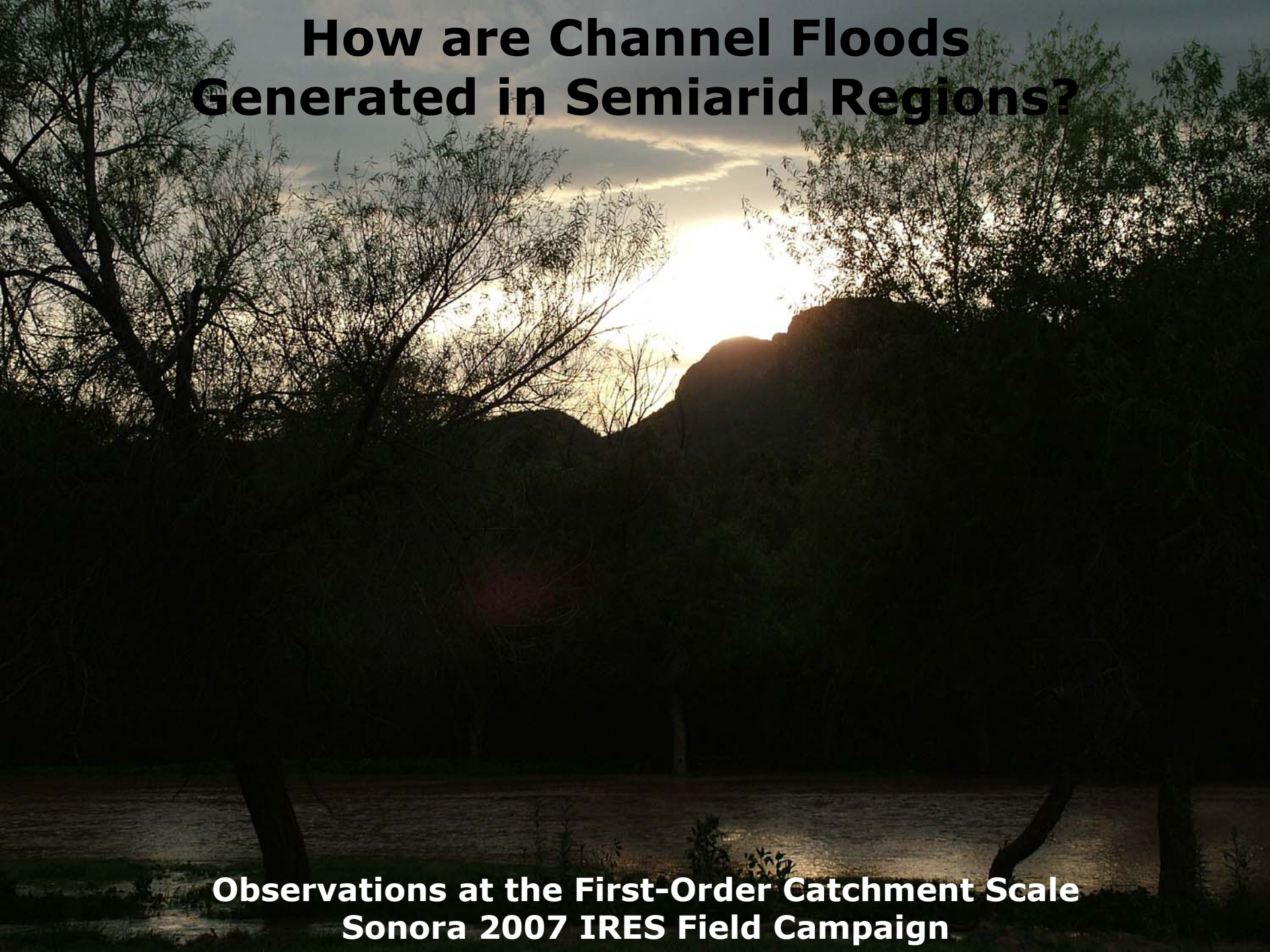
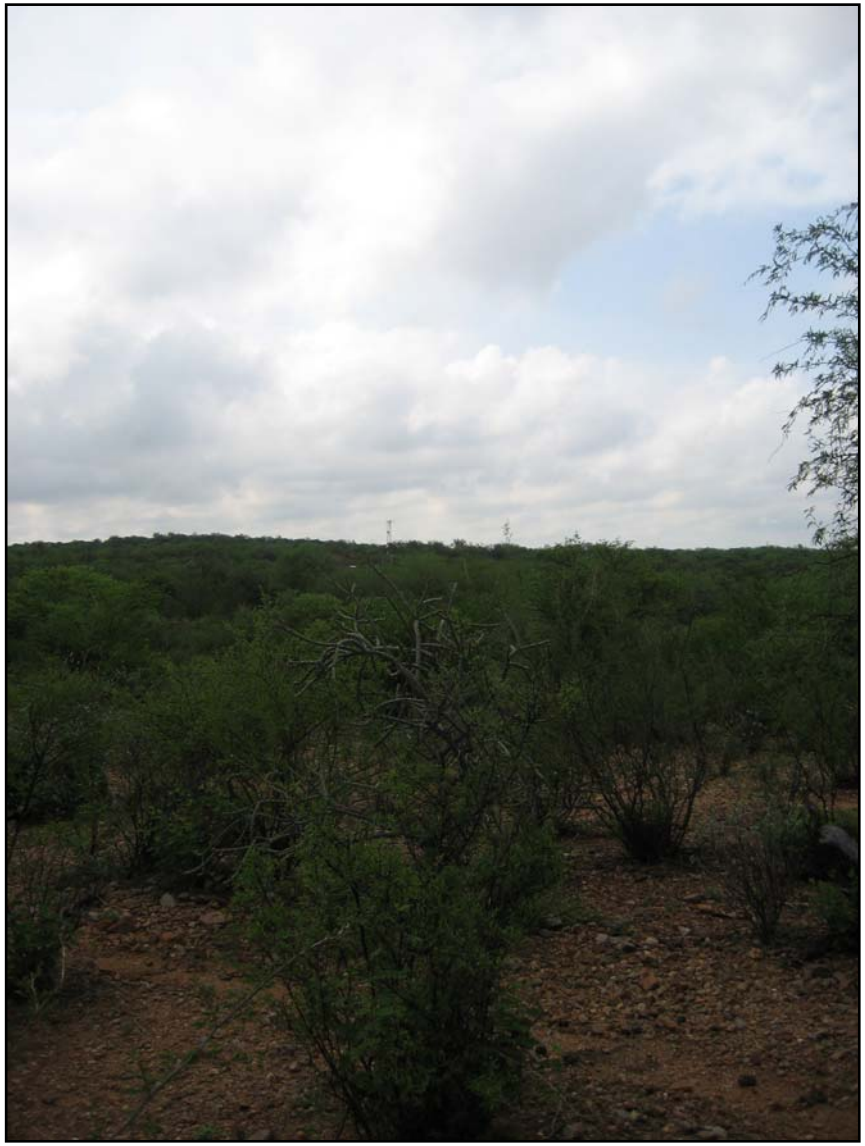


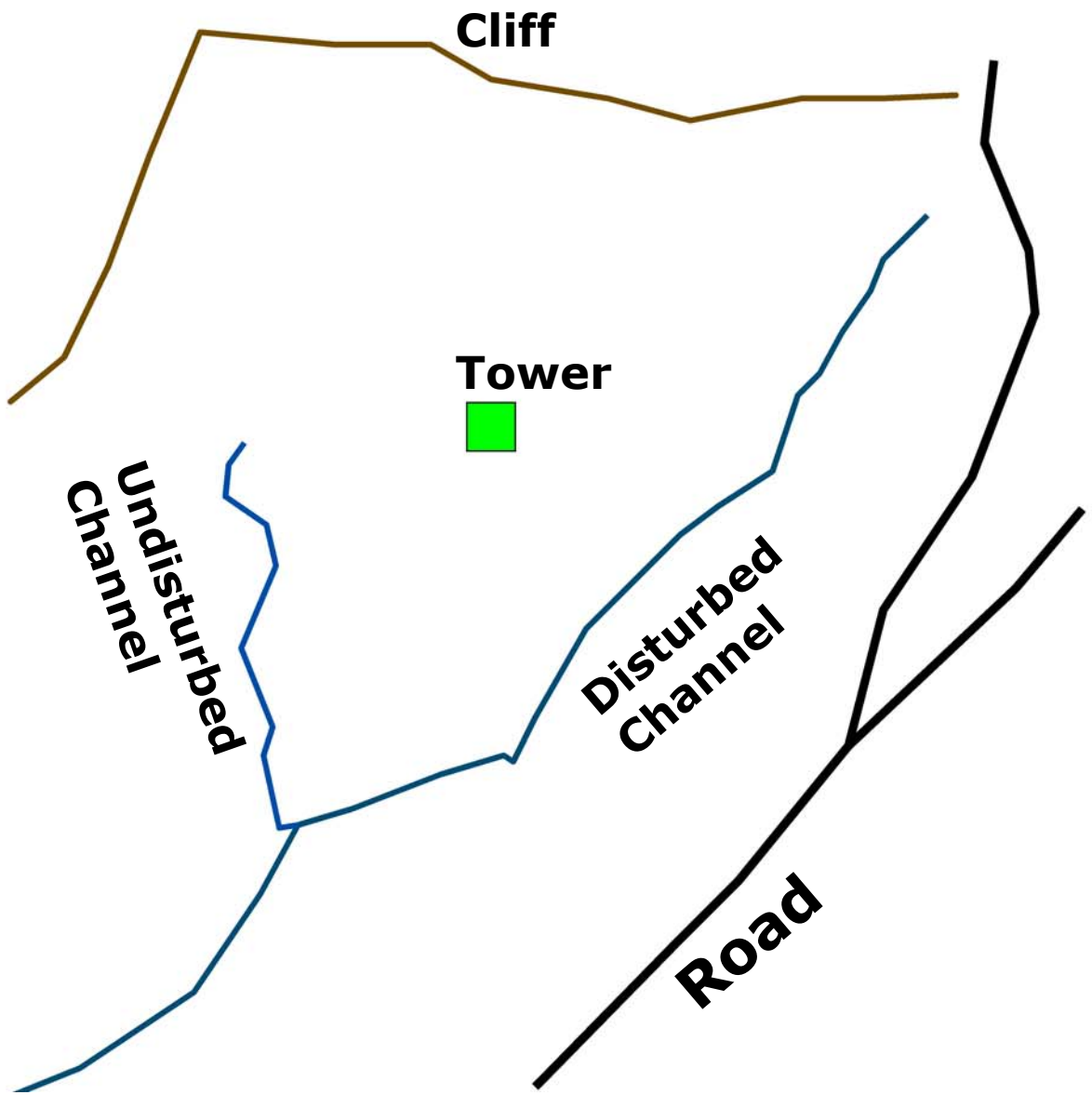
How are Channel Floods Generated in Semiarid Regions?

Observations at the First-Order Catchment Scale
Sonora 2007 IRES Field Campaign

Rayon Eddy Covariance Tower Site in Subtropical Scrubland



Rayon Tower Site in Subtropical Scrubland



Four Consecutive Cloudy Days with Two Rainfall Occurrences Prior to an Early Morning Storm at Rayon Tower

Short, High Intensity Rainfall Periods Led to Ponding on Flat Alluvial Surface and Dirt Road Near Tower


Road Runoff Channelizes in Rills along Road Edge


Road Runoff Finds its Way Downhill

Rill Transport and Incision from Road through Hillslope


Channel Flow of Externally-Produced Road Runoff


Hillslope Runoff Sampling Bottle

Arrival of Locally-Generated Channel Flow at Confluence

Movie of Flood Wave Arrival at Channel Confluence

Travelling Upstream along Locally-Generated Channel Flow

Channelized Flow Diminishes Upstream in Width and Depth


Minimal Flow near the ‘Hard to Define’ Channel Head

Dry Hillslopes Upstream of the Channel Head

How are Channel Floods Generated in Semiarid Regions?

Locally-Generated Channel Flow Processes

- Minimal Overland Sheet or Rill Flow on Hillslopes
- Saturated Regions near Channels (But no Surface Ponding)
- Clear, Sediment-Poor Water in Undisturbed Channel
- Slow Channel Velocities and Retarded Basin Response
- Subsurface Hillslope Contribution to Channel?

Externally-Generated Channel Flow Processes

- Minimal Overland Sheet Flow on Hillslopes
- Primarily Road Runoff Contributions
- Fast Velocities in Large Rills and Channel
- Muddy, Sediment-Rich Water in Channel
- Rill Transport Contributions to Channel