ERTS SEMINAR

GSFC, 29 September 1972

Abbreviated Version of

E72-10039
CR-128120

URBAN-FIELD LAND USE IN SOUTHERN NEW ENGLAND: A FIRST LOOK.

We are highly gratified at the amount of information potentially available for urban analysis in the first ERTS imagery. Our principal question has shifted from "what will be be able to see?" to "will ERTS continue to get returns long enough to fill in those cloud gaps?"

The Dartmouth project deals with urban sprawl, and with open space as a disappearing resource (Figure 1). Until very recently urban planning has been conducted at a local level. As an example of current trends, however, megalapolitan New England embraces three states (Fig. 2), and the New England Regional Commission is considering using the open space resources of 2 1/2 additional states to help solve the problems of the first three (Fig. 3). Obviously a large-area data base is required. ERTS can help.

ERTS Products Available to Date. 85% of our first look has focussed on a single CIR transparency (Figure 5). The location of this and two other CIR composites, is shown in Figure 4. Our first b/w multiband images have just been received.

First-Look Findings. Suspension of the RBV pictures was for us small loss, but we regret the absence of scene-corrected imagery. Much adjustment will be required in transferring land use maps drafted as overlays to scene-corrected photos, onto base maps which meet or approach national map standards of accuracy.

(E72-10039) URBAN-FIELD LAND USE IN SOUTHERN NEW ENGLAND: A FIRST LOOK R.B. Simpson (Dartmouth Coll.) 28 Sep. 1972 7 p CSCL 08B
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We expect to make frequent use of Band 5 b/w transparencies and are investigating false color, density slicing and edge enhancement. However, in general we favor a more simplistic approach.

What the ERTS Reveals. The image on which we have focussed our preliminary investigation is shown as Figure 5. Professor Lindgren, and one assistant mapped the land use of the state of Rhode Island on a single weekend recently. They mapped at a scale of 1:250,000 using as a base a four-times magnification of the Rhode Island portion of the ERTS photography (Fig. 10). Time invested was a little less than 40 man hours, for an average mapping speed of 30 square miles per man hour. We believe the product warrants optimism regarding mapping the land use of the United States at this scale. The present standard 1:250,000 map sheet coverage of the state of Rhode Island is shown as Figure 6. The ERTS product is Figure 7.

The amount of land use detail which can be extracted confidently from the ERTS images is encouraging. Our map (Fig. 7) has eight land use categories as shown on the legend at Figure 8, and as compared to the legend used for comparable RB-57 land use mapping in Figure 9.

The fact we did not attempt an Institutional category (for example) does not mean that no institutions were recognized, but simply that too few representations were identified to justify a separate category.

Finally, a look at some thresholds of recognition. Figure 10 shows the section of the CIR image on which our land use map was drawn as an overlay. On the photo can be seen the urban-rural interface on the north edge of North Providence. Figure 11 shows how the interface looks on RB-57 imagery.

Figure 12 shows the island on which Newport, Rhode Island, is situated. Its "moth-eaten velvet" pattern stands for well-developed but small-field agricultural patterns plus sprawl, with an urban population density over 1,000 per square mile. The rather "thready" rural pattern which appears in Figure 12 is common in wooded areas. Here it marks a population density of about 60 people per square mile. In Figure 13 the cause of the threads can be seen: cleared fields in a linear pattern along the rural roads. Comparable population densities also are attained without the threads, as shown in the RB-57 photo labelled Figure 14.

Figure 15 lists some of the informational thresholds we have encountered.

IN CONCLUSION: the objectives stated in the project proposal (Fig. 1) are feasible, providing timely cloud-free coverage is available.

Accompanying:

13 35-mm slides and
2 8 x 10 color prints

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Preliminary Land Use Map of the State of Rhode Island, 1:250,000.

Map compiled from a CIR composite image (ID No. 1005-15005) from the Earth Resources Technology Satellite dated 28 July 1972.

(Dartmouth College Project in Remote Sensing)

yellow -	Single family residential (Dense)
orange -	Mixed single-multiple family residential
red -	Commercial & manufacturing
black -	Transportation & utilities
lt. green -	Rural residential & open space
dk. green -	Woodland
brown -	Agricultural (Row crops)
blue -	Water
(blank) -	Obscured by clouds

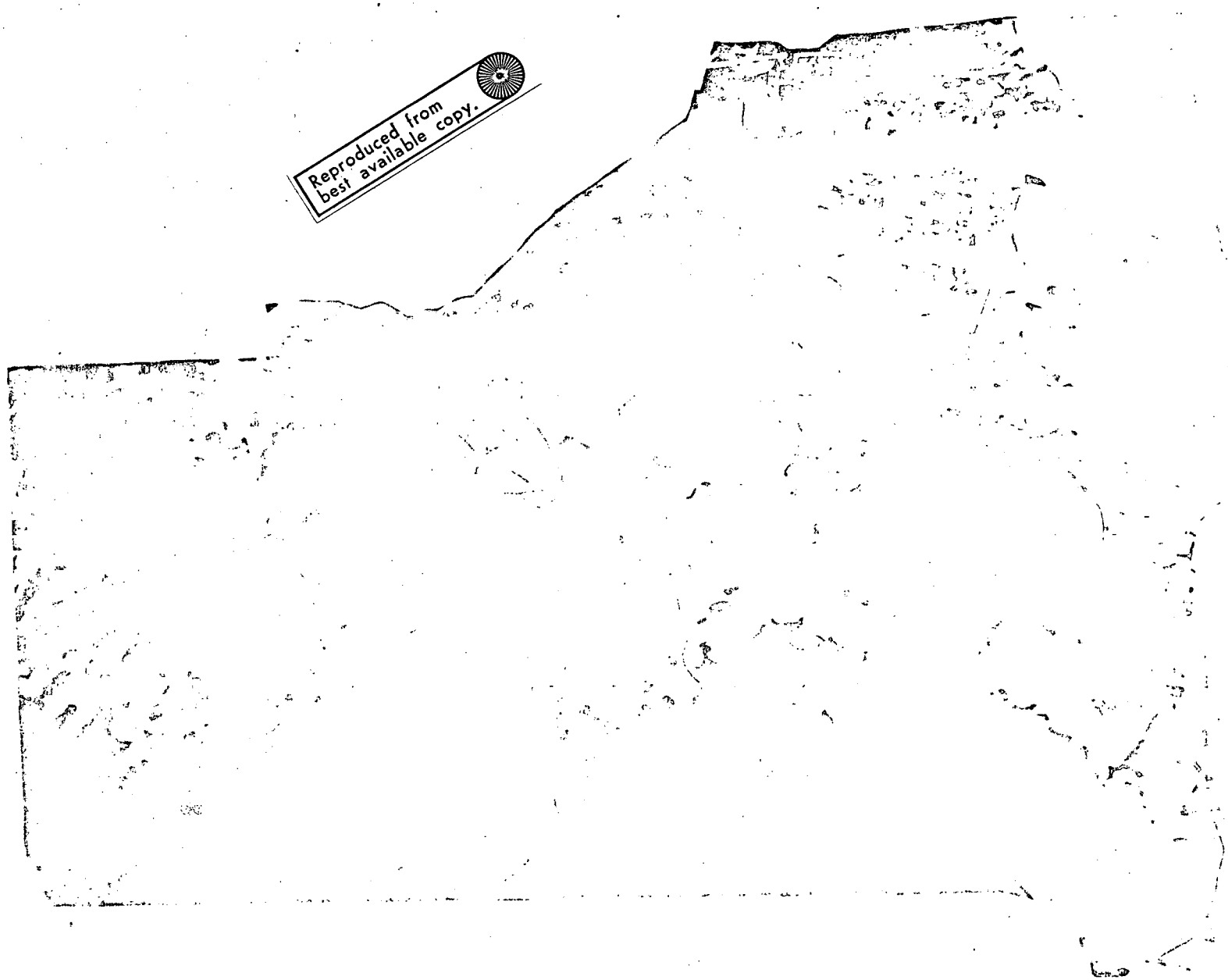

Figure 6. The State of Rhode Island as shown on the USGS 1:250,000 Topographic Map.