

# Do More Biodiversewise

Pollinators and butterflies are in peril and you can help by creating “spas” places to recharge!

## What do they need? A place to live!

- Their needs are our needs: Food, water, and shelter for each stage of their life cycle! (e.g. nesting, or overwintering)
- Insects have life cycles of several stages; each stage may have different needs.
  - Caterpillar (larval stage) may eat different plants than the adult butterfly needs for nectar
  - Solitary leaf cutter bees nest underground
  - Mason bees nest in wood borings
  - Some bees or butterflies prefer deep tubular flowers, others prefer open flowers

## What can we do? Create habitat!

- **Plant flowers**, preferably native, that have different colors, shapes and overlapping bloom times
- **Protect** nesting and egg laying sites and provide nesting material by leaving bare ground and avoiding weed cloth
- **Provide** secure places for overwintering by being slow to take down your garden and by leaving brush piles, hollow twigs, and rotten logs
- **Create** a shallow clean water source
- **Do no harm!** Don't use pesticides, keep nesting sites clean, and **TURN OFF LIGHTS AT NIGHT!**
- **Learn** about pollinators; spend some time observing
- **Involve** a young person
- **Teach** the community

# Know More Biodiversewise

## General References

**Mader, E. et al.** 2011. Attracting Native Pollinators. Protecting America's Bees and Butterflies. Storey Pub. North Adams, MA. 371 p.

**Pollinator Partnership.** [www.pollinator.org/](http://www.pollinator.org/) Planting guides by zip code, pollinator syndrome chart and more

**Texas A&M Agrilife Extension.** Butterfly gardening.

[www.agrilifeextension.tamu.edu/solutions/butterfly-gardening/](http://www.agrilifeextension.tamu.edu/solutions/butterfly-gardening/)

**USDA Forest Service**

<http://www.fs.fed.us/wildflowers/pollinators/> There is a wealth of information here.

**Xerxes Society.** [www.xerxes.org](http://www.xerxes.org) several publications about attracting pollinators and gardening for butterflies.

## Butterflies

**Ajilvsgi, G.** 2013. Butterfly gardening for Texas. Texas A&M Univ. Press. College Station, TX. 437 p.

**Butterflies and Moths of North America**

<http://www.butterfliesandmoths.org/>

**Journey North:** Monarchs and a whole lot more!

<https://www.learner.org/jnorth/>

**Monarch Watch.** <http://www.monarchwatch.org/>

**The Children's Butterfly Site.** <http://www.kidsbutterfly.org/>

**Texas A&M Agrilife Extension.** Butterfly gardening.

[www.agrilifeextension.tamu.edu/solutions/butterfly-gardening/](http://www.agrilifeextension.tamu.edu/solutions/butterfly-gardening/)

## Bees

**Wilson, J.S. and O.M. Carril.** 2016. A guide to North America's Bees: The Bees in your Backyard. Princeton University Press. Princeton, N.J. 288 p.

**Spivak, M.** 2013.

<https://www.youtube.com/watch?v=dY7iATJVCso&t=97s>

**Spivak, M and C. Mraz.** 2017.

<https://www.youtube.com/watch?v=pStpt0ZLK9Y&t=27s>

# Do More Energywise

While energy is essential to modern society, most primary sources are unsustainable

[http://css.umich.edu/sites/default/files/U.S. Energy System Factsheet CSS03-11\\_e2018.pdf](http://css.umich.edu/sites/default/files/U.S._Energy_System_Factsheet_CSS03-11_e2018.pdf)

**What is the problem: Energy has become an invisible, cheap commodity which few people consider.**

- With less than 5% of the world's population, the U.S. consumes 17% of the world's energy and accounts for 15% of world GDP.  
<http://css.umich.edu/factsheets/us-energy-system-factsheet>
- The generation of electric power and the infrastructure that delivers it is in the midst of dramatic and rapid change. <https://energy.utexas.edu/policy/fce>
- When we think about electricity and how it is made, we need to think about the direct and indirect costs for the whole system.

**What can we do? Become more energy conscious and save money!**

- Increase your use of renewable energy
- Invest in solar panels
- Bike for short errands
- Use a clothesline
- Install energy efficient windows
- Put in more insulation
- Choose EnergyStar appliances
- Eat locally
- Recycle where possible

# Know More Energywise

## General References

**Center for Sustainable Systems.** U.S. Energy System.

[http://css.umich.edu/sites/default/files/U.S. Energy System Factsheet\\_CSS03-11\\_e2018.pdf](http://css.umich.edu/sites/default/files/U.S._Energy_System_Factsheet_CSS03-11_e2018.pdf)

**Environmental Protection Agency.** Reduce the Environmental Impact of Your Energy Use. <https://www.epa.gov/energy/reduce-environmental-impact-your-energy-use>

**The University of Texas at Austin Energy Institute**

The Full cost of electricity <https://energy.utexas.edu/policy/fce>

## Solar References

**Environmental Protection Agency.** Planning a home solar electric system <https://www.energy.gov/energysaver/planning-home-solar-electric-system>

**US Energy and Information Administration.** (EIA). Solar explained. [https://www.eia.gov/energyexplained/index.php?page=solar\\_home](https://www.eia.gov/energyexplained/index.php?page=solar_home)

# Do More Foodwise

*Eat Food! Mostly Plants! Not too Much!*

Michael Pollan

**What is the problem:** The way we grow our food has economic, social and environmental costs that make our food system unsustainable. Overtime there has been an increase in:

- agribusiness vs small family farms.
- dependence on chemical fertilizers, pesticides, and herbicides.
- unhealthy mass production of meat animals.
- human obesity and unhealthy eating habits.
- increased transportation costs for food.
- complicated and unequal food distribution systems.
- soil and water degradation.

**What can we do?**

- Eat locally and in seasonally
- Eat less meat
- Eat organic
- Reduce waste
- Grow your own
- Make your own
- Enjoy your food

# Know More Foodwise

## General References on Growing your Own Food

**Texas A&M Agrilife Extension.** Gardening and Landscaping.

<https://agriflifeextension.tamu.edu/browse/featured-solutions/gardening-landscaping/>

**Permian Basin Master Gardeners.**

<https://www.westtexasgardening.org/>

## Food Thoughts

**National Public Radio.** The Future Of Food: NPR

<https://www.npr.org/2019/06/03/729327973/the-future-of-food>

**Pollan, Michael.** 2006. Omnivore's dilemma. The Penguin Press. New York, NY. 450 p.

\_\_\_\_\_. 2008. In defense of food. The Penguin Press. New York, NY. 244 p.

\_\_\_\_\_. 2009. Food rules. The Penguin Press. New York, NY. 140 p.

\_\_\_\_\_. 2013. Cooked. The Penguin Press. New York, NY. 140 p.468.

\_\_\_\_\_. In Defense of food.

<https://www.youtube.com/watch?v=37NHX2iZrBA>

**The Pavarotti of Pasta**

<https://www.cbsnews.com/video/chef-massimo-bottura-the-pavarotti-of-pasta-60-minutes-2019-07-14/>

# Do More Soilwise

**Soil is being depleted on the average each year 18 times faster than it is being built up in Nature!**

## **What is the problem: Our soils are literally leaving us!**

- About 1/3 of the world arable soils have been degraded so that they no longer can produce food.
- With an increase in the world population, there will be a need for more food.
- By some estimates, we may have only sixty more years of farming left if soil degradation continues.

## **What can we do? Restore soil health!**

- Find out about local ecosystems
- Irrigate efficiently and wisely
- Reduce soil and wind erosion
- Compost
- Add organic material to your soil
- Buy organic foods
- Know how your food is grown
- Eat locally from a producer who uses regenerative farming practices
- Remember that soil is “living” and how you treat your soil matters

# Know More Soilwise

## General References

**Environmental Protection Agency. Improving Urban Soils.**

[https://www.epa.gov/sites/production/files/2015-08/documents/fs\\_improving\\_urban\\_soils.pdf](https://www.epa.gov/sites/production/files/2015-08/documents/fs_improving_urban_soils.pdf)

**Natural Resources Conservation System (NRCS). Soil erosion report**

[https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_010152.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_010152.pdf)

**Sustainable Agriculture Research and Education (SARE).**

**The Living Soil.** <https://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version/The-Living-Soil>

**Texas A&M Agrilife Extension.** Gardening and Landscaping.

<https://agrilifeextension.tamu.edu/browse/featured-solutions/gardening-landscaping/>

**Texas A&M Agrilife Extension.** Crops and Soil

<https://agrilifeextension.tamu.edu/browse/featured-solutions/crops-soil/>

**Texas A&M AgriLife Extension.** Earth-Kind Landscaping.

<https://aggie-horticulture.tamu.edu/earthkind/>

# Do More Waterwise

*We forget that the water cycle and the life cycle are one.*

**- Jacques Cousteau**

## **What is the problem: Too little water for our “needs”!**

- Water has become an invisible, cheap commodity instead of a critical resource
- Our water comes from far away: Surface and underground water sources are 67 to 120 miles away!
- We are using Ogallala aquifer water at 8 times the rate it is being replenished.
- About 70% of our water usage goes to growing green lawns
- We will have to reduce our demand by 30% to have enough water for future Texans according to the Texas Water Development Board

## **What can we do? Develop a water ethic!**

- Irrigate efficiently
- Reduce turf
- Choose appropriate plants
- Know your irrigation system
- Irrigate appropriately and maintain system
- Direct and retain rainwater for landscape use
- Reduce impermeable surfaces
- Convert to low water use toilets

# Know More Waterwise

## General References

**Alliance for Water Efficiency.**

<http://www.allianceforwaterefficiency.org/>

**Barnett, C. 2011.** Blue Revolution, unmaking America's water crisis. Beacon Press Books. Boston, MA. 286 p.

**Comptroller, Susan Coombs.** 2011. Impact of the 2011 drought and beyond.

<http://comptroller.texas.gov/specialrpt/drought/96-1704-Drought.pdf>

**Texas A&M Agrilife Extension.** Earth-Kind landscaping:

Landscape water Conservation. <https://aggie-horticulture.tamu.edu/earthkind/training/landscape-water-conservation/>

**Texas A&M Agrilife Extension.** Water.

<https://agrilifeextension.tamu.edu/browse/featured-solutions/water/>

**Texas Water Development Board (TWDB)** Great site with everything from interactive games to how to manuals to area water reports. <http://www.twdb.state.tx.us/home/index.asp>

**TWDB. 2016.** Water for Texas. 2017 State Water Plan

<http://www.twdb.texas.gov/waterplanning/swp/2017/doc/SWP17-Water-for-Texas.pdf>

<http://www.twdb.texas.gov/waterplanning/swp/2017/index.asp>

<https://2017.texasstatewaterplan.org/statewide> (interactive plan)

## Onsite Water Harvesting

**Lancaster, B.** Rainwater harvesting for drylands and beyond.

<http://www.harvestingrainwater.com/>

**Ludwig, Art.** Laundry to landscape system.

<http://oasisdesign.net/greywater/laundry/#design>

**Water Conservation Alliance of Southern Arizona.** Water CASA.

<http://www.watercasa.org/>