

# High-Altitude Stakes in the Himalayas: China-India Boundary Dispute

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**Abstract:** The more than half-century old boundary dispute between China and India is a complex and fraught standoff between the two most populous nations over some of the most inhospitable and least populated land on Earth. The disagreement can be traced back in part to early twentieth-century maps prepared by British Foreign Secretary Henry McMahon demarcating the border between British India and Tibet for the 1913–1914 Shimla Convention. Challenging and oftentimes inaccessible terrain complicated efforts to accurately survey the Himalayas. The result was less precise boundary demarcation and mapping, the consequences of which continue to drive a wedge between China-India relations today. The geography and mapping of this unique alpine environment has shaped regional geopolitics for more than a century and will continue influencing diplomacy going forward.

**Keywords:** Himalayas, McMahon, boundary, Shimla Convention, fishtail

## 1. Early Boundary Mapping

Most of the topographic mapping of India was completed under the Great Trigonometrical Survey during the nineteenth century. Organized and carried out by British colonial powers, the survey was intended to precisely measure and collect comprehensive geographic knowledge of the Indian subcontinent. The harsh environment and inaccessibility of the Himalayas complicated survey efforts and necessitated the use of lower-precision methods, resulting in less rigorous and incomplete mapping of this mountainous region as compared to the plains.

During this time, boundary delimitation in mountainous areas was based on the water-parting principle, an early conception of the watershed limit. More than a century of land surveys using increasingly advanced technologies attempted to define a border in the Himalayas based on watershed limits and dividing ridges. However, implementing this in practice proved challenging in a region where watersheds, like the Indus River, did not align with the highest ridgelines of the Himalayas.

Despite cutting edge, scientifically advanced surveying techniques developed during the Great Trigonometrical Survey, maps prepared by British surveyors delineating the border between China, Tibet, and British India in the early 20th century contained some significant errors. Cartographic fallacies persisting over multiple iterations of border maps have further entrenched the dispute between China and India.

## 2. China-India Frontier

The Governments of China and India divide their frontier into four sectors as outlined in the 1961 *Report of the Officials of the Governments of India and the People's Republic of China on the Boundary Questions*. The sectors are primarily divided by the watersheds of the Karakoram and Himalaya ranges, separating the Tibetan Plateau from the Indian subcontinent. The Western Sector stretches from the Karakoram Pass south to include India's Ladakh Union Territory and part of China's autonomous regions of Tibet and Xinjiang. The Middle Sector lies between Himanchal Pradesh and Uttarakhand in India and Tibet in China, terminating at the tripoint with Nepal. The Sikkim Sector separates the Indian state of Sikkim and China's Tibet between Nepal and Bhutan. The Eastern Sector encompasses the boundary extending from Bhutan to Burma (Figure 1).

## 3. McMahon Line

The boundary in the Eastern Sector separating British Assam (now the Indian state of Arunachal Pradesh) from Tibet is called the McMahon Line. The line's eponymous creator, Sir Henry McMahon, served as Britain's Foreign Secretary to the Government of India from 1911 to 1915. McMahon prepared two maps (Figures 2 and 3) of the boundary for the Shimla Convention of 1913–1914, a treaty negotiation between China, Tibet, and British India to define the status of Tibet. When drafting the maps, McMahon and his team of surveyors attempted to follow the watershed divide. However, McMahon only provided a textual description of the boundary, stating that the watershed was the guiding allocation principle; he did not



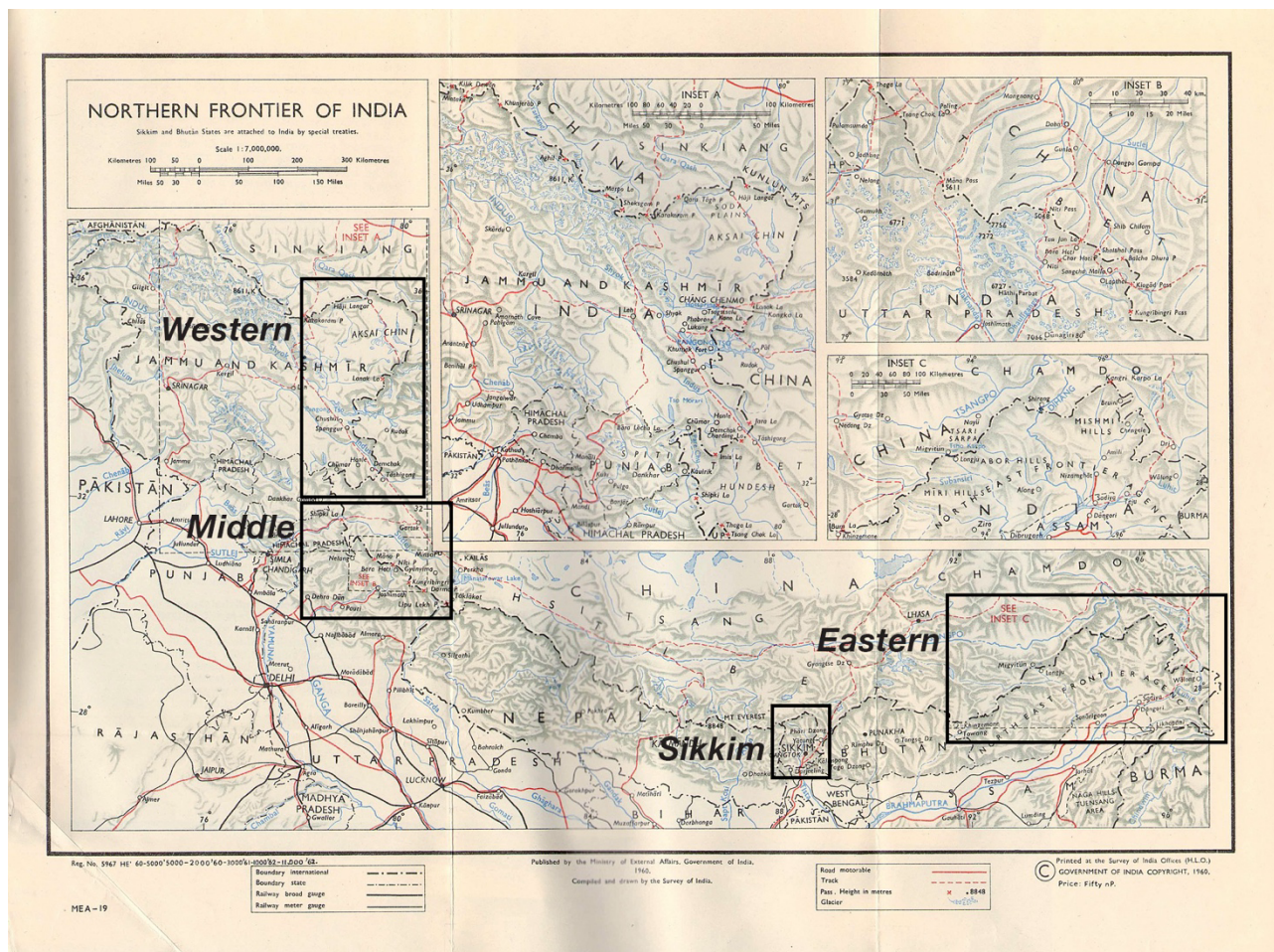


Figure 1. Survey of India map (1960) modified to show geographic extents of the Western, Middle, Sikkim, and Eastern Sectors. Source: Wikimedia Commons, [https://en.m.wikipedia.org/wiki/File:1960\\_Northern\\_Frontier\\_of\\_India\\_by\\_SOI.jpg](https://en.m.wikipedia.org/wiki/File:1960_Northern_Frontier_of_India_by_SOI.jpg).

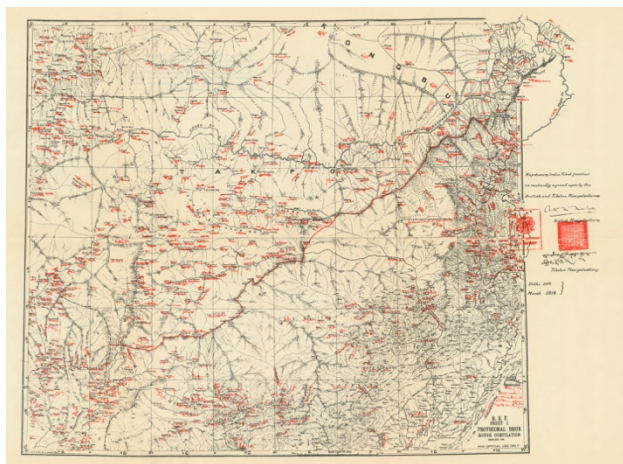


Figure 2. North East Frontier Sheet I (1914) showing western portion of McMahon Line. Red ink stamps are signatures of the British and Tibetan plenipotentiaries. Source: US Government.

provide a treaty protocol or delimitation document. His textual description therefore provided an indication of the intent behind, not the geographic specificity to make, the line. China disputes the validity of the McMahon Line and claims the international boundary runs from the southeastern tip of Bhutan along the base of the

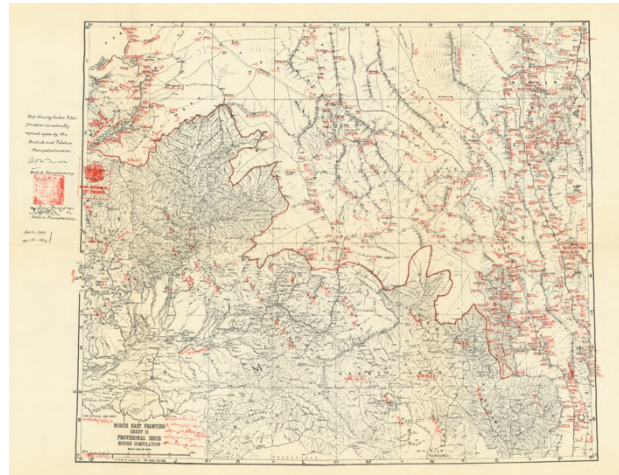


Figure 3. North East Frontier Sheet II (1914) showing eastern portion of McMahon Line. Source: US Government.

Himalayas to a point that is 36-miles southwest of the US-accepted tripoint between India, China, and Burma (Figure 4).

#### 4. A Tale of Two Fishtails

When McMahon drafted the Shimla maps, he included two “fingers”—today referred to as Fishtail 1 and Fishtail





Names and boundary representation are not necessarily authoritative

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Figure 4. US Government map (2023) of Eastern and Sikkim Sectors of the China-India border.



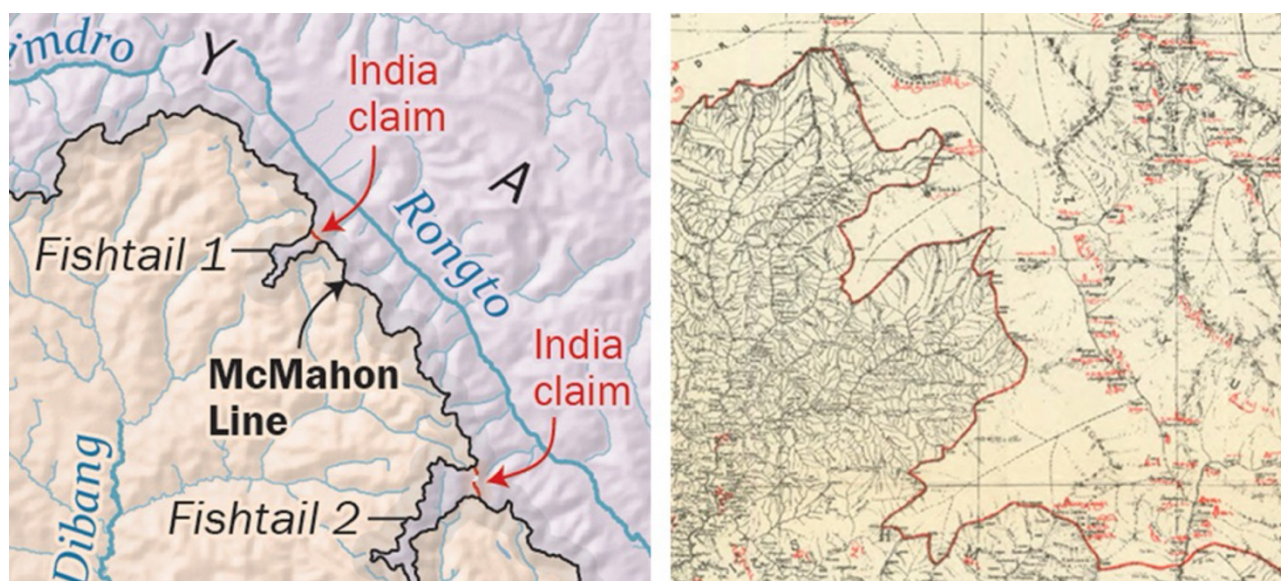


Figure 5. Left: Section of U.S. Government map (2023) showing eastern portion of McMahon Line. Right: Section of North East Frontier Sheet II map (1914) showing approximate corresponding extent of McMahon Line.

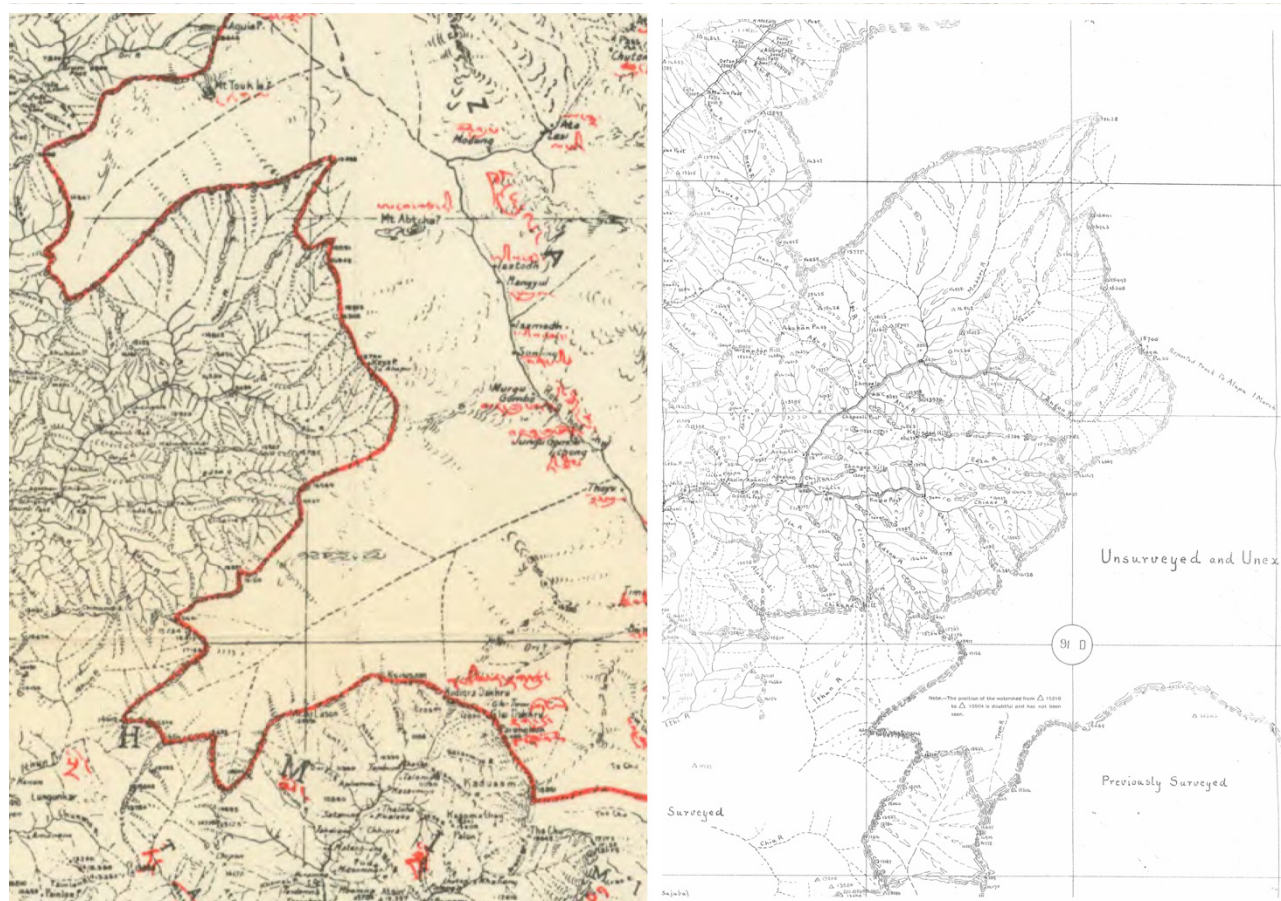


Figure 6. Left: Section of North East Frontier Sheet II map (1914) showing eastern portion of McMahon Line. Right: Section of Mishmi Exploration Survey map (1912–1913).

2—protruding from China into British India in the eastern part of the border. It is evident McMahon was attempting to draw the watershed divide between the known-and-surveyed Indian drainage and the surmised-but-unconfirmed Tibetan drainage systems. The line carefully

skirts the sources of the dozens of watercourses flowing toward India (Figure 5).

Supporting this analysis was the rediscovery of the original 1912–1913 Mishmi Exploration Survey maps in the British National Archives. The Shimla map copies much of its watershed and other topography and





Figure 7. Fishtail 1 area. Left: McMahon Line (red) superimposed on a Google Earth satellite image (2023). Right: North East Frontier Sheet II map (1914) showing approximate corresponding extent of McMahon Line.

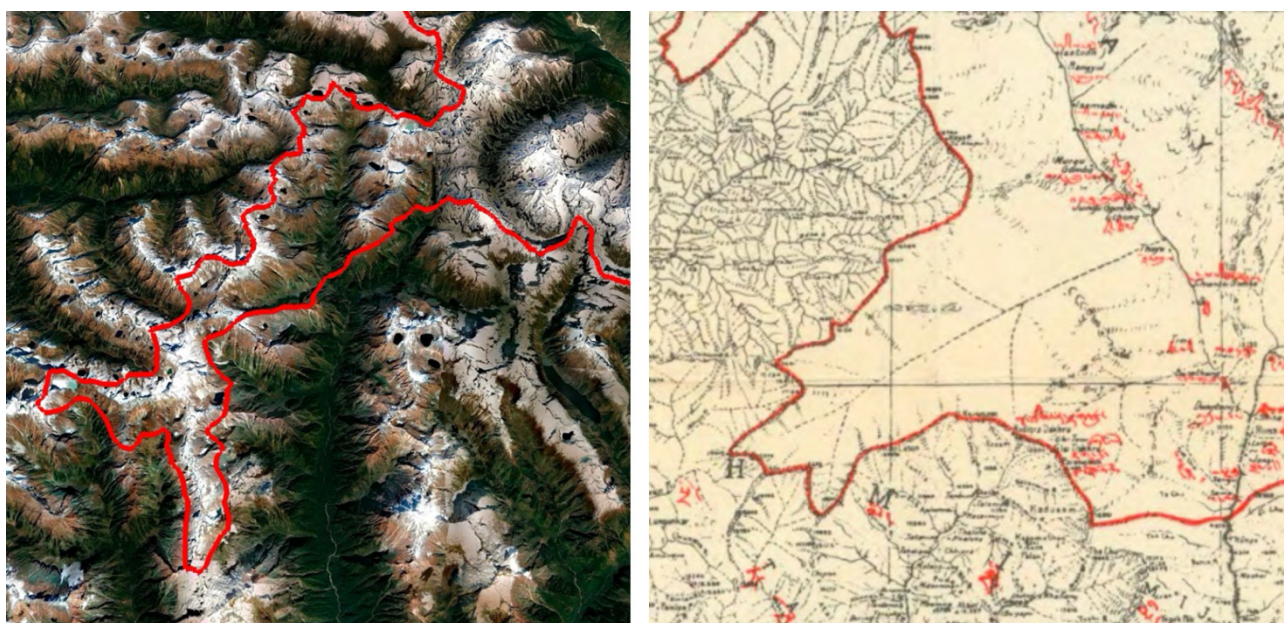


Figure 8. Fishtail 2 area. Left: McMahon Line (red) superimposed on a Google Earth satellite image (2023). Right: North East Frontier Sheet II map (1914) showing approximate corresponding extent of McMahon Line.

watercourse information exactly from the earlier Mishmi map (Figure 6). The Mishmi map includes a notation in Fishtail 2 allocated to the Chinese side of the watershed that states, “Unsurveyed and Unexplored,” and an additional, smaller notation: “The position of the watershed from peak 15210 to peak 15504 is doubtful and has not been seen.” Whereas the Mishmi surveyors caveated their map to indicate possible incomplete or inaccurate information, McMahon filled in areas with assumed information, failing to acknowledge possible errors.

When superimposing the McMahon Line over satellite imagery, the discrepancies between the boundary line and the underlying topography become more apparent. The McMahon Line follows the watershed divide to a point at which it deviates west away from the watershed limit. The resulting area carved out is Fishtail 1 (Figure 7). Interestingly, McMahon included a dashed line on the map indicating the presence of a river valley that does not exist.

Immediately south of Fishtail 1, the McMahon Line again follows the watershed divide until it deviates to the west away from the divide a second time. The second area



carved out is Fishtail 2 (Figure 8). Similarly, McMahon includes a river with multiple tributaries branching off on the map. But as with Fishtail 1, this river and tributaries do not exist.

Directly superimposing the McMahon Line on Landsat imagery makes it clear that the two fishtails from the 1914 Shimla map has no relationship to the local hydrography (Figure 9). The McMahon Line (yellow), which is based on McMahon's assumptions of the Chinese drainage, does not correspond to the watershed divide (black). Red and white circles show valleys on the "incorrect" side of the line. These are valleys that, if the McMahon Line were to ever be demarcated and bilaterally accepted as-is, would be separated from their "host" country.

## 5. Shimla Convention

The British and Tibetan plenipotentiaries to the Shimla Convention, Henry McMahon and Paljor Dorje Shatra, ratified the binding bilateral agreement. Chinese plenipotentiary, Ivan Chen, initially signed a reduced-scale version of the map depicting the eastern two-thirds of the McMahon Line. China later rejected the line outright and withdrew from the conference. Today, China does not recognize the McMahon Line, claiming Tibet was not a sovereign nation at the signing and therefore could not enter into a binding agreement with British India. India generally regards the McMahon Line as the basis for its boundary with China. However, India claims the areas carved out by the two fishtails as their sovereign territory and treat the actual watershed divide as the boundary with China. During the 1962 Sino-Indian War, the United States took the rare position of fully recognizing the disputed McMahon Line as the international boundary between China and India. The McMahon Line is still recognized by the United States as

the international boundary today.

## 6. Conclusion

Although McMahon's intentions were to follow the watershed, he was not always successful. Imprecise surveys with poor accuracy and low detail contributed in part to the combative and hostile relations between countries prevailing for more than a century. One theory on the discrepancy between perceived and actual watershed divides is atmospheric refraction. Light bends over long distances as it passes through different air densities, and temperature inversion (a frequent occurrence in the Himalayas) can cause objects to appear taller and closer than they are. Surveyors may have perceived another ridgeline as higher than the actual divide due to the optical illusion and resulting in the two fishtails. It is important to note that some surveyors, such as the Mishmi team, did recognize their work could contain errors and annotated their maps accordingly.

It is incumbent upon China and India to resolve their boundary and territorial disputes, but in the interim, experts at the US Department of State in boundary analysis, recovery, and historical records have adjusted the US version of the McMahon Line slightly over time to better match the watershed divide intent of McMahon. The line has been modified to more closely represent the original 1912–1914 cartographic drawing of the "finger" areas as very near the sources of the tributaries flowing toward India. As surveying and remote sensing technologies improve, boundary analysts can further refine the line.

## 7. Acknowledgements

I would like to thank boundary and sovereignty analysts Eric Doornbos, Dave Linthicum, and Gene Thorp in the Office of the Geographer and Global Issues at the US

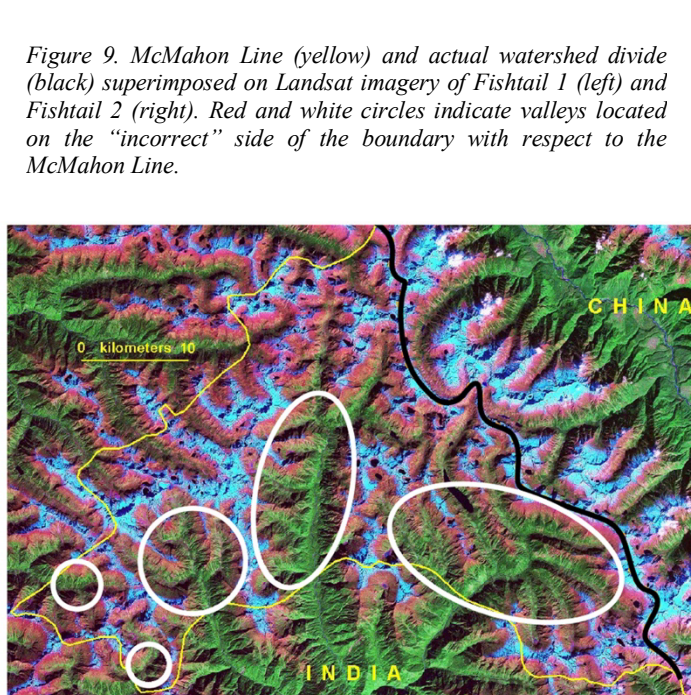
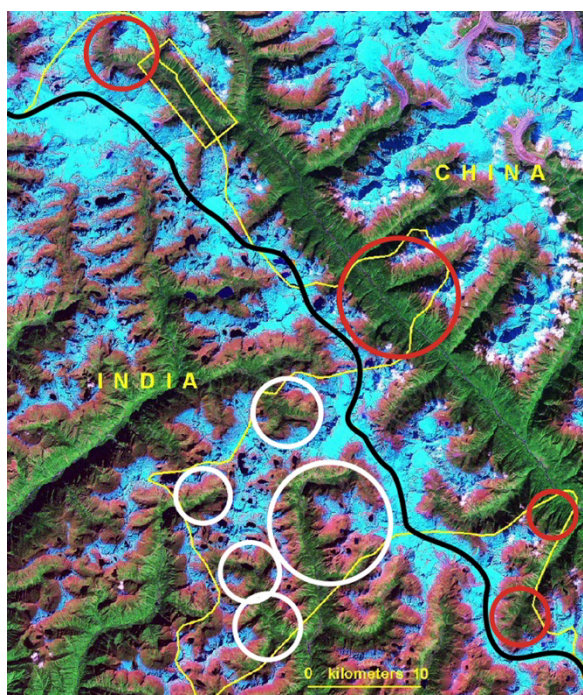


Figure 9. McMahon Line (yellow) and actual watershed divide (black) superimposed on Landsat imagery of Fishtail 1 (left) and Fishtail 2 (right). Red and white circles indicate valleys located on the "incorrect" side of the boundary with respect to the McMahon Line.



Department of State for sharing their extensive and invaluable knowledge, expertise, and passion for the history and depiction of international boundaries and sovereignty.

## **8. Further Reading**

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