



Central Asia Active Fault Database

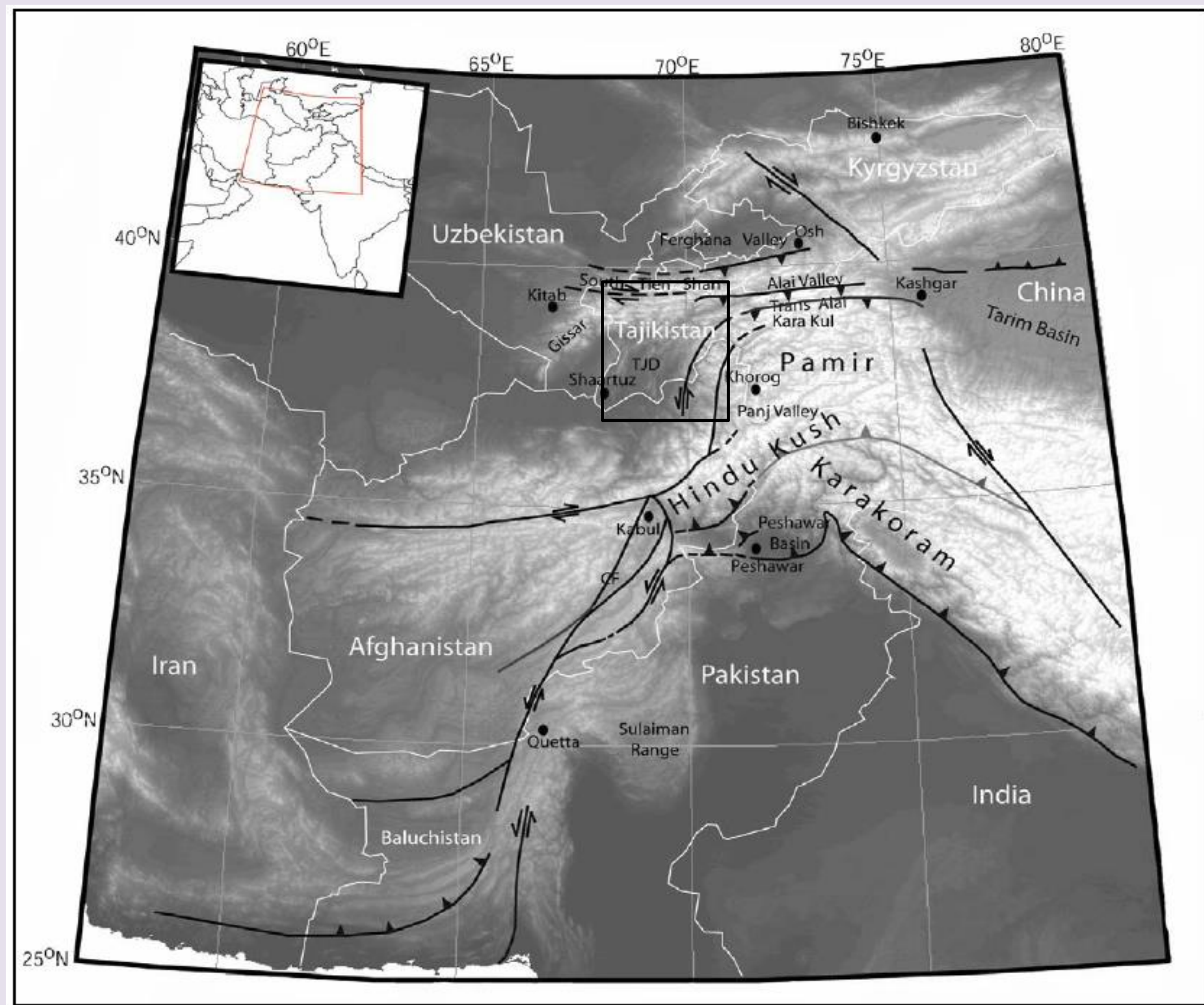
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MOTIVATION

- The ongoing collision of the Indian subcontinent with Asia is accommodated by faults that have historically caused devastating earthquakes. Despite international and regional efforts to assess seismic hazards in Central Asia, little attention has been given to the development of a comprehensive database for active faults in the region.
- To address this issue, we are developing a publically available database for active faults of Central Asia.



Map showing extent of the study region; major active faults are shown as heavy black lines. The black rectangle shows the location of the Darvaz-Karakul fault discussed in this poster (see right column).

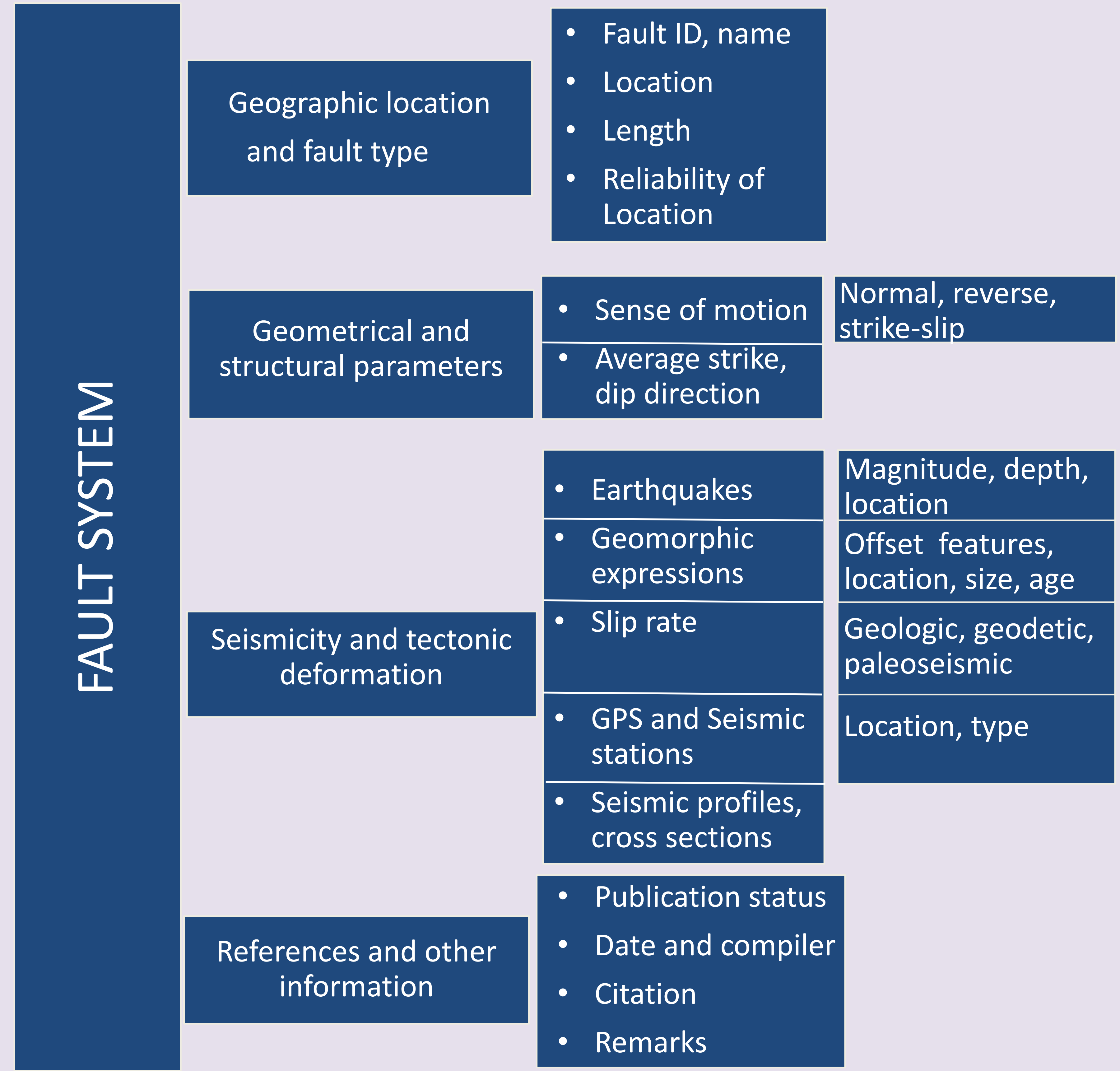
QUESTIONS

1. What are the active faults in Central Asia?
2. Where are the active faults?
3. When did they last have a large earthquake?
4. Where are the high-hazard zones?

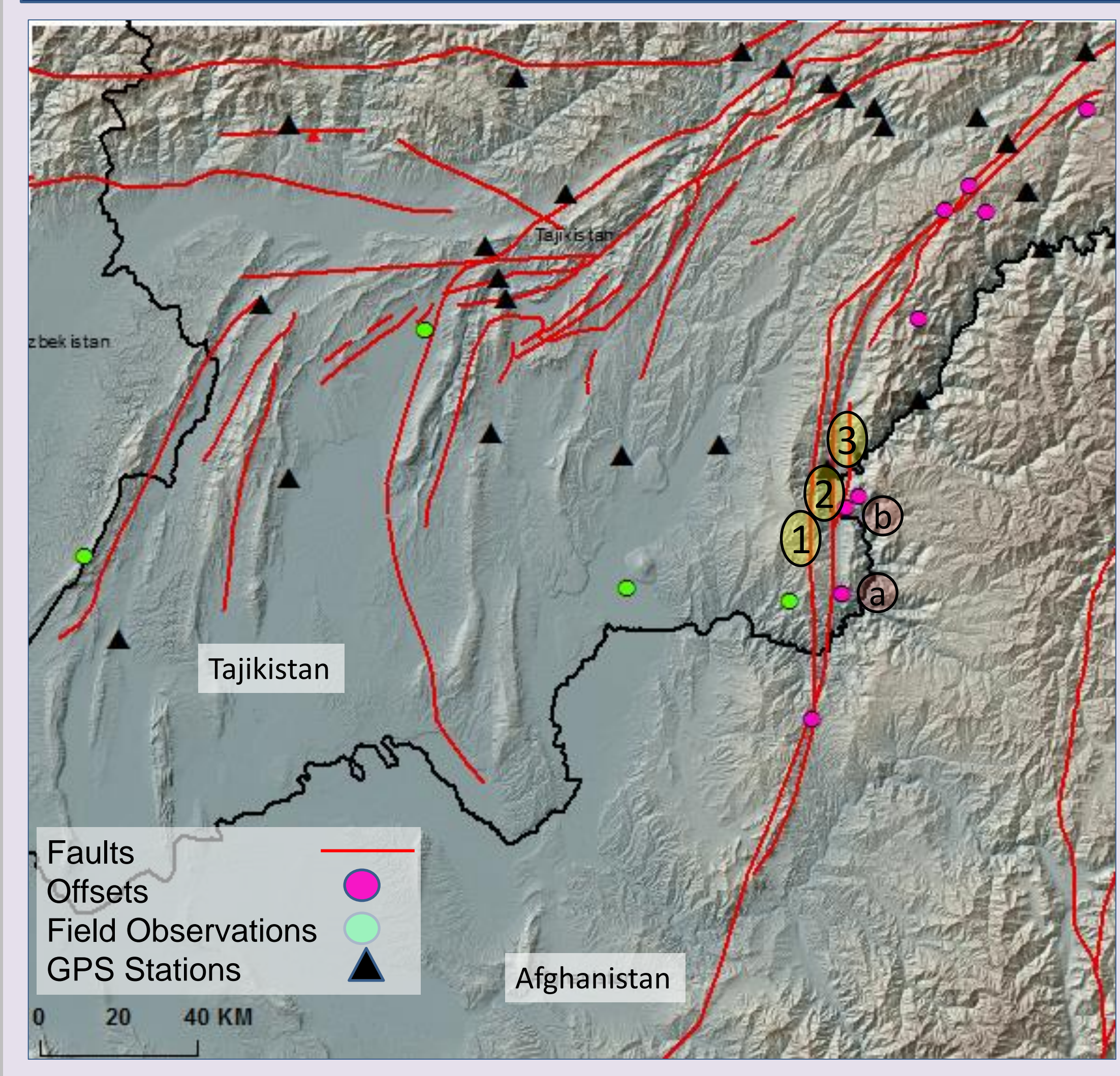
KEY DATABASE FEATURES

- Contains important fault parameters and references
- Based on published and peer-reviewed literature
- Open-access, online database
- Allows users to query, sort, and display information
- Serves the scientific community, members of hazard assessment teams and the general public

DATABASE DESIGN



EXAMPLE: DARVAZ-KARAKUL FAULT



This fault is mapped with differences in location of up to 12 km. The sense of motion ranges from unknown to thrust and strike-slip despite documented sinistral offsets of landforms near the fault.

Sense of motion:

Field	Value	Field	Value	Field	Value
OBJECTID	496	OBJECTID	516	OBJECTID	506
SHAPE	Polyline	SHAPE	Polyline	SHAPE	Polyline
Fault_Type	Thrust	Fault_Type	Left-lateral	Fault_Type	Thrust
Exposure	Exposed	Exposure	Exposed	Exposure	Exposed
Reference	Published	Reference	Published	Reference	Published
SHAPE_Length	153995.830995	SHAPE_Length	314994.802081	SHAPE_Length	34208.881399
Citation	Thomas et al. (1994)	Citation	Burtman and Molnar (1993)	Citation	Leith (1985)
Lines	Fault	Lines	Fault	Lines	Fault
Name	Darvaz Karakul Fault	Name	Darvaz Karakul Fault	Name	Darvaz Karakul Fault
Remarks	<null>	Remarks	Adapted from Geologic Map of Afghanistan (1977)	Remarks	<null>
Split	<null>	Split	<null>	Split	<null>

Geomorphic offsets:

Field	Value	Field	Value
Citation	Personal Communication, Gloguen (2014)	Field	Point
OBJECTID	110	OBJECTID	93
Point	Offset	SHAPE	Point
Reference	Unpublished	Point	Offset
Remark	Sinistral, poor quality (per. comm. Gloguen 2014)	Reference	Published
SHAPE	Point	Citation	Burtman and Molnar (1993), Trifonov (1978, 1983, p. 73)
		Remark	Late Holocene landforms are displaced 20m left laterally along the strike-slip fault

- **Name:** Darvaz-Karakul Fault
- **Location:** Tajikistan, Afghanistan
- **Length:** <300 km
- **Reliability of location:** Poor
- **Sense of movement:** Sinistral*, thrust**
- **Average strike:** Northeast
- **Geomorphic expression:** Unclear along much of its trace, late Holocene and Holocene offsets of 60-95 m and 150-150 m respectively, and late Pleistocene offsets of 300-350 m, and offsets of about 800m since the beginning of late Pleistocene (Kuchai and Trifonov (1997) and Trifonov (1978). None of the offset features have been dated precisely .
- **Slip rate:** 10-15 mm/yr (geologic), 11 ± 2 mm/yr (geodetic – upper bound)
- **Date and compiler:** 2013, S. Mohadjer
- **Citation:** Trifonov (1978), Burtman and Molnar (1993)*, Thomas et al. (1994)**, Kuchai and Trifonov (1997), Cowgill (2010), Mohadjer et al. (2010)

Work in Progress

- Continue populating the database
 - Fault locations, offsets, field observations
 - Seismic, GPS stations
 - Fault slip rates, strain map
- Examine Quickbird (0.6m) imagery for selected features
- PostgreSQL table implementation
- Web interface development

References

Burtman, V., and P. Molnar (1993), Geological and geophysical evidence for deep subduction of continental crust beneath the Pamir, Spec. Pap., Geological Society of America, 281
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