

The EROS program has made a number of experiments with aircraft-carrying instruments so to determine their feasibility for certain purposes and then judging whether these techniques can be used successfully in orbiting vehicles. So the EROS program, per se, is a combination of both aircraft and spacecraft. One of the remote sensors used in this program is the infrared sensor. This determines the thermal conditions of terrain, and the distribution of water as free water and as moisture. This and other sensors will provide information on the distribution of vegetation, the vigor of vegetation, the distribution of alien fluids within water, the coloration of rocks and soils, and the relative differences in temperature.

This exhibit shows an experiment which was conducted in the Hawaiian Islands. It was known to the natives there was fresh water under the sea off the Hawaiian Islands. In aircraft mounted with an infrared sensor we flew and located more than 200 offshore springs where fresh water from the land was being lost but is coming out of the ocean bottom. I happen to have here a jug of water taken from the bottom of the ocean near station 2. Two springs are located there. This is a most important scientific discovery because we can apply this technique not only to Hawaii, which is relatively short of water on the west and south side, but to other coastal areas. If we can locate such lost water springs we can then recover the water for use on land. You can see many applications in recovering this undersea water before it is lost to the sea.

Since this infrared sensor measures relative temperature it is the cold fresh water coming up through warm sea water that has been detected.

Relating to our aircraft experiment again we wanted to see if we could in some way observe the distribution of pollutants. This is a photograph of the mouth of the Maumee River as it enters Lake Erie; a polluted lake. The photograph depicts the course of the pollutants issuing from a sewage treatment plant and shows that the breakwater is effectively impounding the sewage and preventing its dispersal into Lake Erie. We have only one station located on shore which analyzes the quality of this water, obviously this meter is not giving the whole answer. This same illustration is given in black and white in your booklet. The job here is to determine what is happening to the general flow of these polluted waters in such areas. Such experiments will give us an overview immediately rather than requiring a great number of quality measuring stations or a great number of vessels at the mouth of the river to determine what is happening.

The next illustration shows results of an infrared sensor experiment that determined the temperature differences between salt water and fresh water at the mouth of the Merrimack River in Massachusetts. The fresh water is on the left and the salt water is on the right. They have a different color because their temperature is different.

The CHAIRMAN. What is the temperature difference between fresh and salt water? How do you know it is really not fresh water temperaturewise?

Dr. PECORA. The Atlantic Gulf Stream shows a 5° to 10° difference in temperature from the bordering ocean. We can measure down to a degree or better, depending on the nature of the instrument.

This infrared sensor can detect the interface of the fresh and salt water during movements of the tides and floods. This exhibit shows