



2015

International Year of Soils

January... Soils Sustain Life



Issues:

Soils are Alive and Complex

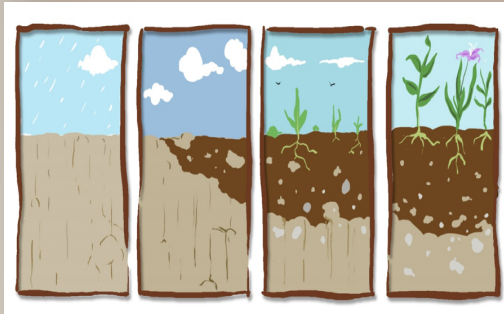
Soils lie at the root of our existence. Not only are they home to many living organisms, but they provide the physical foundation of every ecosystem and food web.

Understanding soils requires a multi-disciplinary approach that includes biology, chemistry, physics, and the interactions thereof.



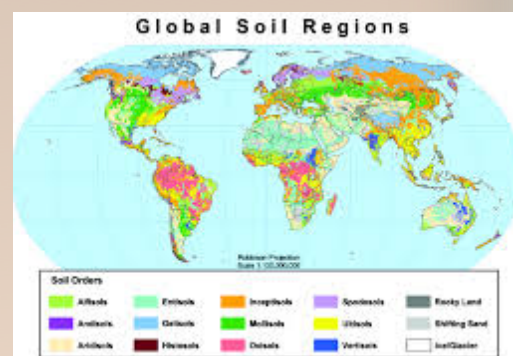
Soils are Created and Destroyed

Soil degradation has led to the fall of many a civilization: from the hillslopes of Persia, eroded by deforestation to the "Fertile Crescent," laid barren by salinization from over-irrigation. Today, 33% of global soils have been degraded, due to human activities and reports estimate only 60 years of topsoil left!



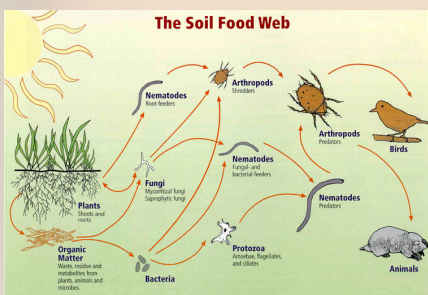
Soils are Everywhere

Soils are located all across the globe. Oceans occupy 75% of Earth's surface; 21% is inhospitable (too rocky, too wet, or too hot) and the remaining 3.1% must support both development and food production for all.



Soils provide Ecosystem Services

Soils are often taken for granted as mere media for plants, when in fact they are quite multi-functional! From clean air & water to raw materials that support global economies, soil ecosystem services enable life on Earth!



"Civilization itself rests upon the soil." - Thomas Jefferson

Resources:

January Resources: <https://www.soils.org/iys/12-month-resources/january>

January SSSA Video: <https://youtu.be/vDL6F6GkAzI>

Show a little love for soil -- support #IYS on social media!



Science:

Soils are Alive and Complex

- Soil is the interface of the hydrosphere, atmosphere, biosphere, and lithosphere
- Soil is a 3-Phase System: liquid, gas, & solid
- 1,000s of species live in just 1g of soil



Soils are Created and Destroyed

- Soil develops from parent material (i.e. rock), subjected to the effects of climate, biotic activity, and topography, over time.
- It takes 500-1,000 years to create just an inch of topsoil!
- Soil erosion (removal by wind or water) outpaces soil formation by 10-40x



Soils are Everywhere

- Soils are mapped by field sampling and remote sensing (ie. aerial photos, LIDAR)
- USDA-NRCS has soil maps and online data for 95% of the US
- SoilWeb (right) provides soil data using Google maps, so you can learn about the soil in your own backyard!



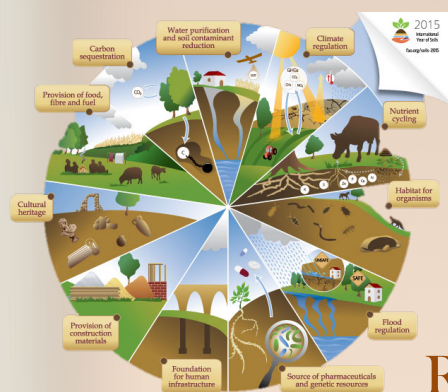
Soil Ecosystem Services

Provisioning: food, feed, fiber, fuel, pharmaceuticals

Regulating: Carbon sequestration, purification of water and air, pest/disease control

Supporting: soil formation, nutrient cycling, primary production

Cultural: art, recreation, aesthetics



"The soil is the great connector of lives, the source and destination for all." - Wendell Berry

People:

Soils are studied in a variety of fields:

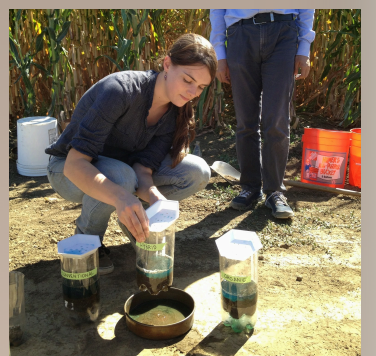


- Microbiologists - study the wealth of genetic diversity in soil for advancing medicine, improving agriculture, etc.
- Chemists study the fate and transport of contaminants in the soil.

• Engineers use soil data to decide the best sites for certain types of development.

• Hydrologists study how water moves through the soil and identify opportunities for groundwater recharge.

• Agricultural scientists study plant-soil-microbe interactions to maximize production on less and less land.



Outreach:



SSSA sends graduate students to DC to advocate for soils.

The Food and Agriculture Organization of the UN has declared 2015 the International Year of Soils! In celebration of the value and importance of our most precious natural resource, SSSA has pooled together soil scientists and enthusiasts from around the country to develop lesson plans, member activities, and media content that raise awareness, inspire reverence for soil, and promote sustainable management practices.

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Supporting Services	Regulating Services	Provisioning Services	Cultural Services
\$100	\$100	\$100	\$100
\$200	\$200	\$200	\$200
\$300	\$300	\$300	\$300
\$400	\$400	\$400	\$400
\$500	\$500	\$500	\$500

NEARLY ALL OF THE ANTIBIOTICS USED TODAY, SUCH AS PENICILLIN, WERE DISCOVERED FROM SOIL MICROORGANISMS. DUE TO ITS VAST GENETIC DIVERSITY, SOIL IS A MAJOR SOURCE OF DISCOVERY FOR THIS.

Example of a lesson plan

"A nation that destroys its soil, destroys itself." -FDR

Special thanks to: Dr. Dave Lindbo and Dr. Kate Scow for leading the January initiative, as well as Katelin Alldritt, Barbara Alves, Annie Bossange, Andrew Brown, Kayla Burns, Jessica Chiartas, Deirdre Griffin, Garrett Long, Andrew Margenot, Zhiyuan Tian, and Hannah Waterhouse for their resource contributions and enthusiasm!