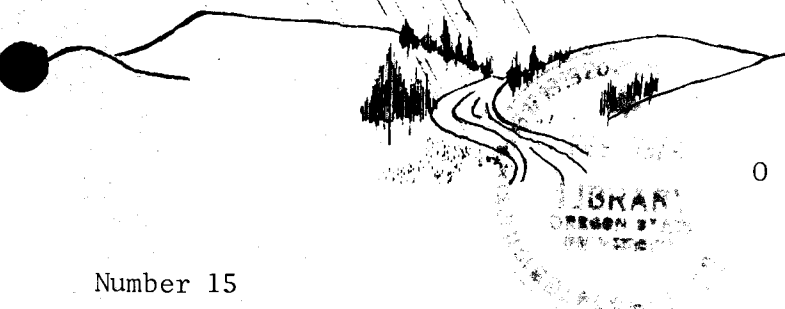


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Oregon's Environment



OREGON STATE UNIVERSITY
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FHA FUNDS ARE EXPECTED

Two or three communities in Oregon can expect to receive federal grants in early February to help finance construction of water supply or waste disposal systems. The state's share of \$30 million recently released by the Department of Agriculture should be approximately \$300,000. Grants under this Farmers Home Administration (FHA) program can cover up to 50% of any proposed project.

Oregon submitted a list of eight proposed community projects, according to Larry Spindler, Chief of Community Services Programs, FHA, Portland, to be considered for funding by the agency's Washington, D.C. office. Final selection is made at that level. In order to qualify at this time, the requirement was that the original application to FHA must have been submitted prior to January 1973. Priority is being given to projects concerned with water supply systems.

One of the features of the program is that FHA is prepared to guarantee loans for all or part of the remaining 50% of the total amount required by a community. Spindler says that most municipalities float bond issues to cover the debt, while private organizations generally secure the loan with a mortgage on property and facilities.

The loans available under this matching grant concept are only part of a larger program of FHA insured loans, some at 100% of project cost, which Oregon communities undertake each year. During the current fiscal year, which ends June 30, the state's allocation has been \$4,575,000.

To date, a total of \$2,690,000 in federal funds has been obligated, Spindler said, involving seven communities. Only one of these was for sewerage construction and the rest for water supply purposes. The communities and federal funds granted to each are: Butte Falls, \$78,000; North Tillamook County Sanitary Authority, \$238,000; Umpqua Basin Water Association, \$125,000; Siletz, \$270,000; West Linn Water Co-op, \$13,000; Talent, \$238,000; and Brookings, \$1,683,000.

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BOOKLET FOR TEACHERS

An environmental study guide has been prepared for teachers by the Bureau of Land Management. It is designed primarily for the upper elementary and junior high school grade levels, but can be adapted for other grades as well. The booklet was developed by six young people, schooled in physical sciences, social sciences and education.

Entitled "All Around You," the 177-page volume is divided into three sections under the headings -- Awareness, The Urban Ecosystem, and Nature's Ecosystem. A series of Teacher's Pages provides a background for each activity to be undertaken. (Supt. of Documents, U.S. Govt. Printing Office, Wash., D.C. 20402. Price \$2.35 postpaid).

DAIRY FARM WASTES

Six recommendations to reduce water pollution by dairy farm wastes have emerged from a three-year research project at Auburn University. As dairy operations become larger and rural areas become more densely populated, disposal of animal wastes becomes increasingly important. The conclusions reached are:

1. There was not an appreciable deterioration of runoff quality nor accumulation of manure or nitrate in soil applied with 0.6 to 1.20 tons manure (30-60 lbs. nitrogen) per 3-week period. Since runoff was not appreciably contaminated and the rates of nitrogen supplied were within the range normally applied to crops, the suggested guideline for bovine manure disposal on grassland is one ton per acre per month.
2. To speed up decomposition of manure, and to get benefit from the manure in improved crop yields, plow down the manure. This practice will virtually eliminate fly, odor, and runoff problems. Also higher rates of manure application could be accomplished without pollution problems when manure is plowed down.
3. Preferably waste should be applied to grassland to check runoff from the disposal area. This would permit more frequent use of field equipment during wet seasons that would otherwise require the waste to be stored.
4. A grassland buffer zone around the disposal area and grassed diversion ditches will minimize the chance of manure in runoff from entering streams.
5. Do not dispose of manure near streams or private dwellings.
6. Avoid public criticism by disposing of manure frequently to minimize fly and odor problems. Manure that had been held for several days before disposal generally is more obnoxious during field spreading than manure that is field spread more frequently.

(From "Water Pollution by Dairy Farm Wastes As Related to Method of Waste Disposal". WRRRI Bulletin 18, October 1973, Auburn University, Auburn, Alabama.)

SALT FROM COOLING TOWERS

A study has been initiated by the University of Maryland to examine the meteorological aspects of emission from the cooling tower of the Chalk Point electric generating plant. The power facility features the first large, natural draft cooling tower using brackish water to be constructed in the United States. Involved in the study are meteorologists, plant physiologists and soil scientists. Information is being accumulated on the impact of salt drift from the tower on crops and other vegetation in the area. One of the goals is to develop and verify models which described the dispersion and fallout of salt that is contained in the cooling tower drift. In predicting drift, the following meteorological data are used --- wind speed, calms, relative humidity, wind direction and mixing height.

RECREATION STUDY

A study is underway at Oregon State University to estimate the demand for outdoor recreation in 12 western states. Dr. Herbert H. Stoevener, agricultural economist, is developing methods and procedures for evaluating the demand and its economic impact. The study began several years ago with Agricultural Experiment Station scientists and cooperators in the U.S. Department of Agriculture.

Energy is a vital component of environmental rehabilitation as well as America's prosperity. The problem is whether reasonable energy demands can be met without harming the environment.

CSF PLANETOLOGISTS PUZZLED OVER ROLE OF METALLIC RINGS

USA, Earth--- Cosmic Science Foundation (CSF) planetologists continue to search today for clues which will explain the significance of the small metallic rings which pepper the surface of this planet where the ancient Americans once flourished. CSF scientists say the rings are made of aluminum, an element especially prized by the Americans during the last few hundred years of their civilization.

Found almost everywhere on the planet's surface, the rings appear to be concentrated along "roadways," corridors along which Americans traveled in crude self-propelled machines long before the perfection of molecular transporters.

Caches of the rings have also been discovered near the ruins of "stadiums" - temples where Americans are thought to have worshipped the Life Force contained within an egg-shaped animal skin, ritually fought over by teams of warrior-priests representing the great American metropolises.

"In the absence of a Rosetta Stone, we can only speculate as to what might have been the role of these rings in the complex American social order," a CSF spokesman told this reporter.

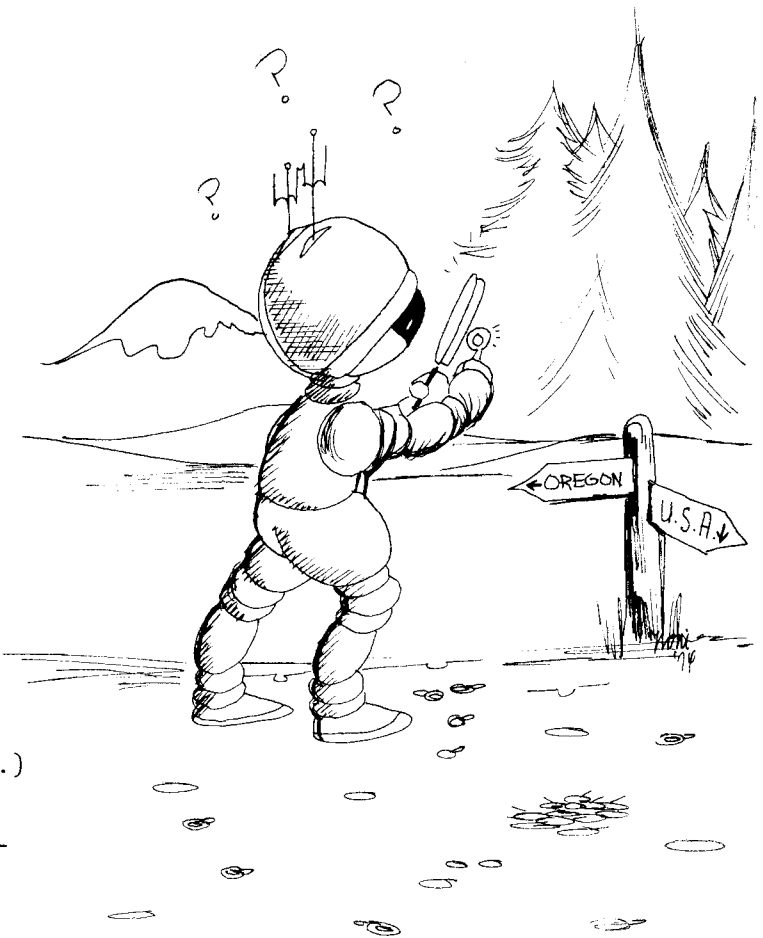
"The fact that the rings are found in greatest concentration in areas where Americans spent those hours of their lives known collectively as "leisure time" would seem to indicate that tossing these aluminum rings wildly about may have been, in itself, a pleasurable pastime," the spokesman said.

Curiously enough, CSF planetologists say, the rings are noticeably missing from the ruins of large cities located in the section of the USA known to Americans as Oregon.

Because the rings are not widespread there, there is some speculation in scientific circles that the Oregonians may have been an ascetic, splinter cult, perhaps, even relatively uncivilized compared with other Americans.

Such a conclusion may well be misleading, however, CSF says. The Oregonians, for reasons which may remain forever hidden, may have replaced indiscriminate ring flinging with other diversions. Other than the absence of rings, no evidence exists to support the theory that Oregonians had a lower order of civilization than other Americans, CSF says.

(We felt that we had to share this with you. It appeared in the November issue of Environmental Science and Technology as a dispatch from the Intergalactic News Service.)



ROCK SAUSAGES CONTROL EROSION

Rock sausages were invented by the Chinese many centuries ago. They were originally trumpet-shaped bamboo cages filled with headsized rocks, and were used for temporary dams, to divert streams, and otherwise protect against destructive currents. Breaks in the levees of the Yellow River were closed by having hundreds of men roll in long rock sausages, nearly six feet in diameter, with heavy wire cables extending upriver to secure anchorage points. Recently the Chinese have stopped the flow through channels subject to powerful tidal currents by rolling giant sausages from the decks of boats. They have placed miles of riverbank revetments made with wire-bound rock sausages placed in tight rows.

It is evident that the Chinese have considerable experience with rock sausages. What we don't know is whether they have formulated criteria that will permit them to predict the size of sausage that will resist being moved by a given depth and velocity of flow. The project reported here was planned to investigate this problem by means of model tests.

Although rock sausages have not as yet found much use in the United States, an increase in their use can be expected. Mechanized manufacture and handling will reduce the cost. Less rock is needed than for riprap, and smaller sizes can be used. Especially where rock is scarce this gives an advantage over the alternatives of concrete or asphalt. If washed out by unexpectedly heavy flows, sausages can be salvaged and used in rebuilding. They can be used again and again when needed for temporary protection.

Increasing concern over the loss of soil by erosion, with consequent sediment pollution of streams, has heightened interest in developing inexpensive ways of protecting against erosion. A method of installing rock sausages so as to prevent fine material from being washed out from underneath (leaching) has recently been developed.

There is no evidence that the Chinese have learned of this improvement, although they apparently do know how large the sausages must be to avoid being moved by the current, and under what circumstances they need to be anchored. Investigations to determine the size of loose rocks or riprap required to resist a given boundary shear have been reported. The use of rocks is not recommended when the longitudinal slope of the stream is greater than ten percent; it is already known that rock sausages can be used on slopes as great as fifty percent.

(Quoted from "Erosion Control: Stability of Rock Sausages". Report No. 19, Nov. 1973, Institute of Water Resources, University of Connecticut, Storrs, Conn. 06268).

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STREAMBED DEGRADATION

Streambed degradation along the mainstem Willamette River is approximately one foot per decade and may be due to several factors. These factors include natural geological events, sand and gravel removal, bank stabilization, and watershed changes. However, upstream dams do not appear to have had much effect to date. The lower McKenzie River is locally subject to severe streambed degradation which has amounted to 6 ft. in 26 years.

These are the tentative conclusions reached in a brief study conducted by Dr. Peter C. Klingeman of Oregon State University. The research was aimed at developing techniques for analyzing streambed elevation techniques and to make a preliminary assessment of the extent of any indicated problems.

(From "Indications of Streambed Degradation in the Willamette Valley". WRRRI-21. Oregon State University. December 1973).

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LAND APPLICATION OF WASTEWATER

Land application of wastewater is one of the alternatives considered when advanced treatment is being evaluated. It has its proponents and opponents. A recent survey by EPA cites two municipalities and two industrial firms in Oregon which use the system.

Hillsboro

The city is served by two plants which are owned and operated by the city. The drainage system is in part a combined and sanitary system. Cannery wastes arrive at the plant from the industrial outfall of a canning and freezing plant. Flow passes over a shaker screen before mixing with the domestic input. Plant effluent may be discharged to the Tualatin River or flow to a holding pond. A buried pipe sprinkler system irrigates a healthy stand of grass on the bank of the river.

Milton-Freewater

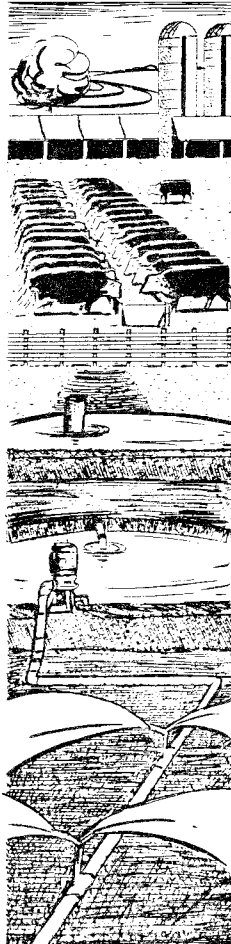
The city has a secondary plant which treats a flow which is primarily domestic. The effluent discharges into a gravity outfall which serves various canneries by its upstream branches. This outfall empties into a series of ponds, totalling 18 acres, adjacent to the farm which uses the effluent for irrigation. Crops that have been irrigated include alfalfa and wheat. As the farming is conducted on over 1000 acres, supplemental water is used from wells and from a stream. The farm takes the effluent on a basis of no payment either to or from the city.

U.S. Gypsum Co., Pilot Rock

Plant waste is pumped approximately a mile to a 40-acre holding pond within a fenced area which includes the irrigated pasture area and a portion informally designated a game reserve. It takes 14 days to irrigate the entire pasture area and then the cycle is repeated. The irrigation season extends for about 270 days per year depending upon the duration of freezing conditions. This requires that the pond be drawn down by late fall to permit flow storage for the entire winter. Grazing cattle seem to do well on the pasture.

Weyerhaeuser Co., Springfield

The plant treats paperboard black liquor and normally discharges a secondary effluent into the McKenzie River. During periods of low flow in the river, the effluent is applied to a field which is on a gentle slope bordering the river. Although the site is under company control, the grazing lessee is permitted to alternate the banks of sprinklers as best suits



his grazing needs. The practical application season is limited as high water inundates some of the land.

The arguments in favor of land application are: groundwater sources are augmented; economical to operate; effluent quality is improved by soil uptake of constituents which would adversely affect receiving streams; enhances crop growth and timber stands; and augments water sources for recreational purposes. Opposed to this are certain aesthetic and psychological objections on the part of the public and fears of virological or pathological infections.

Further study is required to develop findings regarding the presence or absence of health hazards in the practice.

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SURVEYING PUBLIC ATTITUDES

Small surveys are feasible and are relatively inexpensive methods for assessing public attitudes toward water resource issues, according to a study conducted at Doane College. Such surveys offer a systematic way of acquiring information efficiently and accurately.

The author emphasizes the importance of basing any survey on the principle of random sampling. It is recommended that the questionnaire be relatively brief and that it be pre-tested on a group similar to that to be surveyed. Consultation with a social scientist is recommended in designing the survey.

The size of the sample is critical. A relatively small sample of a very large population will give a fairly accurate estimate of the total population, and the accuracy of the estimate increases with the sample size. The choice of sample size depends on the purpose of the investigation. To predict a close election one might require a sample size of 2500. That size would insure that 95 samples in 100 would not vary more than 2 percent in either direction from the true population characteristic. For 5 percent accuracy, a sample size of 400 would be required. This is about the minimum size needed for cross-tabulations and other types of statistical analysis.

To simply estimate public reaction to policy needs and initiatives, a smaller degree of accuracy should suffice. This smaller size might be ideal for use by water resources agencies in their planning work.

For example, only 156 people are required to insure that 95 samples in 100 would not vary more than 8 percent in either direction from the true population characteristic. A sample size of 124 would be required for 9 percent accuracy. This would allow a relatively quick and inexpensive way to survey public attitudes.

(From "Attitude Change on Water Resources Issues," by E.J. McPartland, Doane College, Crete, Nebraska. 1973).

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MORE FLOOD INSURANCE SOUGHT

Congress is attempting to expand the current flood insurance program. The House has approved a new bill (HR 4889) which requires flood-prone communities to participate in the National Flood Insurance Program.

The bill, which must pass the Senate, would increase the total amount of flood insurance available from \$6 to \$10 billion. The amount of subsidized insurance available for a single family home would be increased from \$17,000 to \$35,000 and for other residential and nonresidential property from \$30,000 to \$100,000. Total coverage available through private insurance companies would double the amounts.

In order to qualify for government assistance in financing acquisition or construction, such as government-guaranteed mortgage loans, homeowners and businessmen in flood-prone areas would be required to buy flood insurance.

Before passing the bill, the House agreed to several amendments--including one extending coverage to losses from erosion and undermining shorelines.

The House Banking Currency Committee said the expanded flood-insurance program was intended as a substitute and eventual replacement for federal disaster relief programs to help flood victims.

While the legislation gives the Secretary of Housing and Urban Development authority to designate communities as flood-prone, an amendment agreed to on the House floor would grant communities a right to a public hearing and review by the National Academy of Sciences of such a finding by the Secretary.

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STREAM CHANNELIZATION CRITICIZED

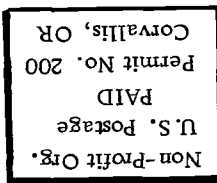
Stream channelization has been over-used, without sufficient consideration for the adverse environmental effects. These effects include the draining of wetlands, destruction of hardwood forests, obliteration of oxbows and meanders, increase in erosion and sedimentation, elimination of habitat needed by fish and wildlife, lowered water tables, and poor water quality. These are the conclusions of a report, recently issued by the House Committee on Government Operations, entitled "Stream Channelization: What Federally Financed Draglines and Bulldozers Do to Our Nation's Streams".

The report arrived at ten major recommendations for improving channelization projects. These are:

1. The Soil Conservation Service (SCS) should comply with two Executive Orders and promptly adopt new regulations designed to promote public participation in the formulation of this project.
2. In accordance with the Administrative Procedure Act concerning rulemaking and public information, the SCS should publish all documents that are in fact regulations, although not so designated, and all other statements of general policy and interpretations of general applicability.
3. The SCS, Corps of Engineers, and the Bureau of Land Reclamation should adopt a policy of fully identifying all known project beneficiaries in pertinent project documents.
4. The SCS should include on its questionnaire forms concerning irrigation, draining, and flood damages a statement which specifies, with respect to commercial and financial data supplied by a respondent, that the respondent shall indicate whether he desires the data to be kept confidential and exempt from disclosure.
5. The Bureau of Outdoor Recreation should begin to review small watershed projects of the SCS to ascertain their probable effects on recreational and aesthetic values.
6. An appropriate House committee should consider amending the Fish and Wildlife Coordination Act to extend it to all water resource projects constructed or financed by a federal agency, to insure that fish and wildlife agencies are notified at an early stage in project development, to require that federal water resource agency to set forth its reasons for not including fish and wildlife mitigation and enhancement features recommended in the project, and to require that estimates of fish and wildlife losses not be evaluated solely in monetary terms.
7. The SCS should be required to obtain from the state water pollution control agency, or from EPA, a certification that a proposed project will, as a minimum, maintain the chemical, physical, and biological integrity of the effect of water.
8. The SCS should adopt a policy of full compliance with the requirements of section 102(2)(C) of the National Environmental Policy Act.
9. The Council on Environmental Quality should develop and, after providing opportunity for public comment, recommend that the President promulgate comprehensive guidelines for federal agencies in planning and carrying out projects involving channelization.
10. An appropriate House committee should consider clarifying the Fish and Wildlife Coordination Act to insure that water resource development agencies can acquire mitigation lands without further authorization by Congress, but subject to obtaining an appropriation for such acquisition.

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PHOSPHORUS IN SEPTIC TANKS

Researchers in New York are investigating a process for removing phosphorus in septic tanks by chemical precipitation. The phosphorus would settle to the tank bottom and eventually be removed with other normal sludge deposits during regular tank cleaning. Preliminary laboratory studies are concerned with the following questions:

- 1) Would the addition of the appropriate chemical (in this case ferric chloride compound) adversely affect normal activity of those microorganisms present in the tank;
- 2) How much of this chemical would be required;
- 3) Would the additional sludge formed due to precipitation drastically alter the frequency and method of tank cleaning; and
- 4) Would the system as a whole be efficient enough to remove significant amounts of phosphorus without otherwise impeding normal functioning of the septic tank?

Ferric chloride was added to effluent from a laboratory scale anaerobic digester. A dose of 200 mg/l ferric chloride resulted in approximately 81% removal of phosphorus for an initial phosphorus level of 19 mg/l. The results indicate that it may be possible, under certain conditions, for a chemical precipitation process to be successful. In addition to the need for additional lab studies, there is a need for field evaluation. The potential value of a system requires that a full-scale pilot study be set up to further investigate and evaluate the feasibility of phosphorus precipitation in septic tanks.

(From newsletter of Rensselaer Fresh Water Institute at Lake George, New York, Nov. 1973).