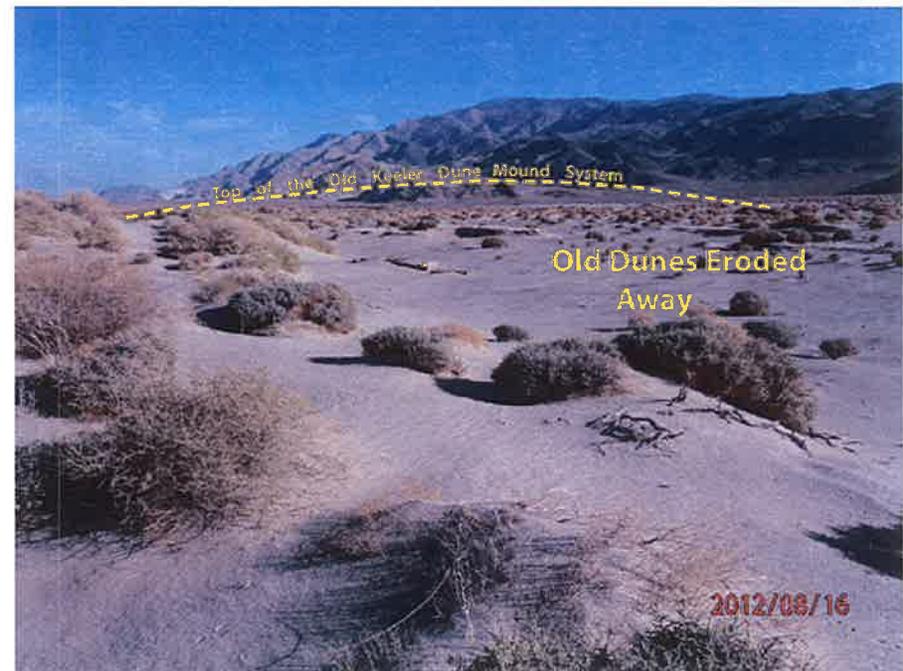
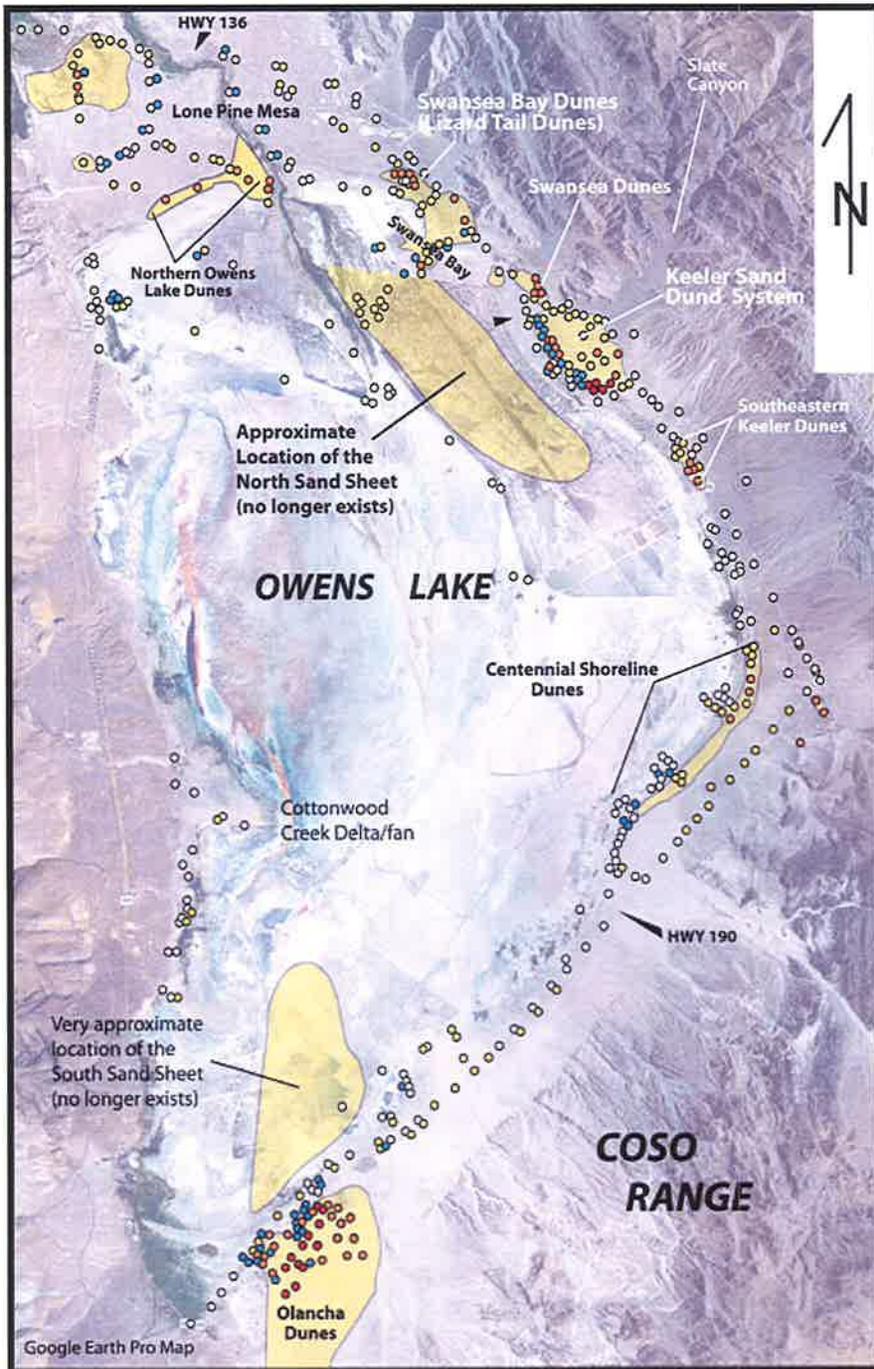


Preliminary Report on the Effects of Flood Control Berms on the Keeler Dunes, Inyo County, California

Dr. Miles Kenney, PG
AECOM

December 13, 2012

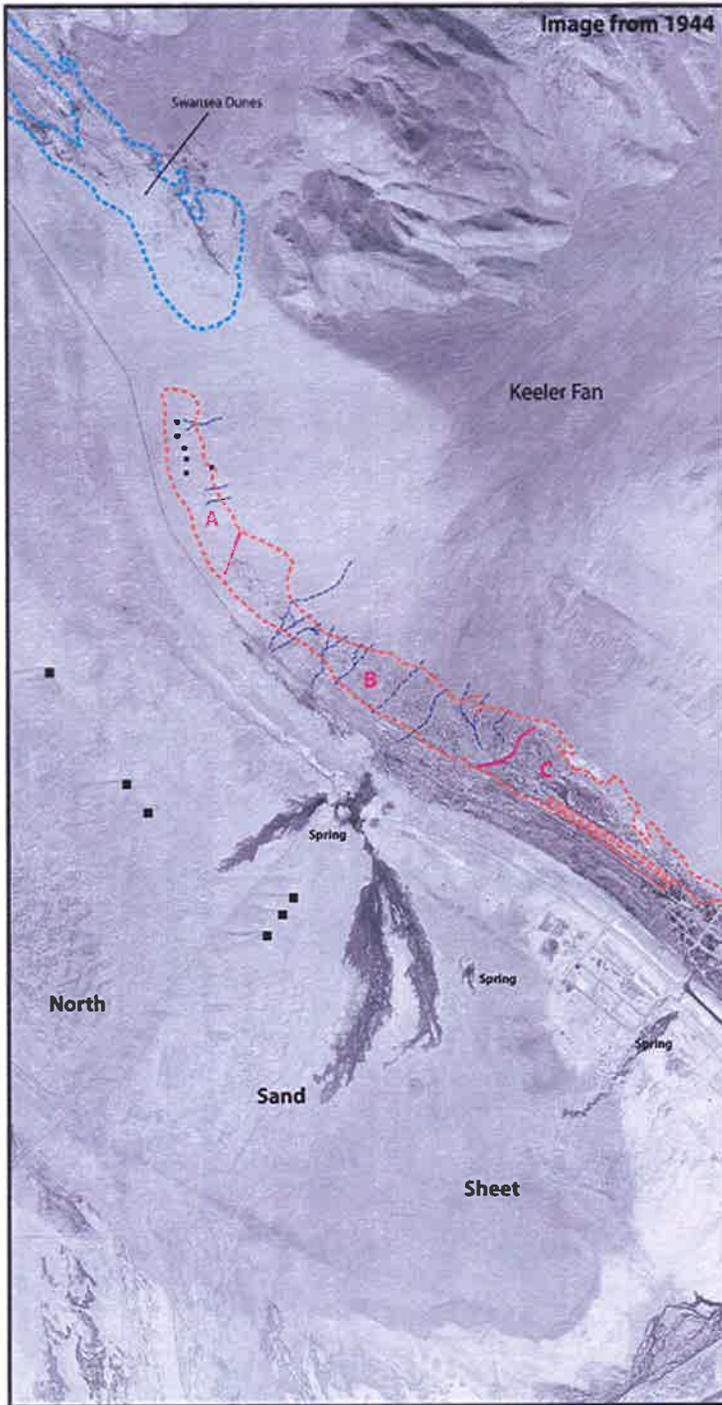




Field Sites Visited

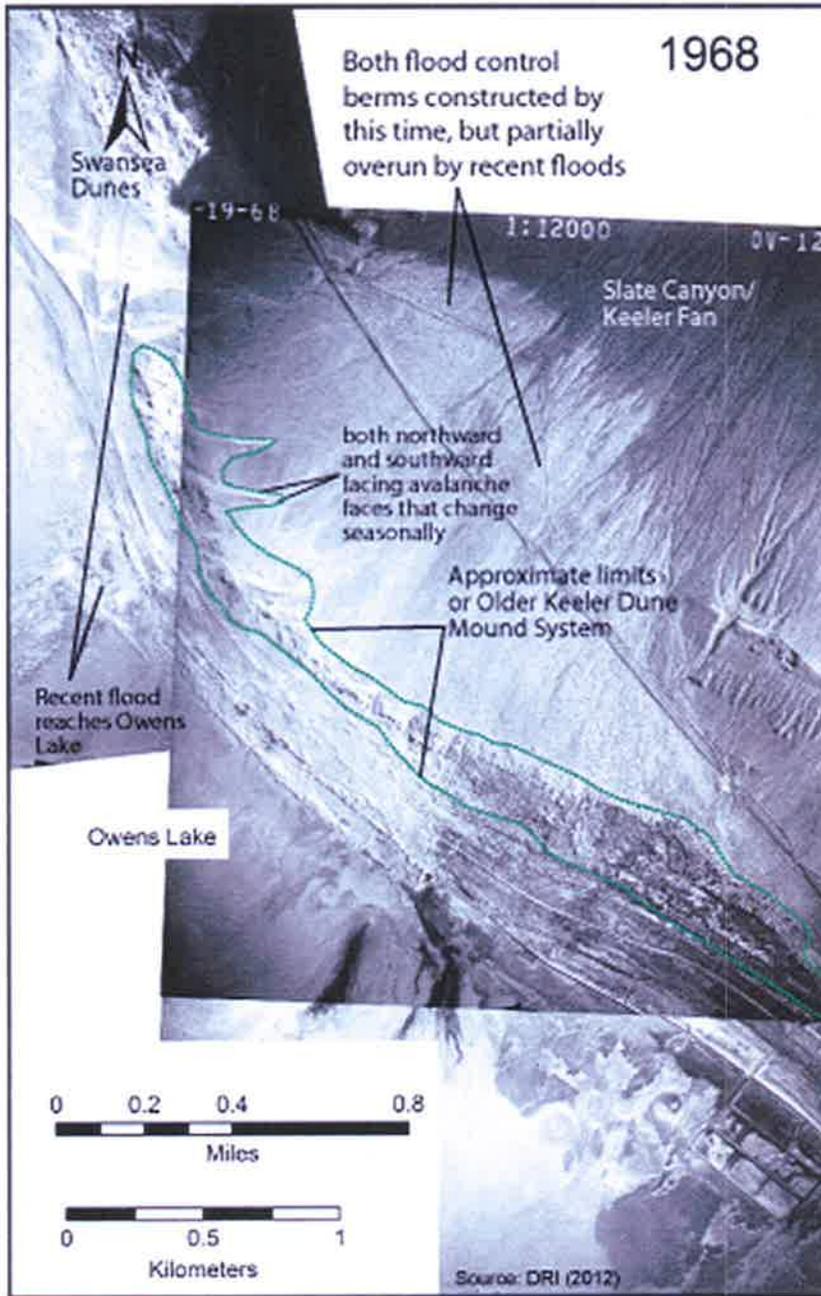
And

**Dune Systems
Bounding
Owens Lake**



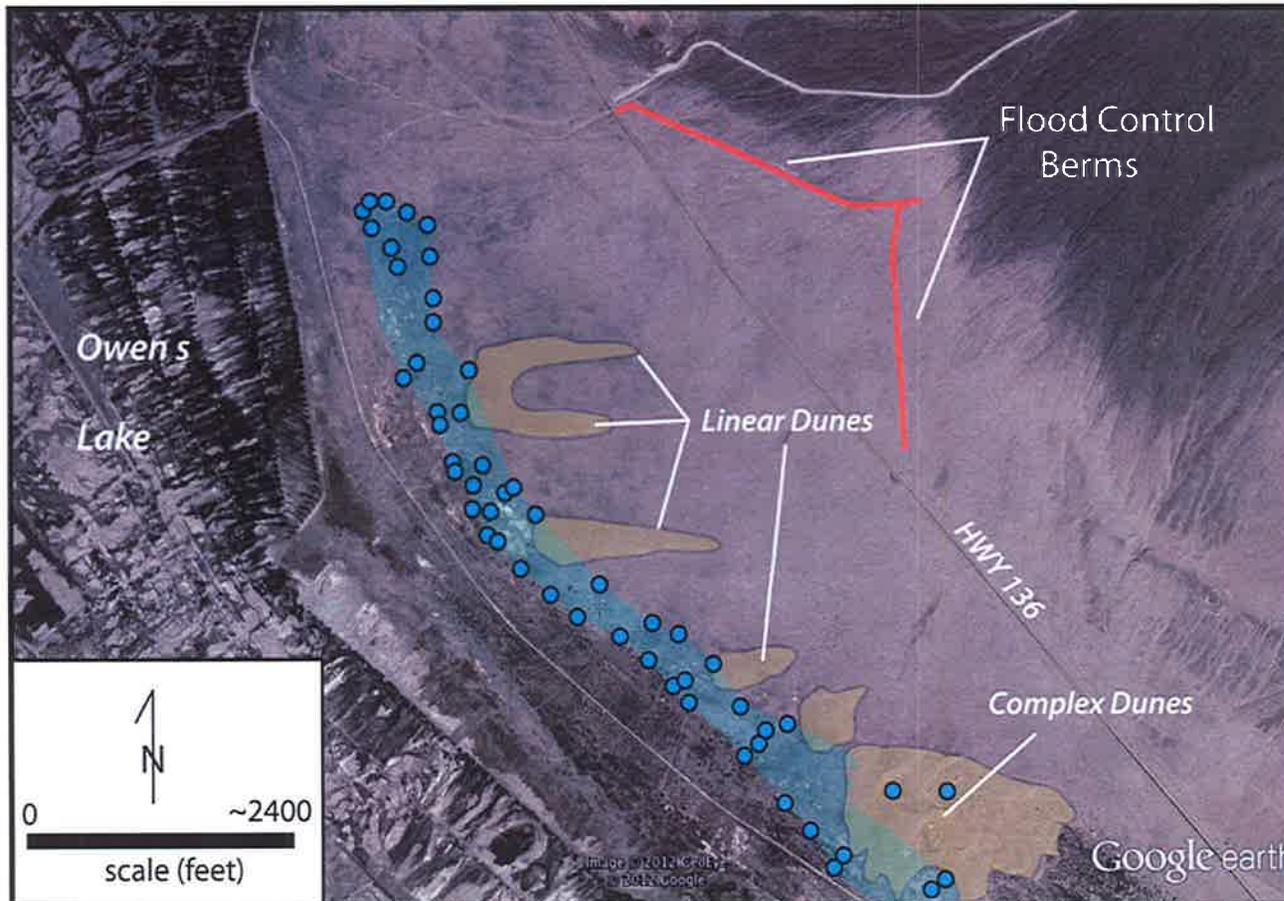
Keeler Dune Mound System

1944



Keeler Dune Mound System

1968

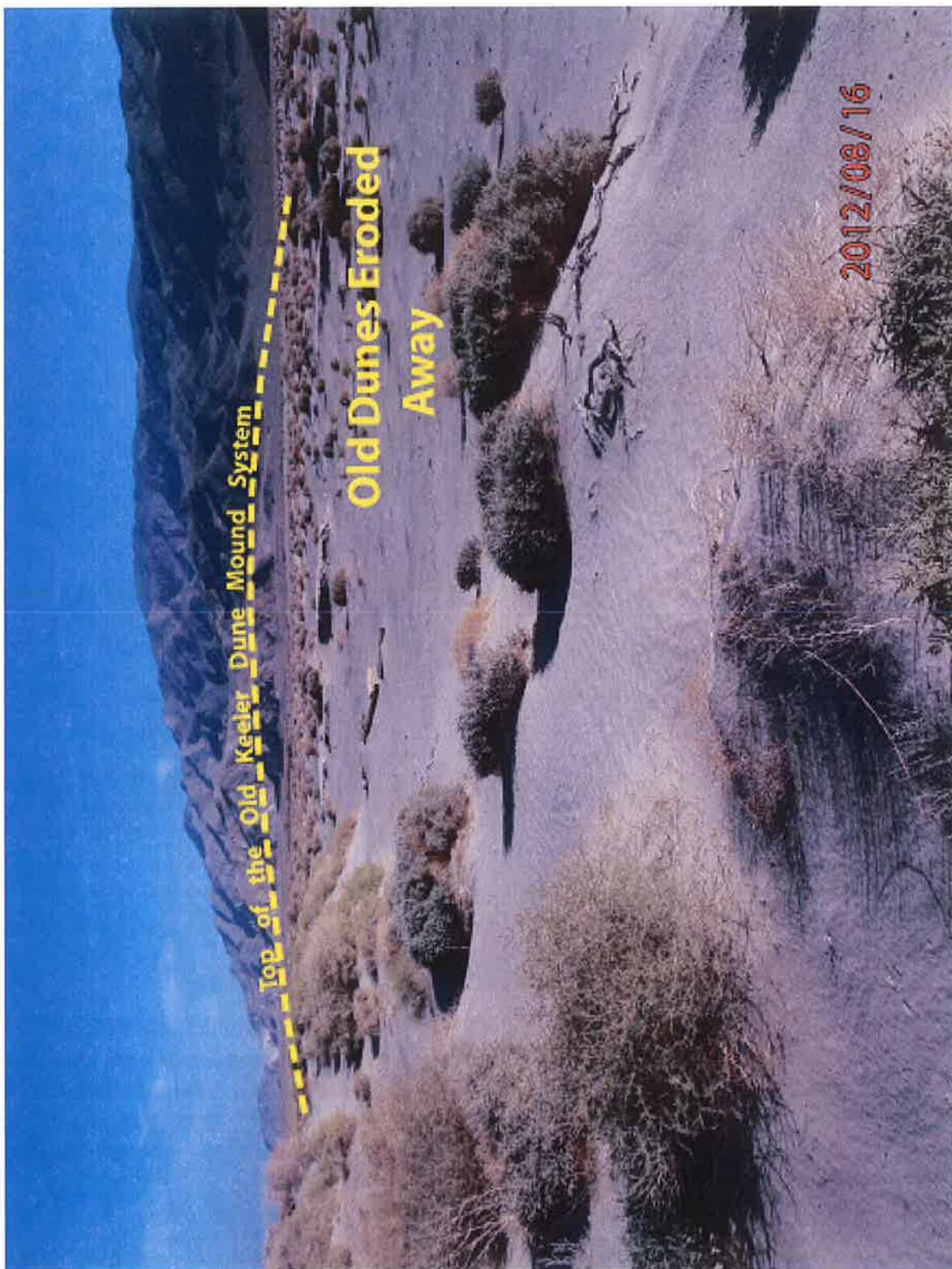


Keeler Dunes Today -

Old Keeler Dune mound system is mostly eroded away

Why?

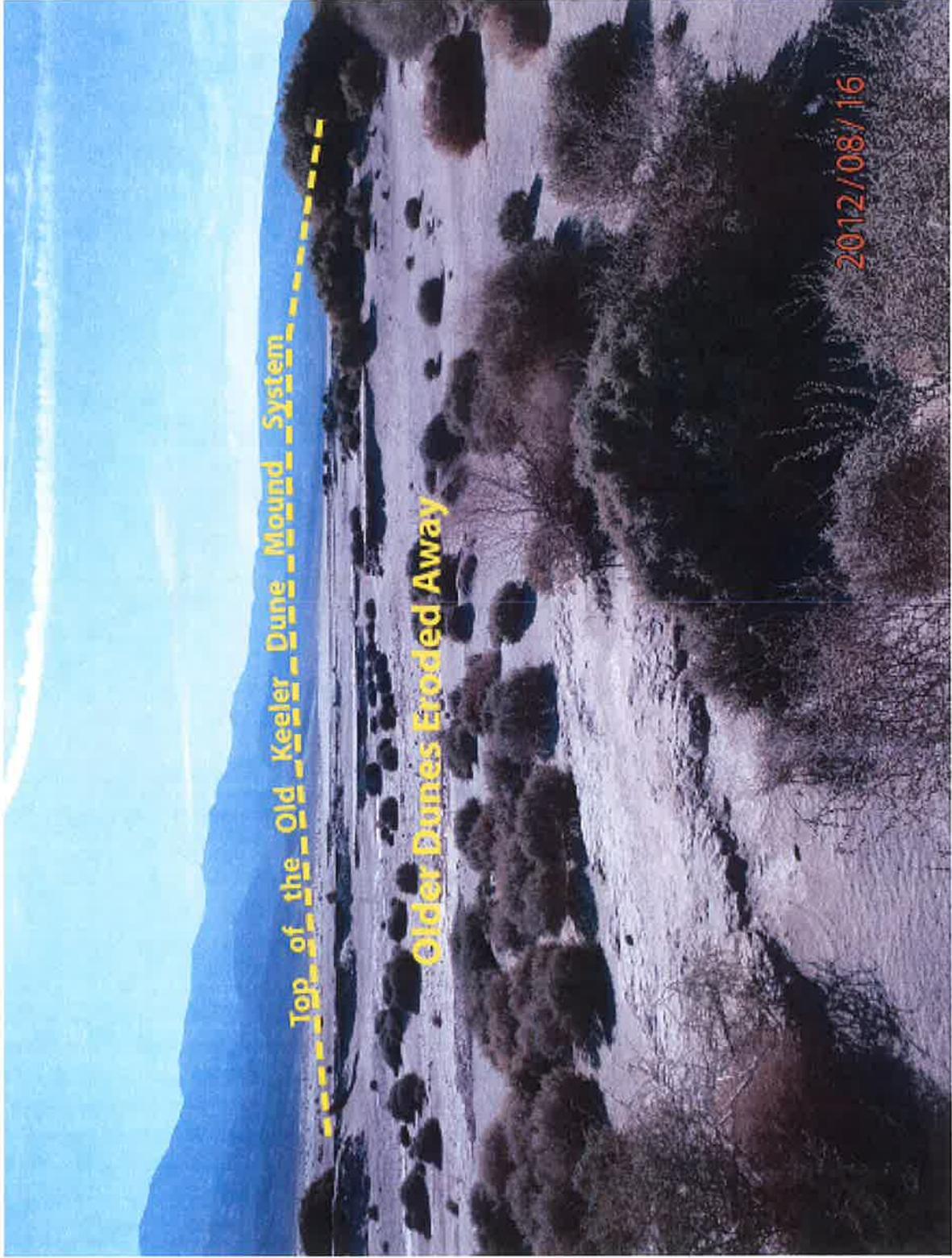
- Field site documenting area of Historical abrasion (deflation)
- Approximate limits of Historical abrasion area where Older Keeler Dune deposits deflated.
- Approximate area of Younger Keeler Dunes (linear and complex only)

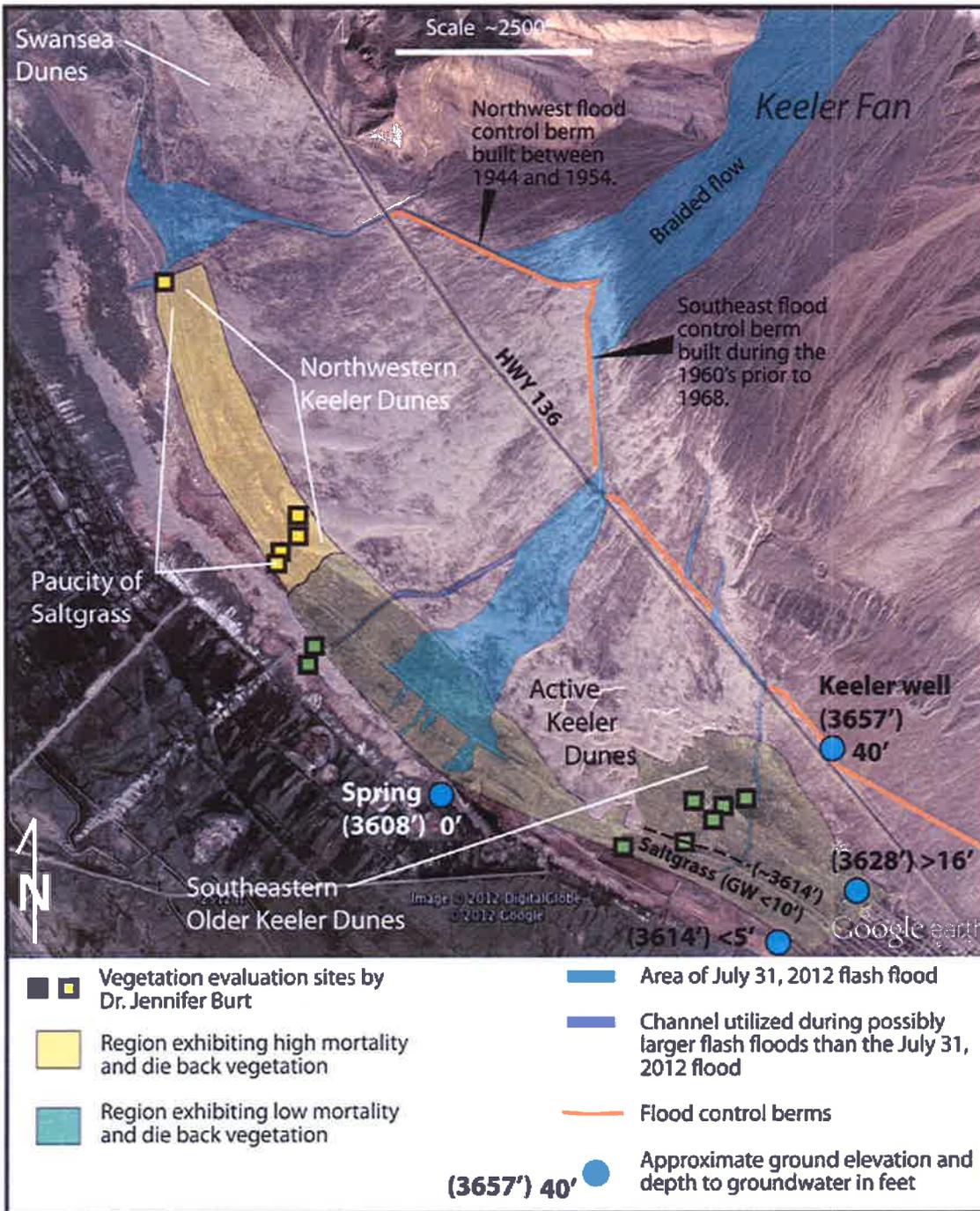


Top of the Old Keeler Dune Mound System

Old Dunes Eroded
Away

2012/08/16





The First Clues

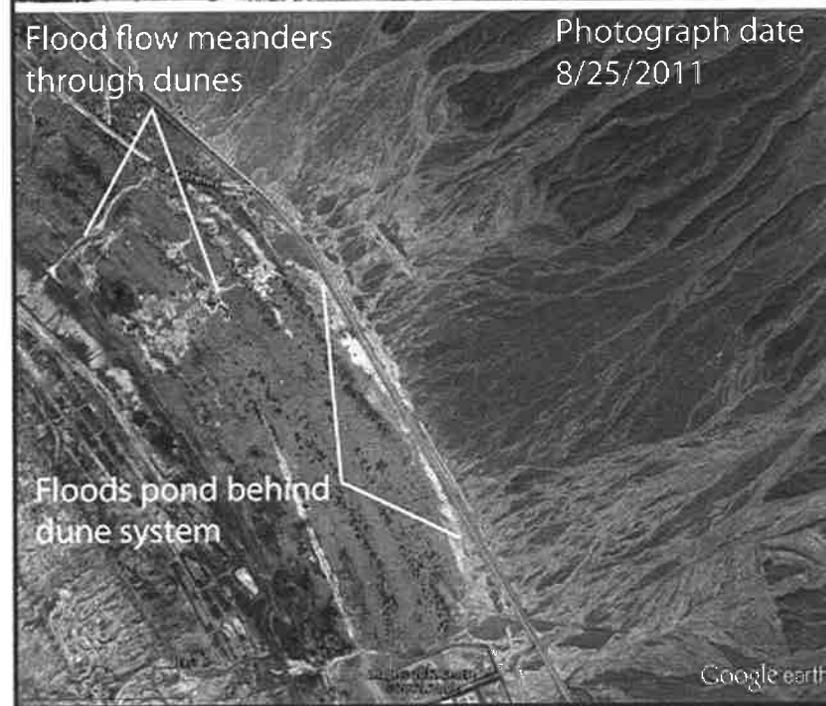
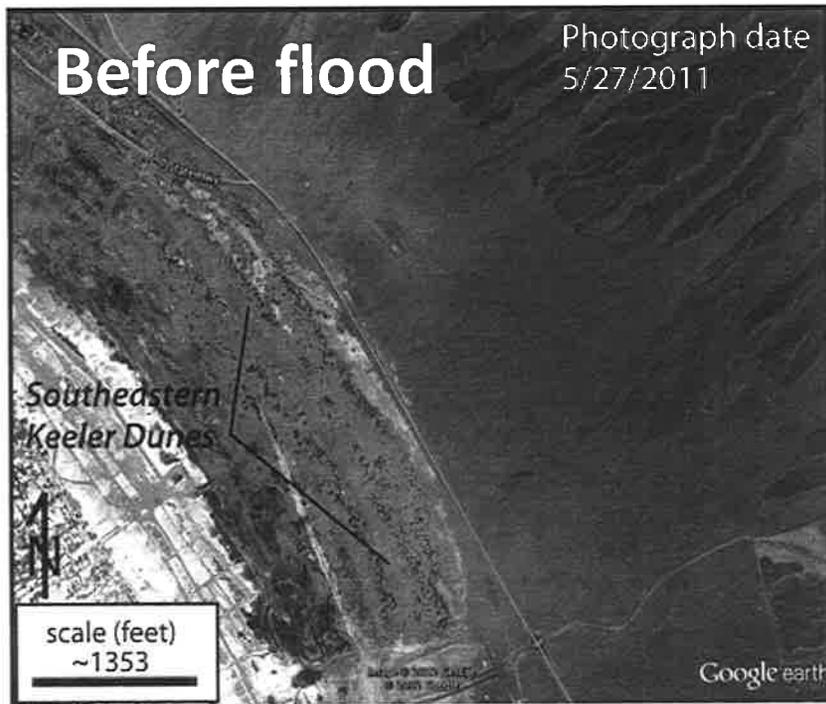
July 31, 2012 flood

And

Vegetation

led to a new hypothesis regarding what caused erosion of the Older Keeler mound system.....

The Keeler Dunes Dried out... (yellow area)

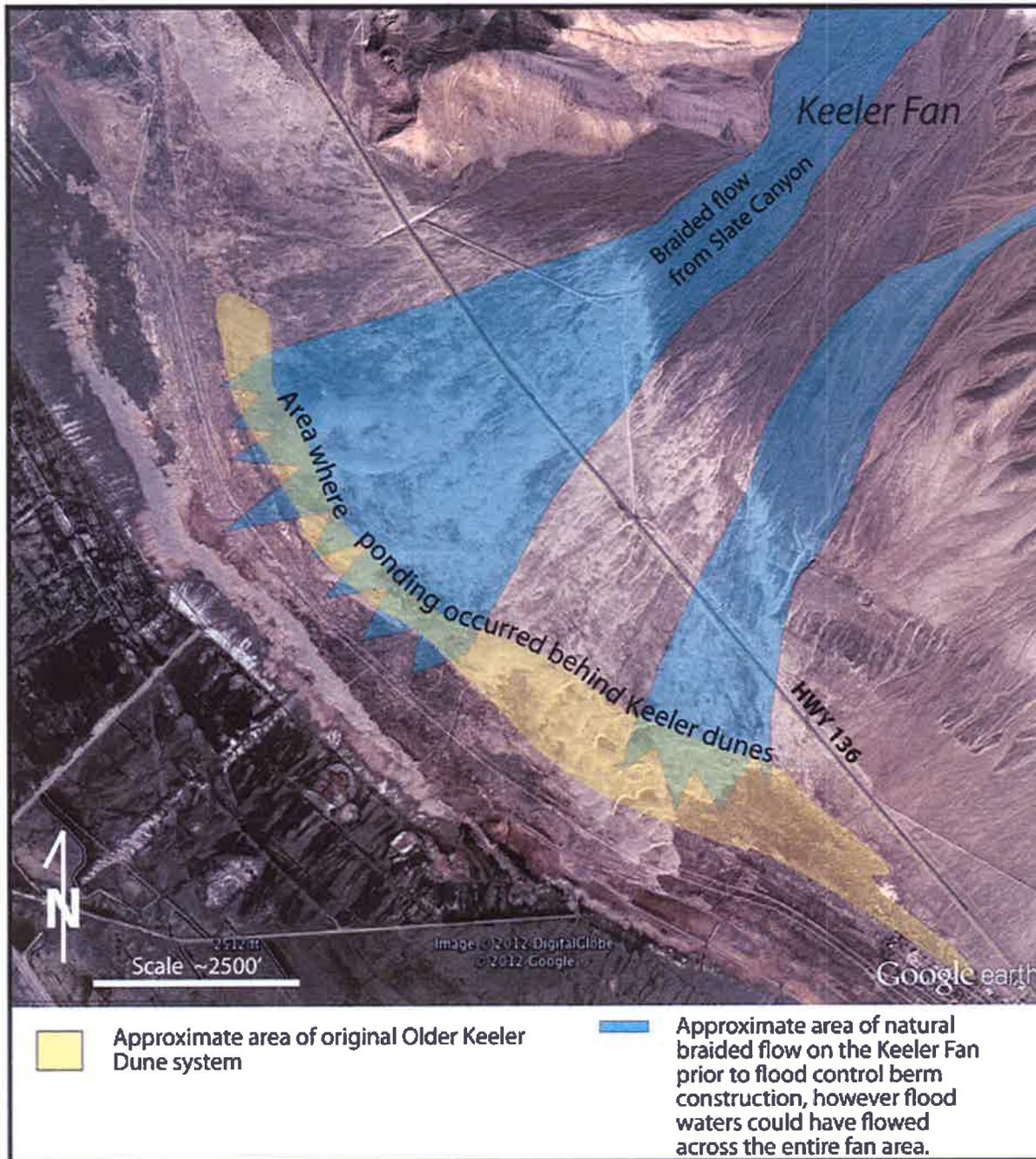


How “Natural” flooding in a local dune System looks....

Flood in the Southeast Keeler Dunes 2011

Notice ponding of flood waters behind the dune mound system and slow flow through the dunes

This type of flood was common in the Keeler Dunes throughout most of their history



How flood waters may have entered the Keeler Dunes prior to construction of the flood control berms

South

North

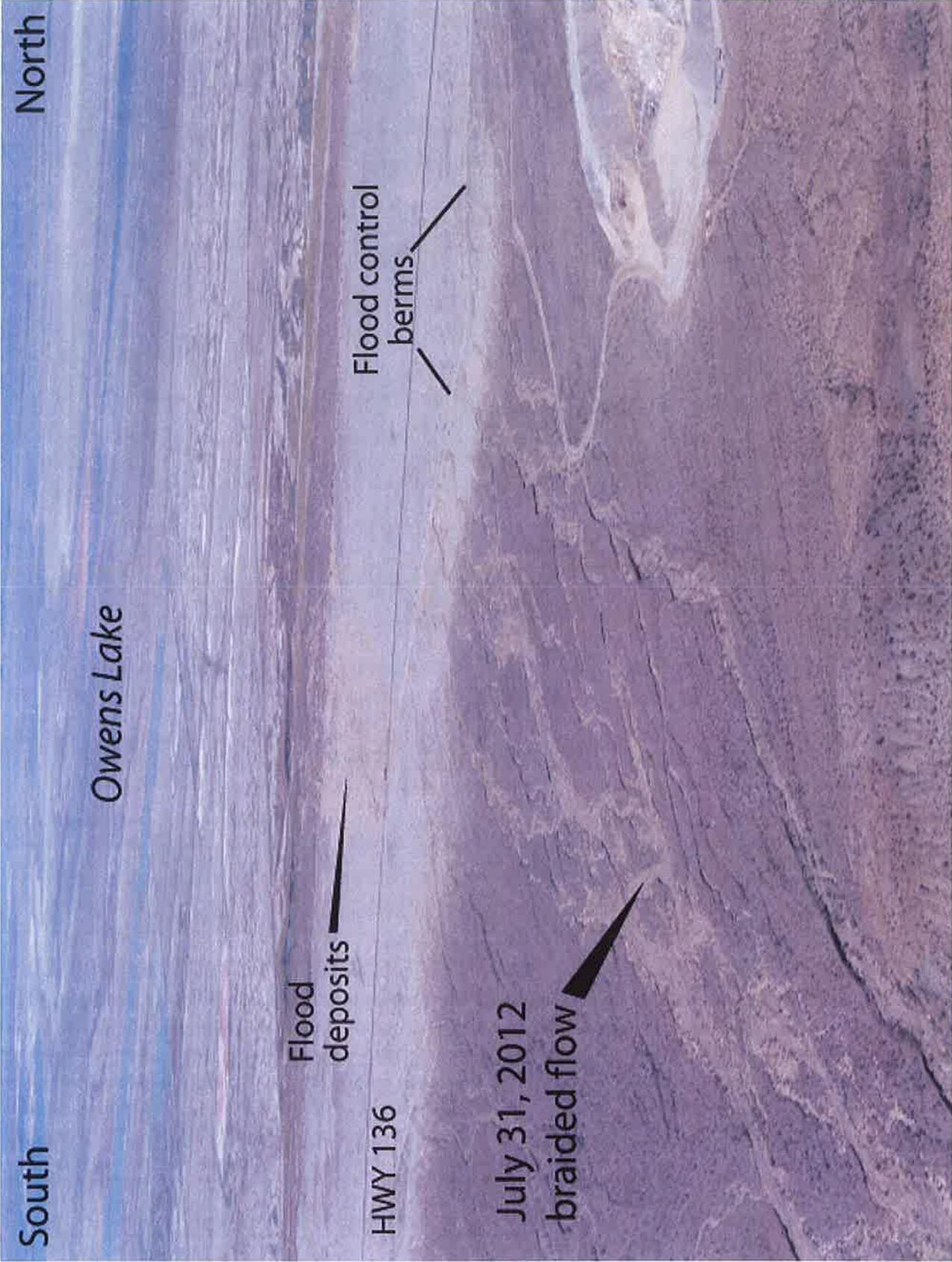
Owens Lake

Flood deposits

Flood control berms

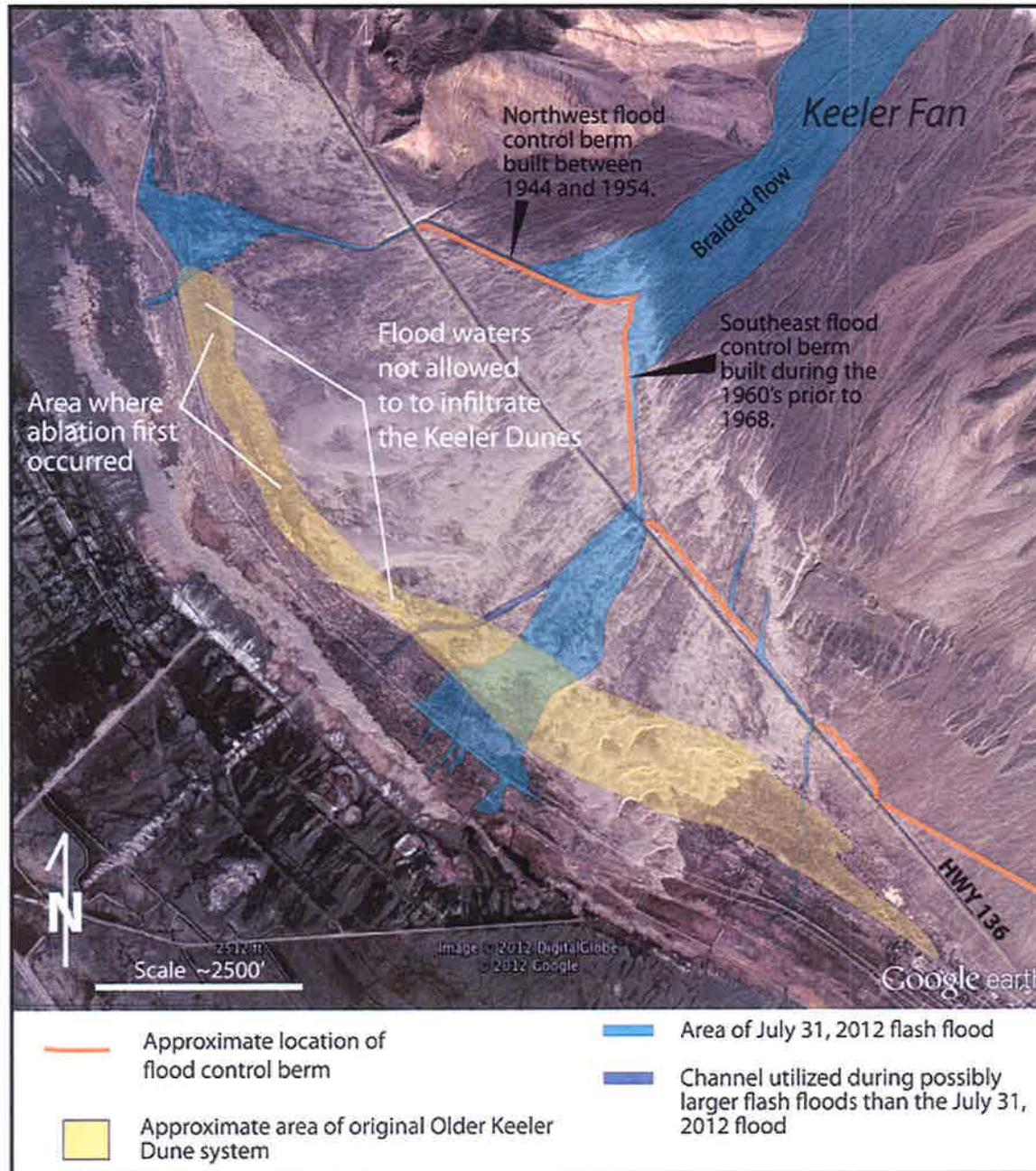
HWY 136

July 31, 2012
braided flow

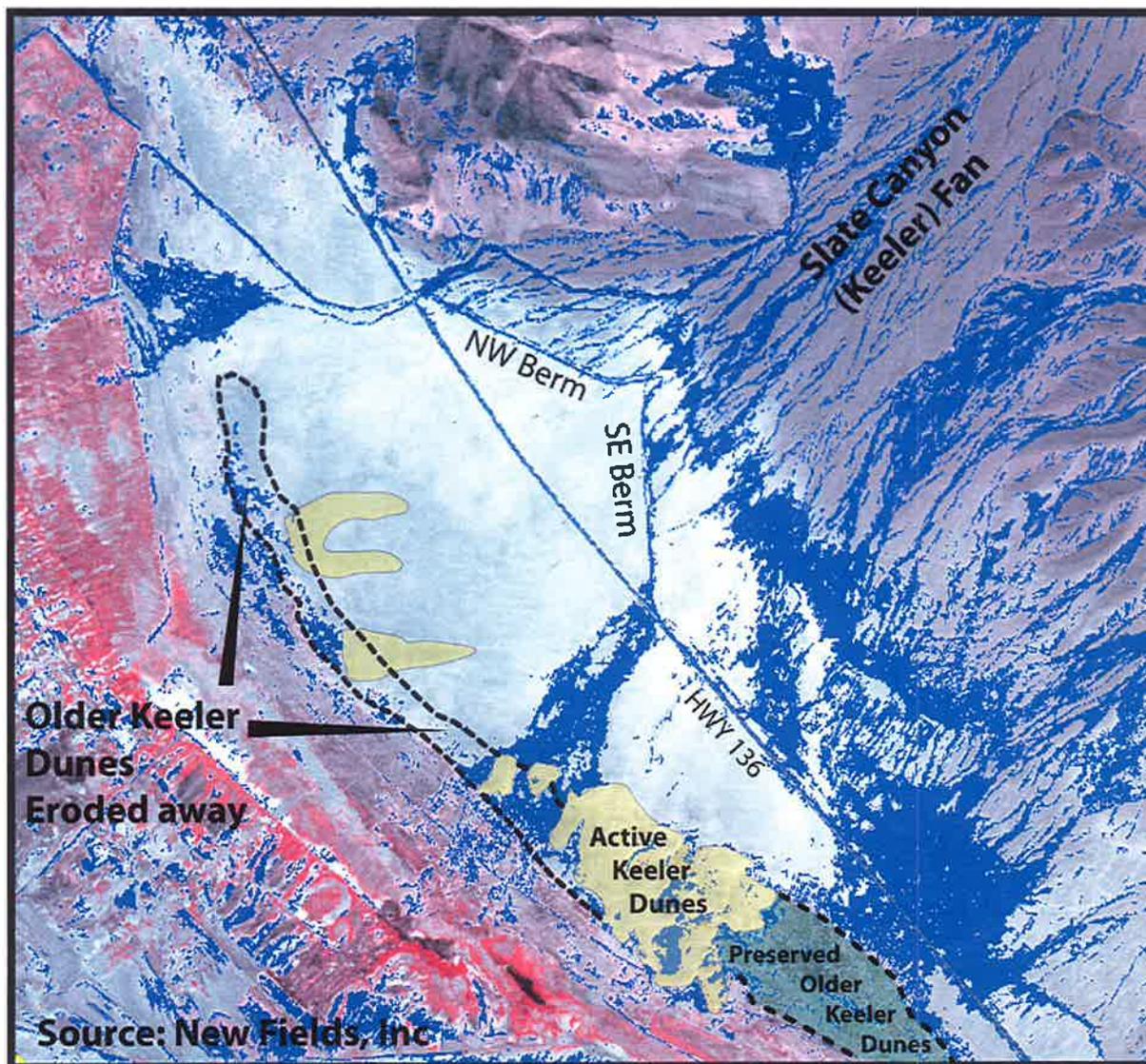


Extent of flood water flow during the July 31, 2012 flood

Waters were diverted away from the northwestern Keeler Dunes

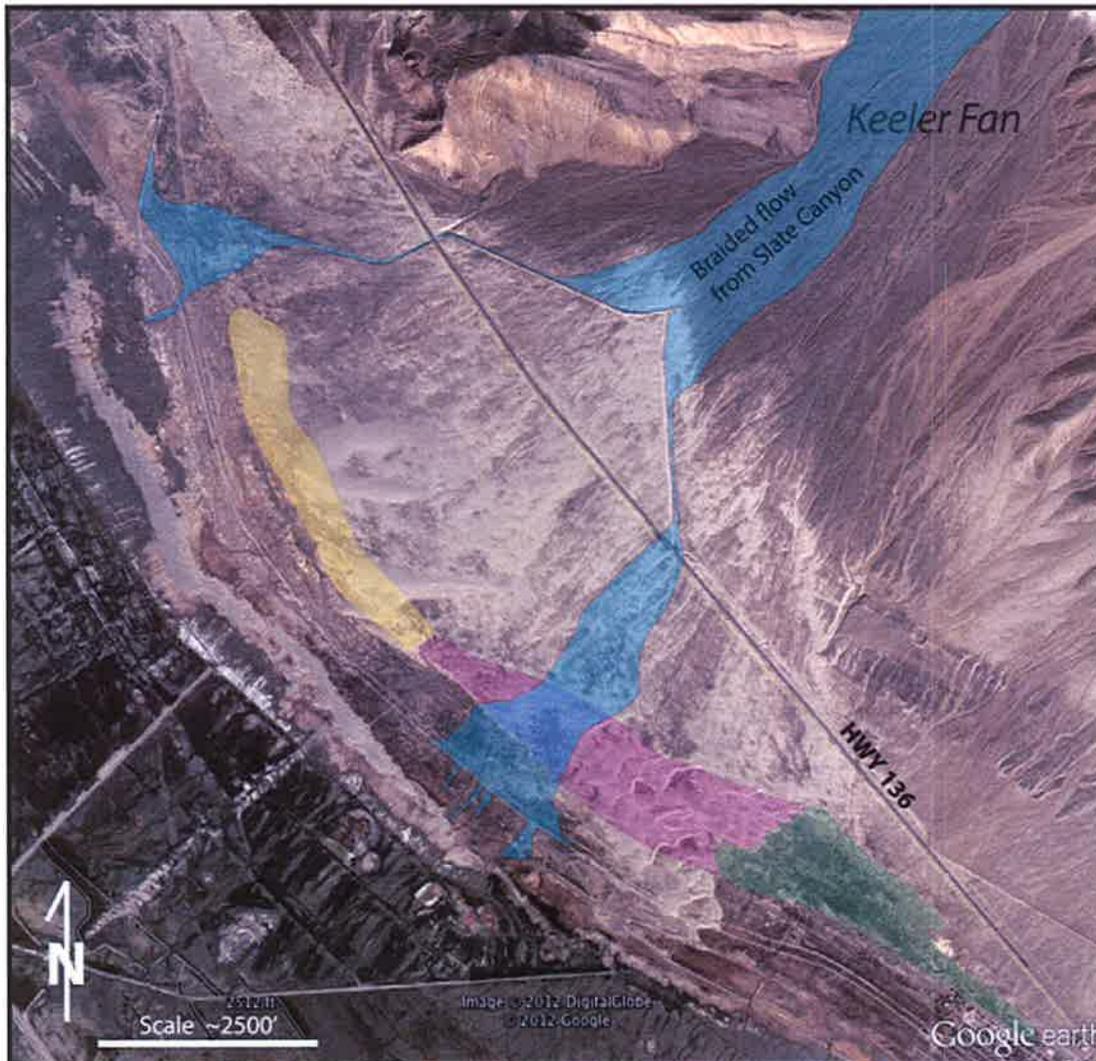


What were the affects of the diversions of the flood waters to the Keeler Dunes?



Cascade of Geomorphic Events

1. *Erosion of the old dune mound system in the Northwest, which assisted in the creation of*
2. *The transverse dunes to the Southeast, which has led to the*
3. *Exposure of old Keeler Dune material and flood water sediment with dust emission potential*



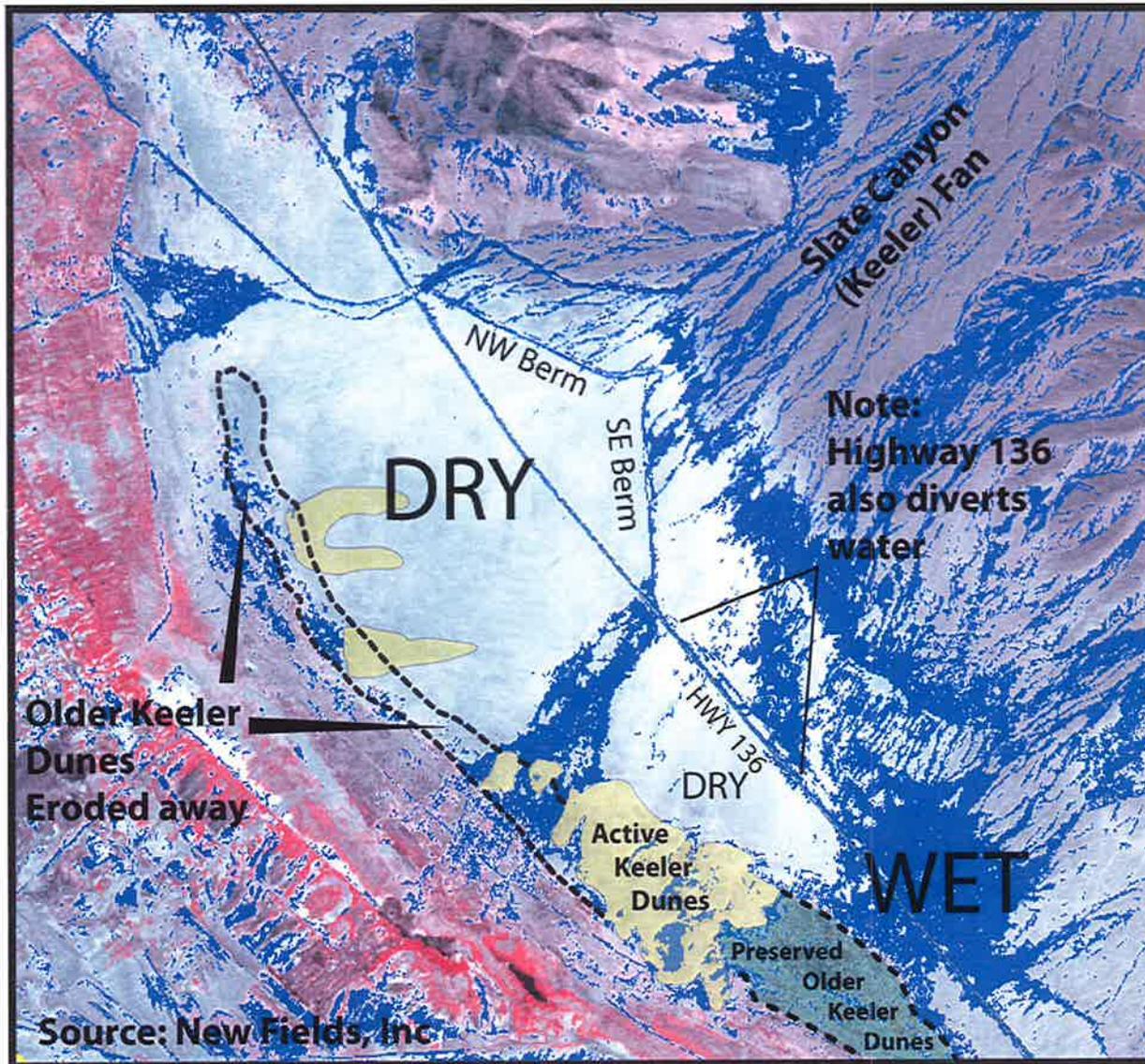
Blue = Area of July 31, 2012 flood.

Yellow = Region where the Old Keeler mound system used to exist.

Purple = Region where transverse dunes migrated, assisting in the removal of Older Keeler dunes

Green = Area of stable and preserved Older Keeler Dunes. This area gets a lot of flash flood waters.

- Approximate region of the Older Keeler Dunes where ablation due to decrease in infiltration flood waters occurred. Also the area where Keeler Dunes received sand input during aggradational events when Owens Lake was low similar to Historic times.
- Approximate region where destruction (erosion) of the Older Keeler Dunes was primarily associated with migration of Younger Keeler Dunes. Original Older Keeler Dunes in this area were primarily complex and not shoreline-type.
- Approximate region of preserved Older Keeler Shoreline dune mounds
- Limits of July 31, 2012 flash flood



How could local erosion in the Keeler Dunes have Caused dust emissions?

By increasing the Exposure of fine-grained Flood deposits (older and younger flood deposits)

And

Potentially by eroding Older Keeler Dune sands that may be emissive