F. Robinson 54.1

EROSION AND SEDIMENT

A slide presentation for
Norman A. Berg, Associate
Administrator, SCS, at
North Carolina SCSA Chapter
Meeting, Raleigh, North
Carolina, June 22-23, 1972

It's a pleasure to be in North Carolina and speak to a group that has as its motto "To advance the science and art of good land use." For the need for such work is greater today than ever before. We all have a mutual interest in your program theme -- SEDIMENT. We also have a mutual interest in what causes it, and how it can be controlled.

Fortunately, the public interest in sediment and erosion control is growing. What for decades has been considered a farm problem is now catching the interest of urban people. Sediment is recognized as a major water pollutant and as a carrier of other pollutants.

This recognition puts the spotlight on the urgent need for conservation programs. For through this we improve the environment for whole communities.

We can't fully realize the national sediment problem without viewing the causes. So in a series of slides, let me give you an overview of the problem.

LIGHTS OUT. SLIDE RUN BEGINS.

1. Our single largest source of sediment is from farms and ranches, but they only account for half of the 4 billion tons of sediment produced. And our 3,000 soil conservation districts are vigorously attacking this agricultural related sediment problem.

2. Other serious sediment sources include the thousands of miles of secondary roads. A Georgia study showed that measured soil losses from bare roadside cuts were as high as 185,000 tons per square mile per year.

3. Nationally it is estimated that 56 million tons of sediment are washed from unstabilized roadsides each year.

4. Soil erosion is also a problem along an estimated half million miles of streambanks in the United States. It causes loss of valuable land and increases sediment pollution.

5. According to the U.S. Army Corps of Engineers, there are some 555,000 miles of eroding streambanks that produce sediment.

6. Surface mining has disturbed more than 4 million acres, and the acreage is estimated to more than double by the year 2,000.

7. Much of this mining has been done without adequate regard for restoration.

8. Spoil banks are steep, stony, and highly acid.

9. They almost defy revegetation, and pollute streams with sediment, acid materials, and debris.

MORE

10. But one of the greatest erosion and sediment threats today is on areas undergoing urban development.

11. Our metropolitan areas are growing very rapidly, taking an estimated three-fourths of a million acres of farm and open land each year. Much of the growth has been haphazard and poorly planned.

12. It is said that in the next 10,000 days we will build in and around our major cities the equivalent of everything we've built since Plymouth Rock. And a staggering amount of soil will be moved in doint it.

13. This burgeoning growth is the result of our increasing population. We are adding 6,000 people to our cities each day. That's another Hartford every 30 days. Another Atlanta in under 3 months. Another Los Angeles in a year.

14. For the most part this growth is accomplished by chance. A farm is sold and a crop of houses sprouts up instead of corn or cotton.

15. All too often the new crop doesn't have the soil protecting safeguards of the farm crop it replaces. The land is stripped bare and left vulnerable. Soil erosion on a square mile of land can skyrocket from as little as 50 tons a year on farmland to more than 25,000 tons a year on land being converted to suburban uses.

16. When it rains, the runoff water rips away the unprotected soil, damaging the construction site itself.

17. The eroded soil material washes from higher ground to lower ground.

18. And is carried along in the water to storm sewers to reappear downstream.

19. Here a muddy tributary from a construction site joins a relatively sediment free stream that drains farmland.

20. The soil particles don't stay suspended in the water for long. Many are dropped out along the course of the stream, filling the streambed and clogging expensive drainage structures.

21. The soil laden water pours into lakes and reservoirs . . .

22. Reducing the storage capacity, increasing the cost of water treatment, and destroying the usefulness of lakes for recreation and scenic enjoyment.

23. The cost of removing all this mud and restoring our lakes and waterways is staggering.

24. About one and a half billion cubic yards of storage space a year is lost to sediment. The cost of dredging ranges from 50 cents to two dollars a cubic yard--a bill that is paid, not by the people who create the problem, but by the taxpayers, many of them far downstream from the source of sediment.

25. But much of this damage can be halted. We have the basic tools and technical knowledge right now. And they are being put to good use in many areas.

26. For example the soil survey is a scientific inventory of soil potentials and limitations.

27. It can help engineers and others evaluate the suitability of each soil for various uses.

MORE

28. The soil map can identify land that has good qualities for roads.

29. It can help locate good sites for private dwellings.

30. It can help planners find safe places for sanitary landfills.

31. It can help determine locations for lakes and other recreation areas.

32. It also identifies soils that may mean trouble such as those that are highly erosive.

33. The Department of Agriculture has been making soil surveys for more than 70 years. In making them, a soil scientist studies the land acre-by-acre, its vegetation, and its features.

34. He identifies the different kinds of soil by examining the soil layers.

35. He determines the slope, possible erosion hazard, and depth to rock if it occurs within five feet of the surface.

36. He determines the color, tests the acidity or alkalinity, estimates the proportions of sand, silt, clay and organic matter.

37. He classifies the soils according to a national system and outlines each kind of soil on an aerial map before he leaves the field.

MORE

38. The survey is published, usually on a county basis, by the Soil Conservation Service. The work is done in cooperation with state and land grant universities, and in many instances, other federal, state, and local agencies.

39. At first glance, a soils map looks pretty complicated. However, each of the symbols, printed over an aerial photo, stands for a specific kind of soil.

40. By checking these symbols against the tables in the survey, we can find a storehouse of information on soil behavior.

41. For example, that symbol, HmB2, identifies a soil with slight limitations for residential development, and septic tank filter fields installed in the area should function properly.

42. But move a short distance away to the next soil type and you could have trouble. This soil has a temporary high water table that will result in wet basements and septic tank failure during parts of the year.

43. A little farther to the right and we run into soils that have severe limitations for homes because of a permanent high water table. Also, the shrink-swell capacity is so great that the land is ill suited for roads and commercial and industrial development.

44. With proper soil map interpretation, a developer would know what soils were highly erosive and the corrective measures necessary to avoid sediment problems like this.

45. For example, heavy rains falling on this exposed soil could have caused severe sediment damage downstream. But not in this case.

MORE

46. The developer with help through his local soil and water conservation district had built a temporary sediment basin that trapped the sediment laden water and kept it from polluting waterways downstream.

47. In some cases, diversions can be built to channel surplus water safely around areas of disturbed soil.

48. Quick seeding or sodding of exposed soil around homes drastically reduces erosion problems.

49. On steeper slopes, jute matting can be used to protect the soil until plants can take over the job.

50. On construction areas that must be left unprotected for several weeks, grassed waterways, similar to those used to protect farmlands, conduct runoff water safely off the site without erosion.

51. Grass can be made to grow even on a slope that will carry a lot of runoff water by using boards to make temporary terraces.

52. Trees that had to be cut down can be chipped and used as a mulch to protect the soil until vegetation can be established.

53. Steep slopes can be changed from a sediment producing area like this . . .

54. To a spot of beauty with the proper conservation measures and vegetation.

MORE

55. Sediment producing drainageways like this . . .

56. Can be stabilized quickly with sod and rock even while construction is underway around it.

57. So in many areas there is help available right now in proper land use planning.

58. It is possible to have more homes for people without first wrecking the landscape and polluting our water.

59. It is possible to build commercial or industrial centers a piece at a time without leaving the whole site bare for years.

60. It is possible to build highways, even great ones, without ruining waterways for miles downstream.

61. Citizens and governments in both town and country can work to change the use of land without ruining the land and the water that drains from it, and assure the kind of pleasant surroundings that you in North Carolina work toward every day.

62. What does it take? A workable sediment control program is one in which responsibility is transferred all along the line from the people who plan a land use change, to those who review it, the builder, the bulldozer operator, the sediment control inspector, the landscape architect, the nurseryman, the homeowner.

63. A workable sediment control program is one that is part and parcel of a larger planning effort. Sediment is but one of the many effects from unwise use of land and water resources. And sediment control efforts, to be most effective, must not be piecemeal but included in a comprehensive body of policies and guidelines for good land use.

* * * *