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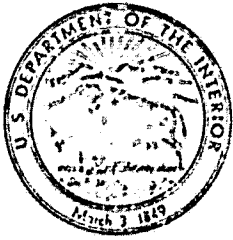
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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

Technical Letter
NASA-53
October 1966

Dr. Peter C. Badgley
Chief, Natural Resources Program
Office of Space Science and Applications
Code SAR, NASA Headquarters
Washington, D.C. 20546

Dear Peter:

Transmitted herewith are 3 copies of:

TECHNICAL LETTER NASA-53
EVALUATION OF NIMBUS VIDICON
PHOTOGRAPHY SOUTHWEST FRANCE AND NORTHEAST SPAIN*

by

Edward G. Hasser**

Sincerely yours,

William A. Fischer
Research Coordinator
Earth Orbiter Program

Work performed under NASA Contract No. R-09-020-011
U.S. Geological Survey, Washington, D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TECHNICAL LETTER NASA-53
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PHOTOGRAPHY SOUTHWEST FRANCE AND NORTHEAST SPAIN*

by

Edward G. Hasser**

October 1966

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not be quoted without permission

Prepared by the Geological Survey
for the National Aeronautics and
Space Administration (NASA)

*Work performed under NASA Contract No. R-09-020-011

**U.S. Geological Survey, Washington, D.C.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Evaluation of Nimbus Vidicon
Photography Southwest France and Northeast Spain

by

Edward G. Hasser

ABSTRACT

Southwest France and much of the Pyrenees are in a humid region and most of northeast Spain is arid or semiarid. The vegetation is the principal image maker. Its images are modified, particularly in southwest France, by terrain and cultural influences, such as plains and mountains, and the suitability of the terrain for irrigated and nonirrigated agriculture. The vegetation tends to mask landform boundaries, geology, and stream lines. Tones are lighter in the arid and semiarid regions and, therefore, slopes and stream beds are more noticeable in northeast Spain.

General Analysis

The variety of features and environments in southwestern France and northeastern Spain makes Nimbus vidicon photographs of the area suitable for study. Culture, including agriculture, many roads, and some sizable cities, is extensive. There are mountains, hills, plains, and streams. There are dense, extensive, small, and varied types of forests. Finally, there is an arid region and a humid region.

In and north of the Pyrenees, the mean annual rainfall almost everywhere exceeds 20 inches. The climate is generally humid and most of the region is either forested, in meadow, or under cultivation. Most of the region south of the Pyrenees, principally the Ebro trough, is arid. It has a mean annual rainfall of 12 to 15 inches. Large parts consist of impoverished steppe in which the thin clumps of plant growth, largely of wormwood, cannot hide the bare earth. The semidesert aspect of the Ebro trough is broken in the irrigated areas. Note the thick appearance of the Ebro river and some of its tributaries.

Figure 1 shows the comparatively light-gray tone of much of the Ebro trough, the dark appearance of the Pyrenees and the medium- and dark-gray tones of southwest France. The gray tones reflect the type of vegetation, its density, and its extent. Vegetation distribution, for the most part, reflects agricultural and lumbering activities. The forests either occur in a poor agricultural environment or on terrain generally inaccessible to lumbering. Forests, woodlands, or brush contribute medium- to dark-gray tone to the imagery. Other smaller and less dense vegetation, including cultivation such as orchards and vineyards, occur in areas that have light medium to medium gray images. The result is, that compared to semiarid and arid regions such as the Ebro trough, the image of the humid area of southwest France has a gray cast.

Although there are some resemblances between the geology and some of the images, the geology is not mappable. However, since geology has a great influence on the landforms, by mapping the landforms the geology, generally of a coarse order, is also mapped. The relief of hills and mountains appears light medium gray to medium gray. Soil on plains generally appear as light gray.

The principal source of information shown on the overlay is the topographic map at 1:250,000 scale, Army Map Service Series M501. There is some difficulty in control between the topographic maps and the Nimbus photograph, but a consistent distortion is not evident.

Characteristics of Features on Nimbus Imagery

<u>Feature</u>	<u>Characteristic on Nimbus Imagery</u>
1. Arid region (soil, thin vegetation).	Generally overall light-gray appearance.
2. Humid region (much vegetation).	Flatish medium-gray to dark-gray appearance.
3. Evergreen or coniferous forests.	Dark medium to dark gray tones.
4. Scattered, small, deciduous forests in a principally cultivated region.	Light medium gray tones.
5. Forested mountains or ranges.	Dark-gray tone.
6. Unforested or sparsely forested or sparsely	Light medium to medium gray tones.
7. Stream lines	Light-gray to dark-gray lineaments.
8. Irrigation along streams.	Unusually thick streamlike shape, medium- to dark-gray tone.
9. Water bodies.	Monotonous generally dark medium to dark gray tones.
10. Boundary between water bodies and terrestrial features.	Generally sharp.
11. Boundary between forests and plains.	Generally sharp.

Feature

Characteristic on Nimbus Imagery

12. Boundary between forests
on mountains and
mountain slopes.

Generally gradational.

13. Boundary between unforested
mountains and unforested
plains.

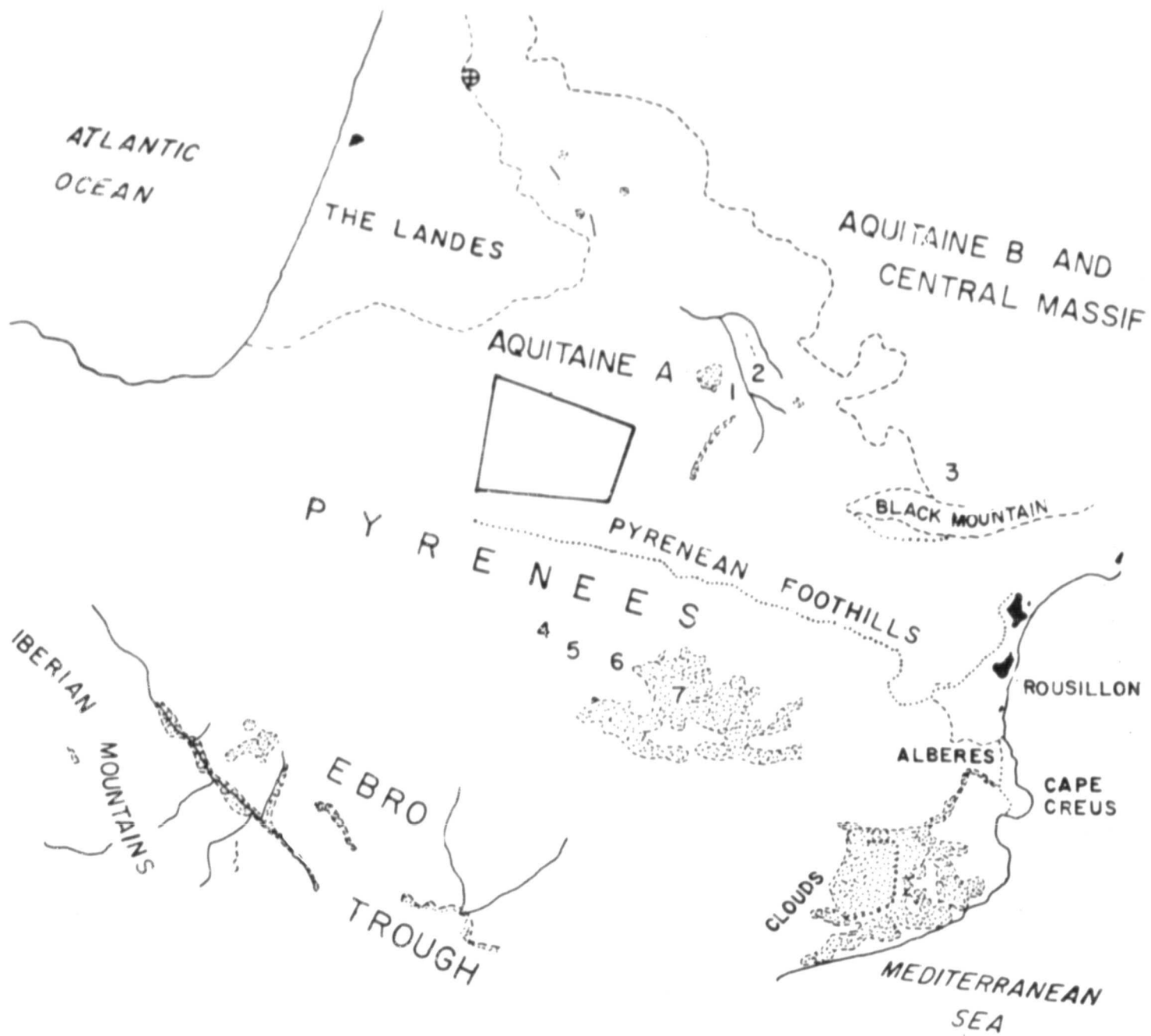
Gradational.

42N000

Atlantic
Ocean

CAMR	C	ORBIT	FRAME	NASA	TIME								
2	0	0	4	6	2	4	4	1	1	0	0	3	4
TAPE				DAYS	HOURS		MIN		SEC				

Figure 1



EXPLANATION

Stream lineament or coastline	Vegetation boundary	Focus area in text
		3
Water body	Cultivation or forests	Focus point in text
Landform boundary	Possible cultural feature	

Scale approximately 1 : 3,230,000

Figure 2