



西北大学
NORTHWEST UNIVERSITY

Study on the Spatial Differentiation Patterns of Gullies in the Middle Scale Watershed of the Middle Reaches of Yellow River

Reporter: Chunmei Zhang

中国·西安
China Xi'an

Contents

1

Introduction

2

Methods and material

3

Results and discussion

- ◆ **Integrated management of soil and water loss** is an important challenge that the middle stream of the Yellow River faces when it comes to high-quality development, among which gully erosion is one of the soil erosion types with the largest sediment yield, which severely damages farmland soil fertility, also being extremely harmful to agricultural production.
- Clarify the morphological characteristics and distribution patterns of gullies in the medium watershed scale on the Loess Plateau, therefore providing theoretical basis for gully erosion control and cultivated land protection.

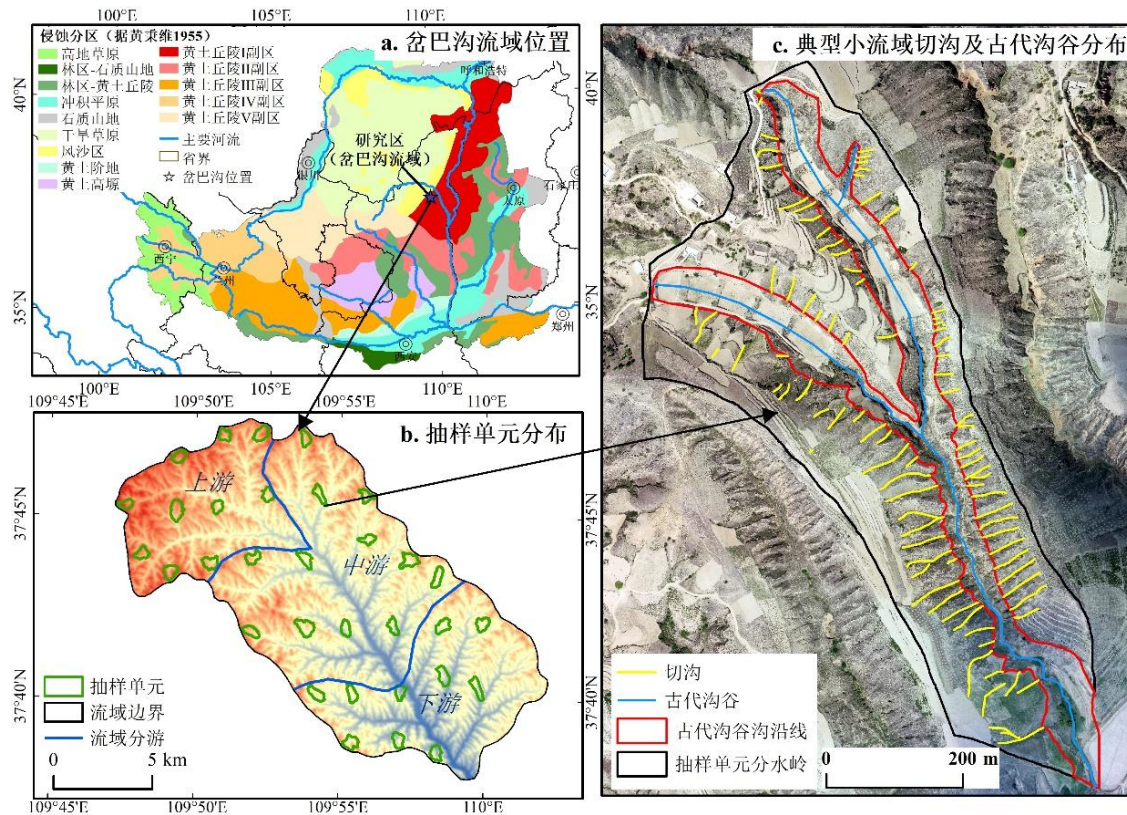


Figure 1 Study area and spatial distribution of the sampling units

- Subarea I of loess hilly and gully region
- Secondary tributary of Wuding River
- Northwest-southeast trend
- Area 207 km², main stream length 25 km
- Yellow loamy soil

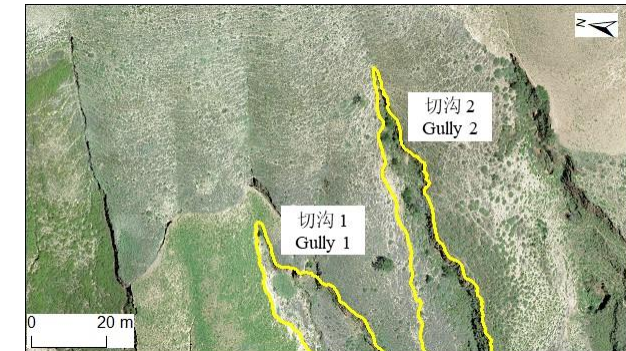


Figure 2 Illustration of typical gullies

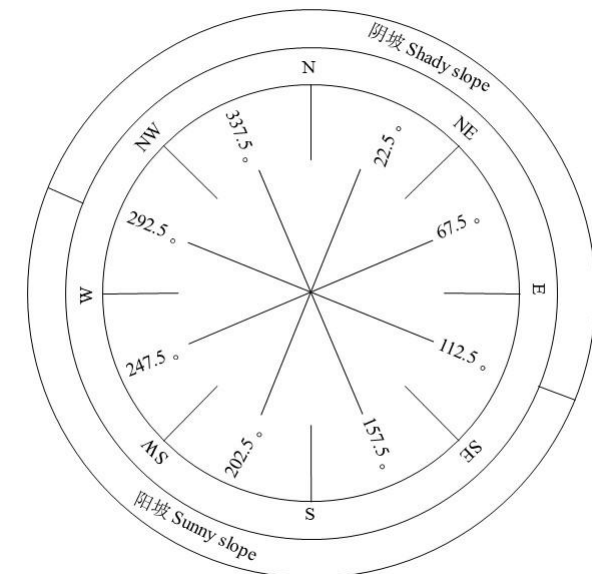
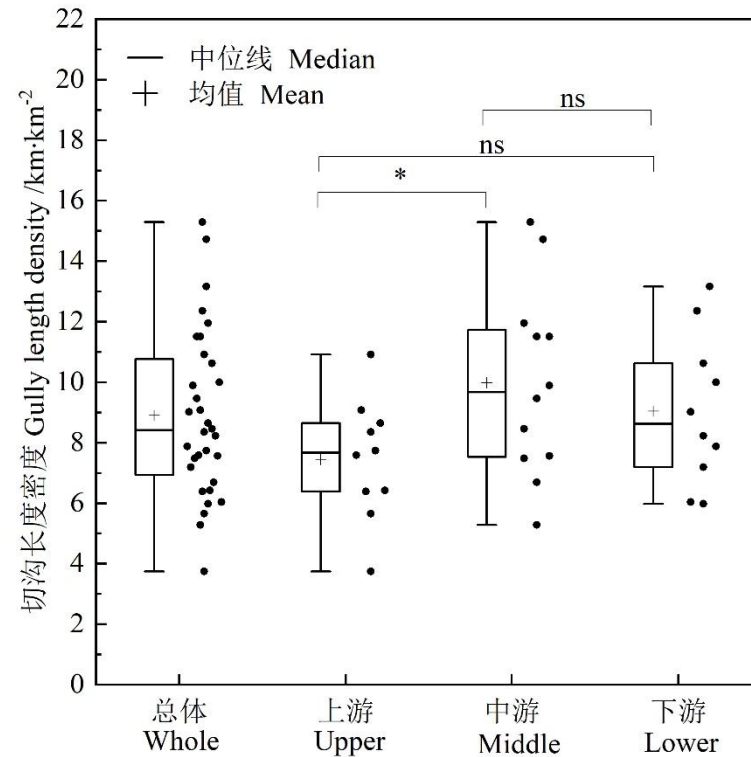


Figure 3 The illustration of aspect



注: ns表明两者无显著差异, *表明两者有显著差异 (P<0.05)。
 Note: ns indicates no significant, * indicates significance difference (P<0.05)

Figure 4 Statistics of gully densities

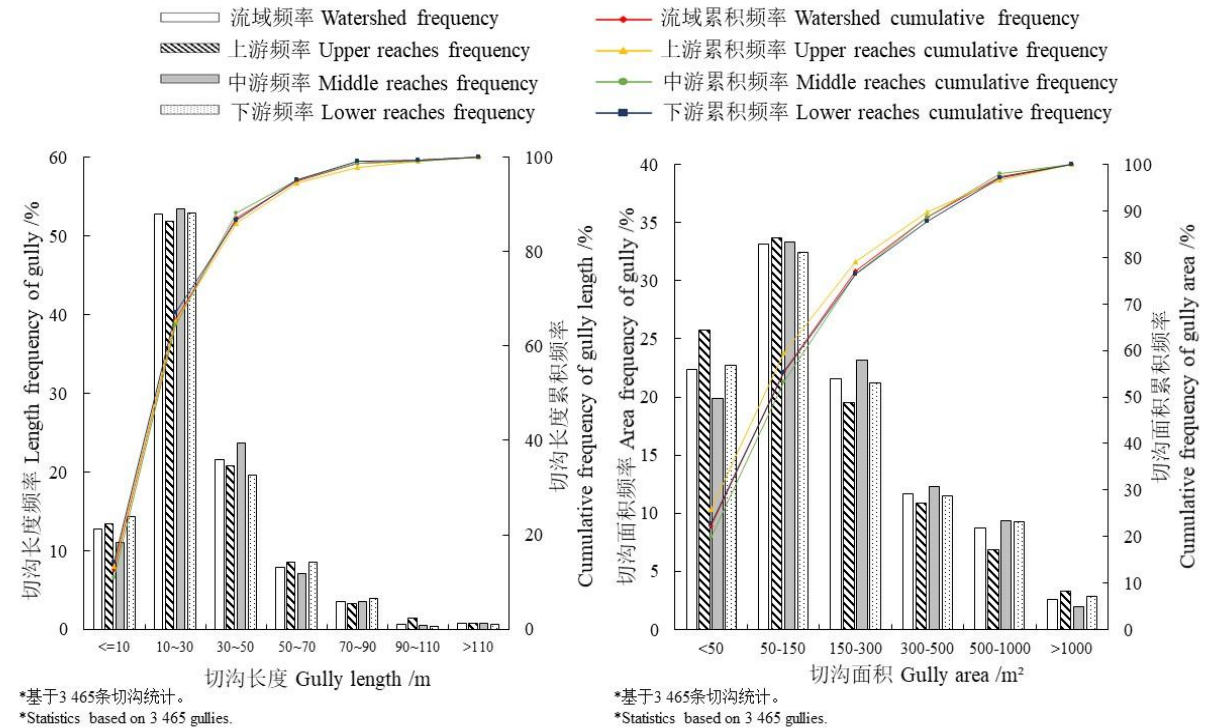


Figure 5 Histograms of gully length and gully area

Results:

(1) Gullies in Chabagou watershed are at its most in the middle reaches, the gully density is mainly centered around 7~11 km·km⁻², the gully length is mainly within 50 m, and its area is mainly within 500 m²;

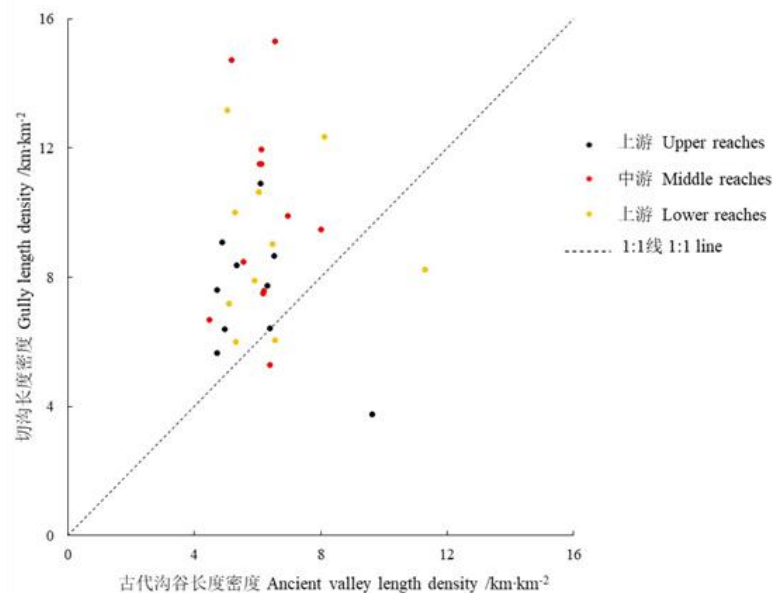


Figure 4 Correlation between gully and ancient valley density

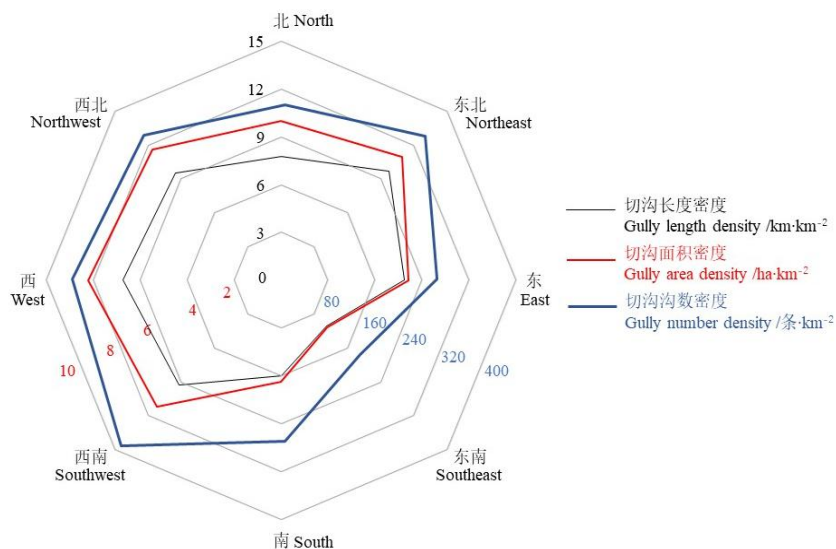
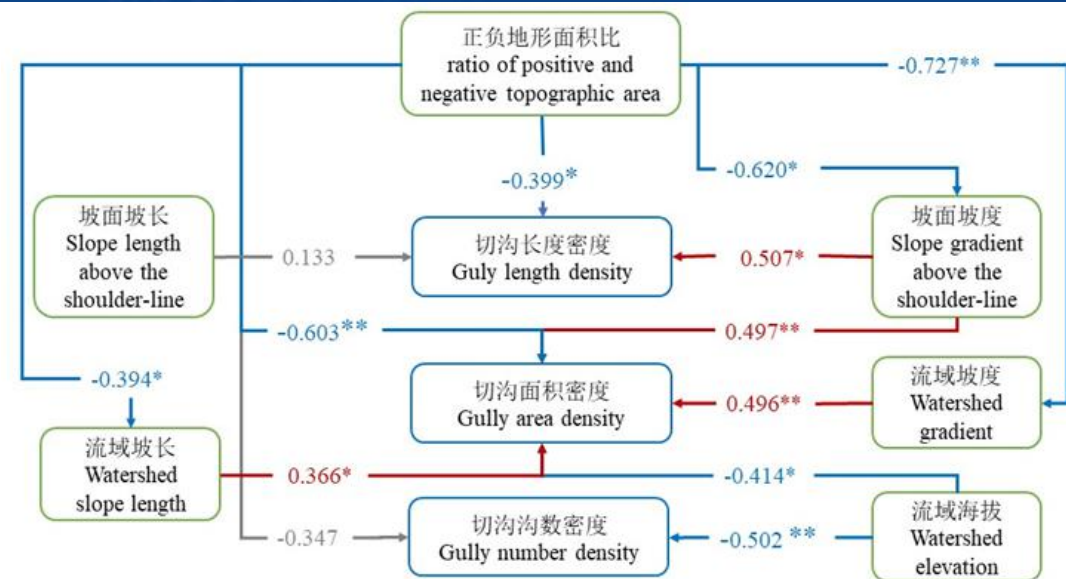


Figure 6 Gully density variation with slope aspect



注：*和**分别表示在95%置信度下通过了0.05和0.01的显著性水平。
Note: * and ** indicate that significance levels of 0.05 and 0.01 were passed at 95% confidence, respectively.

Figure 5 Correlations between gully density and terrain parameters

Results:

- (2) There is no obvious correlation between ancient valley length density and gully length density;
- (3) Gully density is significantly positively correlated with slope gradient above the shoulder-line, watershed gradient and length, significantly negatively correlated with ratio of positive and negative topographic area and watershed elevation, the distribution density of gullies in shady slopes was slightly higher than that in sunny slopes.

Thanks for your
attention!