

What factors contribute to the development of a Karst sinkhole?

- Man's alterations of natural filtration of water into the ground
- Ground water withdrawals
- Vibration inducing activities (drilling, mining, artillery shelling, heavy traffic)
- Weight of overlying material down along the walls of the void (road traffic, structures, retention ponds, etc.)

What factors contribute to the development of other types of sinkholes?

-These can be similar to Karst sinkholes-

- Man's alterations of natural filtration of water into the ground
- Burying cut tree stumps rather than pulling and filling
- Leaking or damaged culverts
- Improper disposal of building materials by burial on property
- Improperly sealed wells (drinking water or irrigation wells)
- Improperly functioning drainage system

How are sinkholes related to groundwater quality?

Water is naturally purified when it passes through soil. Where soil cover is thin, groundwater may not be filtered sufficiently to remove surface contaminants (e.g., disease causing organisms, pollutants, carcinogens, etc.). Surface water that enters a sinkhole passes directly into the groundwater without any filtration. In addition, contaminants that enter a sinkhole are transported at a very high rate of speed, meaning that they enter the groundwater quickly.

What can I do about sinkholes and what preventative measures can I take?

- Report a suspected sinkhole to the Onslow County Emergency Management Operations Center during normal business hours at (910)347-4270.
- To prevent contamination, properly seal unused wells. Test wells annually for nitrate and bacteria.
- Properly store and dispose of fuels, fertilizers, chemicals, trash, junk, and waste material. **Don't put any of these into a sinkhole!!!** You might contaminate the ground water and nearby waterways.
- Sinkhole insurance can be purchased for geologic sinkholes, but not those caused by drainage issues or buried material decay.

Where can I get more information on sinkholes?

NC Geological Survey

http://www.geology.enr.state.nc.us/Geologic_hazards_sink_holes_karst/sinkholes.htm

NC Division of Water Resources

http://www.ncwater.org/Education_and_Technical_Assistance/Ground_Water/Sinkholes/

Onslow County

Emergency Management: Call during working hours: (910) 347-4270

<http://www.onslowcountync.gov/>



Eastern North Carolina Sinkholes



What is a sinkhole?

A **sinkhole** is a natural depression or hole in the surface caused by the removal of soil or bedrock, often both, by water. Sinkholes may vary in size from less than a foot to several hundred feet both in diameter and depth, and vary in form from soil-lined bowls to bedrock-edged chasms. They may be formed gradually or suddenly and are found worldwide. It is a localized collapse or subsidence of bedrock and/or soil. When a break in the soil is visible—this is called a “cover-collapse” sinkhole. A “closed depression” is another type of sinkhole where the ground cover hasn’t collapsed, but where the subsurface is likely to be relatively unstable and water may flow very quickly into the bedrock aquifers.

What is Karst geology?

Karst is an area where bedrock such as limestone or dolomite is easily dissolved by water. Karst regions are large geographic areas where cracks and layers between the bedrock easily transport water and pollutants to the groundwater. Sinkholes, shallow soils, sinking streams and springs are found in areas of Karst bedrock. Onslow County does have areas of Karst geology (see map on cover).



What other types of sinkholes are there?

In addition to the Karst types mentioned above, there are two other types of sinkholes. The first is decayed material like a tree stump or construction debris that is buried and eventually rots. The topsoil caves into the hole created by the rotten material. The second type is one that is caused by faulty culverts, drains or pipes that are leaking. The flow of water along the culvert, drain or pipe causes the topsoil to erode away creating the sinkhole.

What are the signs of a sinkhole?

(Caveat: these signs of sinkholes may also be signs of other types of problems. For example: cracks in pavement could be due to a tree root or ice expansion)

- Fresh exposures in fence posts, foundations, and trees that result when the ground sinks
- Sloping, sagging, slanting of fence posts, trees or other objects
- Doors or windows that don’t close properly
- Ponding—small ponds of rainfall forming where water has not collected before
- Wilting of vegetation—wilting of small circular areas of vegetation. This happens because the moisture that normally supports vegetation in the area is draining into the sinkhole that is developing below the surface
- Turbidity in well water—muddy water in nearby wells during early stages of sinkhole development
- Structure failures—cracks in walls, floors, pavement; cracks in the ground surface