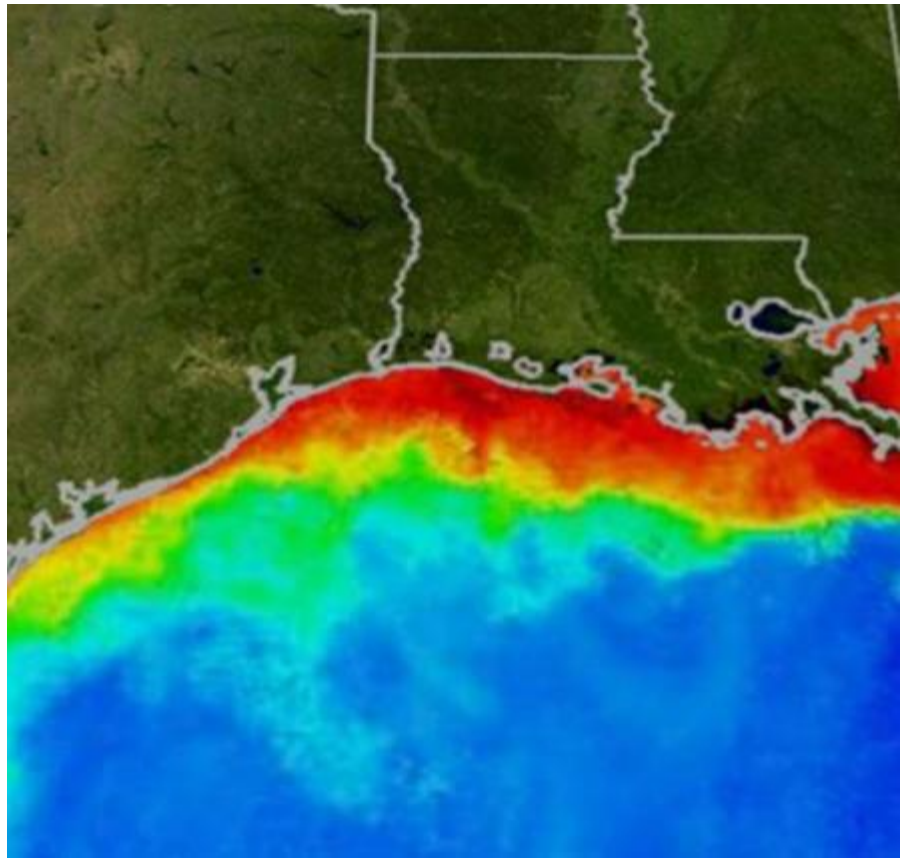
It’s an improvement over the last two years, when the government raised the cap by only 15,000 visas each year, Hance said. This year, the 66,000 workers allowed in under the normal cap are already spoken for, she noted.

Costing Time and Money

Texas' seafood industry is very small and uses less than 1,000 workers total, though a shortage of foreign seasonal workers is crippling.

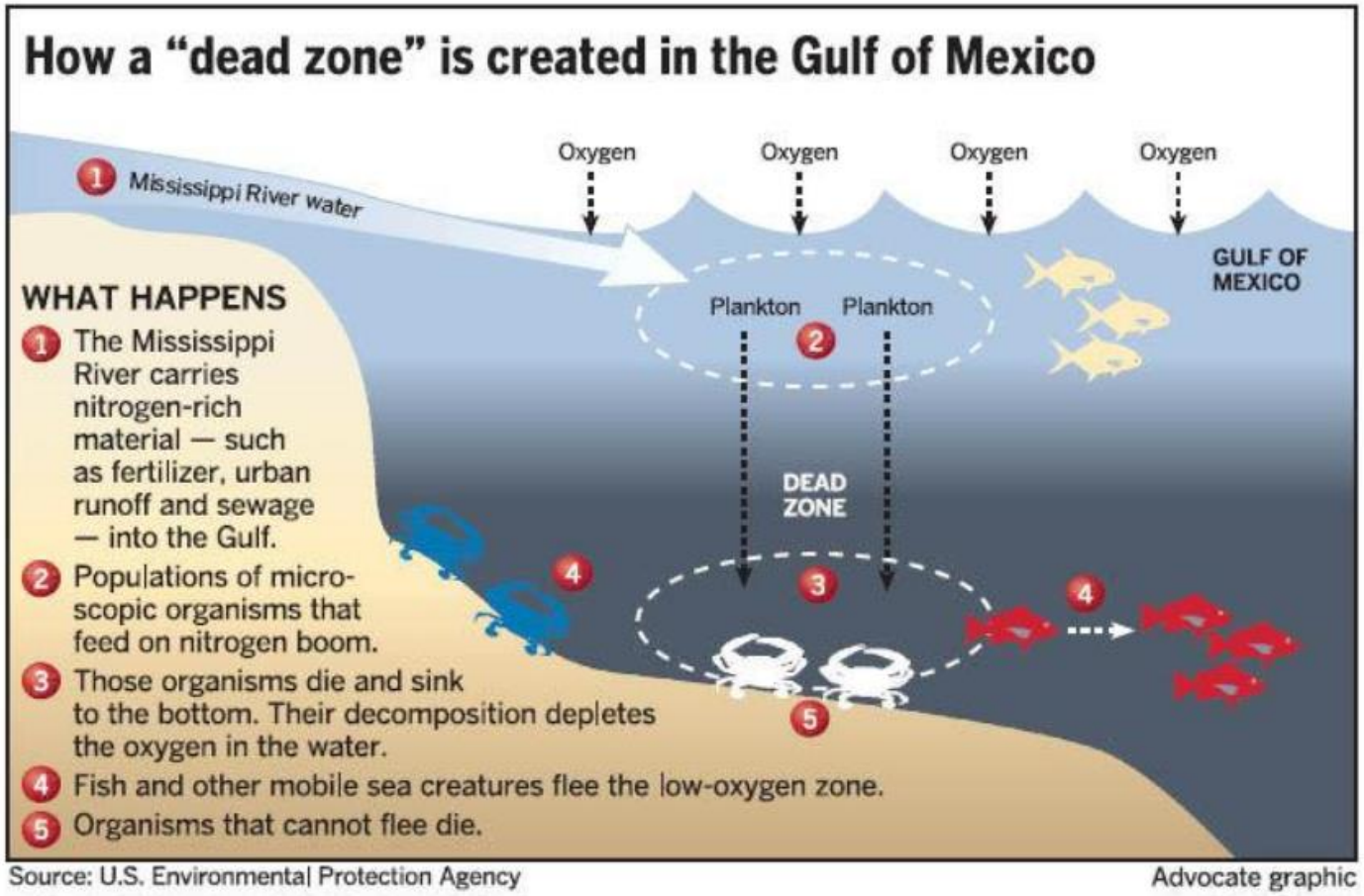
"It's costing us $1 million a day during peak season, the entire industry, all because of a handful of workers." Andrea Hance, Executive Director of the Texas Shrimp Association

The Dead Zone



The Dead Zone

Just off the coast of Louisiana, where the Mississippi River lets out into the Gulf of Mexico, an enormous algae bloom, fueled by fertilizer from Midwestern farm fields and urban sewage, creates an area so devoid of oxygen it's uninhabitable to most marine life every summer.



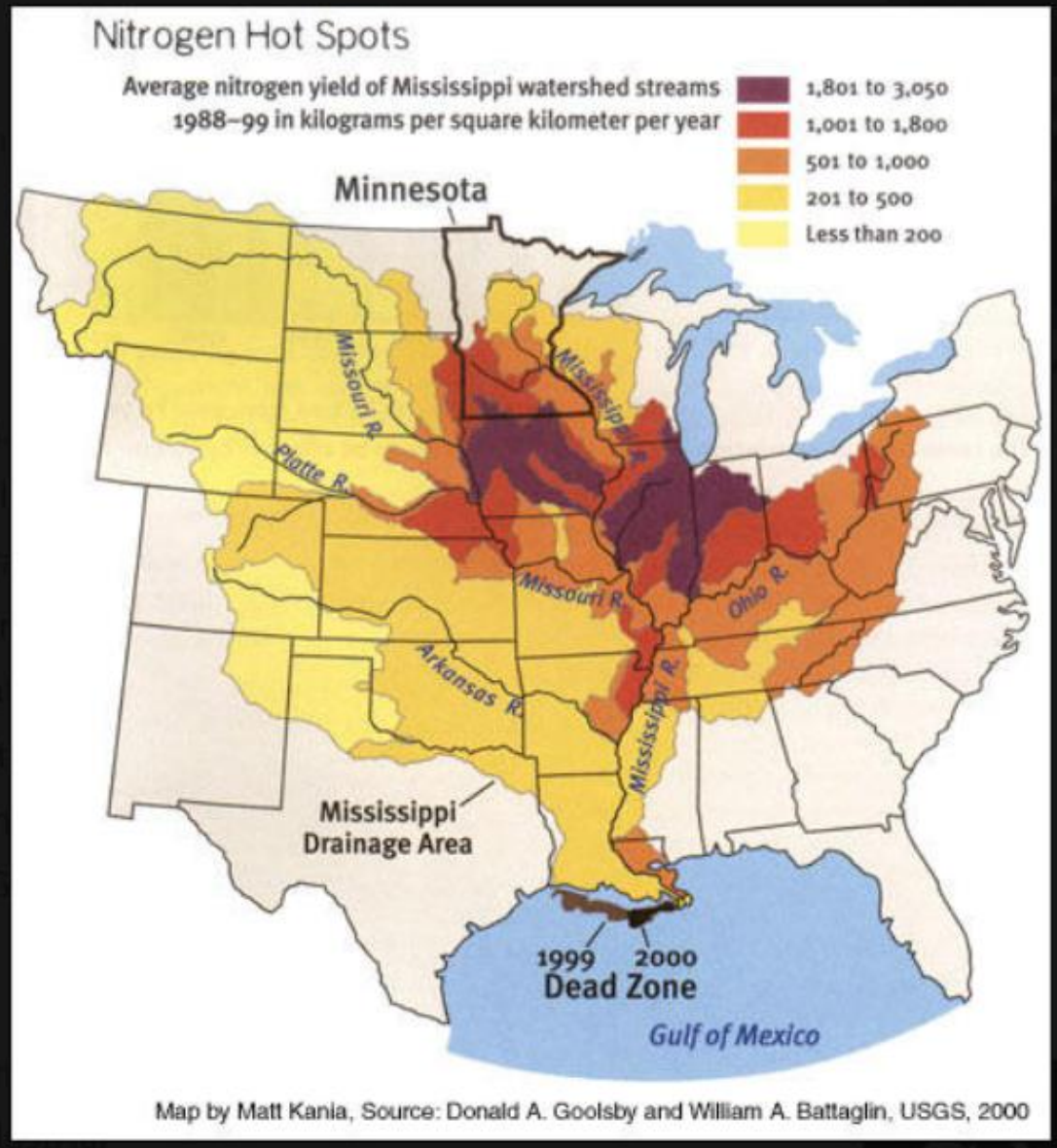
Mississippi River

A historic slow-moving flood of polluted Mississippi River water loaded with chemicals, pesticides and human waste from 31 states and two Canadian provinces is draining straight into the marshes and bayous of the Gulf of Mexico — the nurseries of Arnesen's fishing grounds — upsetting the delicate balance of salinity and destroying the fragile ecosystem in the process. As the Gulf waters warm this summer, algae feed on the freshwater brew, smothering oxygen-starved marine life.

Fleeing Fish

Scientists with the NOAA and several research universities announced that the so-called dead zone in the Gulf of Mexico is projected to be around 7,800 square miles, roughly the size of Massachusetts, the second largest on record behind 2017.

As in past years, the ensuing dead zone is expected to result in widespread die-offs and migration, influencing the region's fishing and shrimping industry.



The darker regions show watersheds with high levels of nitrogen pollution. The squiggly grey lines represent the 818 watersheds that flow into the Gulf of Mexico.
Credit USGS

Dead Zones Stunted Growth in Shrimp

NOAA says higher than average amounts of rainfall along the river's watershed could make this year's dead zone especially aggressive.

NOAA has previously found these dead zones lead to stunted growth in Gulf shrimp. That ecological impact becomes an economic one for shrimpers, who haul in smaller shrimp, which net less money.

Dolphins Impacted

It’s not just fisheries that are suffering. Dolphins have been dying in huge numbers across the region — nearly 300 this year already, which is three times the number in a normal year, according to federal and state officials. Fishermen report finding dead dolphins floating in water near shore or beached in the marshes, covered in painful skin lesions that scientists have linked to freshwater exposure.

Not Getting Better Soon

“The Army Corps of Engineers says we had the most rainfall in 124 years. Shrimpers and crabbers are struggling. Oystermen are almost nonexistent. … It’s not going to get better soon.”

-- Joe Spraggins, executive director of the Mississippi Department of Marine Resources.

It Takes Time

The enormous “dead zone” in the Gulf of Mexico will take decades to recover even if the flow of farming chemicals that is causing the damage is completely halted, new research has warned.

A new study has found that even if runoff of nitrogen, a fertilizer chemical, was fully stemmed (a scenario deemed unrealistic), the Gulf would take about 30 years to recover.

Cause and Effect

Fertilizers and agricultural waste spilling into the oceans promote the growth of algae, which can trigger toxic blooms harmful to fish, shellfish, marine mammals and birds. These outbreaks can discolor water and befoul beaches. It also depletes oxygen in the water, leading to further damage to marine creatures and dwindling supplies for the people who rely upon them for food.

More change ahead

Meanwhile, fishermen know a changing climate is not working in their favor. Scientists say the Mississippi River is expected to continue to flood in future years as the atmosphere heats up and produces stronger storms and more rainfall.

Oysters

Oysters

Texas oyster reefs are under threat, and so are local fishermen's livelihoods and way of life.

The fishermen are worried about the future. They know they have a rough season ahead.

The Unsung Heroes of Our Oceans

Though bivalves might not seem like the most exciting sea creature, they have significant impacts on the marine ecosystem and beyond.

They support habitat for diversity of marine life, reduce shoreline erosion, buffer storm waves and sea level rise, and really without oysters our coastal ecosystems break down.”

Oysters also improve water quality — one adult oyster can filter around 50 gallons of water a day.

And from a commercial perspective, oysters contribute around $40 million to the Texas economy annually.

Same old Struggle

Once again, they and the rest of the state's oystermen are caught in an all-too-familiar struggle to harvest legal-sized bivalves amid a dwindling supply, which has marred each six-month oystering season for the past decade. Well before the season ends, they know, the oysters will run out entirely, the result of various factors, including a litany of natural disasters

Problem of Mismanagement

The oystermen believe part of the problem is mismanagement on the part of the state: Texas, they say, is opening and closing the wrong areas, although officials dispute that.

Spiraling Down

The Gulf Coast region—composed of Texas, Louisiana, Mississippi, Alabama, and Florida—is the leader of America's $217.2 million dollar industry, producing 44 percent of all oysters consumed in the country each year, with the bulk of that production coming from Texas and Louisiana.

And the Texas oyster industry itself has a $50 million impact on the state economy annually. But the resource has declined over time, part of a downward spiral worldwide.

Oysters Around the World

“There are predictions that globally, we’ve lost 85 to 91 percent of oysters around the world,” says Texas A&M University–Corpus Christi marine biology professor Jennifer Pollack, who studies the bivalves in the bays surrounding Corpus Christi, “and 50 to 85 percent of all oyster habitat here in Texas.” When you harvest an oyster, she explains, you’re taking away its habitat with it, which is bad news for bays, wetlands, and even the coast, since reefs act as natural barriers against big storms.

A New Normal

In 1999, a high-water mark for the industry, fishermen harvested 6.13 million pounds of oysters, not including shells, in Galveston Bay, about 95 percent of the 6.4 million pounds harvested in Texas that year. But since Ike hit in 2008, the bay's production has never topped more than 3.5 million pounds in a year. In 2016 fishermen harvested just 709,408 pounds out of the bay. While overall Texas still had a strong harvest in 2016, providing 3.1 million pounds of oysters to enthusiasts, that's a far cry from the 1990s and early aughts.

Home to Massive Reefs

Texas, home to Galveston Bay's massive reefs, built up over centuries, is one of the last states that still harvest oysters from natural beds.

A 2017 economic impact study prepared for Galveston County by Martin Associates reported that between seafood processing and commercial fishing, Galveston Bay brings in more than $66 million in direct personal income and about $111 million in direct business revenue each year.

A cautionary tale for Texas

Consider what's already happened in New York Harbor and Chesapeake Bay. Both were considered America's essential oyster hubs until, more than a century ago, they were decimated by overharvesting, disease, and pollution.

Watch and Learn

New York closed to oyster fishing in 1906, its oyster beds nonexistent. Chesapeake Bay went from producing 20 million bushels of oysters in the late 1800s to having three quarters of its natural oyster reefs disappear by the 1920s.

Today in the Chesapeake, oysters are only at 1 percent of their peak historic level, and there's little hope of them ever growing there again—except for genetically engineered (and sterile) triploid oysters harvested in man-made cages.

“We used to have hundreds of miles of shell roads and piles of oyster shells three stories high on the shores of Nueces Bay, but production has been sliding and it’s volatile.”

-- Dr. Joe Fox, Harte Research Institute for Gulf of Mexico Studies (HRI) Chair for Marine Resources Development and Professor of Mariculture, Environmental Science, Coastal & Marine System Science.

They Have Endured

Over the past decade, Texas oysters have endured everything from hurricanes to floods to drought.

In 2008 Hurricane Ike dumped so much silt, sediment, and debris into Galveston Bay that the oysters on more than 8,000 acres of reef, roughly half the reefs in the bay, suffocated to death.

An Overnight Disaster

Seemingly overnight, the bay went from supplying 80 percent of Texas oysters each year to just under a third. While the reefs were easily destroyed by the storm, it has taken years, and more than $70 million, to rebuild just 1,400 acres of these devastated oyster beds. It will take an estimated $330 million over decades—yes, decades—to recover.

Worst Drought

Then, just two years after Ike, the Deepwater Horizon blowout sent crude oil gushing into the Gulf off the coast of Louisiana. Texas bays came through relatively unscathed, but as Robinson explains, “Every other state in the Gulf was closed from that event *but* Texas, so we had increased pressure and harvest. We also had a drought in that time frame.”

The drought, from 2011 to 2015, was one of the worst in Texas history, resulting in too-salty waters, a calling card for parasites, disease, and oyster drills—small, predatory snails that like to stab oysters in the back and eat them from the inside out.

Red Tide and Toxic Algae Blooms

Meanwhile, oysters that weren't devoured by predators were being contaminated by red tide and other toxic algae blooms that thrived in warm, salty water.

Starting in 2011, officials delayed the start of the season and closed off sections hit by these algae spores, in an effort to keep people from getting sick. Then came 2015 and 2016, and the massive floods that brought in too much fresh water, *again* destabilizing the oysters.

Then a storm called Harvey arrived, dumping more than 33 trillion gallons of fresh water, most of which ended up in the bays and estuaries.

Price has Doubled

When you take into account all these stresses, it's not surprising that the quality of the Texas oyster has waned while the price has doubled over the past 20 years.

Part of the problem is the oystermen themselves, TPWD's Robinson explains, because when good-sized bivalves aren't available, some have not shied away from bending the rules to fill their sacks.

Texas has now restricted fishing on any oyster reef within 300 feet of the shore.

Ramping up Regulations

In 2017 the state ramped up regulations even more and increased penalties—a move that's good for the oysters, but "*hard, hard, hard*," on fishermen. Oystermen now have to pay larger fines if they're caught with a sack containing over 5 percent undersized shell, up to $500. If it's over 30 percent, everybody on board can face even steeper fines, license suspensions, even jail time.

A Plan that Backfired

Back in 2005, state officials announced they were going to put a moratorium on any new oyster licenses in Texas. The idea was to reduce the number of boats drawing on the public reefs each year. But the move backfired. The ban sent people into a last-chance-scenario buying mode during the yearlong window before it went into effect, putting licenses on just about anything that floats—someone even tried to put one on a jet ski. The number of licenses skyrocketed from 350 to 760, the opposite of the new rule's intended effect.

Today there are still 557 commercial oyster-boat licenses and 465 oyster-boat captain licenses in Texas, numbers that are still too high.

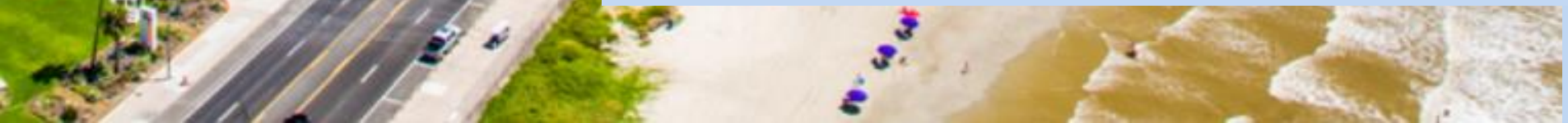
We're kind of watching you

Texas has also introduced a new measure requiring boats to be outfitted with vessel monitoring systems (VMS), which use GPS technology to track boats and bust any that fish on closed waters or poach from private leases.

But while these systems could be key to curbing overharvesting in the future, the state currently can't afford the satellite technology needed to operate it. Instead, the state continues to rely on wardens to hand out citations, but there are only 12 patrolling the waters between Galveston and Chambers counties, and they can't be everywhere at once.

Public Oyster Beds

While most of Texas's rich oystering tradition was built upon its 49,000 acres of public beds, since the 19th century, oystermen have also fished on private leases, of which today there are just 43, covering more than 2,300 acres of reef, all located in Galveston Bay. Since the state placed a moratorium on these leases in the 1980s, they are now controlled by just a few people including two companies whom also own Texas's largest oyster-processing facilities.



Leaseholders

Leaseholders put millions of dollars back into the bay, building up their private reefs, which they typically harvest after the public season is over.

A new industry for Texas

Oyster farming will be legal in Texas as of September 1 now that Gov. Greg Abbott has signed House Bill 1300 into law.

Only allowed to harvest from natural reefs, the Texas oyster industry is hurt by the short season: November 1-April 30. When waters are warm, wild oysters spawn, which turns the meat mushy and undesirable.

Year Round Harvest

Farmed oysters are a sterile variety called triploids that do not spawn and can be harvested year-round. They are fatter and more consistent in size than wild oysters, too, while still retaining that distinctive Texas Gulf Coast flavor.

Multiple Benefits

The Texas Gulf Coast will reap environmental as well as economic benefits, according to supporters of the bill. Oyster farms will join natural reefs in filtering saltwater, helping prevent coastal erosion and protecting wildlife habitat.

First Farmed Oysters

It will most likely take until 2021 before the first farmed oysters are shucked in a restaurant. Once a farm is set up, it takes eight to nine months for the oysters to develop the proper eating size and quality.

Doubling the Current Harvest

Farmed oysters are grown in cages suspended on poles. The cages float in the water and are manually rotated to optimum conditions. The final product is a meaty oyster grown in a teacup-shaped shell.

According to the research center, Texas has about 1.5 million acres of water that could be used. Only about 2,000 acres in production would double the state's current harvest.

Oyster Dredging

Oysters are traditionally harvested from public fishing grounds by dredging, which destroys the sea bottom as it brings up its catch. Reefs can be lost, and so are the benefits they provide as habitat for popular sportfish, protection for the shoreline, and a natural filtration system for coastal waters.

Oyster mariculture takes fishing pressure off these natural reefs with oysters grown in cages so that they can be easily removed and harvested. They still provide environmental benefits without the economic damage to the habitat.

“Texas is way behind the curve, but we have a chance to provide real coastal resilience. This is an economic driver in other coastal states. There’s also an extremely large benefit to bays and estuaries. It’s a no brainer.”

-- Dr. Joe Fox, Harte Research Institute for Gulf of Mexico Studies (HRI) Chair for Marine Resources Development and Professor of Mariculture, Environmental Science, Coastal & Marine System Science.

Half Shell Heroes

Because of their recent struggles, the Texas oyster industry hasn’t been able to fully capitalize on a recent surge in the market, driven largely by the increasing consumption of higher-priced, half-shelled, farmed oysters at bars and restaurants with all kinds of fun names like “Naked Cowboy“ and “Skinny Dipper".

Not easy to Find

Oysters have become “merroir", a play on the French word terroir, used to describe how wine might derive its taste from where its grapes were grown, explained Chris Rubino, a purchasing agent for Elkridge, Maryland-based seafood dealer J.J. McDonnell.

There is a demand for gulf oysters, Rubino told *Undercurrent*. It’s just not easy to find them right now.

Price is High

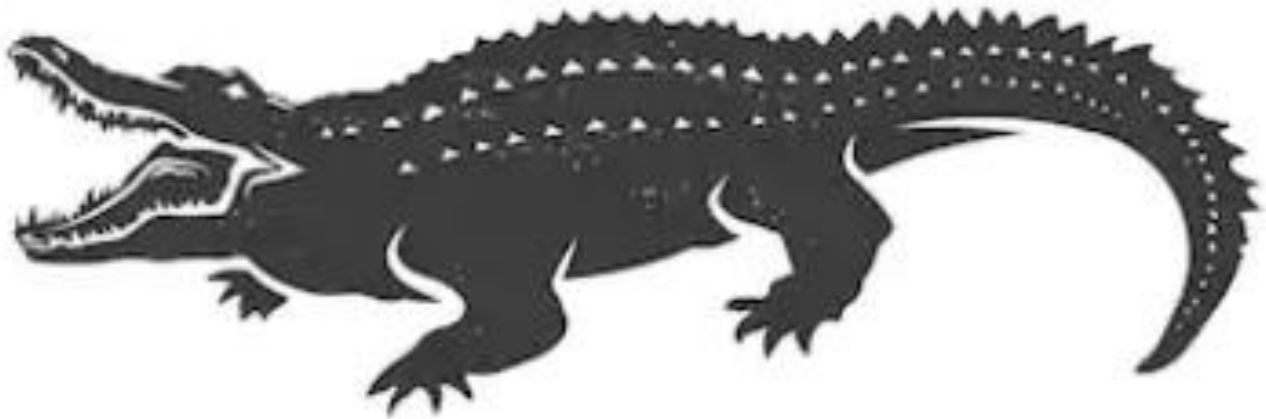
Also like wine, prices for oysters range widely, said Rubino, who noted that some West Coast oysters are going for as much as $1.50 each.

Gulf oyster sellers have noted prices as high as $75 for a bushel of gulf oysters since Harvey. A price of about 40 cents per oyster is more the norm in the gulf.

Alligators

Gator Country

The number of gators in East Texas continues to grow. Only Louisiana and Florida hold more wild alligators than Texas.



“I’m always a little surprised that so many people are shocked when they see an alligator. They’re not exactly rare in this state.”

-- Amos Cooper, who has spent 30 years working with alligators and coordinating the state’s alligator management programs.

Population Boom

Texas' alligator population, which numbered just a few thousand when they were protected by state and federal laws in the late 1960s, has exploded over the past half-century. The 22 Texas counties with the highest concentrations of alligators (so-called core alligator counties in southeast Texas and along the upper and middle coast) hold at least 500,000 gators, "And that's a low-end, conservative estimate."

Licensed to Kill

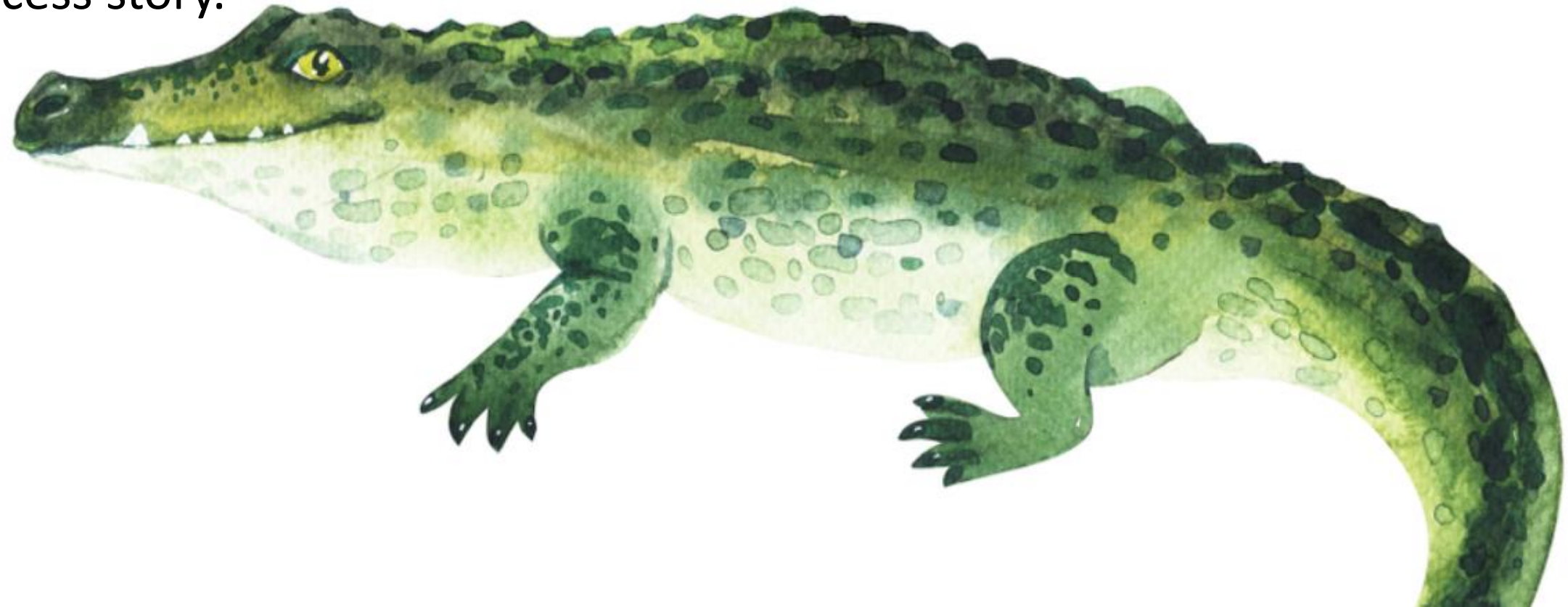
While most people do their best to avoid alligators, some seek them out. Texas' thriving, expanding alligator population supports a two-part alligator hunting season, with one of those seasons set during spring.

Since 1984, Texas has held an annual alligator hunting season each September in counties holding the highest gator populations. In the 22 so-called core counties, alligator harvest is regulated through issuance of tags to landowners.

But since 2007, the state has allowed a spring season in all counties outside those 22 core counties. The season, which runs April 1-June 30, allows a person holding a Texas hunting license and hunting on private property to take one alligator per license year, with strict requirements on reporting the take and obtaining a federally required tag from TP&W.

A Real Success Story

“Our alligator population in Texas is excellent,” said Cooper, noting good habitat conditions created by abundant rains. “They’ve been a success story.”



Beef

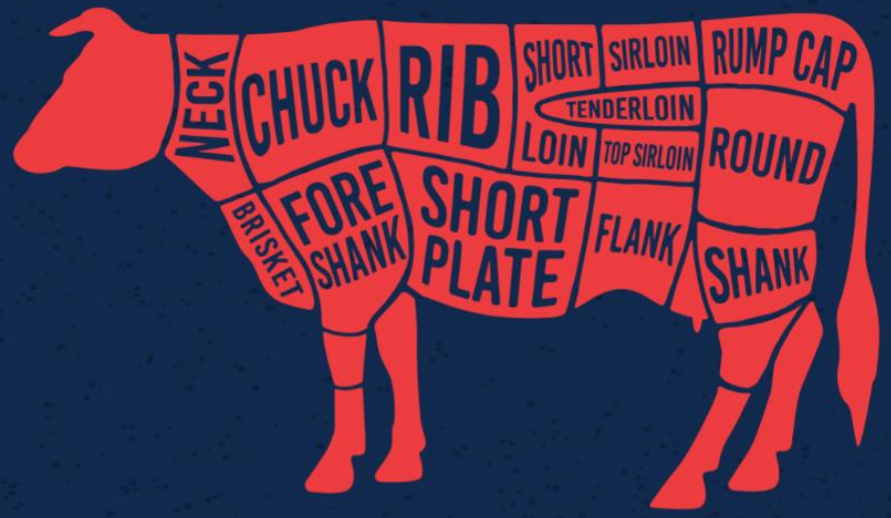
East Texas

Generally, east Texas is not considered cow country in comparison to the western, northern and southern areas of Texas.

A yearly normal rainfall average of 35 to 60 inches gives east Texas a moist climate which promotes good grazing habitat.

Preparing for Drought

Since drought has become more of a norm in Texas than an occasional event ranchers are breeding drought resistance into their cow-calf herds through the use of Brahman influence to produce environmentally adapted cattle.



Taking it Back

The United States and Canada have agreed to eliminate, no later than May 19, all tariffs the United States imposed on imports of aluminum and steel products from Canada and all tariffs Canada imposed in retaliation.

This would include removal of the 10% tariff Canada imposed, beginning in July of last year, on prepared beef items imported from the United States.

A Global Agreement

Canada is the fourth-largest market for U.S. beef and first quarter exports were down 14% in both volume (23,199 mt) and value ($143.8 million). Canada's imports of the U.S. beef products affected by the 10% duty fell by about $20 million (or 16%) from July 2018 through March 2019.

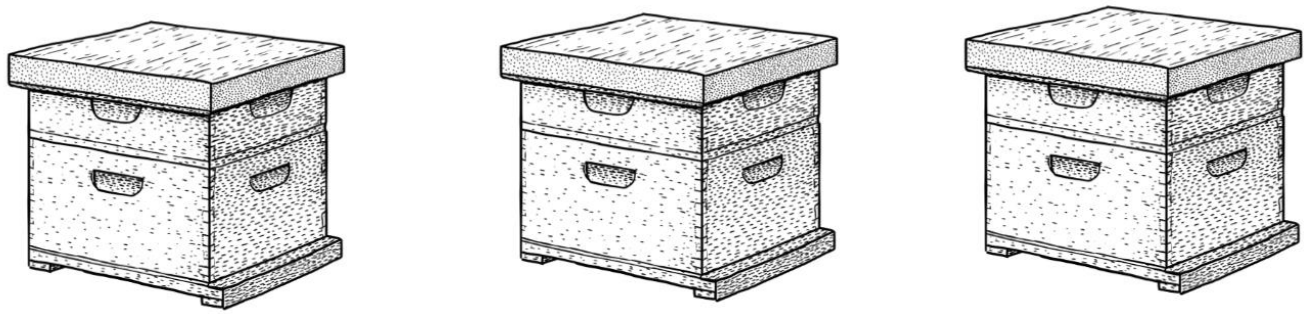
This is excellent news for the U.S. meat industry, as it will mean restoration of duty-free access for all U.S. red meat to Canada and Mexico. Elimination of these duties also removes a major obstacle for the U.S.-Mexico-Canada Agreement, which is a very important trade agreement for U.S. agriculture.

Bees and Honey

Everything is bigger in Texas

Texas is bigger in terms of beekeeping. In spring, early pollen sources provide the protein for each colony to build up bee numbers early in the season, which allows beekeepers here to divide their colonies more aggressively and still make good honey crops.

After spring splitting, the number of colonies in Texas is likely to top 300,000.



Helpful Invader

Here, as in a lot of places, human-induced changes have a huge influence on beekeeping. The Chinese Tallow Tree (introduced as an ornamental in the 1700s and widespread on the Gulf Coast by the 1900s) provides an intense early-summer honey flow, especially in East Texas near the Gulf of Mexico.

Flight of the Honeybees

Many US commercial honeybee colonies are part of migratory beekeeping operations.

Some beekeepers only bring their bees out of state for almond pollination or for honey production. But most follow an extensive migration route that includes Texas, the Dakotas and California (and for some beekeepers, indoor wintering sheds in Idaho).

Where the Money is

Around 85 percent of all commercial colonies in the United States visit California's almonds. That's where the money is. – $2 billion a year, in fact.

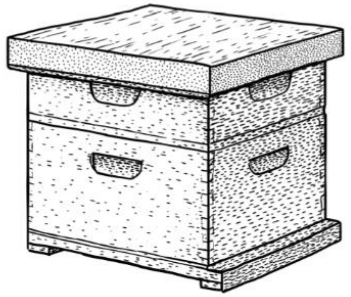
It's a chance to make nearly half their yearly income, and a place for the bees to work and grow early in the spring while healing up from winter.

Roadshow Honey Bee Business

Almonds are California's most important crop, valued at $5.33 billion in 2015. Their blooming period is the earliest and one of the shortest among California crops. It begins in late January and lasts less than a month.

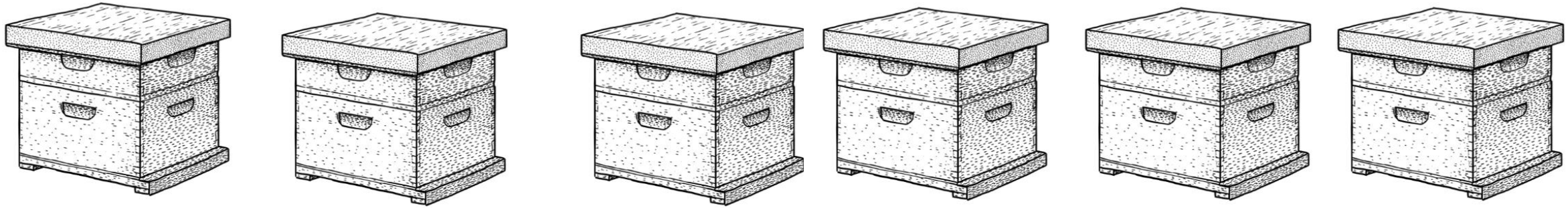
Every year, the arrival of the bees to pollinate almond flowers in California marks the start of a brief frenzy of activity. It is the world's largest pollination event.

Without these hives, there is no harvest.



Flying High

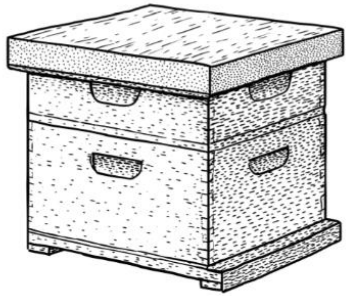
For beekeepers like Orin Johnson, whose father once loaned bees to farmers for $2 per beehive, surging growth in the almond industry means he can rent his 400 hives for $200 each, reaping a minimum of $80,000 for a month's worth of busy bees. Nationwide, pollination income for commercial beekeepers increased 8% to reach $302 million in 2018, according to the USDA.



Deceptive Dollar Signs

However, that top-line figure disguises the amount of labor and capital beekeepers pour into their colonies year-round. Johnson worries that this is attracting amateurs into the industry who are less likely able to keep their colonies and healthy through winter.

"There's a saying for those young beekeepers," Johnson said. "If you want to make a small fortune in beekeeping, start with a large fortune."



Essential to the Success

Because the bees are essential to the success of an almond crop, is in the interests of the almond growers to ensure the honeybees' health. And some say they are trying to do so, growers and beekeepers work each other and with the scientific community "to find [agricultural] methods that are safe for honeybees.

Many growers cooperate willingly, for “why pay $400 per acre for pollination if they are working against the bees?” This was true in the growers’ response to a misapplication of pesticides that killed 80,000 hives in 2014, when bee researcher Gordon Wardell worked with them to identify the problem and implement safer methods.

A Lethal Cocktail

When orchard management problems such as tank-mixing insecticides led to bee death or larval deformation in about 80,000 colonies they agree that almond growers almost universally responded to beekeepers' concerns by changing practices and avoiding tank mixes that include insecticides.

Growers also agreed that fungicide sprays, only when necessary, would be done late in the afternoon or evening when the bees were done for the day.

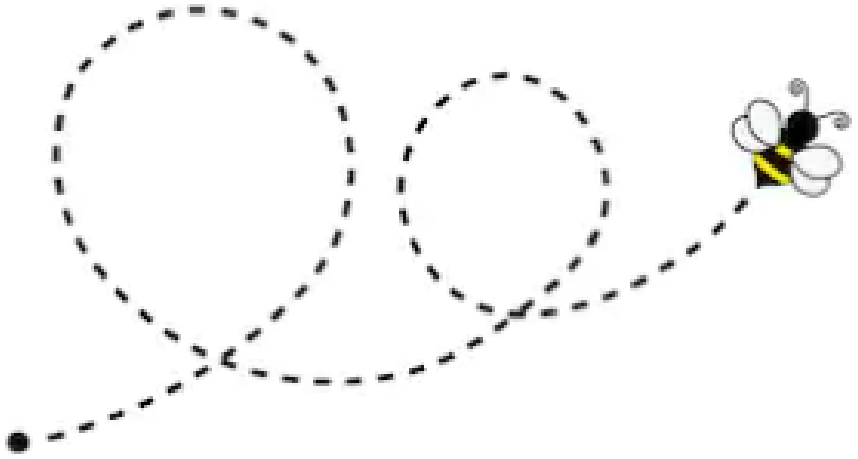
Doubling Down to Death

Insecticides are fairly inexpensive, but the process of spraying is labor-intensive, so growers choosing to double up may have been looking to maximize their investment.

"I think it was a situation where it wasn't disallowed. The products were thought to be bee-safe and you've got to spray a fungicide during bloom anyway, so why not put an insecticide in the tank, too?"

Risks of the Road

Wardell's sole concern about the migratory beekeeping business is the stress that being trucked from coast to coast puts on already vulnerable honeybee colonies. "There is a three percent chance of losing queens every time they put bees on a truck," he said. And there are other risks, like nutritional stress and exhaustion.



No Time to Rest

When traveling, the bees are more susceptible to viruses triggered by cold snaps. They are also often worked nearly year-round, without a hibernation period.

And when there is insufficient natural forage for the bees, they are held in their shipping containers and have to be fed sugar water and protein patties.

The impact becomes apparent generations down the road, because the continual need to reorient decreases the number of broods raised by the hive.

Staggering Losses

Many beekeepers across the U.S. have lost half their hives — they call one with no live bees inside a "deadout." Some beekeepers lost as many as 80 percent. That's unusual. And many of the hives that did survive aren't strong in numbers.

For decades if a beekeeper lost 5 percent he or she really got nervous. Now a 40 percent loss every few years is more common. But this many lost hives across the country is concerning.

Tiny Parasite

Experts say honey bees are dealing with many stressors: chemicals, loss of wildflowers, climate change, nutrition and viruses. But this year, a special problem might have taken down the honey bees more than usual.

A tiny parasite called the varroa mite sucks at the bee's body, causing big problems.

Deadly Mites

With a long warm season when the bees are raising brood, Texas also has a very long “mite season,” during which parasitic *Varroa destructor* mites can reproduce in a honey bee colony.

Varroa mothers crawl into the cells of baby bees and hide there until the bees close the cell up with wax. Then they lay an egg and rear their young on the baby bee.

“The last 30 years have been the most tumultuous time for beekeepers in almost four centuries. In the 1980s we had tracheal mites, and we solved that problem. Now it’s Varroa, Varroa, Varroa and everything else.”

-- John Miller, a fourth-generation beekeeper

Unnatural Causes

Bees can die from just about anything, including mites, malnutrition, adverse weather — even "colony collapse disorder," when hordes of bees inexplicably abandon their queens and hives. A single misstep can require beekeepers to tally up their losses and start over.

Survey Says

The results of this year's annual Bee Informed Partnership survey, a collaboration by leading research labs, found that winter colony losses were nearly 38%, the highest rate since the survey began 13 years ago and almost 9% higher than the average loss.

Sucking Them Dry

Acreage once left native as part of the USDA's Conservation Reserve Program has been converted to corn and soybean production. This loss of native forage, and a general loss of bee pasture and wildflowers due to drought and other factors, is forcing beekeepers to increase the level of supplemental protein and sugar feed they provide their colonies. Forage losses have also greatly diminished the honey revenue side for professional beekeepers.

Costs of Feeding Bees

Miller also said the costs for supplemental feeding have exploded in the last decade. Last year, he fed 1.2 million pounds of supplemental feed, including 800,000 pounds to get hives ready for pollination and another 400,000 or so to prepare them for winter.

Pollination Disaster

“We are one poor weather event or high winter bee loss away from a pollination disaster,” Jeff Pettis, an entomologist who was then head of research at the USDA’s Bee Research Laboratory, said in 2012. And while the disaster Pettis warned of hasn’t struck yet, its likelihood grows each year.

Bee Thieves?

Surging almond production means bees are more in demand than ever, proving a lucrative opportunity for thieves who want to make a quick buck.

In many ways, bee theft is the perfect inside job. For anyone scanning the colonies housed in the California foothills, a bee thief — often a beekeeper himself to have the knowledge and equipment for moving bees — looks no different from the owner with a bee suit, flatbed truck and forklift.

Down the Road

Thieves need only load up a couple hundred beehives before driving down the road to the next almond farmer for a quick transaction, often making tens of thousands of dollars in the process.

One California man in 2017 was caught after stealing thousands of hives worth nearly $1 million — one of the biggest bee thefts ever. "It's more lucrative than selling drugs," said Kim Flottum, publisher of trade magazine Bee Culture.

Protective Practices

In response to the thefts, beekeepers are wising up by sequestering beehives behind locked fences, installing hidden cameras to watch over equipment or tucking GPS trackers into beehives.

Deputy Freeman, who investigates the thefts, also said he typically recommends beekeepers mark their hives, so they can be identified if they're stolen. But he admits it's difficult to track thieves once they're gone. Said Freeman: "It's a tough crime to investigate."

Speaking Up for Bees

Mary Reed, chief apiary inspector for the Texas Apiary Inspection Service, ticked off the challenges for commercial bee keepers in the state: foul brood, a fatal spore driven disease; varroa mites; and nosema. Reed said Texas beekeepers reflect the national averages for mites, which is the No. 1 threat to honey bee colonies.

Impossible to Make a Living

Clint Walker, owner of Walker Honey Farm, said that because of habitat loss, pesticide use, and climate change, it's almost impossible for Texas beekeepers to make a living producing just honey.

It wasn't always so, said Walker, who has been keeping bees for 50 years. Before big freezes hit citrus groves in the 1980s, honey made from orange and grapefruit blossoms was the most prized nectar product. "It's not even on the radar today. … Orange blossom honey doesn't even gain shelf in the grocery store."

One man's weed is another bee's honey

The most productive and profitable honey crop results from the invasive Chinese tallow tree, labeled a noxious weed by the state of Texas.

It's the No. 1 honey-producing plant in Texas. Without Chinese tallow, honey production in Texas would be cut in half.

Chinese Tallow Tree

The nectar from Chinese tallow tree is non-toxic, and has become a major honey plant for some beekeepers. The honey is of high quality and is produced copiously during the month of June, on the Gulf Coast. In the Gulf coast states, beekeepers migrate with their honey bees to good tallow locations near the sea.

Foreign Invader or Beneficial Plant?

Chinese tallow is a prolific invader and destroys wildlife habitat and grazing land. Because of Chinese tallow, less than 1 percent of the original Texas coastal prairie remains and less than 500 of the original 2.2 million acres still exist in Louisiana.

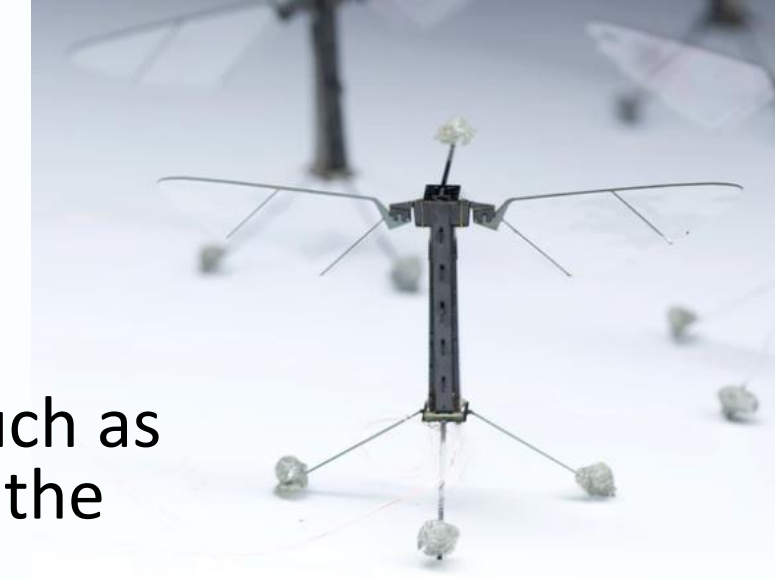
Not allowed here!

The Texas Department of Agriculture lists Chinese Tallow as one of the 24 most invasive plants, and includes Chinese Tallow in a list of Noxious and Invasive Plants which are illegal to sell, distribute or import into Texas.

Legislating Bees

The Texas Legislature is considering a record number of bills that impact beekeepers and those concerned about bees & pollinators in our state.

Robo Bees



Walmart has taken the first step to ensuring foods such as apples, pumpkins and almonds remain on shelves in the event of a bee extinction.

Walmart has filed for a "Pollination Drone" that would be capable of pollinating flowers and crops the same way a bee would. The drone would be fitted with cameras and sensors to identify pollen in one flower before taking it to another.

The robo-bees would also have "sticky bristles" that can extract the pollen and keep it held until the Pollination Drone arrives at another flower.

Harvard has one too

Harvard has previously built its own robot bee, which looks similar to a hobby drone. In 2013, the university launched the device, which could only fly and hover. Now, the bee-sized drone can swim underwater and stick to surfaces.

Harvard's John A. Paulson School of Engineering and Applied Sciences has been working on a robo-bee for the past five years. Harvard School of Engineering and Applied Sciences

Have you heard this news?

Scientists in Japan have built a pollinator bot, a remote-controlled drone, that can go from flower to flower, brushing against the flower's stamen with a horsehair paintbrush that's covered in a sticky ionic liquid gel, both lifting off pollen from each flower as well as depositing some of that pollen on to the next. It's a little hard to "drive", but put Artificial Intelligence (AI) in the driver's seat and this may be the future of pollination.

Hold on.

Let’s pump the brakes for a second here, folks. Is it even feasible at this point that these drones could take over the role of the honeybee in the pollination process?

Breaking Down the Numbers

Almond Grove Estimates

- **Avg. acreage:** 40 acres
- **Trees / Acre:** 120 trees
- **Total Trees:** 4,800 trees

Bee Estimates

- **Hives / Acre:** 2 hives
- **Frames / Hive:** 8 frames
- **Bees / Frame:** 1,500 bees
- **Bees / Hive:** 12,000 bees
- **Foragers / Hive:** 4,000 bees
- **Foraging Bees / Acre:** 8,000 bees

Adding it all up

About half of the foraging bees per acre (~4,000 bees) will be actively pollinating at one time. The other half will be back in the hive (or on their way back) to offload their pollen and fuel up for the next trip.

The bees end up visiting each flower multiple times during their daily foraging period. The extra trips to the flowers, dropping off extra pollen, stimulates the growth of the pollen grain that did end up pollinating the flower.

Each tree has about 20,000 flowers. With 40 bees to pollinate each tree at the rate of about 10 flowers per minute, they'll be able to pollinate about 96,000 flowers during a workday. Which equates to visiting each flower 4 to 5 times.

Bees		*Drone Equipment*	
Hives / Acre	2 hives	Drone	$50
Hives / Avg. Grove (40 Acres)	80 hives	Horsehair brush	$10
Cost / Hive	$180	Ionic gel	$20
Cost for 80 Hives	**$14,400**	Set-up labor (4 hrs @ $20/hr)	$80
Time Spent Pollinating	**21 days**	**Cost for 1 Drone**	**$160**
Cost per Day	**$686**	**Cost for 46 Drones**	**$7,360**

Bees are Still Key

Until AI can replace a manual operator, a remote-controlled drone needs a human to control it. Let's say a person controlling a drone is super focused and can pollinate 5 trees, lush with almond bloom, trying their best to get all the flowers nestled within the branches, in a day, at $15/hr.

To get the pollination job done in the same amount of time using drones, it would cost over $100,000--more than 8 times as much as the cost of renting bees!

For now, bees are still key.

Blueberries

Feeling Blue!

The data is in! We're eating more blueberries today than just a few years ago. In fact, there's a 50% increase in consumption per cap in the last ten years. This is a global trend. Demand is high and prices for fresh, processed, and juice markets are just plain exciting. Besides a growing fresh market, blueberries are finding their way into juices, jellies, and other processed products.

Alternative Crop

Blueberries are an exciting alternative crop for East Texans. The economic picture has improved greatly in the last few years due to increased demand for both fresh and processed product.

Rabbiteye Blueberry

The best blueberry for Texas is the rabbiteye blueberry. It is grown commercially in East Texas, where the humid woodlands are typical of native rabbiteye blueberry habitat.

A single rabbiteye blueberry plant can produce 15 pounds of berries per year, and the berries are easily marketed. With proper management, commercial blueberry plantings in Texas can yield from 5,000 to 9,000 pounds per acre per year.

Man or Machine

Blueberries may be harvested by hand or by machine. Most of the fruit grown in Texas is picked by hand and sold for fresh consumption. A successful strategy in many areas is pick-your-own blueberry marketing.

In most Texas locations, the harvest season extends from May through July, depending on the varieties grown

A bit of competition

With Mexico staying in the blueberry market longer, prices have not been as good as in the past. This year, in particular, we're starting to see the impact of Mexico's increasing volume in their later varieties.

Not only is Mexico shipping more volume, but its varieties have gotten better. This trend has been observed in other South American producers as well, ex. Peru and Chile also have become bigger players in recent years.


Cotton

Harvey Hit Cotton Hard

In 2017, Texas led U.S. states in cattle and cotton production. An estimated $150 million worth of cotton was lost as the storms ripped the bolls off plants and left white fiber strewn across fields.

The loss, though a small part of the total U.S. cotton crop of about 20 million bales a year, was devastating for individual farmers.

South Texas and Coastal Bend cotton farmers were expecting a record crop that year. Thirteen of the counties in the disaster area were major cotton producers.

“It was the best cotton crop we ever raised. We really needed it this year to make up for other years.”

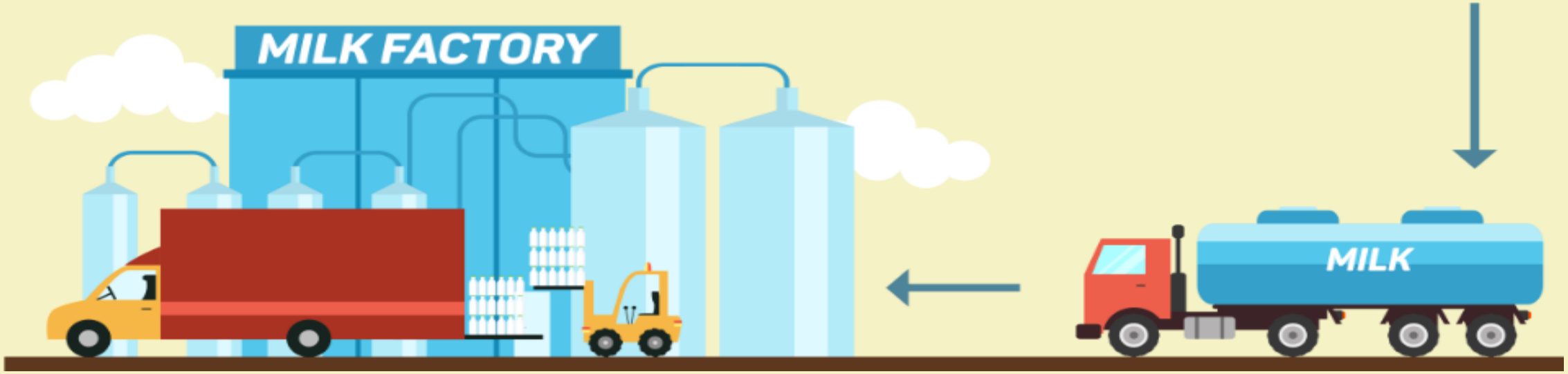
-- Jimmy Roppolo, general manager of United Agricultural Cooperative Inc in El Campo, Texas.

Dairy

Shifting Milkscape

Texas milk production continues to rise. Dairy facilities increased production 9 percent in 2017, to more than 12 billion pounds of milk.

It’s likely Texas will become a top-five milk producing state in the nation this year, she said, but where that milk is produced shifted dramatically over the past four decades.



Hopkins Was The Dairy Capital

In 1980, almost 25 percent of the state's milk was produced in Northeast Texas. Hopkins County was the dairy capital of the state and produced 16 percent of the state's 3.5 billion pounds of milk that year, or 560 million pounds, according to U.S. Department of Agriculture Marketing Service.

Milk Moved to the Panhandle

Production in Northeast Texas rapidly declined over the next two decades as milk production moved west to a region that accounted for less than 1 percent of production in 1980 – the Panhandle.

The Factors

Rainfall, animal welfare, quality of life for producers, the economics of production and other factors all contributed to the move from East Texas.

Too Wet to Moo

East Texas weather, including up to 50 inches of annual rainfall, heat and humidity, presented several challenges for dairies. Rain caused problems with mud and waste management. And cows don’t like mud.

Heat and humidity reduce herd production significantly, including milk pounds and fertility rates. It’s easier to cool cows in the summer and warm them in the winter in areas where humidity levels are low.

Getting a Handle on Milk Production

The Panhandle receives around 20 inches of rainfall each year. And costs decrease with in drier regions of the state. Happy, healthy cows produce more milk and moving them to an environment that is better suited for them made sense.

Room to Grow

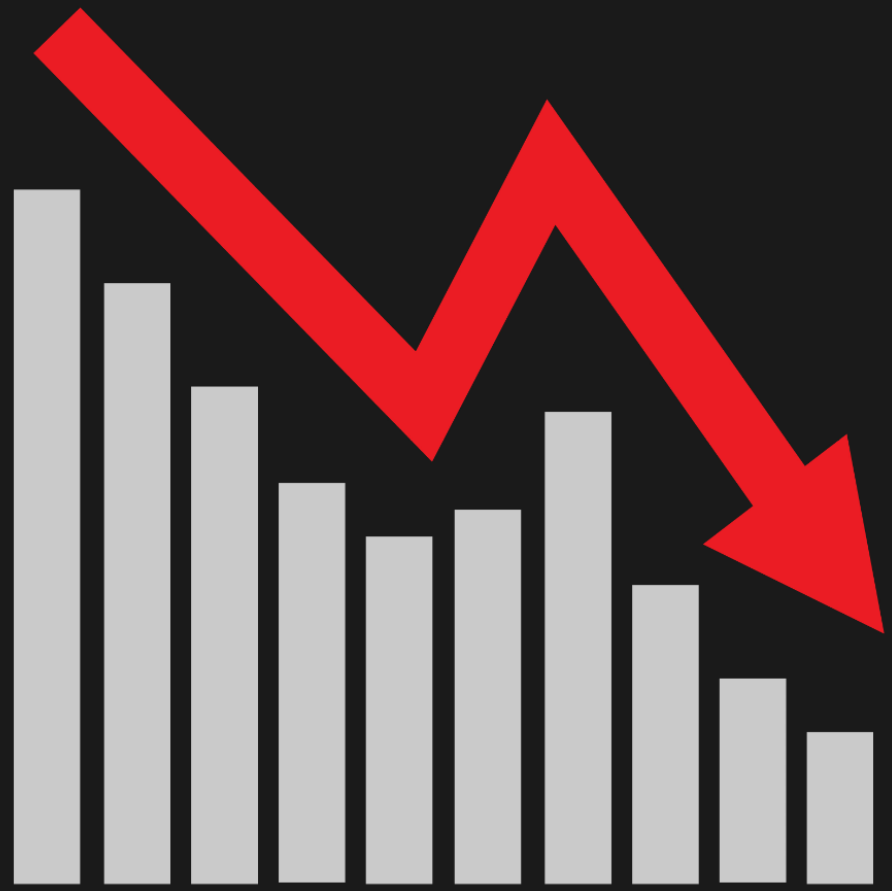
Dairy farmers wanted to get big enough to hire managers and enough workers so they could attend family events and take vacations as with other vocations, but expansion was costlier in East and Central Texas.

Higher land values and suburban sprawl contributed to the economic decision to move west. Landowners also faced the increased demand to sell as encroaching development placed a premium price on their land holdings.

No one to hand it to

As a result, a lot of dairy producers sold out entirely and either retired or took up beef or poultry production. There were also many producers who retired and the next generation were not interested in continuing in the dairy business.

For example, in the first half of the 20th Century, there were 200 dairies in operation in Dallas County. Today, there are none.



Easy to Feed

The Panhandle was a good option because of rainfall amounts and land availability, but it also provided a steady supply of high-quality feed because of the well-established feedlot industry in the region.

Cottoning to Milk

Cottonseed, a waste product that ended up in landfills in the 1970s, emerged as a high-quality feed option for dairy producers as well.

Dairy cows like cottonseed. Converting a waste product into a valuable food source was a win for cotton and dairy producers. Nutrition and high-quality feed is critical for milk production

Still there

Since dairy moved west, urban sprawl has stretched out in east Texas.

There is still a dairy industry there, it just has shrunk in size. And the same goes for Central Texas.

In the dairy business, they're always looking for a place where they're welcome, where there's space available, and where the cows are happy


Farmers

No Guarantees

Agriculture can’t guarantee a farmer a paycheck like other jobs, and that uncertainty is unsettling for many young people entering the workforce.

Aging Out of the Fields

Meanwhile, the average age of Texas farmers in 2015 was 58—almost two generations ahead of the current working class. That's a huge concern of many farmers—the age — is a huge concern of the entire industry nationwide. So with an aging workforce whose children largely aren't willing to continue farming, the industry is forced to ask itself how to move forward.

Where do we go from here?

One of the biggest questions, is the choice between organic and conventional farming. These two practices are often viewed as the only options, but the solution to the future of agriculture might not be in such black-and-white terms. Farmers who've been in the practice for some time are saying we can have our cake (or fruits and veggies) and eat it too with sustainable agriculture.

What does it mean?

Sustainable agriculture does encompass organic farming, but it’s not exclusive to that. The main difference is that sustainable farming is just as much about the practice as it is about the farmer.

Sustainable Agriculture

Sustainable agriculture is not only a solution to keep farmers in the business and consistently producing food, but it’s also a way to market agriculture as a viable career choice for college grads and the emerging workforce. Sustainable farming is a realistic way to draw in outsiders and make agriculture a desirable career again.

Younger Generation

A huge part of sustainability requires keeping pace with changing practices of agriculture and incorporating developing technologies, something that a younger generation will certainly identify with.

New Silicon Valley

“Agriculture is like the new Silicon Valley. I have companies calling me all the time who have this new app or invention or new precision ag hardware that they want me to try. Young people don’t think of ag as like this awesome tech world. But it is.”

-- Timothy Gertson, Texas Farmer

Number Declining

The number of farms across the U.S. is declining even as the value of their crops and livestock has increased over the past five years.

Future of Farming

The future of farming requires equal if not more attention and resources put toward sustainable farming as opposed to conventional or organic.

Time, unfortunately, is not a luxury. The world's population is growing faster than ever, and food security remains a challenge. So there must be a compromise.

Give and Take

Farming itself is a process of give and take, a process filled with much uncertainty but also an immense trust in the land. And in the same way we respect the earth and its bounty, we must care for our farmers and their livelihoods to ensure that they can continue their role as stewards of the environment and gatekeepers of a sustainable future.

Feral Hogs

Here Piggy !

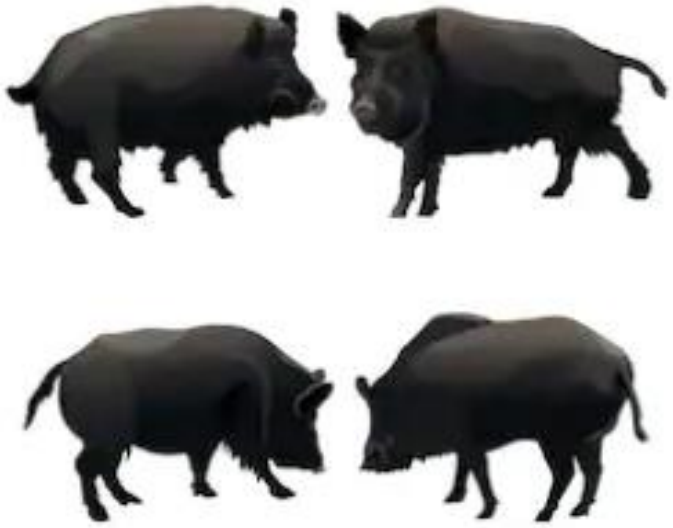
It’s no secret that Texas has a problem with its feral hog population. There are estimated to be more than 2 million feral hogs in Texas. Regardless of the measures taken, at present, there seems to be no dent in their uptick, and the damage they’re causing is outrageously expensive. Wild pigs cause up to $2.5 billion in damage to the U.S. economy each year and $1 billion of the total is exclusive to agriculture.

Feral hog distribution, Texas. Photo: Texas Parks and Wildlife

Invasive Species

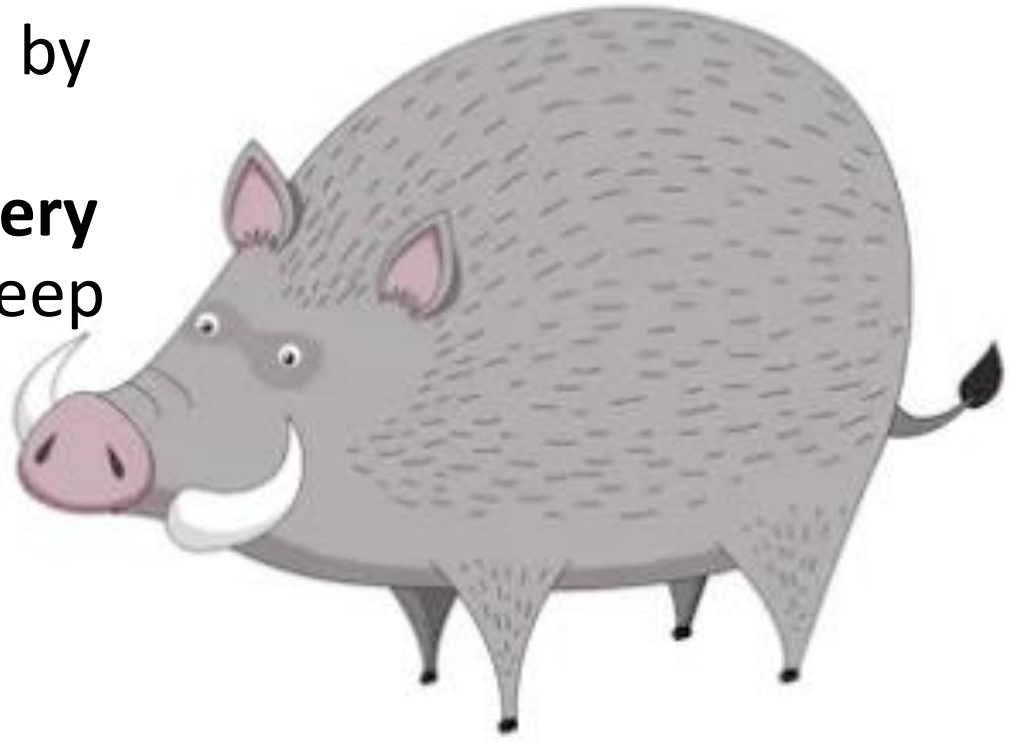
These hogs aren't native to the Lone Star State. In all honesty, they're not even native to the U.S.

They thrive in almost any type of climate in which they're found. They've proven to be highly adaptable creatures which have continued to expand their Texas territory since their introduction, going well beyond our state borders ever since



Not Killing Enough

Hunters and trappers are killing approximately 30 percent of the hog population in Texas annually, but hog numbers are still growing by about 20 percent each year. Biologists and wildlife managers estimate that **7 out of every 10 hogs** in the state must be killed just to keep their numbers where they are right now.



Hard to Control

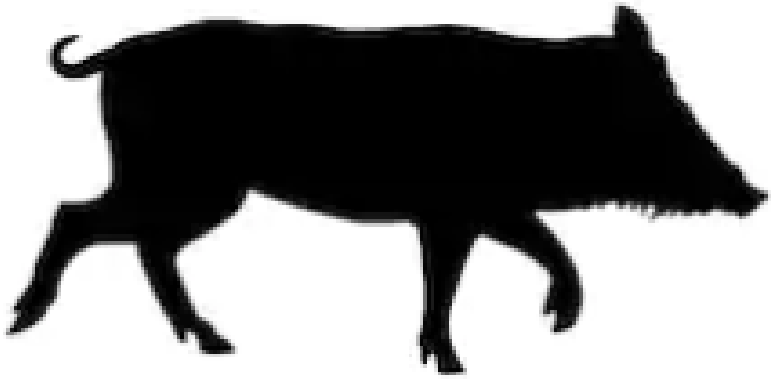
Hogs breed almost as fast as rabbits. They become sexually mature before they are a year old and a single female can produce as many as 24 piglets every year.

Feral pigs are very intelligent and resilient animals. They quickly respond to hunting and trapping pressure by changing their habits or just leaving the area for greener pastures when things get too hot.

And they roam over extremely long distances in search of food, making long-term hog control measures difficult and complicated.

Hogs Will Eat Anything

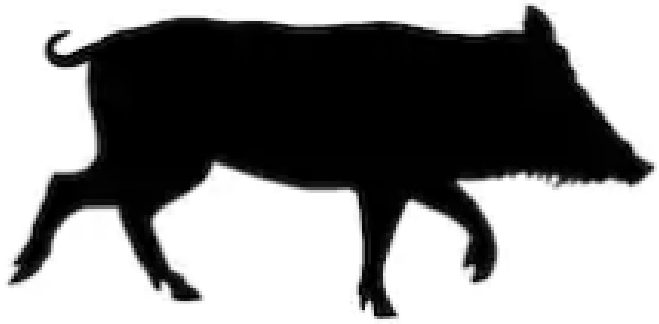
While wild hogs are fun to hunt and provide some very tasty table fare, they cause all sorts of problems. Their diet normally consists of things like roots, acorns, tubers, and other plants, but they will eat literally anything they can find or catch. Crops, snakes, insects, ground-nesting birds, sheep, goats, and even deer fawns are not safe from a hungry hog.



Carry Diseases

When it comes to the state's livestock herd, producers worry most about wild pigs spreading disease. Pigs can vector 21 some odd diseases we are aware of – communicable to all livestock animals.

Producers have to vaccinate for diseases they would not normally have to vaccinate for because of this wild pig problem.



Changing the Farmscape

Some farmers have quit producing grains and now produce cotton because wild pigs won’t eat it. Wild pigs eat seed corn at night, destroying fields. The damages to small grain operations in Texas is so high that many are having a hard time staying in farming because of it.

"Cockroaches on Hooves"

Poison has been touted as one potential way to turn things around in the war on feral hogs. However, the use of a feral hog poison on a large scale is a very hotly contested idea.

And proponents of hog poison experienced a big setback when nearly 200 birds died after consuming poison intended for hogs during field testing.

War with Warfarin

Warfarin-based pesticide, such as Kaput Feral Hog Lure, will kill hogs, but is it worth it? Warfarin has been used to poison hogs in the past. Australia introduced the idea to the world to address its overpopulation issues. After several years of use, Australia banned the act due to “extreme suffering.”

Internal and external bleeding are common during the week-long process. The poisoned pigs’ muscles are also very identifiable, appearing a bright blue due to dye in the poison.

Biggest Issue

The largest question surrounding poisoning feral hogs is how will the poison be kept from other animals. EPA regulations require hogs to be fed the poison from bins with 10-pound lids. That's the only plan to keep other animals from ingesting the toxicant. It's one that Tyler Campbell, a former researcher with the U.S. Agriculture Department, said won't work.

Even if animals don't ingest the poison itself, it's likely birds and predators will feast on hogs' poisoned meat after they die.

Pigs don't Fly. They're Carried on Rubber Tires

Still in the rudimentary stages of testing, genetic technology is documenting the unnatural spread of pigs. Populations don't just spring up overnight. Illegal transport is a major cause of increased wild pig presence, an advance which contributes to an annual multi-billion-dollar bill.

International Markets, Tariffs, and Trade

Not a Good Way to Measure

"Using the trade deficit as a metric for how well we are doing in trade is really silly."

-- Katheryn Russ, a research associate at the Dallas Fed's Institute for Globalization and Monetary Policy, pointing out that the quickest way to reduce a trade deficit is to have a recession.

A Type of Accounting Measure

Trade deficits or surpluses simply reflect an accounting measure — which can create misperceptions.

Interestingly, agriculture is one industry with a positive trade balance.

An Extreme Example

A Texas business loads $100 million of grain sorghum on a cargo ship that leaves the U.S. for China. The ship then sinks halfway through the trip, leaving the company at a total loss. The U.S. would still show a $100 million trade surplus.

Increase the Trade

More important than the trade balance, experts said, is that increased trade makes a country's economy more productive. The U.S. has seen both exports and imports keep growing over time, thanks to decreased trade barriers, better technology and other factors.

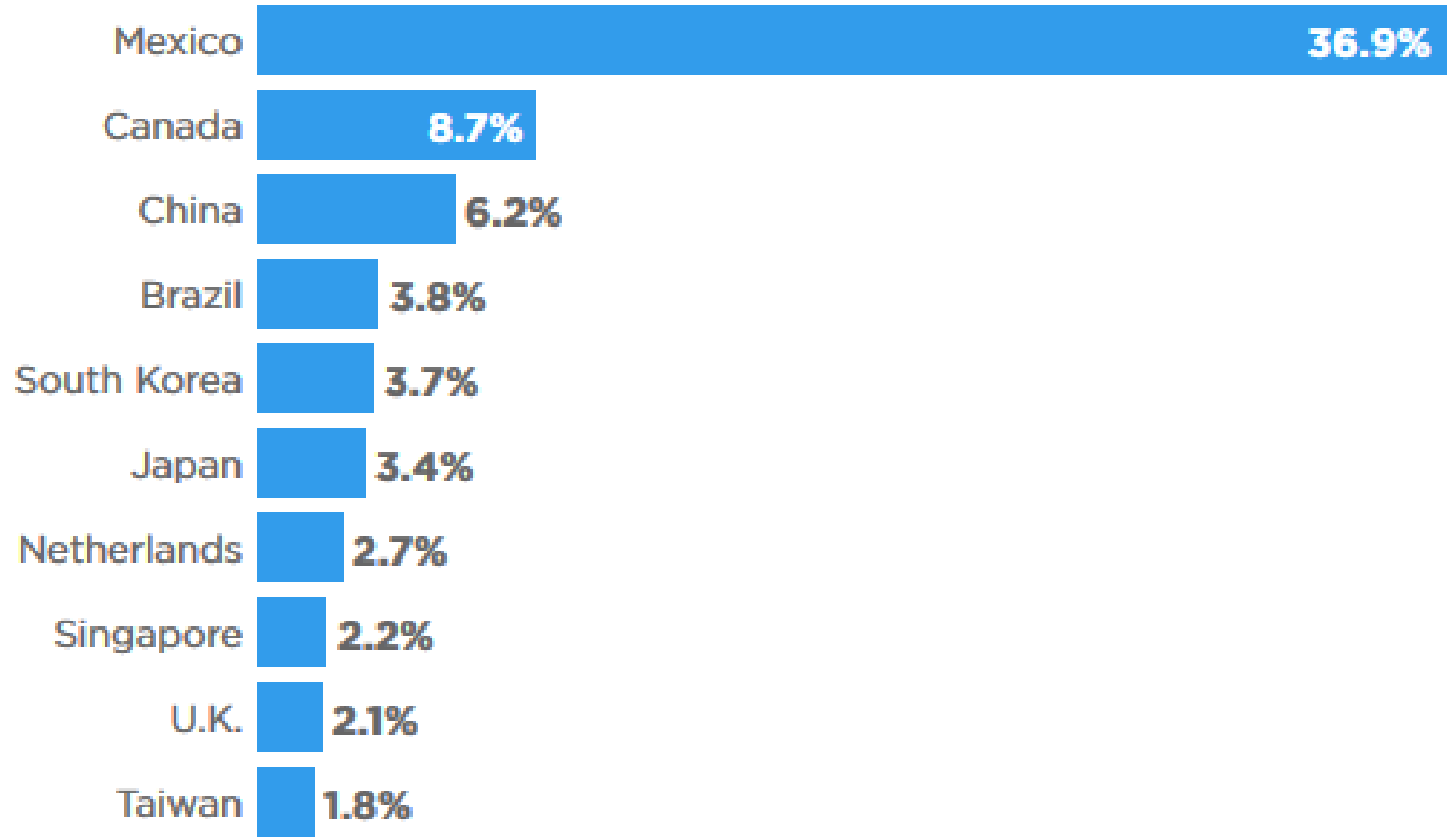
We Need our Neighbors

Texas growers and livestock producers rely heavily on trade. Overseas markets, including China and other parts of Asia, are important and lucrative destinations for Texas crops.

About one-third of Texas farm income is derived from exports and NAFTA countries account for six or seven percent of the total.

Who are Texas' biggest trading partners?

Mexico is Texas' biggest trading partner, measuring by the percentage of the state's exports last year.



SOURCE: U.S. Census Bureau

Tom Benning / DMN

What Tariffs Are

Tariffs are taxes borne by U.S. businesses, which are then forced to choose whether to absorb that hit, tackle the costly task of reworking supply lines or pass the burden on to customers.

“There are a lot of threats out there to the Texas and American economy. Trade wars would be on that list.”

-- U.S. Sen. John Cornyn of Texas, a Republican who likened the tariffs employed by Trump to an “unguided missile.”

A Lot on the Line

South Texas farmer Bobby Nedbalek figures America's growing trade conflict is the ultimate poker game.

And while he says he's glad President Donald Trump "is there in the game for us" — he can't help but look with trepidation at his latest hand in the wake of extraordinary antes made Friday by the U.S. and China.

Among the dueling tariffs imposed on a combined $68 billion in goods was retaliation that Beijing aimed at cotton and grain sorghum — cash crops for Nedbalek and many other Texas farmers.

"I don't think there has ever been a time when there is so much money on the line," said the 77-year-old, who sees nearly all the harvest from his 6,000-acre operation exported to China.

Trying to Stay Optimistic

But margins are always thin, particularly given the whims of Mother Nature. Last year was a bumper crop, causing many farmers to load up on expenses. Now a drought in many parts of Texas has wrecked this year's yield — "the worst time in the world to have a bad crop," he said.

"We're really vulnerable," South Texas farmer Bobby Nedbalek said, explaining that low market prices, driven in large part by the tariffs, will make it "really hard for the numbers to work."

Affecting all of Texas

Payback from China and other countries for Trump's trade actions now covers billions of dollars in Texas exports. That hit, focused on the ag and energy industries, appears to be greater than what's being felt in any other U.S. state.

No corner of Texas' Economy left Untouched

Texas companies already paid $1.1 billion in added tariffs due to the trade war just through last October, per one study, while the state's farmers have been hammered by retaliatory duties.

Texas farmers are now bracing for the effects, via reduced commodity prices, from retaliation that China and other trading partners have launched in response to Trump's trade escalation. That payback covers key crops like grain sorghum, cotton, soybeans and rice.

Making the List

China’s proposed tariff hit list was a nightmare to U.S. Sorghum and the U.S. soybean industry, as farmers last year exported $12 billion worth of the product to China, making it the biggest U.S. agricultural export.

“We export about 90 percent of our cotton and the majority is produced in Texas. We export close to 50 percent of our soybeans and China is, I believe, our No. 1 market. Beef, the same thing. It’s more important for pork but beef is still important,” said Texas A&M University agricultural economist Luis Ribera.

Soybean Farmers

“Soybean farmers lost $1.72 billion in value for our crop this morning alone,” American Soybean Association President John Heisdorffer, an Iowa farmer, said in a statement. “That’s real money lost for farmers, and it is entirely preventable.”

Plains Cotton Growers said China last year reported purchase of $980 million of U.S. cotton lint, one of the listed products.

And who will help me harvest the crop

Finally, there are critical shortages of farm labor due to Washington's inability to deal with basic immigration reform. Put it all together and farmers are facing a "perfect storm" that is driving many to financial disaster even with federal aid.

Beef is not for Dinner

“It is unsettling to see American-produced beef listed as a target for retaliation,” said Kent Bacus, director of international trade and market access for the National Cattlemen’s Beef Association, which fought years before regaining access to Chinese consumers in 2016. “This is a battle between two governments, and the unfortunate casualties will be America’s cattlemen and women and our consumers in China.”

Amazing Productivity

Ironically, a problem this time is agriculture's amazing productivity in the U.S. and other developed nations. Five straight years of bumper crops have resulted in excess supply, depressing commodity prices and eroding the savings and equity on the balance books.

A Double Whammy

Add to this extreme weather this spring that has produced massive flooding and significantly delayed most planting, which will mean lower yields this fall. Eventually, this may raise commodity prices, but in the short term it creates a “double whammy”: less to sell at lower prices, resulting in drastically reduced income.

Feeling Sick

Another complication: China's pork producers are suffering from an outbreak of African Swine Fever that may cut their production in half. U.S. farmers export soybeans to China as feed, but with significantly lower pork production, China won't need as much

Suffering Due to Tariffs

At least 11,000 Texas farmers believe they have suffered because of tariffs and trade disputes. USDA spokeswoman Brenda Carlson said in an email response to questions that the USDA-Farm Production and Conservation Business Center in Texas had processed about 11,000 applications, but applications received during the 35-day government shutdown may remain in the processing stage

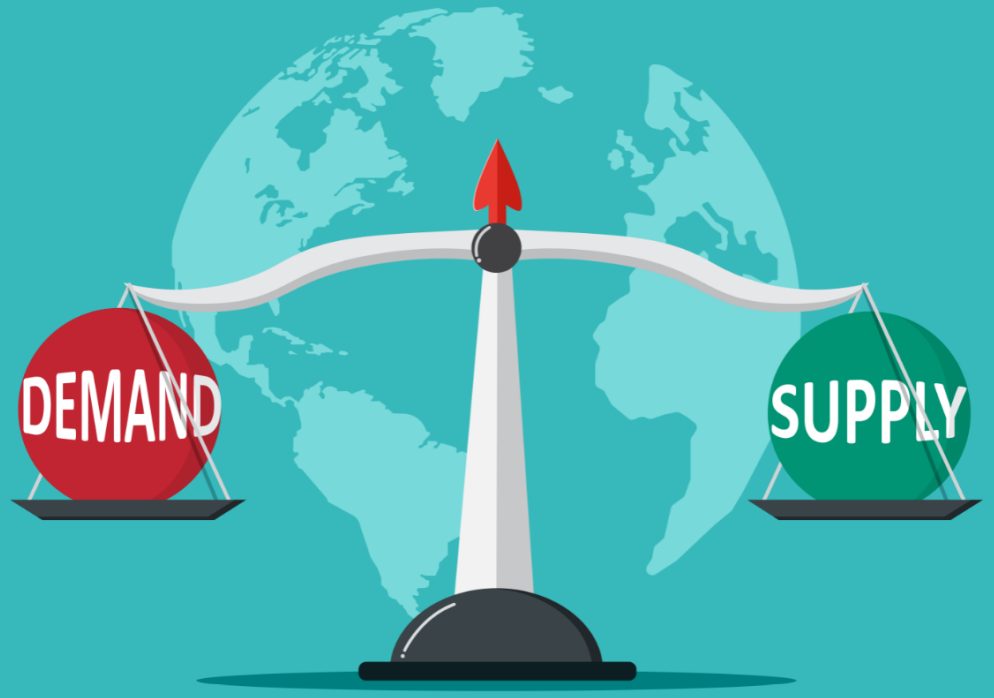
Not a Permanent Solution

“China is a very bad actor, involved in currency manipulation, cheating on subsidies and abusing World Trade Organization rules. There is a lot of support for taking aggressive action against that country. But a trade war could not have come at a worst possible time. It is being felt most acutely in the Midwest, but we’re having problems here, too. These market assistance payments are helpful, but no one considers them a long-term solution.”

-- Texas Farm Bureau spokesman Gene Hall

China says no to US Ag in August

In retribution for the announced 10 percent tariff on approximately $300 billion in imports from China, not already subject to duties, China has ceased importing all agricultural products and has rescinded waivers of tariffs on ordered soybeans.



Weather is beyond our control. But our trade and immigration policies are not. What farmers want most is trade, not aid. Trade uncertainties — whether driven by disputes on tariffs, as we are seeing now, or from unpredictable approvals of genetically modified crops in certain foreign countries — affect planting as well as grain marketing decisions. Fair and open global trade in agriculture can’t come soon enough for U.S. farmers, ranchers and agribusinesses.

Collateral Damage

On immigration, farmers see themselves as collateral damage to the incessant partisan feuding and deadlock in Congress, where some seem to care more about scoring political points than actually solving problems and looking out for the interests of America's key industries.


Labor

The biggest threat to the rolling Texas economy?

Look beyond the tariff talk, trade uncertainties and political conflicts, and focus on the labor shortage. According to employers, it’s already taking a toll, especially in mid-skills jobs.

Worried about the Workforce

Members of the local and state business community — including farmers, owners of construction companies, high-tech executives and restaurateurs —say they worry about the Trump administration's crackdown on certain categories of immigrants previously exempt from deportation and how it could affect an already stretched Texas workforce.

Protection is Ending

The administration says it plans to end protections for about 200,000 Salvadorans who have lived in the U.S. for at least the past 17 years. An estimated 36,000 of them reside in Texas and many now could be subject to deportation when it takes effect in September 2019.

Debate over DACA

Meanwhile, an estimated 700,000 young unauthorized immigrants — including about 113,000 in Texas — are awaiting the outcome of negotiations in Washington regarding the Deferred Action for Childhood Arrivals program, known as DACA, that has provided them with work permits and protection from deportation.

“We have to continue the (DACA) program — it is too vital to our state and our businesses not to. We simply have to have the workforce.”

-- Chris Wallace, president of the Texas Association of Business.

Elimination Costs

Elimination of DACA could reduce gross domestic product in Texas by nearly $6.3 billion annually, according to the Center for American Progress, which also has predicted a $1.8 billion annual blow to the state's economy when the TPS program protecting Salvadorans is ended.

Shortsighted

Local and statewide employers consider the potential deportation of tens of thousands of productive people who have been working in the U.S. legally and paying taxes to be shortsighted, particularly at a time when the labor market is extremely tight.

Not the Best Time

The timing is particularly inopportune, Stan Marek, owner of a construction company in Austin, said, because there already is a post-Hurricane Harvey labor shortage.

“People graduating high school have other opportunities, and we don’t have people from other states coming to do the work. Meanwhile, construction work is backing up. There are thousands of houses that people won’t be able to fix.”

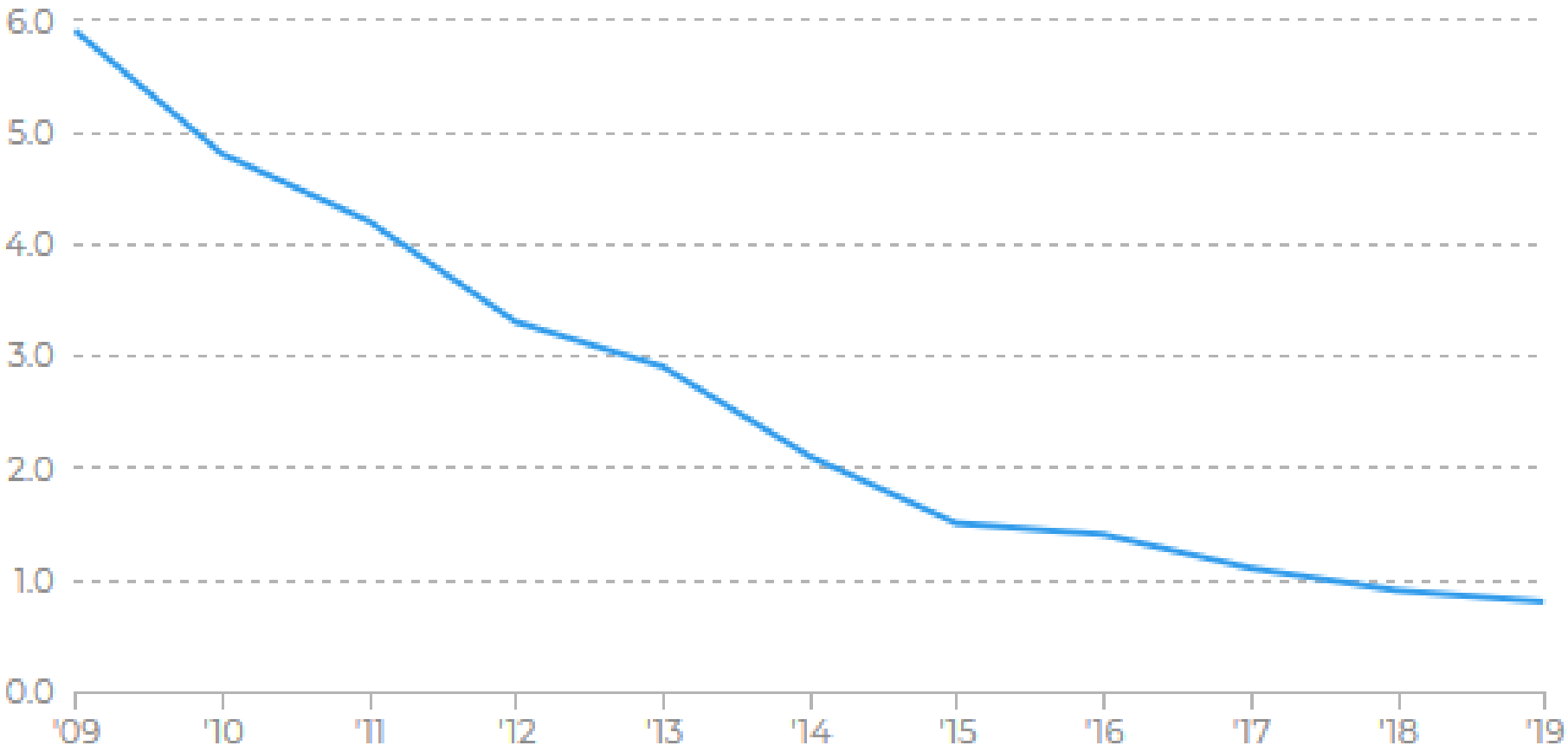
Help Wanted

“Five years ago, you could put a (help-wanted) sign up front and get four or five dozen applicants. Right now, you put up a sign, you have to hang the sign for six months.”

-- A board member of the Greater Austin Hispanic Chamber of Commerce.

How tight is the labor market?

Number of unemployed persons per job opening in the month of April:



SOURCE: U.S. Bureau of Labor Statistics

Mitchell Schnurman/DMN

Watching Crops Rot

For the last two years, Bernie Thiel has watched yellow squash rot in his farm fields outside of Lubbock. The crops weren't diseased, and they weren't ravaged by pests or pelted by hail, he said. There just wasn't anyone to pick them. Though Thiel has consistently lowered the acreage he plants to squash (and other labor-intensive crops, such as zucchini, tomatoes and okra, which must be hand-picked) — from 160 acres seven years ago to 60 acres now — his aging immigrant workforce just can't keep up anymore. Some of them are in their 70s and 80s), and they don't move as quickly as they used to.

And there's no one to replace them.

Staying Home to Work

Unemployment in Texas was 3.5% in May, the lowest since the government began tracking the data in the 1970s. The jobless rate nationwide was almost as low, and in 34 states, it was less than 4%.

That dims the allure of the Lone Star State because most migrants come to Texas for the work. If jobs are just as plentiful where they're at, it’s a harder sell for Texas employers.

More Jobs to Pick From

As unemployment has dropped steadily, the number of job openings nationwide has continued to climb. During the recession, there were nearly 6 unemployed persons for every job opening. In April, that metric was down to 0.8 persons per opening.

Aging Out of the Job

The aging population poses another looming threat in the fields and in the labor pool. In Texas, the average age of a plumber is about 52 and a trim carpenter 50, said Phil Crone, executive director of the Dallas Builders Association.

Too Risky to Travel

The pressure to find adequate labor is increasingly being felt across agricultural industries. Several factors, including relatively low pay and sometimes dangerous work conditions, contribute to farm labor shortages statewide. But especially outside of the Rio Grande Valley, they can also be tied to enhanced immigration enforcement by federal, state and local authorities.

Visa Programs

The H-2A visa program, which allows employers to hire foreign nationals for temporary agricultural jobs, is designed to alleviate such labor shortages. But some growers said the program's requirements — that employers provide transportation to the jobsite and nearby housing — are too expensive, and the paperwork that comes with participating in the federal program is a hassle. Despite the fact that Texas has more agricultural production than almost any other state, it doesn't even break the top 10 in certified H-2A workers.

One Possible Solution

Other rising expenses, including property taxes, have also pushed up local home costs. That threatens the Texas jobs machine, too.

“We’re losing one of our top attractions — our affordability. We need a guest worker program with responsible protections for the country and a chance for employers to fill their jobs.”

Robo Farming

Brandon Alexander grew up on farms, acres and acres of wheat and other broad acre crops in Texas and Oklahoma. So, it’s not entirely surprising that he applied his other expertise—based on a robotics degree from the University of Texas and work at Google X—to some of the biggest issues facing modern farmers: water use, labor shortages and total yield.

Iron Ox

Iron Ox, uses two robots and a cloud-based “brain” to grow lettuce, tomatoes, basil and more in a hydroponic system in its first production farm.

Trying to Solve Farm Problems

“There are three macro problems that we’re trying to solve at the same time. One is access to fresh produce. Right now the average travel distance for strawberries, tomatoes, a head of lettuce, is 2,000 miles. And that’s because farming, right now, is highly centralized to just a handful of counties in the entire United States. What we want to do is decentralize farming, so we can grow close to the consumer.”

Problem Two

“The other big issue facing agriculture today is labor scarcity. The average age of a farmer is 58 years old. We’re finding that newer generations, not just in the United States but across the globe, are not taking up agriculture. There’s a multibillion-dollar loss right now because there’s not enough people to do the work.”

Problem Three

One of the big things that we're concerned about too is food deserts and how you can sustainably provide fresh produce to everybody. And that's one of the reasons we selected hydroponics for our growing, because it not only can reduce the carbon dioxide emissions by growing locally, but we can also use 90 percent less water.

Olives

Green Oil

Oil comes naturally to Texas; some claim it's in Texans' blood. If you've grown up in East Texas or the Permian Basin, talking about that black ooze from the earth is as natural as breathing.

But in the last couple of years, talk has emerged about a different variety of oil—that golden green oil that comes from olives.

Microclimates

With Texas's range of microclimates, this ancient Mediterranean fruit is taking root here to a degree that has California noticing. Texas now ranks as the second-largest producer of olive oil in the United States. In the Houston area, a risk-taking group of growers is turning their hayfields and cattle pastures into olive groves.

“Olives can grow in the worst soil in the world. In the Middle East, you have rocky soil and 1,000-year-old trees in Israel still producing oil. Climate is key. If you have a 6 to 8 pH and keep the feet dry you can grow in East Texas gumbo clay without a problem.”

-- Randy Brazil, , Southeast Texas Olive Oil

Man versus Machine

While some groves use the Mobile Olive Mill others hand-harvest. “It produces a better fruit, which produces a better oil. It is more expensive to hand-harvest, but the process is much more delicate than mechanical harvesting, so we’re not bruising the fruit.” – Christine McCabe, Lone Star Olive Ranch

Picking Olives

Picking olives by hand “sounds really sexy,” says McCabe, “but it’s not.” Harvest time is September, or sometimes even August. It’s hot. To beat the heat, picking starts at sunrise. “We’re subject to bees and wasps and snakes and spiders and rain. Folks come out and volunteer; they last an hour, then they’re gone.” So she’s developed a crew to get the job done. The fruit has to be picked before it heats up in the sun and starts to break down. Then, it has to be crushed and processed within 24 hours.

It Can Not Be Done

“Year after year they said it couldn’t be done,” McCabe says of the naysayers, “but year after year we’re proving that it can be done.”

Worth the Work

Even if it takes two generations to turn a profit, for this group of Texas olive growers the rewards come in special forms and often unrecognized signs: recovery from disaster, improving the farm, having your olive oil grade better than USDA standards, or simply seeing, in late summer, the olive limbs so heavy with fruit that they bend low to the ground.

“I love it,” says McCabe. And moments like that are worth their weight in gold.


Nursery

The Texas Horticulture Business is Blooming

The green industry's economic impact in Texas exceeds $15 billion according to Texas AgriLife.

The nursery industry can be very competitive because there are so many nurseries in East Texas and Deep East Texas, but it's also a very close-knit group.

Having to Deal

For today's nursery and greenhouse growers, it's not enough to simply produce beautiful plants and flowers, in peak condition, at the right time and cost-effectively. Growers must also deal with uncontrollable weather conditions, insect and disease issues, and labor challenges. They must also meet increasing consumer and buyer demands.

Providing Quality Plants and Services

Big box chains continue to be the primary sales outlet for both greenhouse and nursery producers. Growers who sell to them often must enter into vendor-managed inventory (VMI) arrangements.

These major retailers are increasingly demanding more services from vendors, such as management of their store-level inventory – including watering the plants – which is raising the cost to producers. Suppliers must be very efficient and manage tight margins in order to survive.

Feeling Independent

Many innovative and high-end garden center retailers are surviving and even thriving in today's market, but it's certainly more challenging. It's no longer enough to simply offer good plants to maintain a customer base. To attract and satisfy demanding retail consumers, retailers must offer an experience compelling enough to pull them away from the chains.

Housing Market

One of the continuing bright is the housing market, a prime influencer of derived demand for green industry products and services.

Residential investment and housing starts are usually the best leading indicator for the green industry economy, so this suggests that green industry sectors will continue to grow as long as it continues.

The Great Recession of Gardening

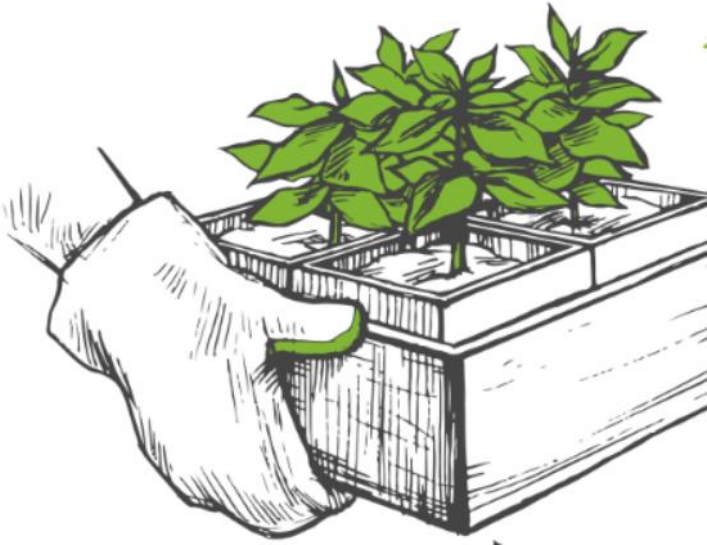
Plant and gardening spending took a big hit during the Great Recession. Gardening fell down the list of the most enjoyable leisure activities and discretionary spending on all kinds of goods, not just plants, dropped off.

Plants on Fire

The crumpled housing market did little to help stimulate new demand for landscaping materials. Nurseries found themselves destroying product — literally burning plants — that they couldn’t sell. Sales plummeted from an all-time high of nearly $1 billion in 2006 to just about $640 million in 2011.

Planting Less

Looking to avoid having to burn their plants, the nurseries that survived the recession — as many as 40 percent of growers left the industry at the time — backed off their plantings. In turn, that's led in some cases to shortages of certain plants and gave customers fewer options at a time when consumer demand began ticking up in the past few years.



Labor Woes

Despite the optimistic run in the current environment, plenty of challenges still dot the road ahead for the nursery industry when it comes to consumer demand. As with almost every aspect of the industry, the need for labor poses a constant difficulty. When it comes to demand, labor plays a role because it’s required to create the supply to feed the ramping-up demand.

“In the last couple years we’ve been hearing from growers who say, ‘Market conditions tell me I should be expanding, but the labor is the thing that is holding me back. Anyone you talk to will say, ‘I could hire 50 people tomorrow, but they’re not there.’”

-- Craig Regelbrugge, senior vice president with AmericanHort, a national trade association that represents the horticulture industry.

Demographic Shifts

Demographic shifts are also playing a role in demand for plants and plant materials. As the Baby Boomers retire and move into smaller homes and planned communities, demand from them has tapered.

“[Millennials] don’t connect with the industry in traditional ways like gardening and plants in the yard. They think more about plants and plant projects. They are very connected to things like the environment and where their food is coming from.”

A challenge AND an opportunity

On top of immigration reform, managing labor issues and keeping plant supply at optimal levels, how the nursery industry shares its stories and markets itself will have a huge impact on stimulating demand from consumers.

Time to Jump Aboard

For example, playing up the role plants can be used for screening and noise reduction in those more densely-packed residential settings. There's huge opportunity in the world of green infrastructure, where cities are using plants for pollution mitigation, stormwater runoff, green roofs and other applications. The planning community has so far driven that trend, but the nursery industry should be jumping on board with it as well.

Tapping into Youthful Trends

Tapping into more youthful trends will help capture the millennial generation and stimulate future demand from them, as well.

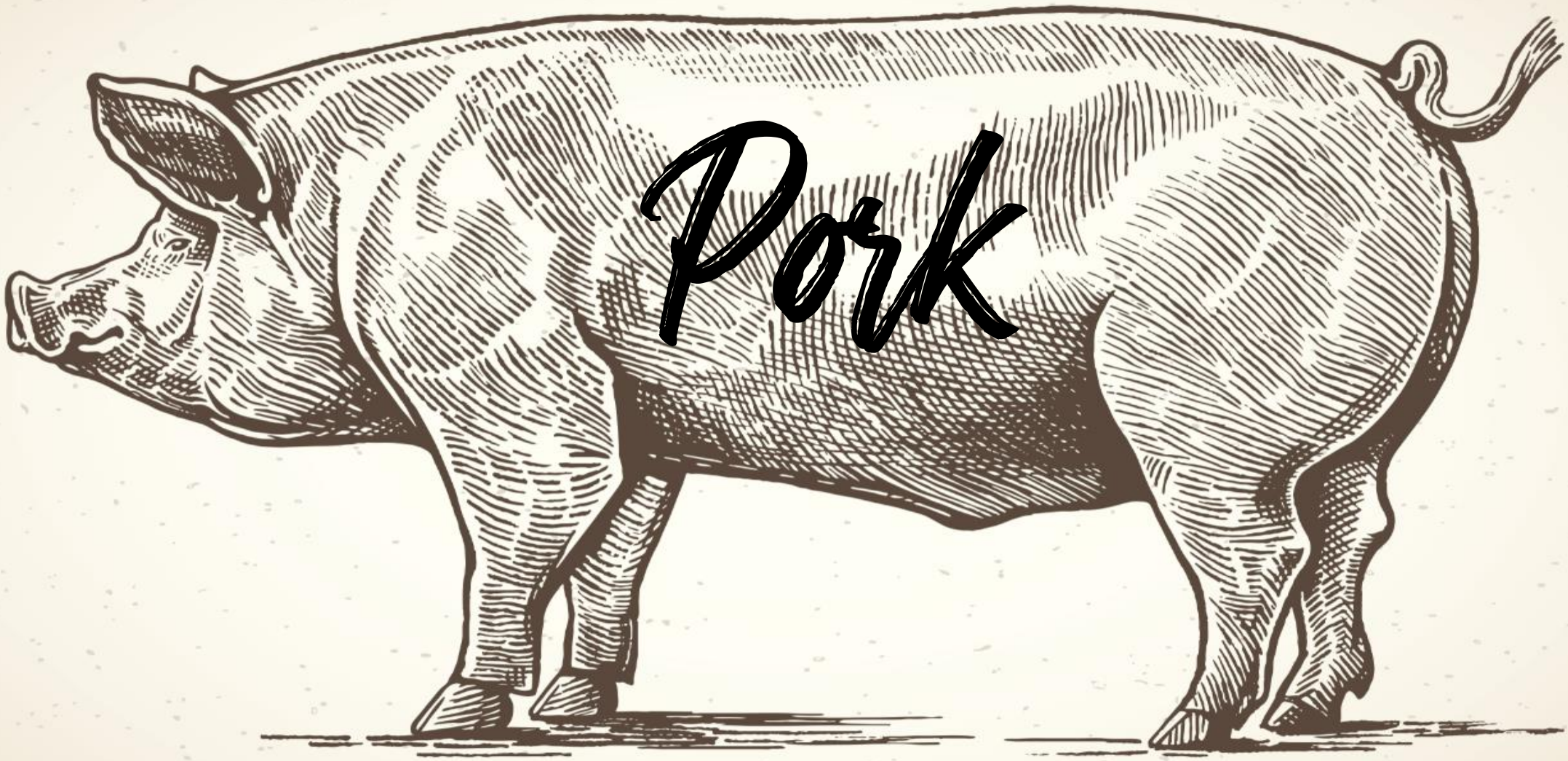
Smart retailers are already targeting the younger set — Urban Outfitters, has a plant shop that offers succulents and other plants for smaller living spaces — but others in the industry need to do so, too.

Plants on Social Media

“Millennials are not going to open an email. They’re on Snapchat and Instagram. We just have to update our game. I still see growers struggling with that because it’s not in their nature.”

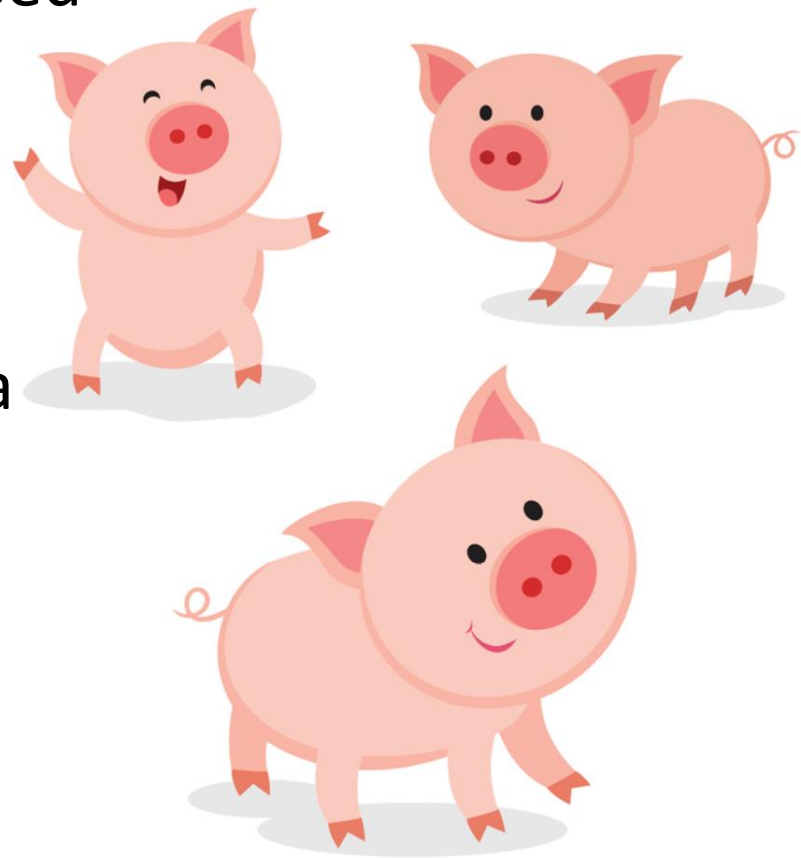
“People are willing to pay for the thing they want to buy. People afford the things they want. We’ve got to tap into those feelings. We should all be storytellers and talking about these benefits to society in our own circles of influence.”

-- Charlie Hall, professor and Ellison Chair in the Department of Horticultural Sciences at Texas A&M University.


Pork

Duty Free

The Mexican government issued a statement saying that it is “committed to eliminating all tariffs imposed in retaliation for the measures taken by the Government of the United States,” which would mean restoring duty-free access to Mexico for U.S. pork. In June of last year Mexico began imposing a 10% retaliatory duty on imports of U.S. pork cuts, a 15% duty on U.S. pork sausages and a 20% duty on some U.S. processed hams. The duty rate for U.S. pork cuts increased to 20% in July 2018.



“Mexico’s retaliatory duties on U.S. pork have absolutely hammered the U.S. industry, and removal of these duties is tremendous news for the entire U.S. supply chain.”

-- USMEF President and CEO Dan Halstrom

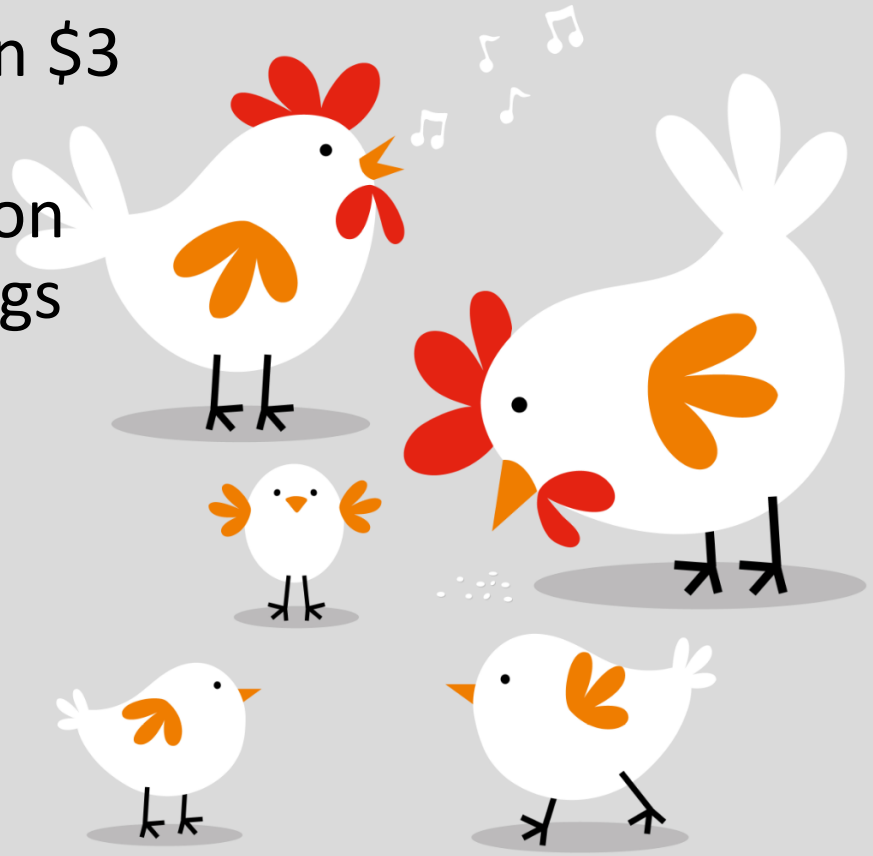
Mexico is Key

Mexico is the leading volume market for U.S. pork, and exports in the first quarter of 2019 were down 13% from a year ago. Value declined 29% to $261.9 million as U.S. producers and exporters bore the cost of the retaliatory duties. When factoring in the lost value due to lower prices for key items often exported to Mexico, such as bone-in hams and picnics, from every hog produced in the United States, industry losses have exceeded $1 billion since June 2018.

Poultry

Poultry Industry

Texas' poultry industry contributes more than $3 billion to the state's economy with broiler production accounting for more than $2 billion in cash receipts. An estimated 472 million eggs were laid in Texas in July of 2017.

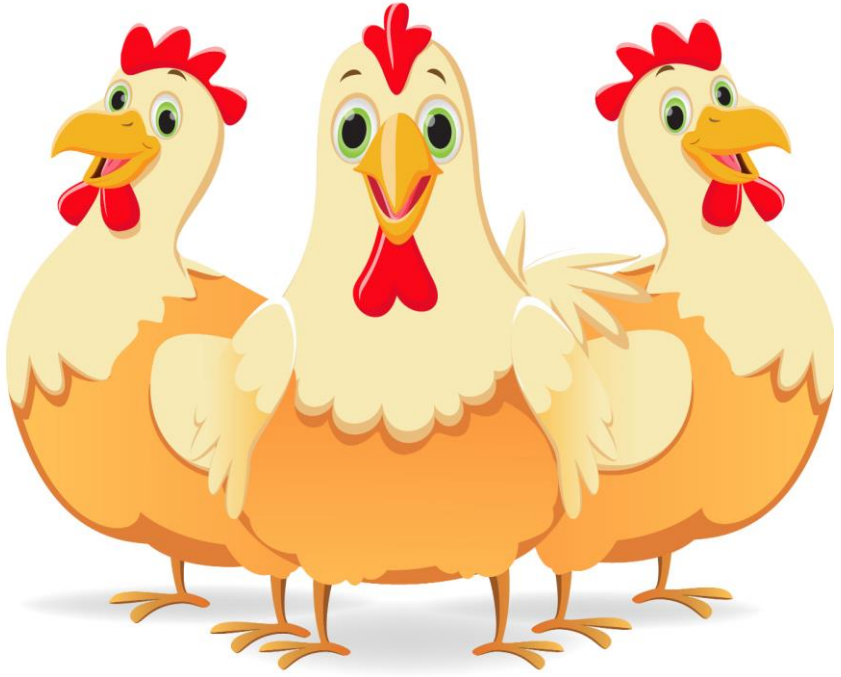


Money in Manure

Poultry litter is a popular alternative fertilizer for East Texas farmers as a viable option for nitrogen, phosphorous and potassium. Nutrient concentrations in litter are highly variable based on whether the birds are broilers, pullets or layers, and even vary from farm-to-farm and house-to-house or how and how often they are cleaned.

Broiler is the Best

"If a producer could purchase broiler litter for less than $70.70 [per ton] it would be a good buy compared to the same nutrients from traditional fertilizer sources."



Worker Woes

Faced with competition from industry and progressively higher labor rates and the imperative to train and retain employees, many egg farmers are evaluating alternatives to their traditional recruiting and retention programs.

Year Round Work

Unlike seasonal harvests, egg production provides year-round employment and demands a high level of training in stockmanship and a commitment to welfare and acceptable procedures.

Labor Demands

With the conversion from conventional cages to aviary systems, labor requirements are at least double and sometimes three-fold compared to conventional cages. This creates a demand for additional workers.

“Selection and then training including supervision is an expensive component of the cost of labor. Motivated employees deserve both job security and domestic stability in return for service and commitment. Providing homes of a suitable standard will generate loyalty to an employer and will contribute to a stable workforce which can be relied on to adhere to company procedures.”

-S. Shane, Egg News

Rice

Home Grown

Forty percent of humans—mostly in populous, less developed countries—depend on rice as their major source of calories and energy. Nearly 85% of the rice we eat in the USA is grown by American farmers.

US is Unique

Each year, 18 billion pounds of rice are grown and harvested by local farmers in Arkansas, California, Louisiana, Mississippi, Missouri and Texas. The U.S. rice industry is unique in its ability to produce all types of rice—long, medium and short grain, as well as aromatic and specialty varieties.

Texas Rice

The upper Texas coast is home to most of the state's rice production and milling industry. The Texas Rice Belt plays an important environmental, as well as agricultural, role in the coastal prairie. Texas produces mostly long grain rice, which cooks up as separate, fluffy grains.

International Buyers

The commercial rice industry in Texas always depended heavily on international markets. According to the USA Rice Federation, Texas rice production and processing adds $200 million per year to the state's economy.

Shrinking Acres

Due to water availability issues, Texas has seen a decrease in rice acres in recent years and now produces about 140,000 acres. Rice production and processing both play important roles, contributing more than $140 million to the state's economy each year and accounting for thousands of real wage jobs in the state.

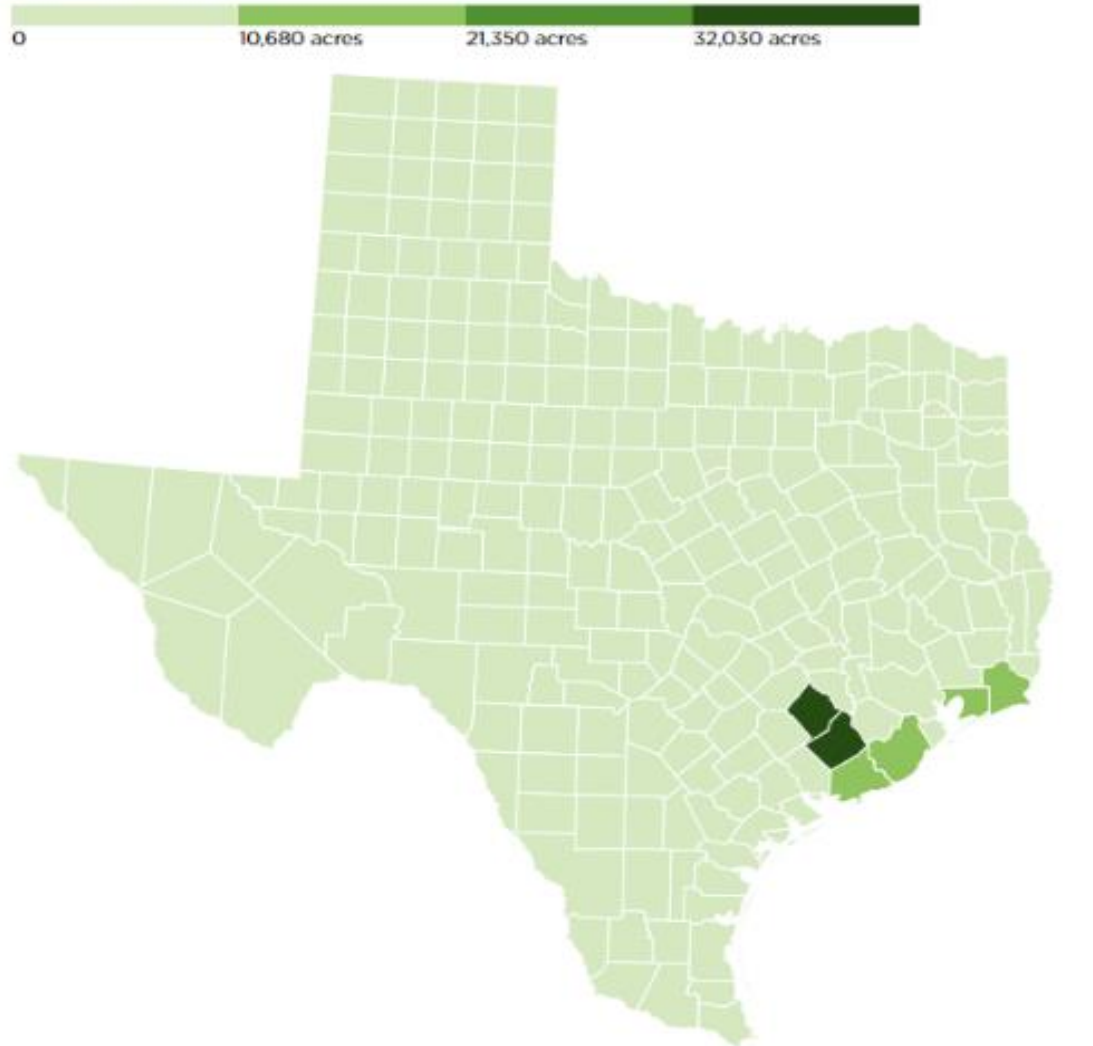
Fewer Farmers

The flat, humid counties east of Houston used to be full of rice fields — in 1968, 70 square miles of Liberty County were planted with the crop. The 70 square miles of rice fields is now eight. And the number of farmers has shrunk from 70 to 3.

The rest of Texas' rice industry has shrunk to 187,000 acres from more than 600,000 in the 1950s.

Texas' rice crop

About 190,000 acres of rice were planted in Texas in 2016. The state' rice belt is clustered in the coastal and near-coastal counties that are east and west of Houston.

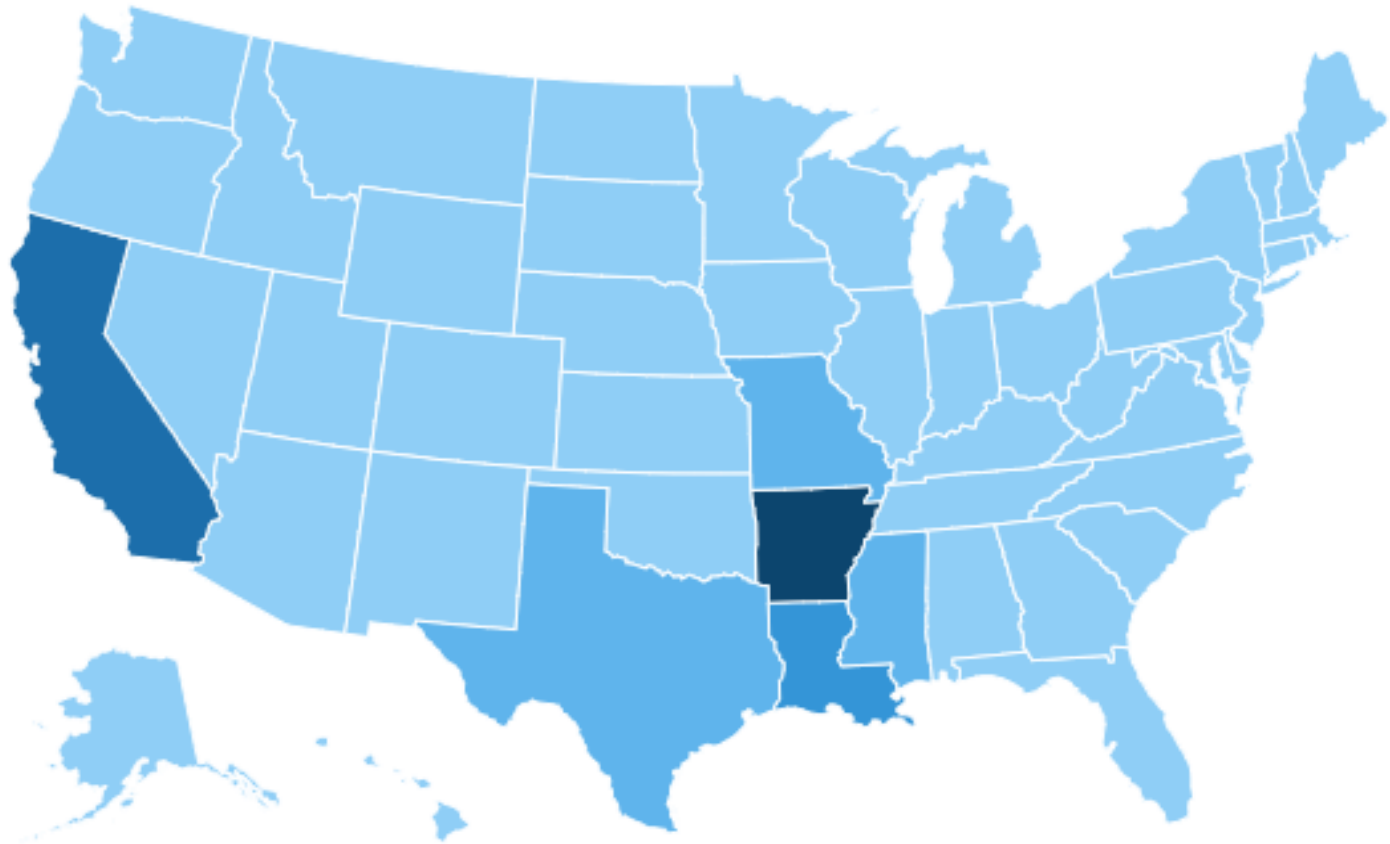


Note: About 30,000 acres of rice were scattered – in smaller chunks – in other counties throughout southeast Texas.
SOURCE: U.S. Department of Agriculture

Tom Benning / DMN

Texas is one of America's few rice states

Six states accounted for nearly all of the 3.1 million acres of rice planted in 2016. Texas tied for fifth among that group, tallying about 190,000 acres of rice last year.



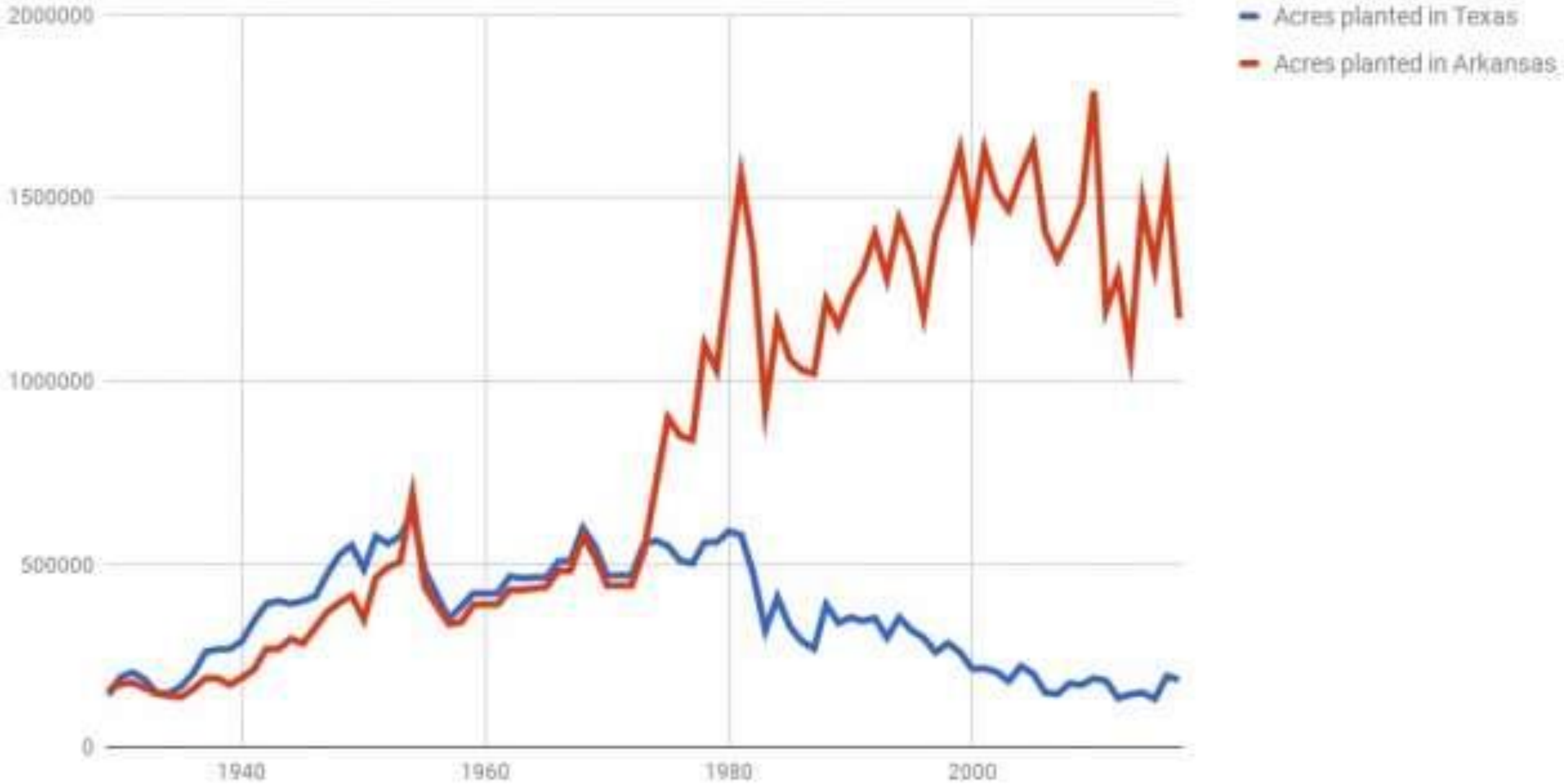
SOURCE: U.S. Department of Agriculture

Tom Benning / DMN

What happened?

Several reasons are behind the decline, including the encroachment of suburban housing developments, which raised land prices to the point where it made more sense to sell than keep farming. Today, Texas accounts for about 6 percent of U.S. rice production, far behind the leader, Arkansas, which accounts for about half.

The rise of Arkansas and the fall of Texas' rice farmers



Rice Water

Traditionally, Texas rice farmers have irrigated their fields with water from one of the Texas rivers that traverses the state northwest to southeast and empties into the Gulf of Mexico—the Brazos and Colorado Rivers in particular. This is accomplished by a complex network of canals and pumps, along with the use of reservoirs and wells.

Holding Back the Flow

Since they were established, the Highland Lakes reserves have been adequate for all purposes, and LCRA has released water from the lakes downriver every year. That is, until 2012. As the multiyear Texas drought has become increasingly serious, the water level of the lakes has dropped to a frightening 34 percent of normal capacity, while the water demands of ever-growing cities have increased exponentially.

Fighting over Water

In times of drought LCRA has declined to release water downriver for irrigation. Similar scenarios are playing out on the Brazos and other Texas rivers. This has set up heated and emotional conflicts of interest between upriver cities and downstream rice farmers.

It’s a textbook example of the competing demands in a state that traditionally has been agricultural and is becoming increasingly urban and industrialized.

Long term trouble?

Is this crop—fundamental to the development of the state for more than a century—going to just fade away from lack of water? Dr. Ted Wilson, director of the Texas A&M AgriLife Research and Extension Center in Beaumont and a world authority on rice production and research, thinks otherwise.

Weathering the Storm

Wilson was cautiously optimistic that the industry could weather this drought crisis. “But there will have to be many changes in the way we grow rice,” he said. Research projects around the world are breeding strains of rice that require less water and developing new methods to grow them. Texas rice-growing counties are slowly developing downstream reservoirs to store irrigation water. Perhaps in the future, water desalination processes will become financially viable. Also, rice farmers are a tenacious lot. “If and when water does become available again, there will be folks left here to utilize it for rice production.”

Changing Opinions

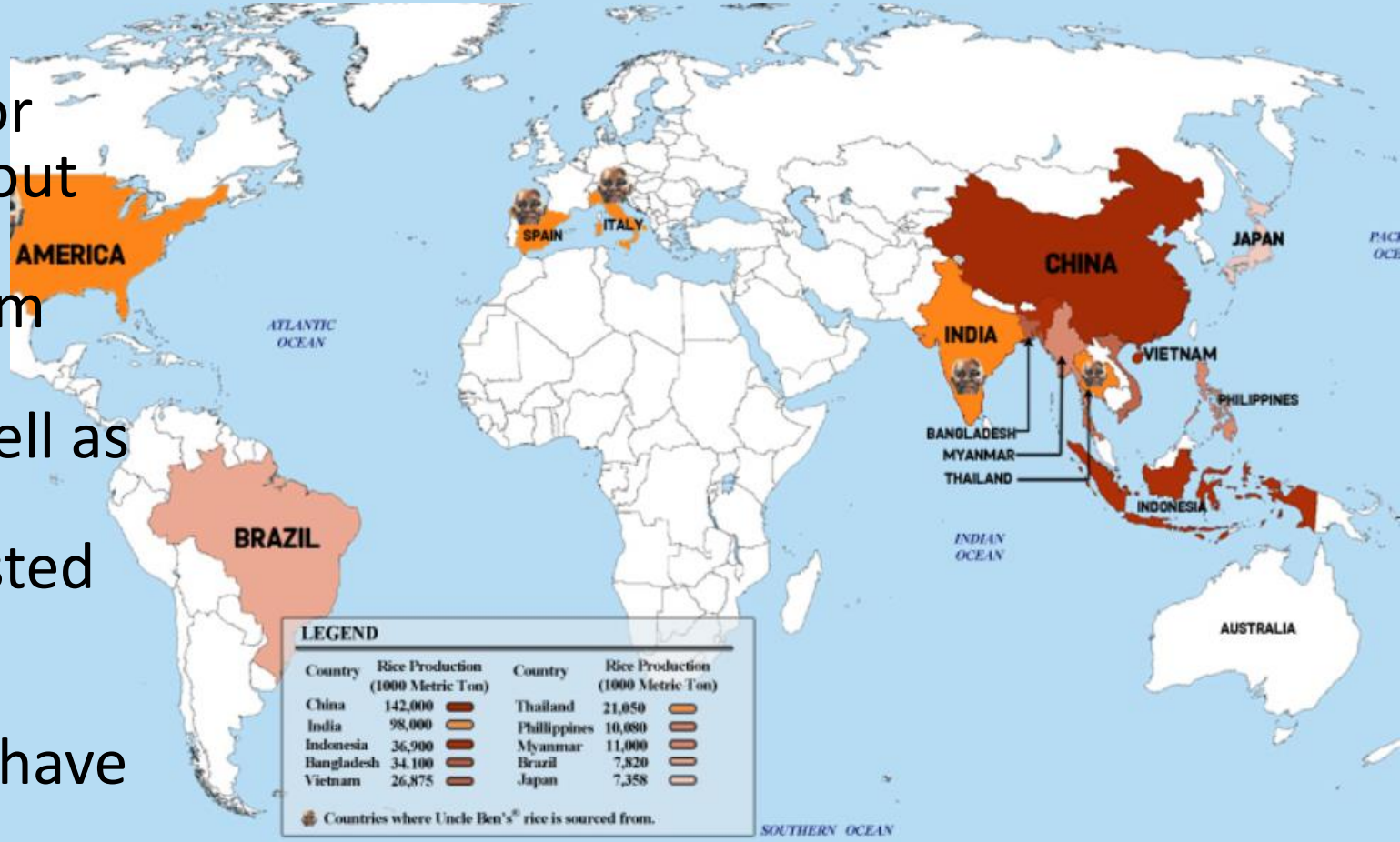
Meanwhile, the rice industry has tried to expand its market by boosting Americans' rice consumption. The Texas Rice Council, which collects payments from the state's rice farmers for joint marketing efforts, such as one that produced a bumper sticker. "Eat Rice," it reads. "Potatoes make your butt big."

Partially Successful

In one regard, they've made progress. Americans now eat 26 pounds of rice per year on average, which is nearly triple their consumption in the 1970s. But that increase is driven largely by immigrant communities that favor jasmine and basmati varieties, mostly imported from Thailand, India and Pakistan, over American medium and long grain rice.

Slumping Prices

Rice prices have declined for several years, averaging about 10 cents a pound in 2016, because of competition from huge rice producers like Vietnam and Thailand as well as increases in agricultural productivity that have boosted supplies. Over the past few decades, hundreds of rice farmers in Southeast Texas have given up the crop entirely.



A New Market

China consumes about 144 million tons of rice every year and is the world's largest rice importing country. China imports about 5 million tons of rice. China represents a major opportunity for the U.S. rice sector, which relies heavily on trade.

Free to Trade

For decades, in the name of national security, China had maintained a goal of producing 95 percent of its grain domestically. Around 2012, rocked by food safety scandals, China backed off that target, allowing it to slip to 85 percent. The U.S. went from exporting about $100 million in grain and feed from the U.S. in 2007 to a peak of $4.9 billion in 2015.

"That 10 percent is big for agricultural exporters," said Luis Ribera, an agricultural trade expert at Texas A&M.

Granted a Reprieve

The Texas rice industry was granted a deal to allow U.S. rice sales to China. The industry estimates that China soon could buy 250,000 tons of U.S. rice per year, out of the 9 million tons it produces, which could boost prices significantly and take a lot of risk out for farmers.

Still Banned

Rice, however, was still barred entirely, since the two countries hadn't agreed on a common food safety protocol. So, a few years ago, the USDA started facilitating trips by Chinese scientists to visit U.S. farms and rice mills. The U.S.A Rice Federation, a coalition of farmers and millers, was sponsoring exchanges as well.

Rice Deal Finally Signed

A few years ago, USA Rice's executive director, Betsy Ward, said she thought U.S. negotiators had a deal with China. But they could never get it signed by the Chinese.

After Agriculture secretary, Sonny Perdue, he visited China to celebrate a deal allowing exports of beef, the rice deal was finally signed.

It was a relief, after more than a decade of work. But the road forward may not be easy.

Room to Wiggle

"It's a very complex agreement and gives them room to find problems when they decide they want to," Ward said.

First Sale

A California producer struck a deal to make the first-ever sale of U.S. rice to buyers in China seven months since China officially opened its market to U.S. rice, ending 20 years of haggling.

Sun Valley and the Chinese buyer – privately owned Shenzen Yintuo – worked out a deal that allowed the purchase despite the tariff now being levied by China as part of the ongoing trade war with the U.S.

Now We're Banned

In August 2019 China banned all agriculture imports in retaliation to tariffs.

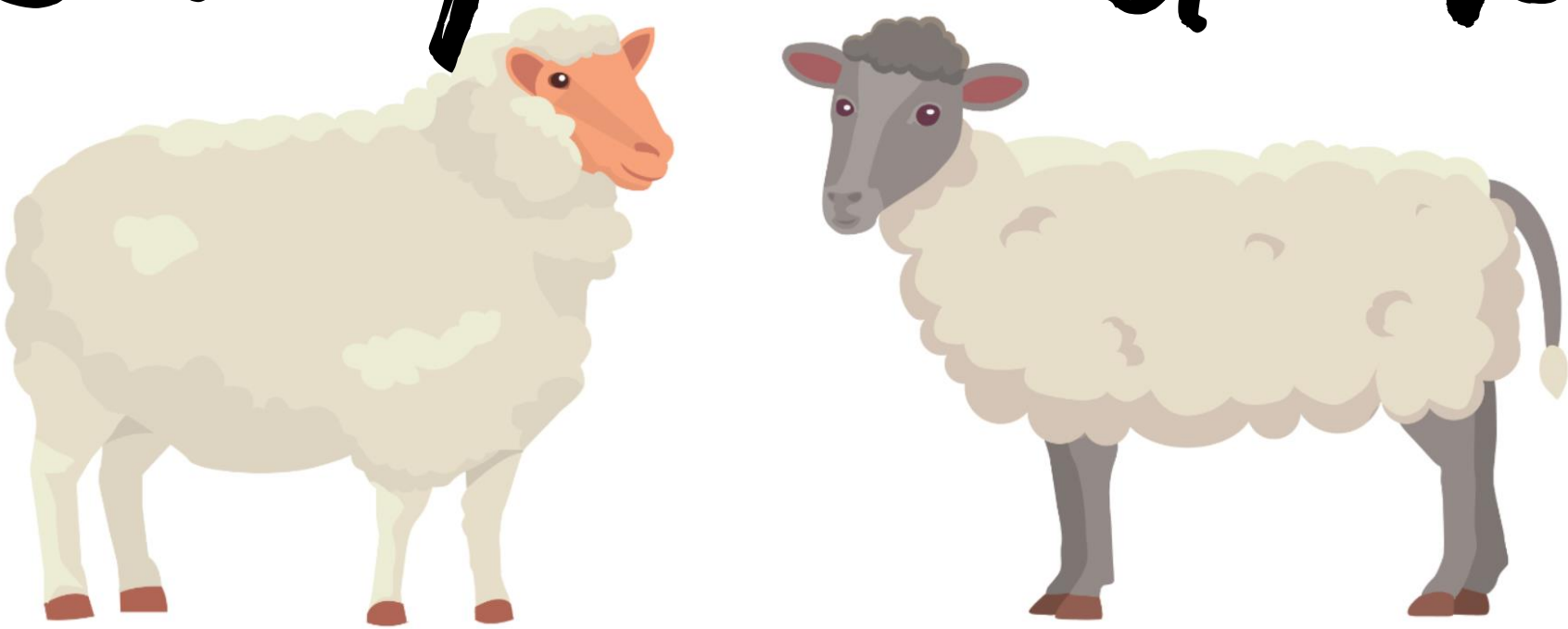
More Trouble with Tariffs

The U.S. rice industry could suffer from retaliatory tariffs in response to proposed steel and aluminum import tariffs.

It is estimated that total U.S. rice production and exports will drop 1.3 percent and 3 percent, respectively, and domestic consumption will increase marginally, as a result of the implementation of import tariffs on U.S. rice.

According to the report, while lower rice prices could benefit consumers by $66 million, lower prices could also negatively affect U.S. rice producers to the tune of $118 million.

Sheep and Goats



Market Continues to Grow

The market for sheep and goat meat, wool and mohair continues to grow.

While wool and mohair demand is high, it's nothing compared to the demand for lamb and goat meat. The markets have really been gaining momentum the last five years. Producers can't keep up with the demand for lamb.

Historic and Trendy

The demand for lamb comes primarily from ethnic markets, but it has also become a trendy meat option for millennials. The demand for lamb is much larger than what the United States can supply, so lamb is imported from Australia and New Zealand.

Top Producer of Goat Meat

Texas remains the top producer of goat meat, with 35 percent of the national supply. The Lone Star State also ranks first in sheep production and mohair production but falls behind other states in wool.

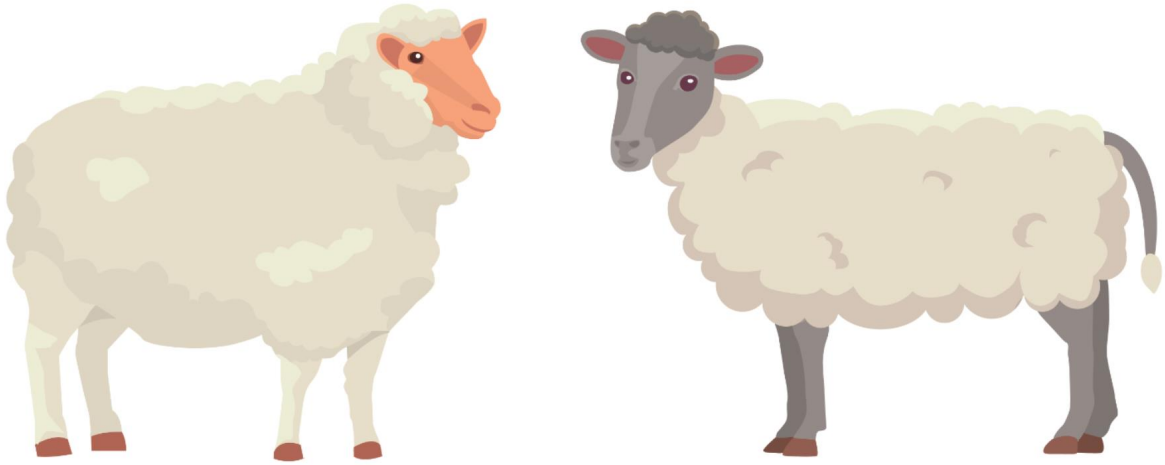
“There’s been a big transition in the last 10 years in the meat market, and now that demands for quality wool and mohair are helping those markets, we’re really seeing profitability opportunities that warrant inclusion of sheep and/or goats into beef cattle operations. There are more challenges in production, but the market for Texas producers is strong and all the trends are positive.”

-- Dr. Reid Redden, AgriLife Extension state sheep and goat specialist

This Year

Markets for goat and sheep meat and fiber continue to be relatively strong despite softening prices and lower inventories.

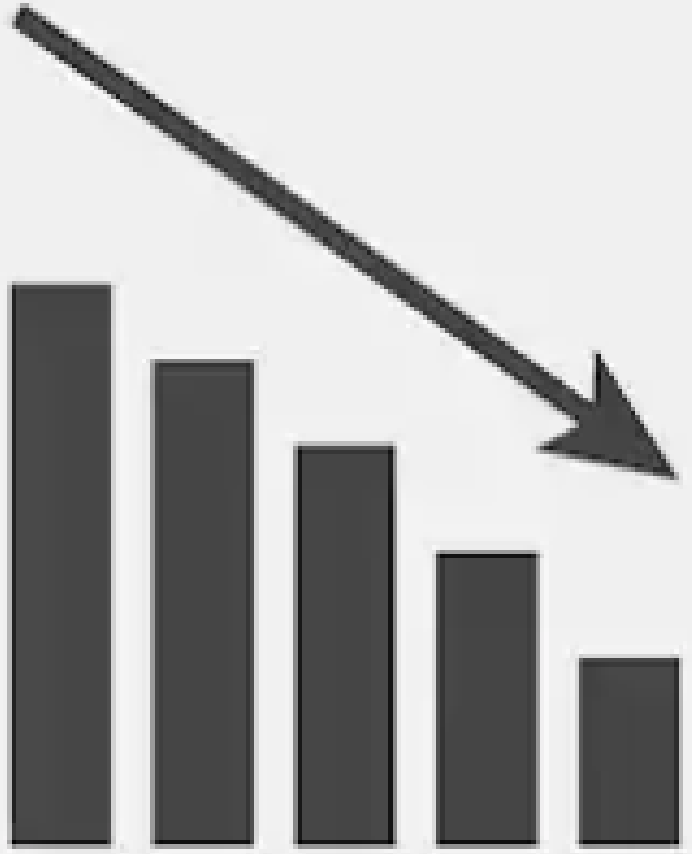
Sheep and goat numbers are down, but prices remain high relative to their respective five-year averages and demand for meat, hair and wool continues to grow.



A Bit of a Drop

"The goat markets were banner for the last few years, but inventories keep dropping. Imports and the value of the dollar may have something to do with that, but there is still room for producers to pencil out pretty good profits."

-- Bill Thompson, AgriLife Extension economist, 2019



Challenges

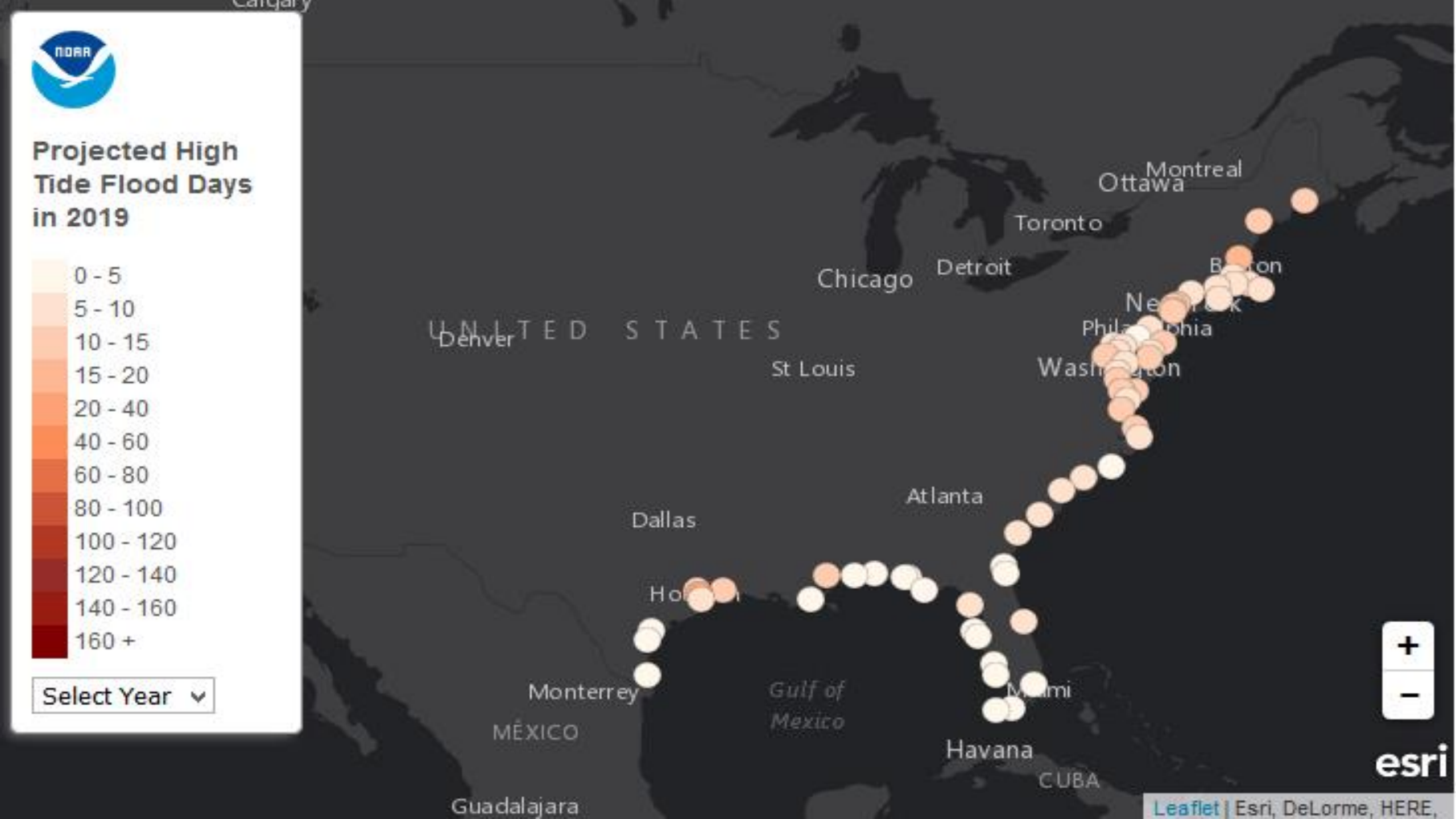
One possible deterrent for goat producers, especially those new to the industry, could be the animals' propensity for escape, property damage and general "mischievousness."

Predation also continues to be a top concern for sheep and goat producers. Producers south and west of San Angelo have faced challenging losses by incorporating management practices, including the use of guardian dogs.

Water

Rising Tide

A new government report says the Texas coast is increasingly at risk of flooding, even when there’s not a rain cloud in sight. Sea level rise is projected to cause more flooding from high tides in Texas and across the U.S


Projected High Tide Flood Days in 2019
0 - 5
5 - 10
10 - 15
15 - 20
20 - 40
40 - 60
60 - 80
80 - 100
100 - 120
120 - 140
140 - 160
160 +
Select Year
Montreal
Ottawa
Toronto
Chicago
Detroit
Denver
St Louis
Atlanta
Dallas
Monterrey
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Gulf of Mexico
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Primed for Crisis

It’s almost a maxim that the climatological history of Texas is in a constant cycle of drought and flood, with periods of just plain hardship in between.

But now, most scientists agree, climate change is making those cycles more severe, the droughts drier and the storms more vicious. And Texas’ antiquated laws are potentially priming the state for a water crisis.

Rules Remain the Same

What isn’t changing with the climate is how Texas deals with water, particularly groundwater. It allows landowners to pump it to their hearts’ content, even if it drains every drop of water under neighboring property. It’s known as the “Rule of Capture.”

Contrast

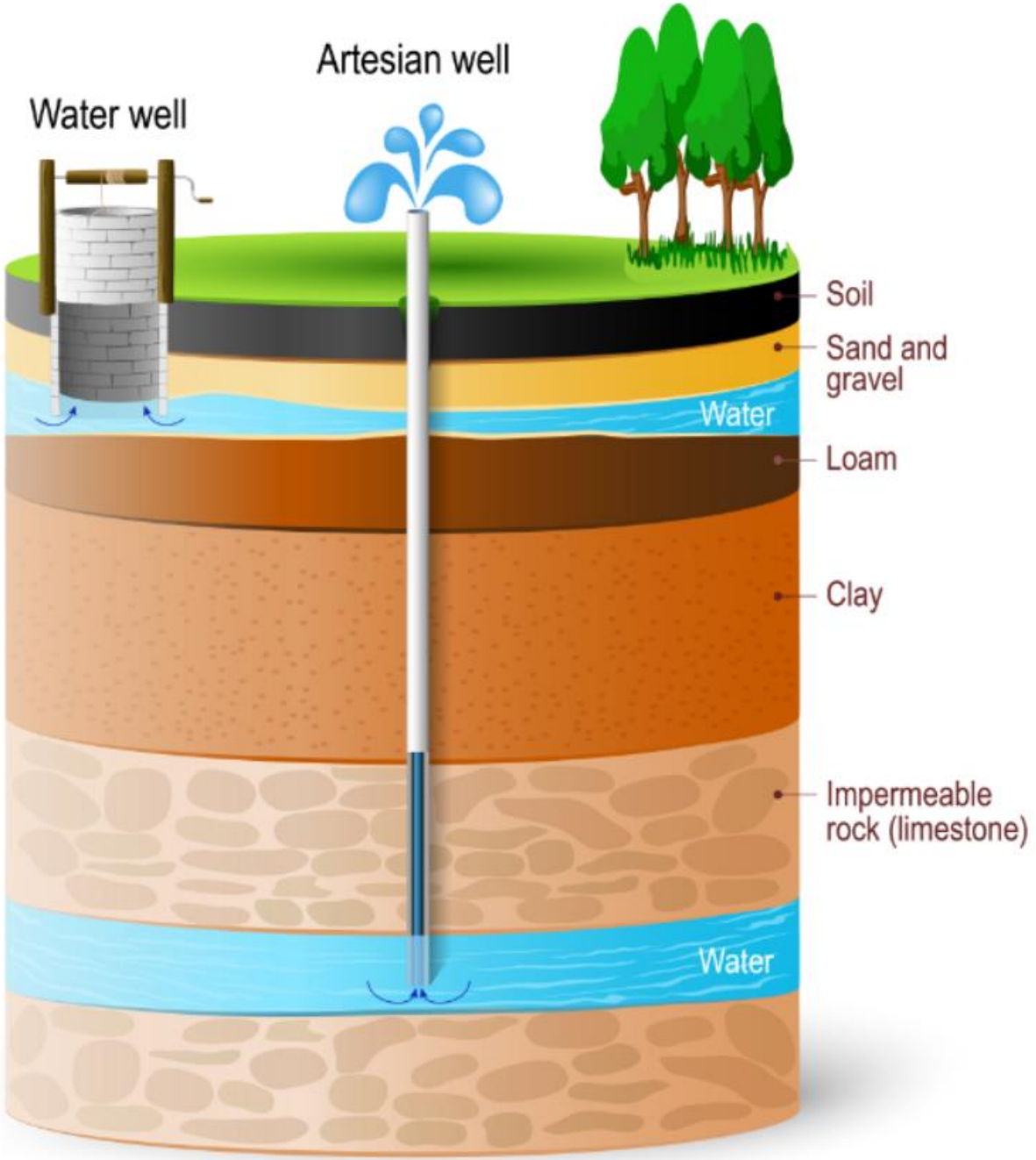
It stands in contrast to how the state, and many others in the West, regulate the use of surface water, which is legally considered a public resource and rights to it are granted on a first-come, first-serve basis.

Ground Water and Surface Water

Though they are linked in countless ways, one often replenishing the other, groundwater and surface water in Texas are viewed as entirely separate resources and are legally disconnected.

Laws of Nature

With global warming exacerbating both extreme weather and drought, the laws of nature are becoming even less friendly to a state that ignores them.



Crisis Closing in Fast

The escalating costs of climate change-related damages (e.g. Harvey & droughts) loom over cities and states nationwide, but Texas' crisis is closing in fast. Its population is expected to double from 24 million in 2010 to more than 54 million by 2050 according to the state demographer, putting exponentially more stress on its water supply.

Not Ready

State officials, among them Robert Mace, senior scientist and deputy executive director of the Texas Water Development Board, the state agency charged with developing the evolving Texas State Water Plan, freely acknowledge that Texas is ill-prepared for another storm like Harvey.

We Won't Make it Through

Chillingly, they concede that Texas currently does not have the resources to make it through a major drought, like the historic decade-long drought that devastated Texas in the 1950s, the so-called Drought of Record, without serious, perhaps even deadly, consequences.

Surface Water

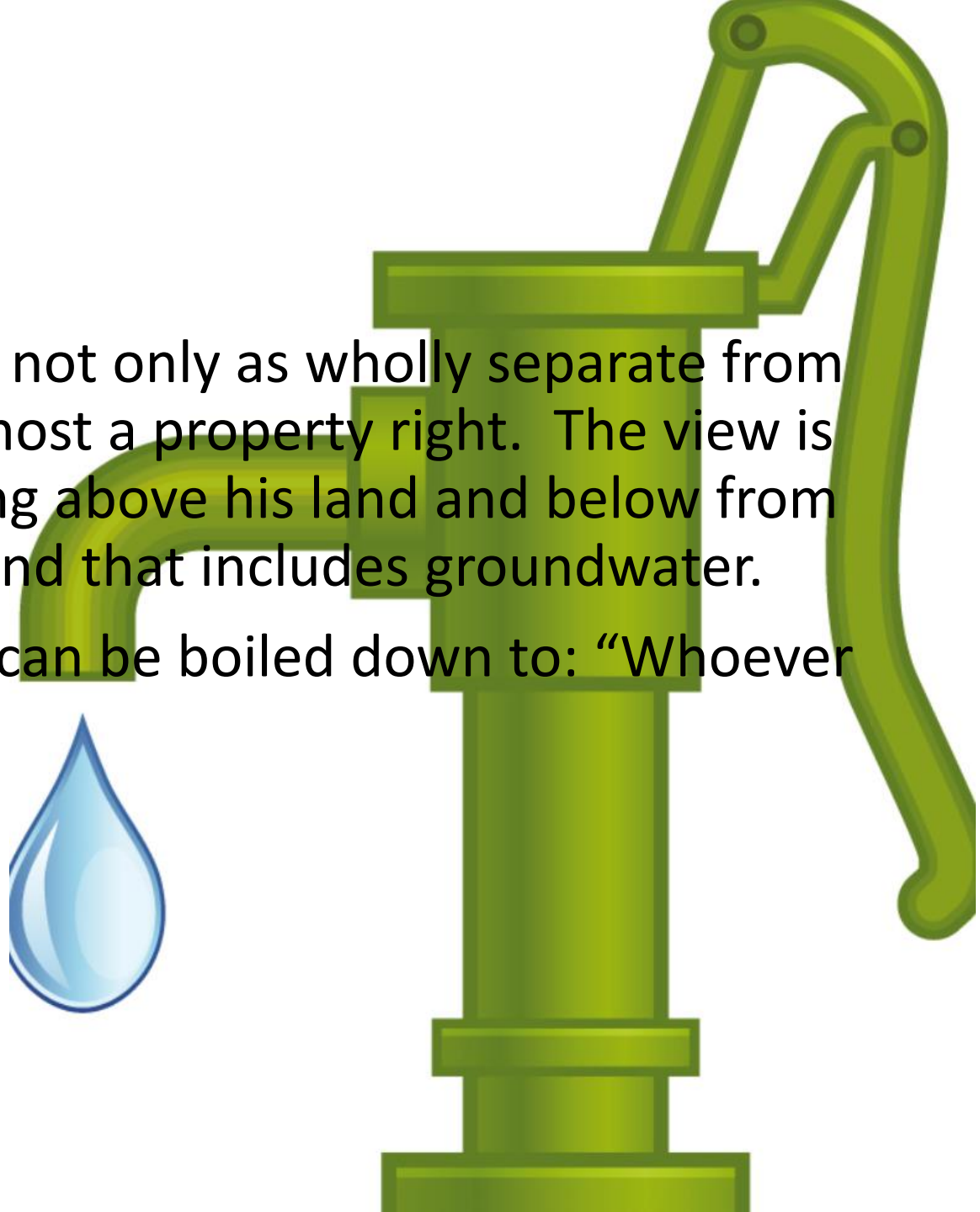
The system for allocating surface water as a public resource—"First in time, first in right" is the way it is essentially distilled—is hardly perfect, most experts say, noting that the state's waterways are over-allocated. There are more entities and people with legitimate claims to the water than there is water, even in good years.

But the system has provided a paradigm for allocation of surface water, which, though contentious, has survived through a couple of deep droughts in the past two decades.

Groundwater

Groundwater, in contrast, is viewed not only as wholly separate from surface water, but as first and foremost a property right. The view is that a landowner controls everything above his land and below from the sky to the center of the earth, and that includes groundwater.

In its simplest formulation, the law can be boiled down to: “Whoever has the biggest pump wins.”



Justification

This has in the recent past been used to justify catfish farms in the dry scree outside of San Antonio and to test plots of rice in the arid basin outside of Fort Stockton even during the worst droughts.

Unhappy Neighbors

This system has put Texas at odds with its neighboring states, particularly those that share the overdrawn Ogallala Aquifer.

What's m=Mine is Mine

Over the years, some halting steps have been taken to circumscribe the Rule of Capture. That authority, however, has been delegated to some 100 local groundwater districts, each defending parochial interests, and each mindful that in Texas, political survival often depends on recognizing that individual property rights are paramount.


Weather and Disasters

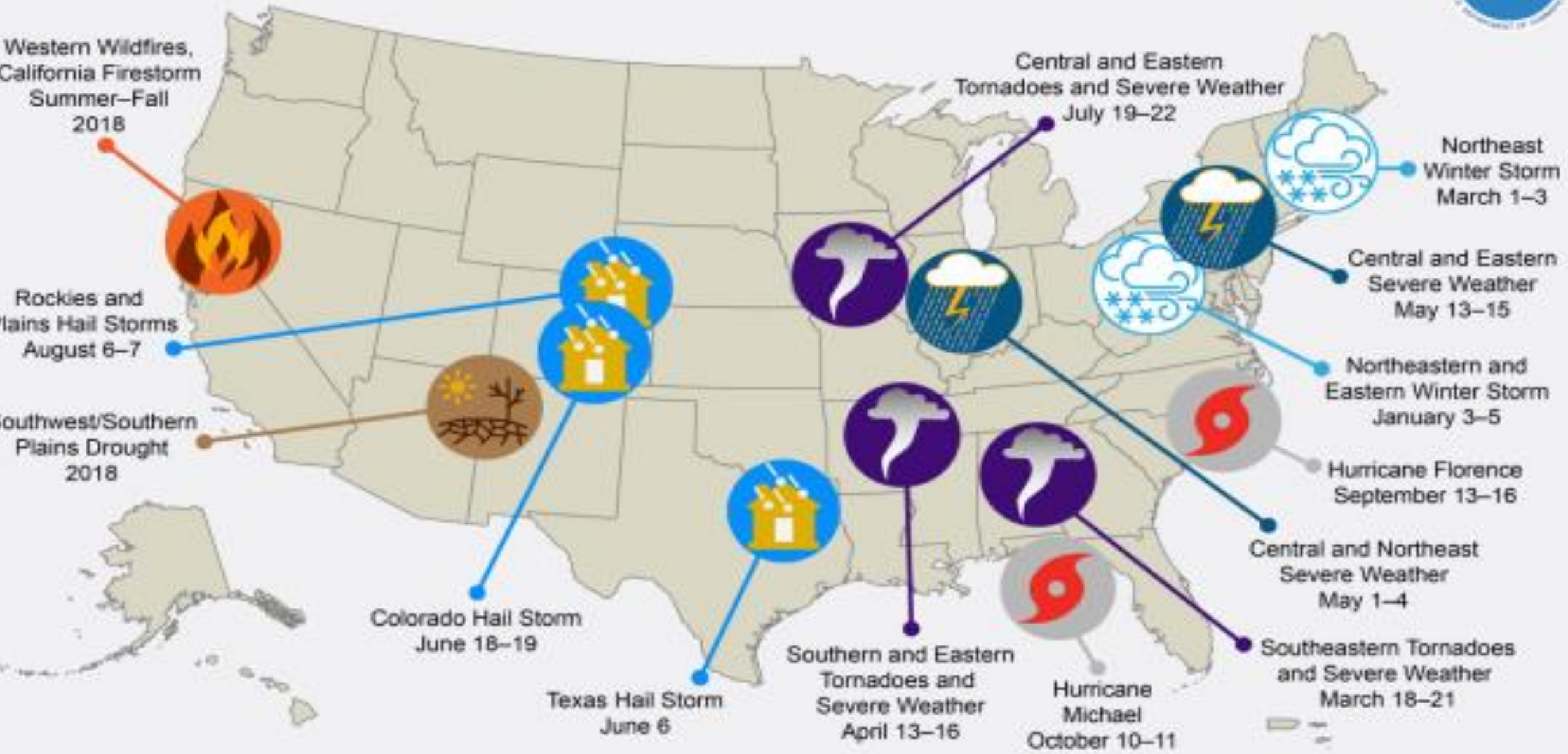
Changing the Nation

From the heat wave currently sweeping the Midwest to the oncoming ravages of hurricane season in the south, extreme and volatile weather impacts every state in the nation. But some states are more at risk than others as global warming changes the entire landscape of the country.

More Disasters

In 2018 the United States experienced 14 disasters that cost the economy as much or more than $1 billion dollars each. But the total cost of these hurricanes, wildfires, floods and other disasters that struck the U.S. last year is about $91 billion.

U.S. 2018 Billion-Dollar Weather and Climate Disasters



*This map denotes the approximate location for each of the **14 separate billion-dollar weather and climate disasters** that impacted the United States **during 2018**.*

“As natural and man-made hazards become increasingly complex and difficult to predict, the need for forward-leaning action is greater than ever before.”

-- Michael Hart, news desk manager of FEMA’s Office of External Affairs

Everything's bigger in Texas

One state really stands head and shoulders above the rest, and that would be Texas, ” says Smith. Over NOAA's 40 years of analysis, the Lone Star State has experienced more than 100 separate $1 billion disasters, from the Houston floods and hurricanes of 2017 to flooding and even winter storms, which are more usually associated with the Eastern Seaboard.

Leading the Nation

Texas has the highest frequency of extreme weather events over the period of analysis, and it also has the highest inflation-adjusted costs related to extreme weather. The government estimate of more than $250 billion in damage is a conservative one. The real number is likely much higher.

One Basic Plan

“Texas takes an all-hazards approach to disaster management and preparedness, whether it is hurricanes, tornadoes, floods, extreme heat or cold,” Chuck Phinney, chief of staff for the Texas Division of Emergency Management. That means the basic plan for dealing with disasters is the same no matter what comes: Local jurisdictions lead the emergency response push, with the state organization providing support for response and recovery.

“Other than using the private sector and nonprofit organizations in our response efforts, we do not work directly with businesses. However, one of our objectives following a disaster is to restore critical infrastructure as quickly as possible so that businesses can open. Because disasters begin and end locally, we suggest that businesses work with the local emergency managers.”

-- Chuck Phinney, chief of staff for the Texas Division of Emergency Management.

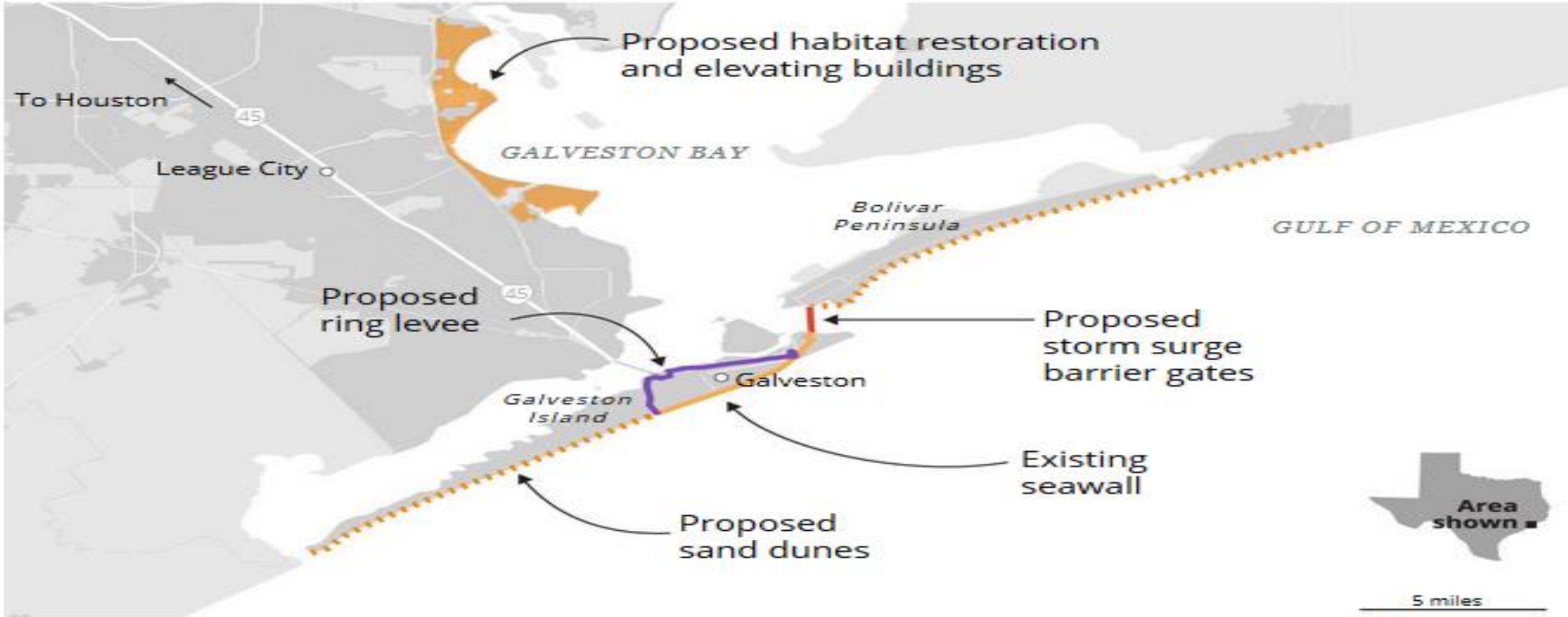
Protecting the Coast

Texas is designing what would become the nation's most ambitious — and expensive — coastal barrier.

If completed, Texas' coastal barrier would become just the second coastal protection system in the United States, after New Orleans' revamped levee system, and the largest that the Army Corps has constructed in its 200-year history — so large it would be visible from space.

How the government wants to guard the Houston area from hurricanes

The U.S. Army Corps of Engineers and the Texas General Land Office have proposed a major public works project to protect the Houston-Galveston region against hurricanes. It has evolved in recent months, but its major components now include sand dunes along Galveston Island and Bolivar Peninsula; massive storm surge barrier gates between the two landmasses; habitat restoration and elevating buildings; and a "ring" levee around the city of Galveston to protect it from incoming and outgoing storm surge.



Source: Coastal Texas Protection and Restoration Feasibility Study, Texas General Land Office
Credit: Connie Hanzhang Jin

But the Plan Remains Controversial

The Galveston business community says the proposed ring levee would hinder cargo and passenger loading at the Port of Galveston, a key destination for major cruise ships.

And environmentalists worry that a gate system between Galveston and Bolivar to block storm surges — the most important, expensive and complex component of the plan by far — would hinder an exchange of saltwater and freshwater between Galveston Bay and the Gulf of Mexico that is crucial for marine life [and the fishing industry].

With a High Price Tag

The original version of the coastwide project, which includes extensive beach nourishment wetland restoration and other natural storm surge barrier absorbers on the lower Texas coast, was estimated to cost between $23 billion and $32 billion, with the Houston-Galveston coastal barrier system making up as much as $20 billion of that.

Proponents note that Harvey and Ike each inflicted tens of billions of dollars in damage. That means this project would pay for itself in one storm.

Not Any Time Soon

Even in a best-case scenario, the project won’t be completed until 2035 and it will likely take far longer than that.

Worried about the Fish

Environmentalists maintain the Ike Dike could screw up Galveston Bay itself, which would affect the wildlife living in and around it, potentially altering the entire estuary system, from the rivers to the coast.

Whooping cranes, sea turtles, shrimp, oysters, fish and bottlenose dolphins are all dependent on the health of Galveston Bay. If the bay's salinity shifts or its water level drops, that effects the lives of everything in and around the bay.

Not without Consequences

Congress also may allow the U.S. Army Corps of Engineers to skip the environmental review and to expedite the entire process so that the details get overlooked. Projects get built faster this way, but not always wisely. “It looks harmless. It looks like a positive thing, but there could be consequences to changing Galveston Bay in such a fundamental way, and they may not even get looked at if Congress just signs off after the next big storm. None of these projects are without impact; none of these ideas are without consequences.”

Agreeing on One Thing

One thing the two sides agree upon: Something needs to be done. When the perfect storm finally hits just to the south of Galveston — where Ike was originally slated to make landfall — feeds off Galveston Bay and then roars up the Houston Ship Channel, it will cut a swath of devastation through the entire coastal region, covering Galveston, Clear Lake and half of Houston with water. It will unleash hundreds of gallons of oil and other chemicals and toxins into the flood waters, creating the worst environmental and natural disaster ever seen in the United States.