

## The SAF and its Neighbors

EQ not only on SAF

north: Hayward, Calaveras, etc

Calaveras well-know for  $M \geq 5.5$

07/01/1911  $M = 6.5$

08/06 1979  $M = 5.8$

04/24 1984  $M = 6.2$

10/30 2007  $M = 5.6$

10/25/2022  $M = 5.1$

same location as 1984



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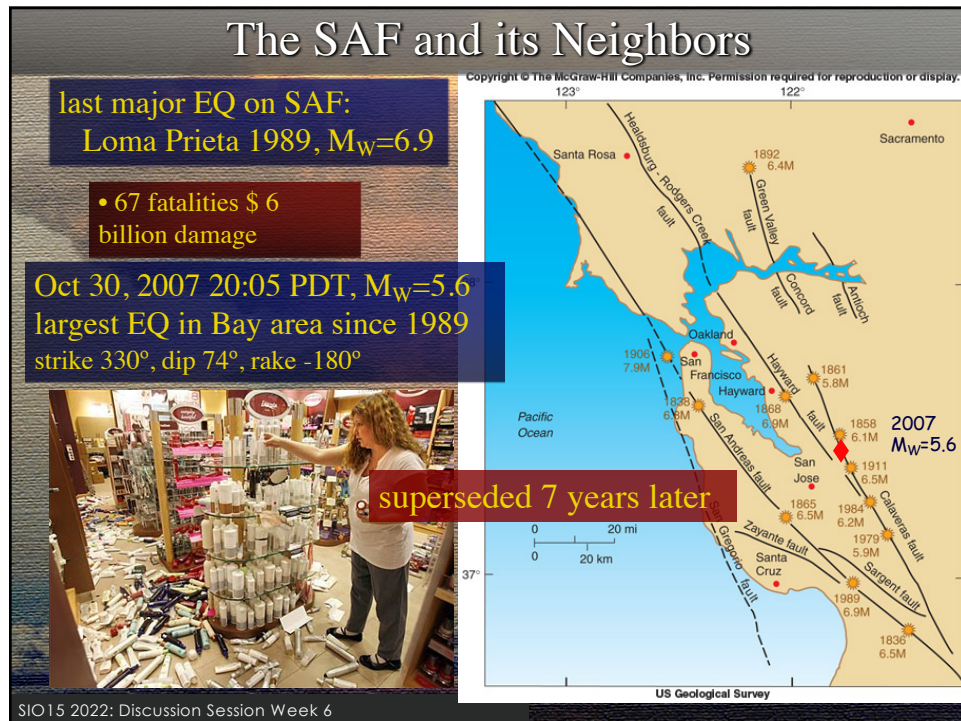
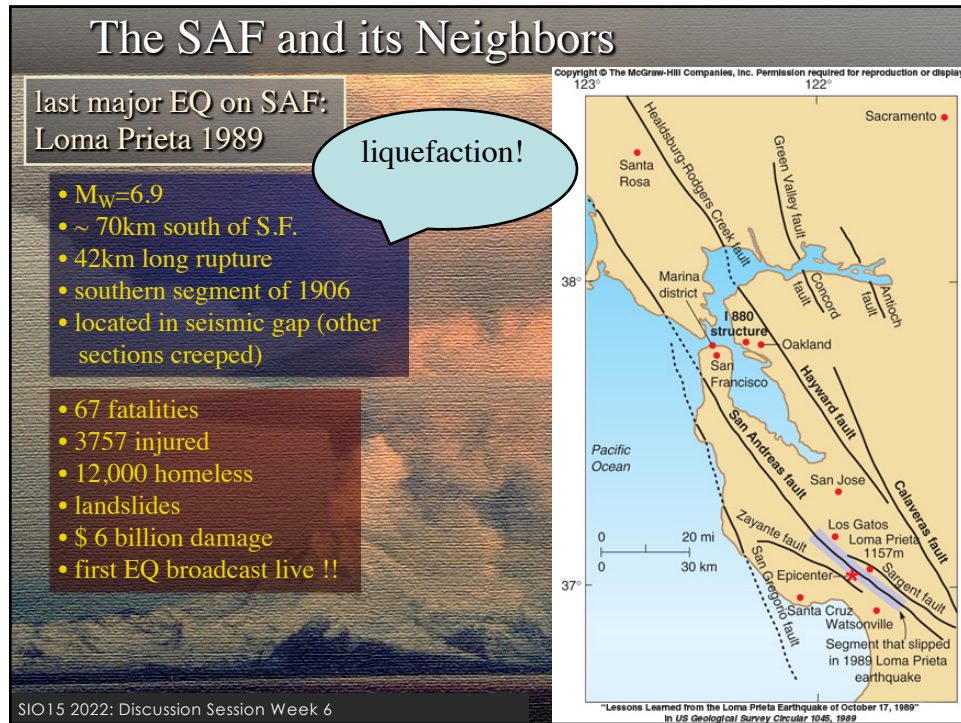
## The SAF and its Neighbors

10/25/2022  $M = 5.1$

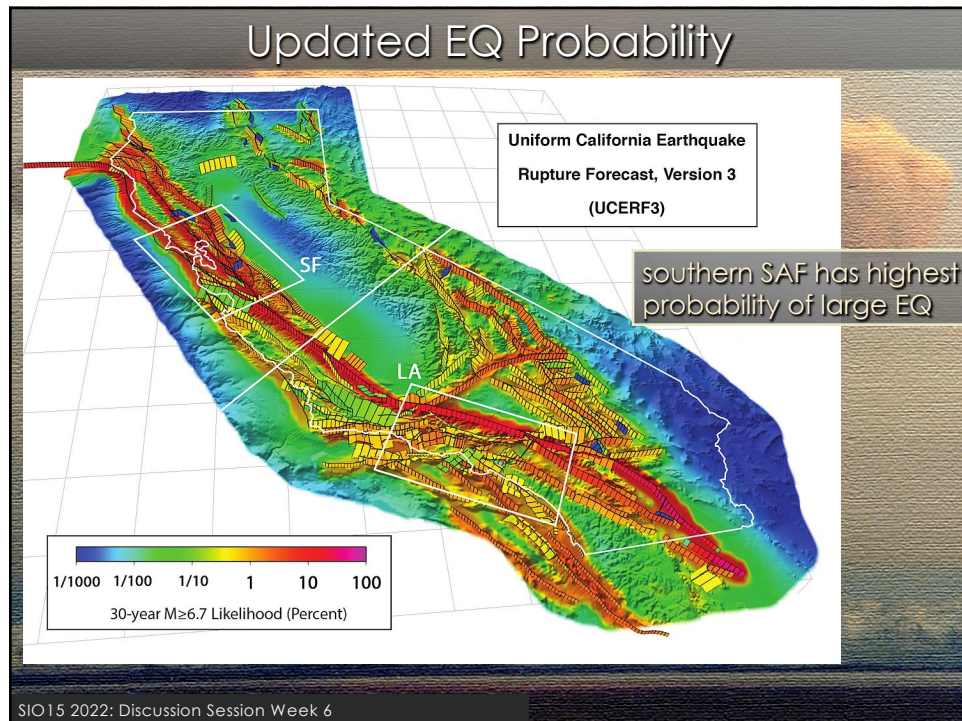
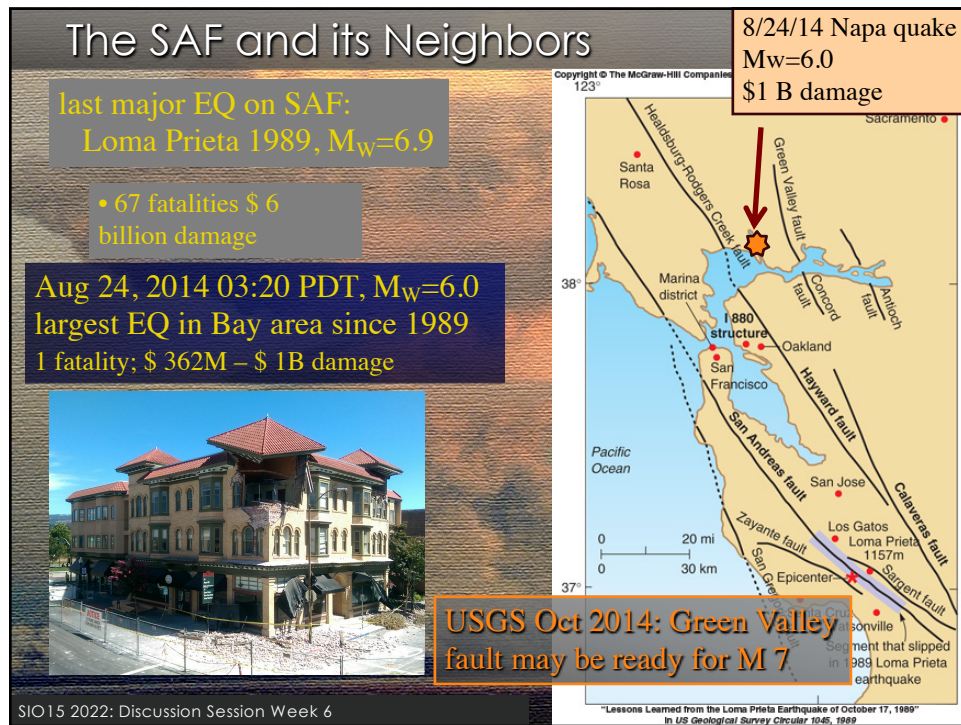
- same location as 1984
- rattled Bay Area
- delays of some commuter trains
- no immediate report of damage/injuries
- felt 75 mi south/Big Sur
- 100,000 received MyShake warning
- 2 s near EQ
- 18 s in S.F. (40 mi NW of epicenter)

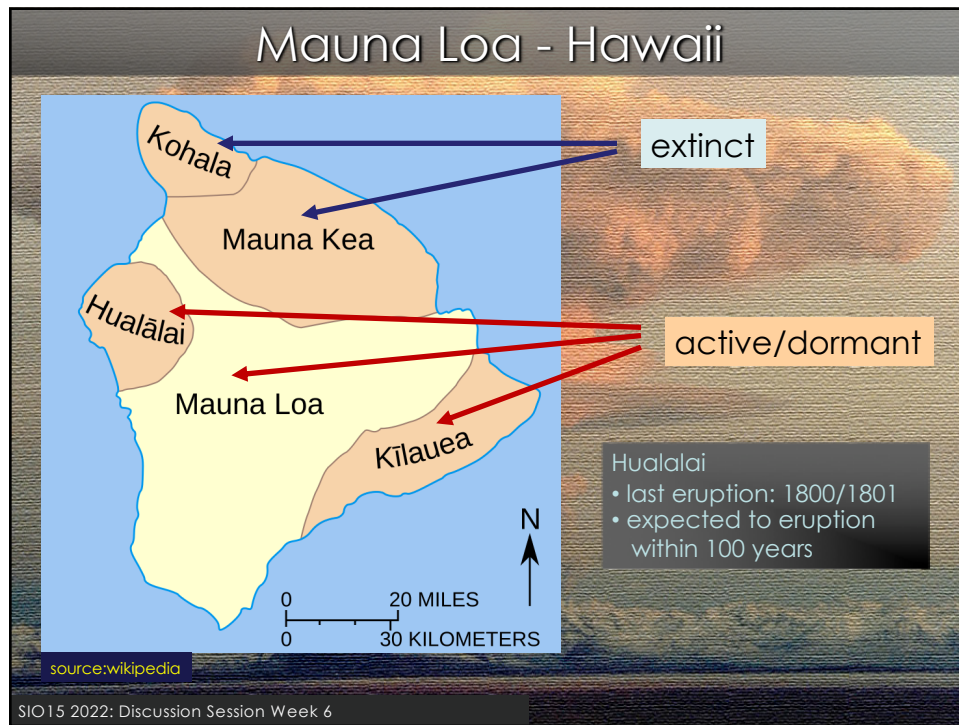


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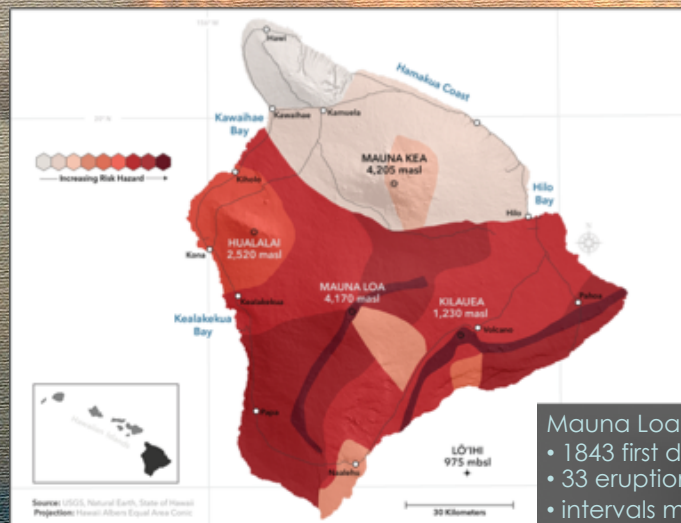








## USGS Hazard Map – 1974/2015



### Mauna Loa

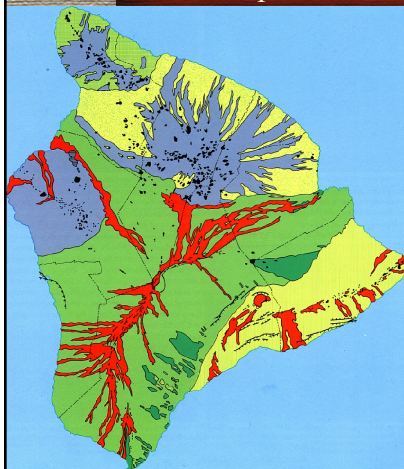
- 1843 first documented eruption
- 33 eruptions since then
- intervals months to decades
- 1984 last eruption

source: wikipedia, USGS

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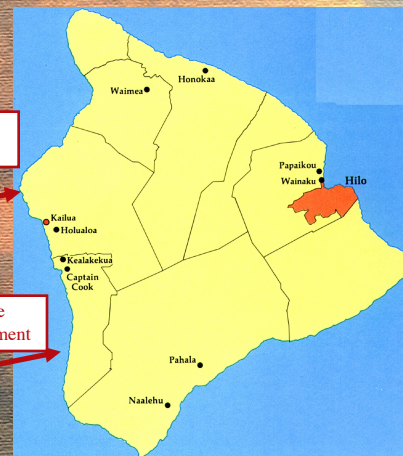
## Lava Flows from Mauna Loa

### When People Get in the Way



red: recent lava flows (<100years)

source: Hawaii Atlas



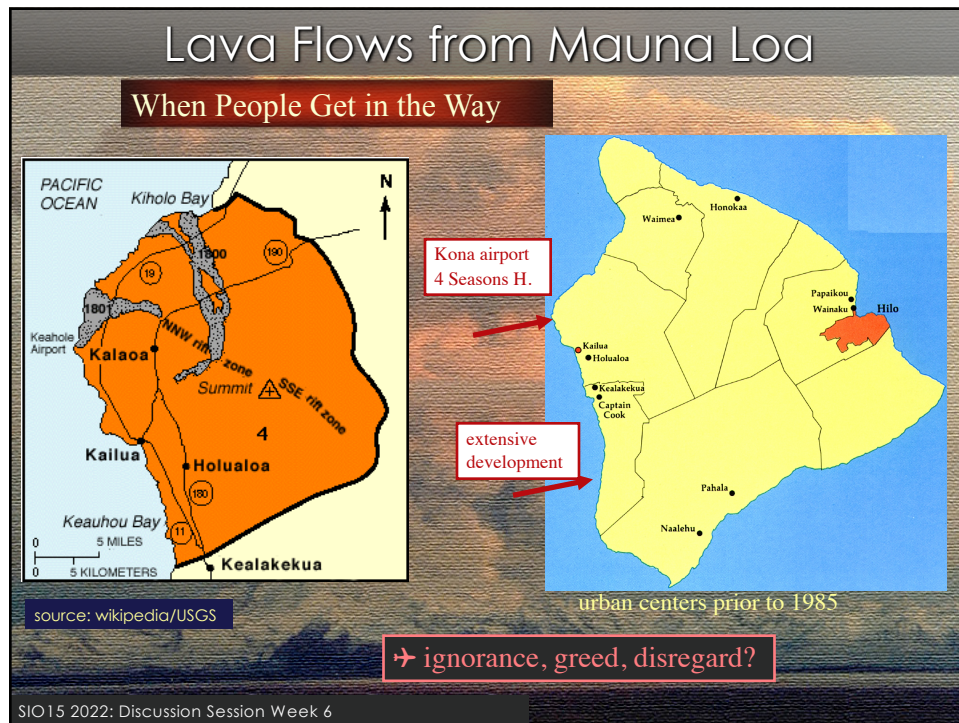
urban centers prior to 1985

Kona airport  
4 Seasons H.

extensive  
development

→ ignorance, greed, disregard?

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## Lava Flows from Mauna Loa

### Kona Coast, Hawaii

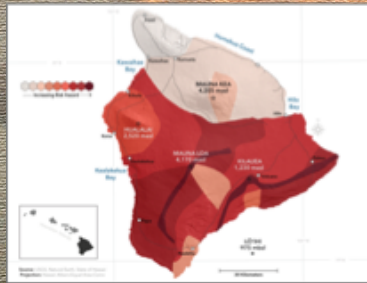
**FOUR SEASONS RESORT**  
*Kualahua at Historic Ka'upulehu*

- aggressive development since 1990s
- development in areas of recent activity
- Kona airport runway extended 1994, 2005 second runway considered, 2013 not yet built but still in 2010 master plan
- 2010: 2.6 Mio passengers

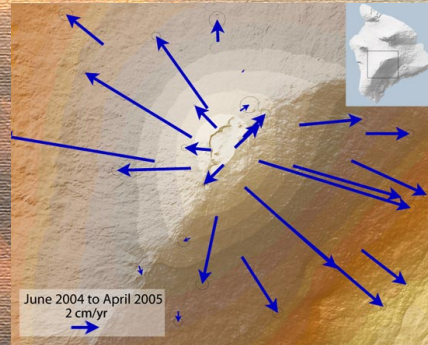
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## USGS Hazard Map – Recent Activity



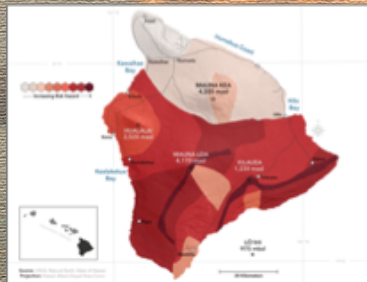
source:wikipedia, USGS



- last eruption 1984
- as of 2021 -> dormant for 35 years (longest period of quiet)
- as of Feb 2021: "elevated state of unrest since 2019"
- slight increase of rate of inflation
- Oct 2022: increase and shallowing of seismicity

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## USGS Hazard Map – Recent Activity



source:wikipedia, USGS

HVO (Hawaii Volcano Observatory)  
 heightened unrest since mid-Sep 2022  
 10/31/22  
 40 small events ( $M < 3.0$ ) in last 24h, 2-5 km beneath Moku'aweoweo caldera  
 GPS -> elevated inflation rates since Sep 2022  
 SO<sub>2</sub>, H<sub>2</sub>S, CO<sub>2</sub>, fumarole T stable  
 alert level: Advisory/Yellow (no indication eruption is imminent)

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