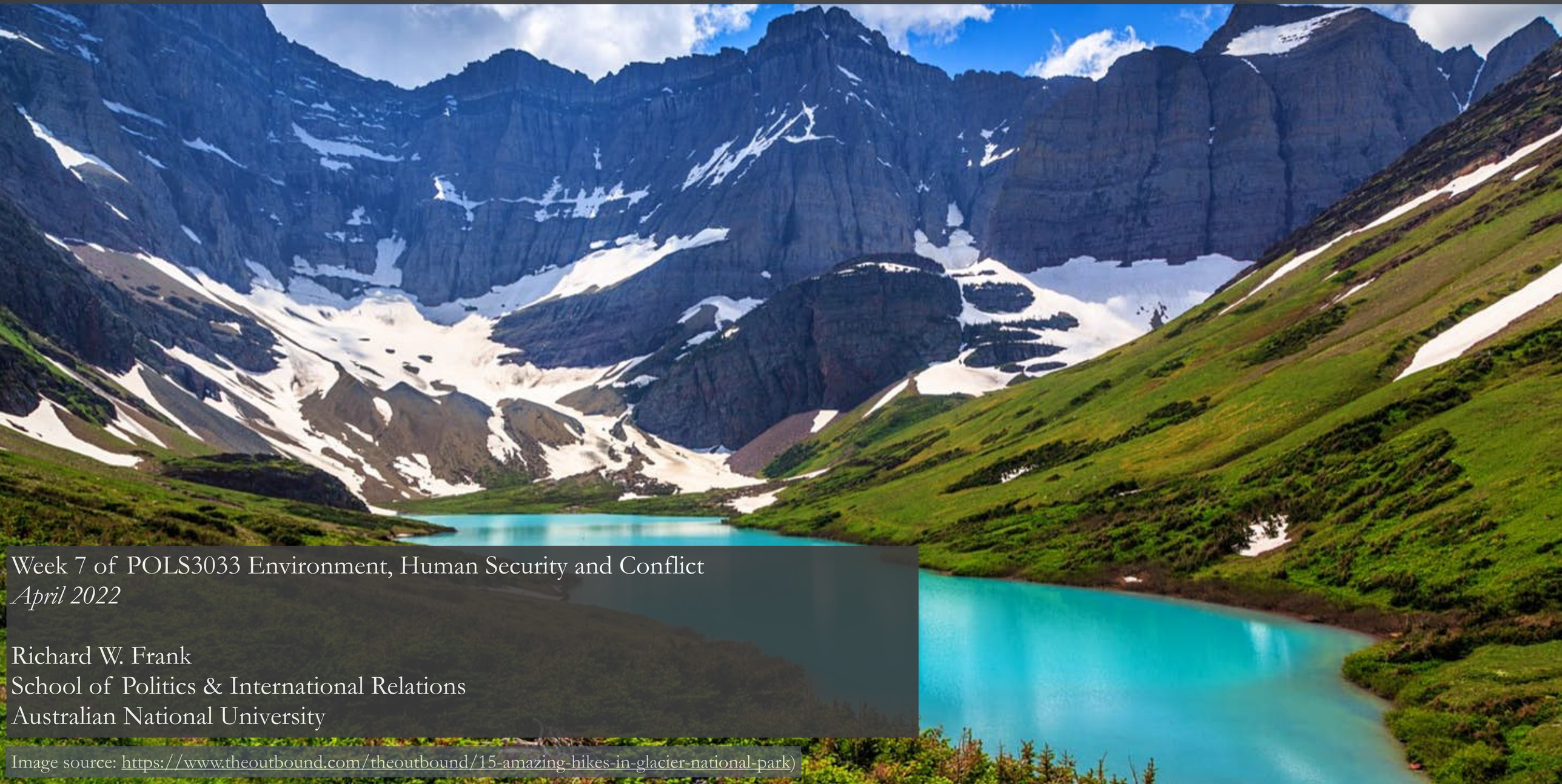
Water and conflict



Week 7 of POLS3033 Environment, Human Security and Conflict
April 2022

Richard W. Frank
School of Politics & International Relations
Australian National University

Image source: https://www.theoutbound.com/theoutbound/15-amazing-hikes-in-glacier-national-park)

1. Why should we care about water and conflict?



Today's motivating question

In what ways can **water affect conflict**?

- Where it is
- How it comes and goes,
- How it is treated
- Who uses it

“The most obvious, ubiquitous, important **realities**
are often the ones that are the **hardest to see and talk about**.”

-David Foster Wallace



Examples of water and conflict



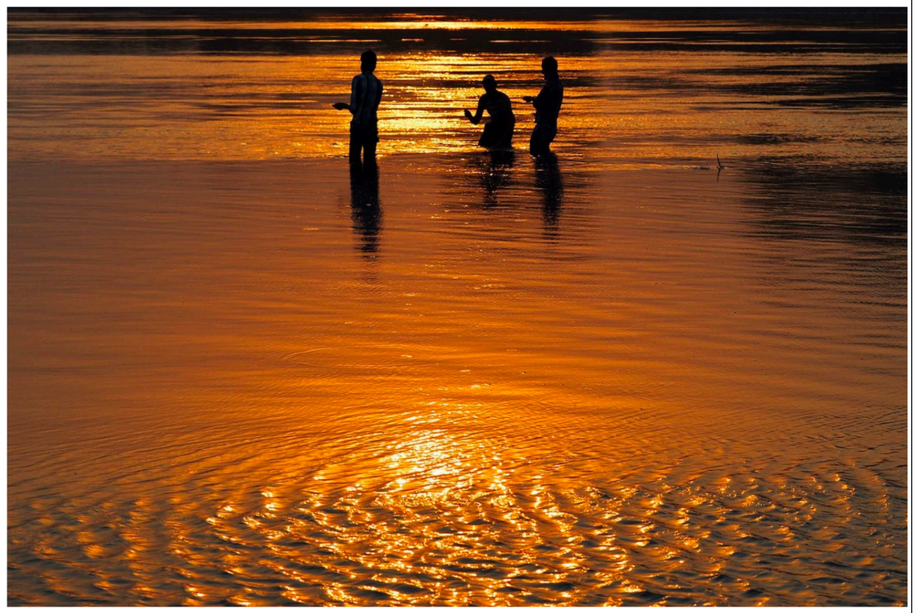
Image source: https://www.newyorker.com/humor/daily-shouts/finally-a-world-without-borders-only-now-were-living-in-the-1995-film-waterworld-starring-kevin-costner

INTERVIEW

Are India and Pakistan on the Verge of a Water War?

In reprisal for a deadly terrorist attack in Kashmir, the Indian government says it will divert river waters that downstream Pakistan has been counting on.

BY KEITH JOHNSON | FEBRUARY 25, 2019, 3:00 PM



Pakistani residents catch fish in the Ravi River near Lahore on Oct. 13, 2014. (Arif Ali/AFP/Getty Images)

With tensions rising between India and Pakistan in the wake of a deadly terrorist attack earlier this month that killed more than 40 Indian police officers in Kashmir, New Delhi has decided to retaliate in part by cutting off some river water that flows downstream to Pakistan. The decision to build a dam on the Ravi River, whose waters are allocated to India by treaty but a portion of which had been allowed to flow through to Pakistan, adds an extra source of conflict between two nuclear-armed neighbors that have repeatedly clashed over the disputed Kashmir territory.

After the floods

The struggle over water in India and China

A thought-provoking history of South Asia through its rivers and rains



Print edition | Books and arts ›
Jan 5th 2019

Unruly Waters: How Rains, Rivers, Coasts and Seas Have Shaped Asia's History. By Sunil Amrith. *Basic Books; 416 pages; $35. Allen Lane; £25.*

ON THE LAST day of 1956 Jawaharlal Nehru, first prime minister of an independent India, took Zhou Enlai, his Chinese counterpart, to visit the Bhakra dam, on the Sutlej river in the north of the country. "These are the new temples of India, where I worship," he told his visitor. Both young governments saw managing water as a central part of their mandate. In Chinese mythology, civilisation dates from the efforts by the Emperor Yu to tame the floods 4,000 years ago. Meanwhile Indian history has been a long battle to predict, harness and exploit the monsoon—or to cope with its failure. Tens of thousands of farmers have recently taken to the streets to vent their anger at the hardship they are enduring after weaker-than-usual rains.

February 27, 2022
4:05 AM GMT+11
Last Updated 2 months ago

Europe

Russian troops destroy Ukrainian dam that blocked water to Crimea - RIA

Reuters

1 minute read

MOSCOW, Feb 26 (Reuters) - Russian troops have destroyed a concrete dam built in Ukraine's Kherson Region in 2014 to cut off water to Crimea, the RIA news agency quoted the governor of Russian-annexed Crimea Sergei Aksyonov as saying on Saturday.

Ukraine cut off the fresh water supply to Crimea by damming a canal that had supplied 85% of the peninsula's needs before Moscow annexed Crimea in 2014.

The Soviet-era canal was built to channel water from the River Dnieper to arid areas of Ukraine's Kherson region and Crimea.

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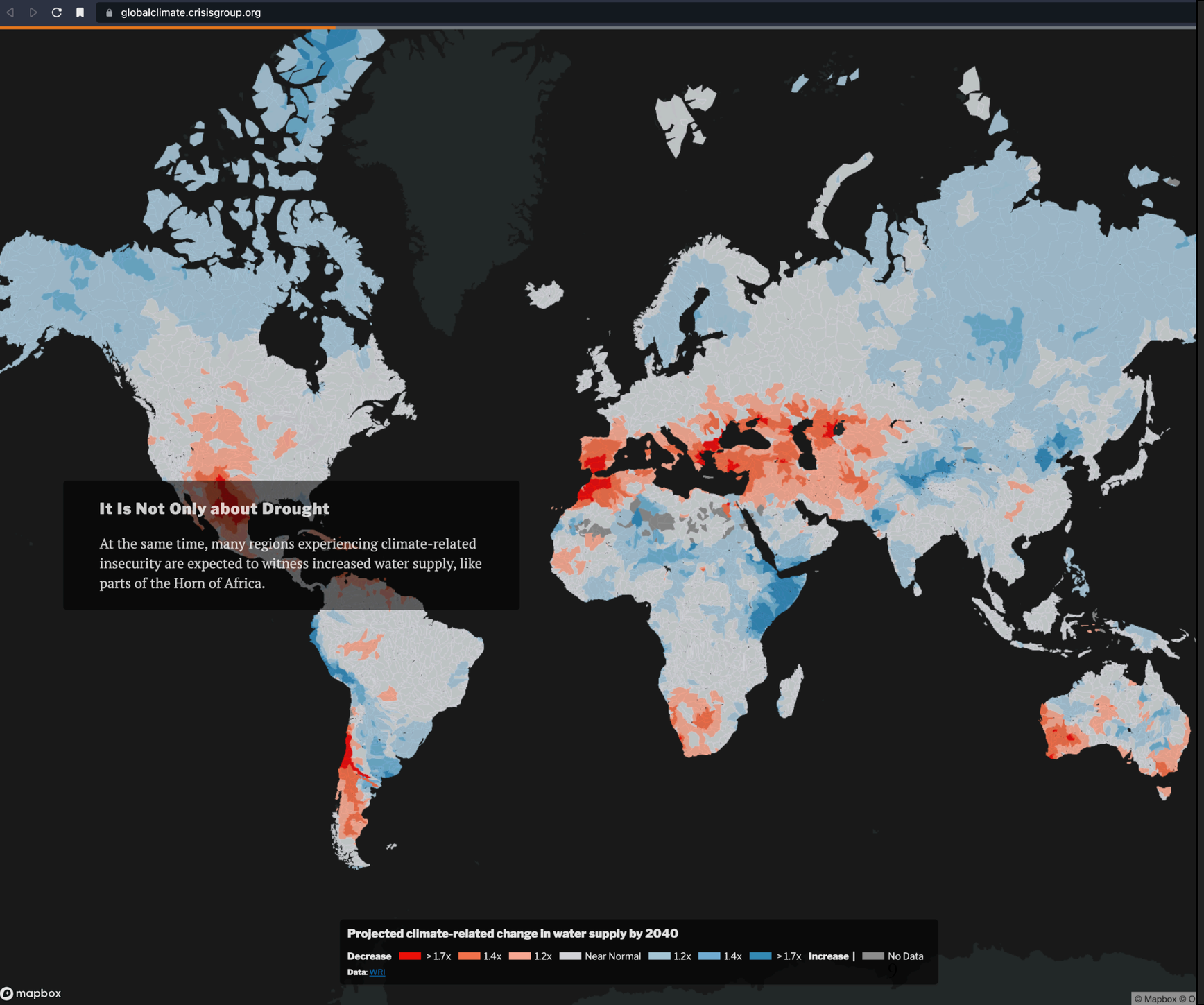
Reporting by Maxim Rodionov Editing by Andrew Osborn


globalclimate.crisisgroup.org
It Is Not Only about Drought
At the same time, many regions experiencing climate-related insecurity are expected to witness increased water supply, like parts of the Horn of Africa.
Projected climate-related change in water supply by 2040
Decrease > 1.7x 1.4x 1.2x Near Normal 1.2x 1.4x > 1.7x Increase | No Data
Data: WRI
mapbox
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Levels & change





Sources: https://media.architecturaldigest.com/photos/56c3aa753968a11e07f333fc/master/pass/mad-max-fury-road-set-design-008.jpg; https://www.npr.org/sections/thetwo-way/2017/11/21/565746002/u-k-water-companies-sometimes-use-dowsing-rods-to-find-pipes

Mt. Kailash, Tibet



mt kailash



Kangrinboqe Peak

冈仁波齐峰

Burang, Ngari

China

4.5 ★★★★★ (3,263)

Mountain peak

Directions | Save | Nearby | Send to your phone | Share

Burang, Ngari, China

阿里地区普兰县

3886+XQ Bagaxiang, Burang, Ngari, Tibet, China

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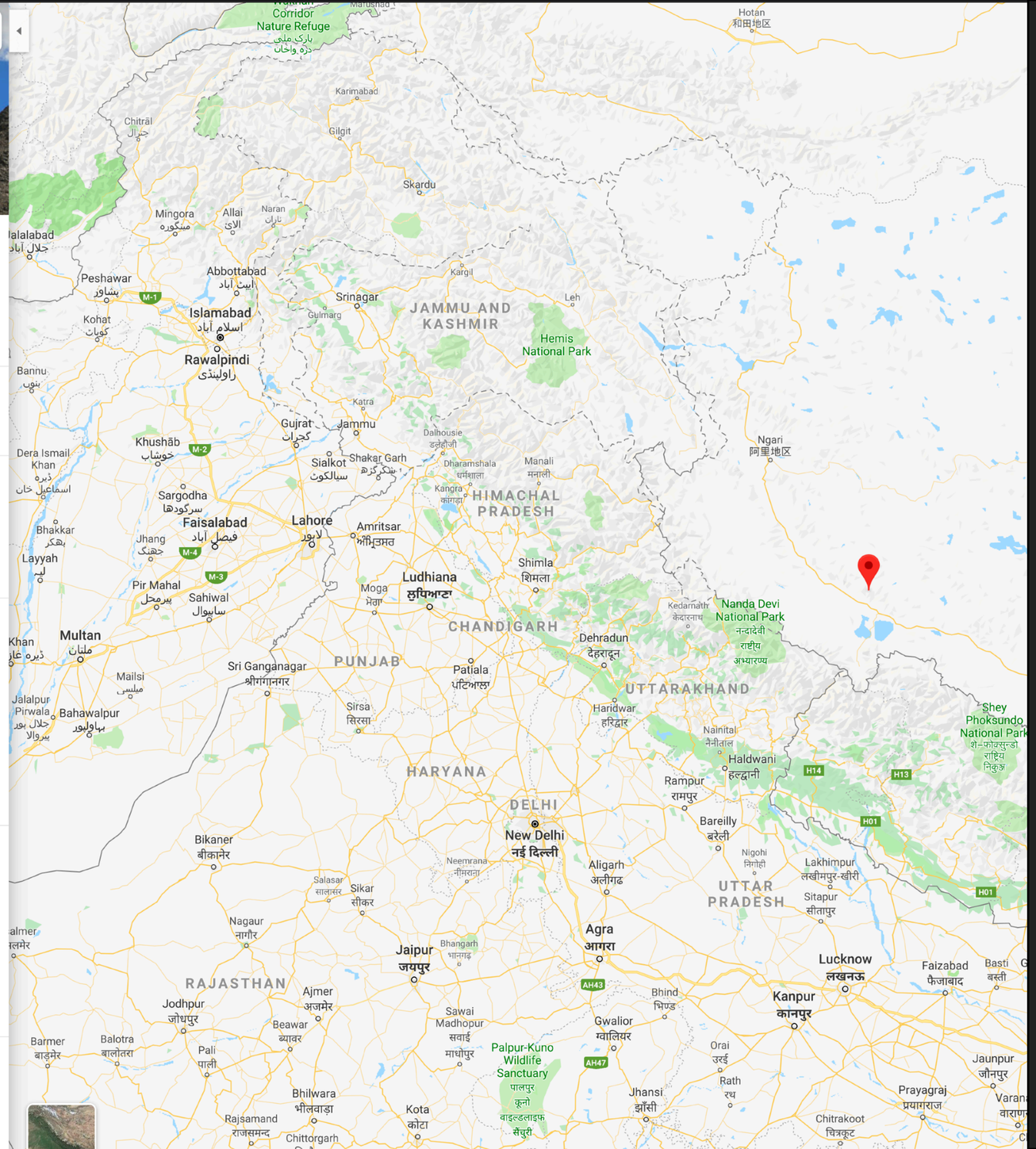

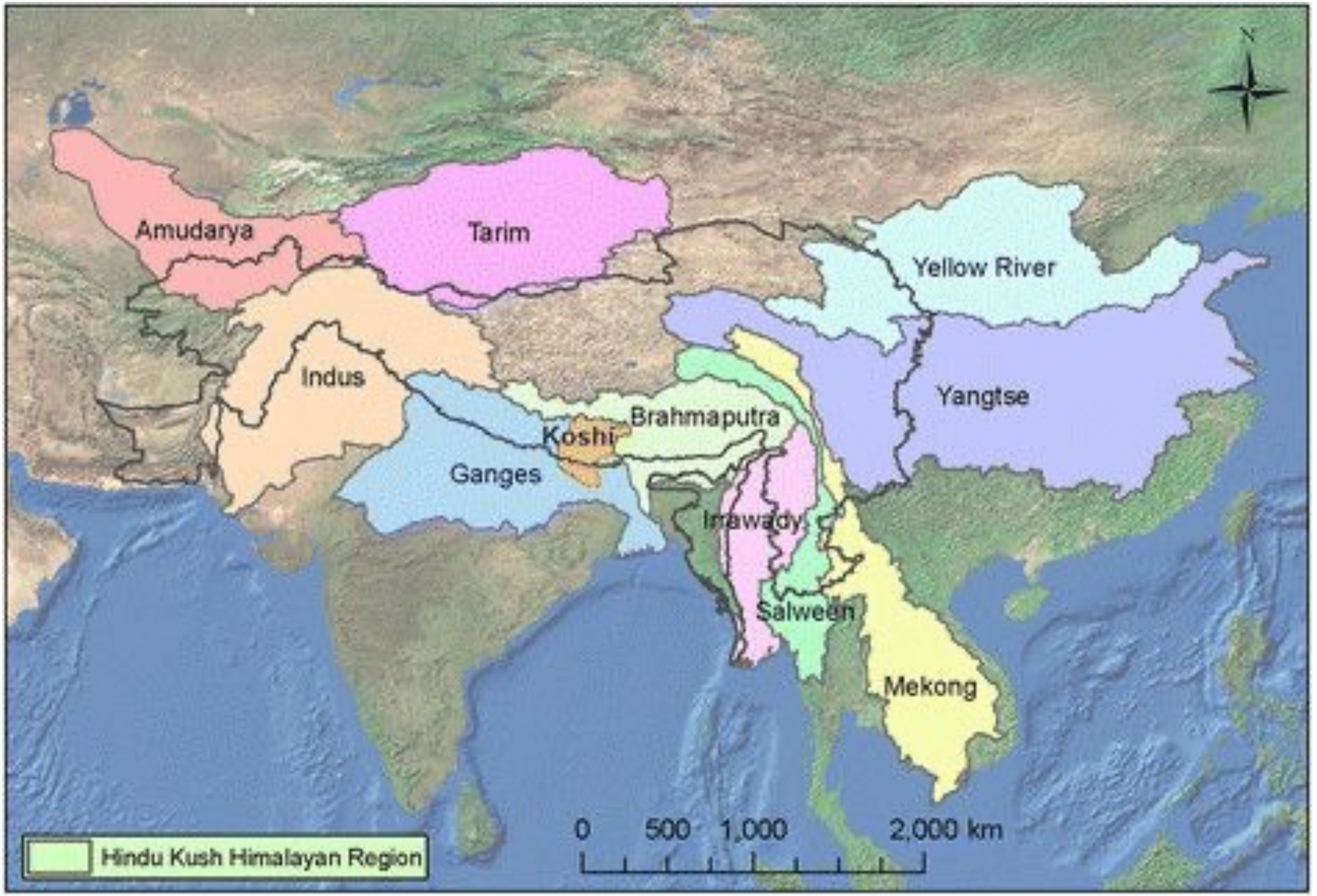

Source: Santosh Nepal, Wolfgang-Albert Flügel & Arun Bhakta Shrestha. 2014. "Upstream-downstream linkages of hydrological processes in the Himalayan region." *Ecological Processes* 3



A hawan being conducted for the benefit and goodwill of family and the group.

Kailash pilgrims perform hawan near Mansarovar lake

By Sahil Pandey (ANI) | Updated: Aug 13, 2019 04:26 IST

Mansarovar [Tibet], Aug 13 (ANI): On the fourth and last Monday of holy Shravan month, Hindu devotees performed a hawan beside the Mansarovar Lake is situated at the Mount Kailash in the Tibet Autonomous Region of China.

"We left Delhi on 30th July and have completed our parikrama of Mount Kailash. We are conducting this yajna near Mansarovar lake as it is a very auspicious day as Monday is lord shiva's day and Karthik maas Paritosh (last Monday of holy Shravan month)

RELATED NEWS



Image source: https://www.theoutbound.com/theoutbound/15-amazing-hikes-in-glacier-national-park)



Image source: CNN (https://edition.cnn.com/travel/article/africas-magnificent-mountains-climb/index.html)

Snows of Kilimanjaro 'to disappear in 20 years'

The snows of Mount Kilimanjaro will have disappeared within two decades because of global warming, claim scientists, changing forever one of the world's most beautiful landscapes.



snows of kilimanjaro disappearing Photo: GETTY



By Richard Alleyne, Science Correspondent
7:00AM GMT 03 Nov 2009

More than 85 per cent of the ice that covered the three peaks of Africa's highest mountain has disappeared in the last 100 years and the rest is melting at such a rate it will be gone by 2030.

The disappearance of the ice-cap will alter one of the world's most

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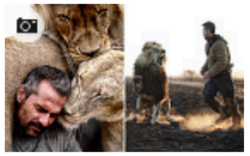
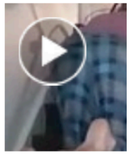
Lions attacked by swarm of bees



Cats pose for the lion whisperer



Latest Video



Disabled gre grandfather stairlift and crawl

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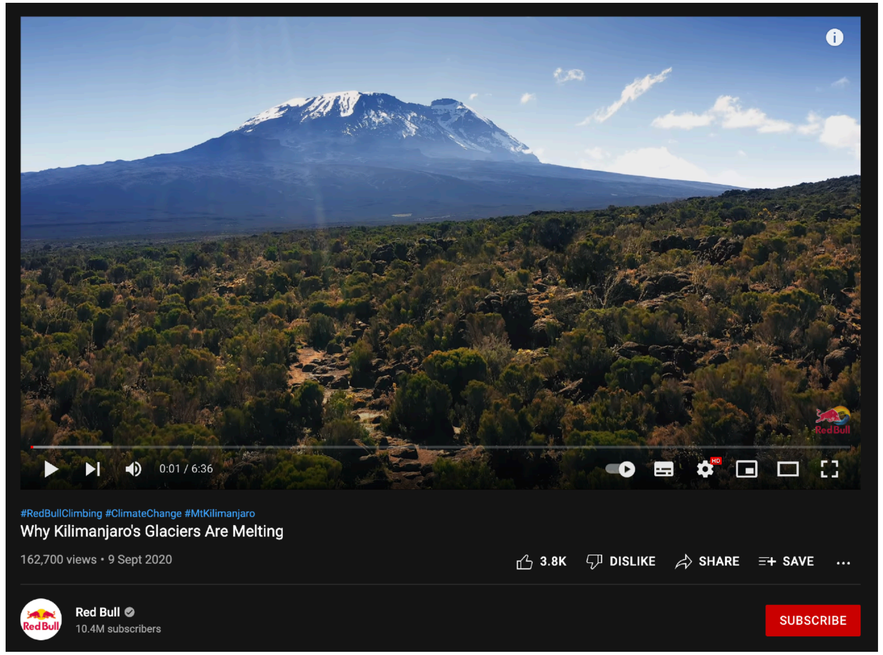
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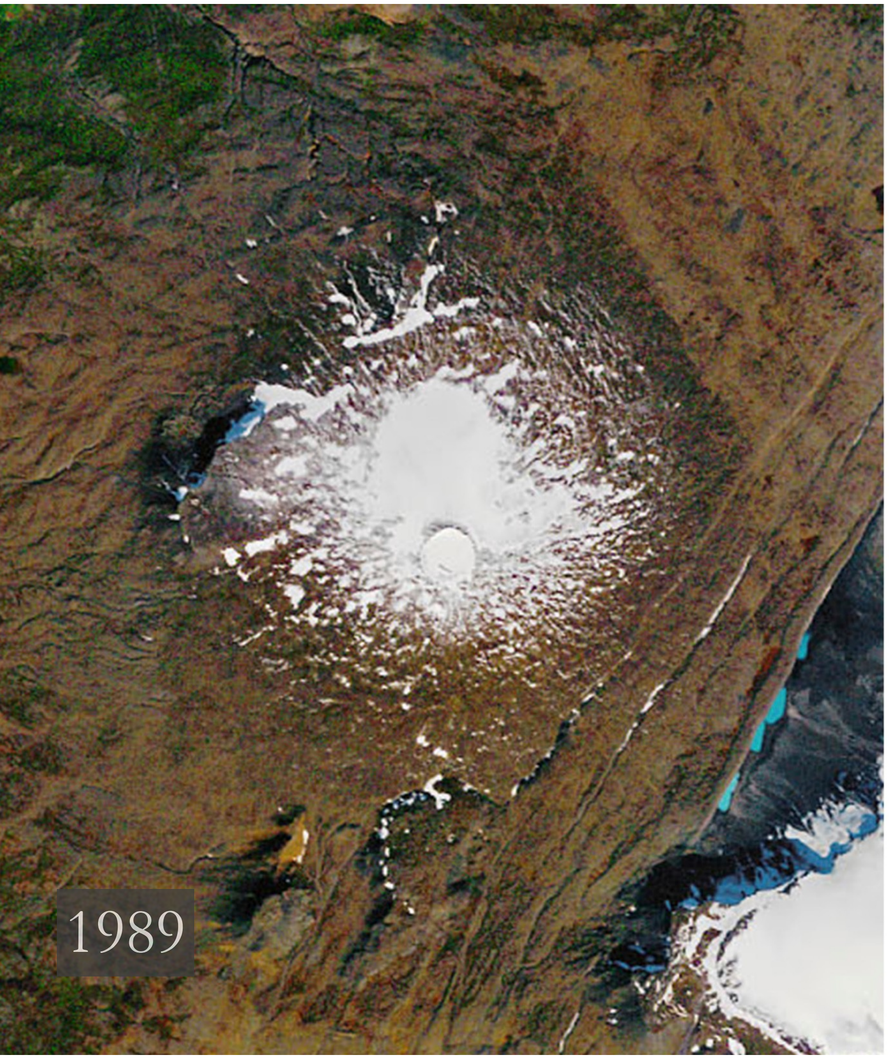
2014
2020

Okjokull Glacier, Island





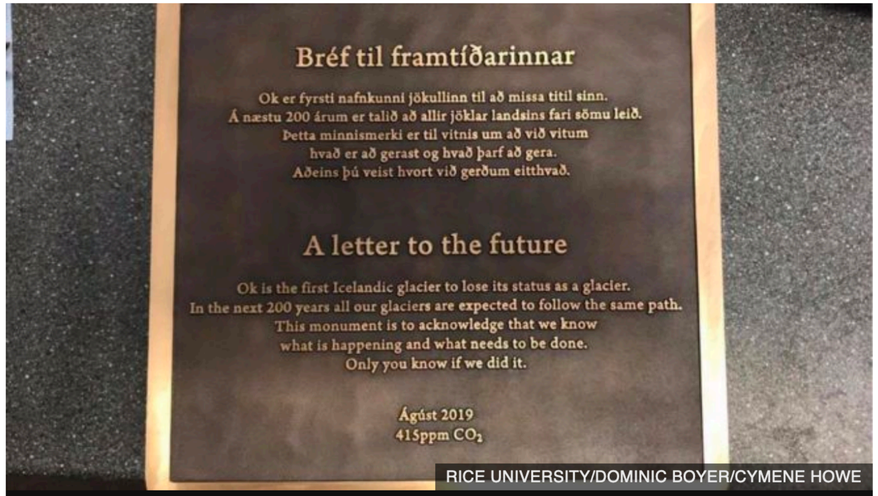
Source: Source: NASA via The New York Times (https://www.nytimes.com/2019/08/19/world/europe/iceland-glacier-funeral.html)

Iceland's Okjokull glacier commemorated with plaque

By Toby Luckhurst
BBC News

18 August 2019

Climate change



RICE UNIVERSITY/DOMINIC BOYER/CYMENE HOWE

The plaque commemorates Okjokull, which once sat atop Ok volcano - "jokull" is Icelandic for glacier

Mourners have gathered in Iceland to commemorate the loss of Okjokull, which has died at the age of about 700.

The glacier was officially declared dead in 2014 when it was no longer thick enough to move.

What once was glacier has been reduced to a small patch of ice atop a volcano.



This is an aerial view of glaciers in Norway that could contain microplastics in their snow cover.

PHOTOGRAPHY BY ARTERRA/UNIVERSAL IMAGES/GETTY

ENVIRONMENT | PLANET OR PLASTIC?

Tiny pieces of plastic found in Arctic snow

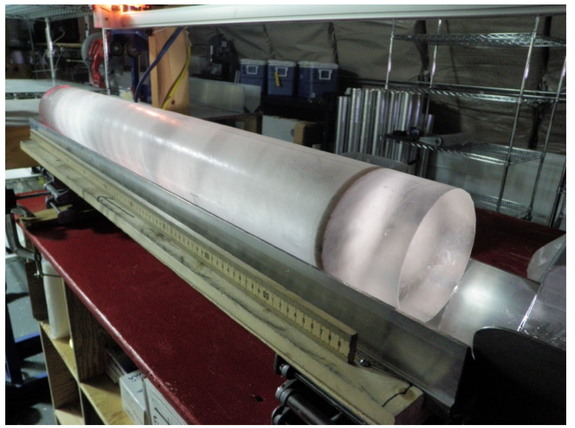
The discovery suggests that microplastics are being carried around the planet in atmospheric winds, and that we're breathing them in.

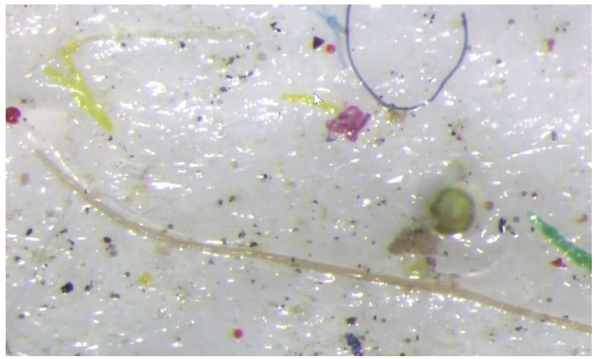
4 MINUTE READ

BY **CHERYL KATZ**

PUBLISHED AUGUST 14, 2019

Microplastics, those pervasive relics of modern times, have invaded seemingly every part of the planet today, including rain over the Rocky Mountains and the most remote reaches of the Arctic. Scientists have been puzzling over how this flood of





WORLD NEWS AUGUST 15, 2019 / 3:08 AM / 3 DAYS AGO

'Punch in the gut' as scientists find micro plastic in Arctic ice

Matthew Green

4 MIN READ

LONDON (Reuters) - Tiny pieces of plastic have been found in ice cores drilled in the Arctic by a U.S.-led team of scientists, underscoring the threat the growing form of pollution poses to marine life in even the remotest waters on the planet.

U.S. Department of the Interior
U.S. Geological Survey

Open-File Report 2019–1048

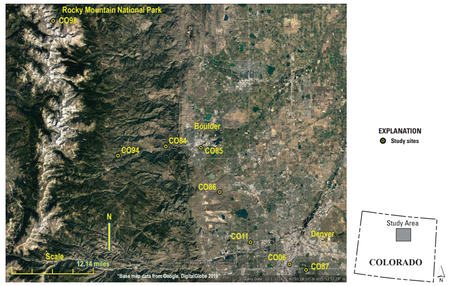
It is Raining Plastic.

By Gregory Wetherbee,[1] Austin Baldwin,[2] James Ranville[3]

[1]USGS, Hydrologic Networks Branch, Denver, Colorado; [2]USGS, Idaho Water Science Center, Boise, Idaho; [3]Colorado School of Mines, Golden, Colorado

Overview

Atmospheric wet deposition samples were collected using the National Atmospheric Deposition Program/National Trends Network (NADP/NTN) at eight sites (see map) in the Colorado Front Range. Plastics were identified in more than 90 percent of the samples. The plastic materials were mostly fibers that were only visible with magnification, approximately 20–40 times (X). Fibers were present in a variety of colors; the most frequently observed color was blue followed by red>silver>purple>green> yellow>other colors. Plastic particles such as beads and shards were also observed with magnification. More plastic fibers were observed in samples from urban sites than from remote, mountainous sites. However, frequent observation of plastic fibers in washout samples from the remote site CO98 at Loch Vale in Rocky Mountain National Park (elevation 3,159 meters) suggests that wet deposition of plastic is ubiquitous and not just an urban condition.



Sampling Network

The Network for Urban Atmospheric Nitrogen Chemistry (NUANC) is an NTN subnetwork of five sites in the Denver and Boulder, Colorado urban corridor. An additional urban site (CO84) is located outside Boulder, Colorado. Rural and remote montane NTN sites are nearby and form a southeast-trending transect of NTN sites with the NUANC.

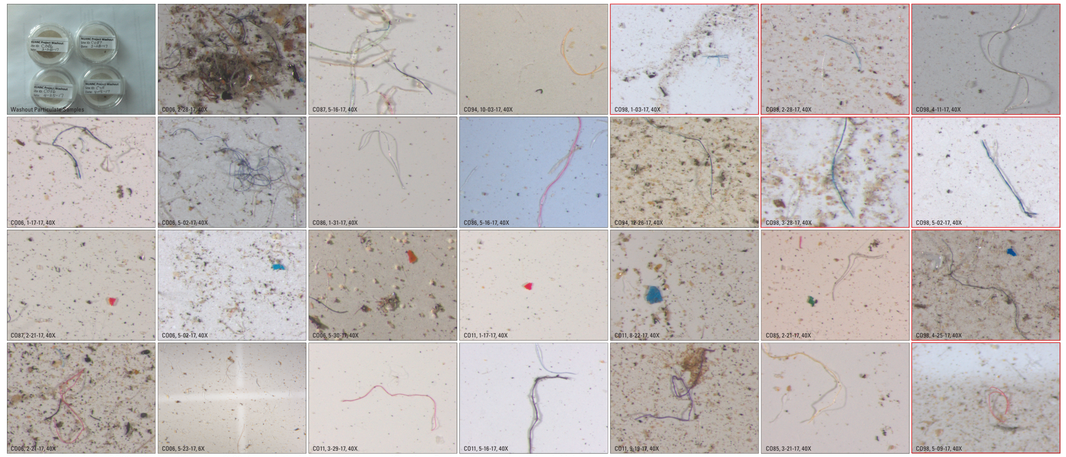
Methods

NUANC samples were collected in plastic bag-lined buckets. Sites CO84, CO94, and CO98 used standard, unlined NTN buckets. The entire volumes of each sample submitted to the NADP Central Analytical Laboratory were filtered (0.45 micrometer, polyethersulfone) to obtain particulates assumed to be washed from the atmosphere (washout). The filters were dried, weighed, and manually analyzed with a binocular microscope fitted with a digital camera (see photomicrographs). Four deionized water rinses of the sampling system were analyzed as blanks. This study was not designed for collecting and analyzing samples for plastic particles. The results are unanticipated and opportune.

Results

General types of particles were classified in the observations (see table). Air mass back-trajectory analysis for site CO98 samples was completed using the HYSPLIT model for 24 hours prior to each sample collection at 500-, 750-, and 1,000-meter altitudes. (National Oceanic and Atmospheric Administration,

Photomicrographs of plastics collected at the NUANC NTN subnetwork, Sugarloaf, and Loch Vale sites in Colorado



(Explanation of labels: CO06, site identification; 2-28-17, month-day-year; 40X, magnification; Red outline indicates Loch Vale samples.)

Data for washout particles collected at site CO98, Loch Vale, Rocky Mountain National Park.

[Bold values indicate easterly air mass back trajectories]

Site identification	Weekly sample collection date (month/day/year)	Sample volume (milliliters)	Estimated solids concentration (mg/L)	Identified materials: Mineral	Soil	Plant	Insects	Micro-plastic	Amorphous carbon	Notes	Back trajectory (degrees from north)
No plastic positively identified											
CO98	1/24/17	337.0	11.4	Yes	Yes	Yes	Possibly	Possibly	Yes		227
CO98	2/14/17	746.4	1.1	Yes	Yes	Yes	Possibly	Possibly	Yes	Egg-shaped particle might be plastic	235
CO98	3/28/17	1,417.3	1.9	Yes	Yes	Yes	No	Possibly	Possibly	Possible blue fiber	**150**
CO98	4/4/17	1,837.1	0.1	Yes	Yes	Yes	No	No	Possibly		**160**
CO98	5/16/17	881.7	4.5	Yes	Yes	Yes	Possibly	Possibly	Yes	Possible black plastic fiber	**62**
CO98	5/22/17	2,856.3	1.0	Yes	Yes	Yes	Yes	No	Yes		**62**
CO98	7/18/17	320.9	3.8	Yes	Yes	Yes	Yes	No	Yes		291
CO98	7/25/17	1,522.5	0.7	Yes	Yes	Yes	Yes	Possibly	Yes		252
CO98	8/1/17	1,897.1	0.2	Yes	Yes	Yes	Yes	Possibly	Yes		213
CO98	8/8/17	2,746.3	0.6	Yes	Yes	Yes	Yes	Possibly	Yes		**176**
CO98	12/19/17	446.2	<2.2	Yes	No	Yes	No	No	Yes		260
Plastic identified											
CO98	1/3/2017	530.5	7.5	Yes	Yes	Yes	Yes	Yes	Yes	Blue fiber	225
CO98	2/28/2017	1,381.2	2.3	Yes	Yes	Yes	No	Yes	Yes	Blue fiber	216
CO98	4/11/2017	918.7	6.1	Yes	Yes	Yes	Yes	Yes	Yes	Blue, green fibers, 2-3	240
CO98	4/25/2017	1,552.8	3.1	Yes	Yes	Yes	No	Yes	Yes	Blue chunk	201
CO98	5/2/2017	1,533.7	0.1	Yes	Yes	Yes	Possibly	Yes	Yes	Blue fibers times 3	266
CO98	5/9/2017	857.1	5.3	Yes	Yes	Yes	No	Yes	Yes	Red fiber	205
CO98	5/30/2017	2,095.2	1.0	Yes	Yes	Yes	Possibly	Yes	Yes	Blue fiber	266
CO98	6/6/2017	557.9	1.7	Yes	Yes	Yes	No	Yes	Yes	White, blue plastic	254
CO98	8/15/2017	2,981.0	0.1	Yes	Yes	Yes	Yes	Yes	Yes	Plastic fiber	275
CO98	8/29/2017	516.4	3.3	Yes	Yes	Yes	Yes	Yes	Yes	Plastic fiber	266

https://ready.arl.noaa.gov/HYSPLIT.php) Urban areas are southeast (approximately 140°) of site CO98, but plastic deposition was more positively identified for westerly storms than easterly storms. In the four blank samples, there was one small translucent fiber observed that might have been plastic. Translucent and white materials, which are the colors of the sampling apparatus, were disregarded in the analyses.

Discussion

The mass of plastic in even the most concentrated samples was not large enough to weigh or reliably estimate. Developing a routine capability to calculate plastic wet-deposition loads is not possible with current (2019) technology. Methods for more accurate estimation of plastic loads are needed.

Better quality control to limit cross contamination and methods for estimation of percent recovery of the plastic materials from NADP samples are needed. Retaining NADP filters for subsequent analysis would make a washout deposition network possible with very little added expense.

How these plastic materials are accumulating and being assimilated in the environment and biota is unclear. Moreover, the potential effects of these materials on biota is not understood.

Conclusions

It is raining plastic. Better methods for sampling, identification, and quantification of plastic deposition along with assessment of potential ecological effects are needed.

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For sale by U.S. Geological Survey, Information Services, Box 25286, Federal Center, Denver, CO 80225, 1–888–ASK–USGS

Digital files available at https://doi.org/10.3133/ofr20191048

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ISSN 2331–1258 (online)
https://doi.org/10.3133/ofr20191048

frontiers in Chemistry

ORIGINAL RESEARCH
published: 11 September 2018
doi: 10.3389/fchem.2018.00407

Synthetic Polymer Contamination in Bottled Water

Sherri A. Mason, Victoria G. Welch and Joseph Neratko*

Department of Chemistry, State University of New York at Fredonia, Fredonia, NY, United States

Eleven globally sourced brands of bottled water, purchased in 19 locations in nine different countries, were tested for microplastic contamination using Nile Red tagging. Of the 259 total bottles processed, 93% showed some sign of microplastic contamination. After accounting for possible background (lab) contamination, an average of 10.4 microplastic particles >100 um in size per liter of bottled water processed were found. Fragments were the most common morphology (66%) followed by fibers. Half of these particles were confirmed to be polymeric in nature using FTIR spectroscopy with polypropylene being the most common polymer type (54%), which matches a common plastic used for the manufacture of bottle caps. A small fraction of particles (4%) showed the presence of industrial lubricants. While spectroscopic analysis of particles smaller than 100 um was not possible, the adsorption of the Nile Red dye indicates that these particles are most probably plastic. Including these smaller particles (6.5–100 um), an average of 325 microplastic particles per liter of bottled water was found. Microplastic contamination range of 0 to over 10,000 microplastic particles per liter with 95% of particles being between 6.5 and 100 um in size. Data suggests the contamination is at least partially coming from the packaging and/or the bottling process itself. Given the prevalence of the consumption of bottled water across the globe, the results of this study support the need for further studies on the impacts of micro- and nano- plastics on human health.

Keywords: plastic pollution, microplastic, consumables, human health, FTIR, Nile Red, drinking water

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INTRODUCTION

Plastic is defined as any synthetic or semi-synthetic polymer with thermo-plastic or thermo-set properties, which may be synthesized from hydrocarbon or biomass raw materials (UNEP, 2016). Plastics production has seen an exponential growth since its entrance on the consumer stage, rising from a million tons in 1945 to over 300 million tons in 2014 (PlasticsEurope, 2015). Some of the features of plastic that make it so attractive from a manufacturing standpoint are of concern when it comes to its environmental impact. It is very light-weight allowing it to be easily transported over long distances, and it is durable being resistant to breakage and biodegradation. Its durability is inherently connected to its chemical structure. Being composed largely, if not entirely, of hydrocarbon chains, the lack of double bonds or other functional groups provides an inherent stability to its molecules, and its synthetic nature means that the vast majority of microorganisms haven't evolved to utilize plastic as a food source. Thus, while plastic will break into smaller and smaller particles via photo-oxidative mechanisms, the fundamental molecular structures of the material change very little throughout that process. Plastics become microplastics become nanoplastics, but they are all plastics, just of increasingly smaller size, allowing them to be more easily ingested and perhaps even cross the gastrointestinal tract to be transported throughout a living organism (Brennecke et al., 2015; Sharma and Chatterjee, 2017).

Forbes

Mar 16, 2018, 08:26am EDT

Study Finds Microplastics In 93% Of Bottled Water [Infographic]



Niall McCarthy Contributor ⓘ
Business
Data journalist covering technological, societal and media topics

This article is more than 2 years old.

The World Health Organization (WHO) has announced that it is launching a review of the potential risks of plastic particles in drinking water, after a study found tiny pieces of plastic in more than 90% of samples from the world's most popular bottled water brands.

That analysis was conducted by the State University of New York in Fredonia as part of a project from the U.S.-based journalism organization Orb Media, and it involved 259 bottles of water from 11 brands across nine countries. They were bought in China, Brazil, India, Indonesia, Mexico, Lebanon, Kenya, Thailand and the U.S.

Of all the bottles tested, only 17 were found to be free of plastic. On average, each liter sold contained 325 pieces of microplastic, including polypropylene, nylon, and polyethylene terephthalate. In one case, a bottle of Nestlé Pure Life contained more tahn 10,000 pieces of microplastic. High levels were also found in bottles of Bisleri (5,230), Gerolsteiner (5,160) and Aqua (4,713).

According to WHO officials, there is no evidence that the consumption of microplastic fibers has an impact on human health, but it remains an emerging area of concern.

Frost and drought: Climate change hammering Australia's biggest tea plantation

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ABC Rural By Tom Major

Posted Tuesday at 08:14



In 25 years at Nerada Tea's main Tablelands plantation, Tony Poyner has never seen such dry, cold winters. (ABC Rural: Tom Major)

Australia's biggest tea producer is reeling from two consecutive seasons of frost and drought, hampering its production in north Queensland.

Plantation manager Tony Poyner said Nerada produces between 1.2 to 1.5 million kilograms of black tea at its farms on the fertile Atherton Tablelands, but production was becoming tougher.

"Last year was a devastating year: two severe frosts over the whole estate, but no rain to follow up was the real problem," he said.

> "It was up to 50 per cent of our production, and we're talking ... around $1 million.

Key points:

- Nerada, Australia's biggest tea producer, estimates losses of approximatelt $1 million over the past year
- This is due to a combination of severe frosts over winter followed by no rain in summer, over two consecutive seasons
- Nerada currently has an 8 per cent market share but hope that will conditions improve to see that raised to 15 per cent

With growing fears about the effect changing

TOP STORIES ›



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Irrigators' effigy of Federal Water Minister floating down the Murray River



How a frozen meringue led investigators to the source of a salmonella outbreak



GM modification law reform could see cotton industry swoop on South Australia



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Drought-affected farmers determined to rebuild after fires in NSW

ABC Mid North Coast By Michael Cavanagh and Luisa Rubbo

Updated yesterday at 7:36pm



PHOTO: Fodder delivered to fire-ravaged properties near the Bees Nest Fire, north of Ebor in NSW. (ABC News: Michael Cavanagh)

Much-needed support is rolling in for drought-affected farmers hit by a massive bushfire burning in northern New South Wales.

Local Land Services General Manager Paul Hutchens said the Bee's Nest fire on the Dorrigo Plateau between Armidale and the Coffs Coast had a great impact on primary producers.

"This is the largest scale fireground and where the greatest livestock losses have been experienced."

RELATED STORY: Winds stoke more fire chaos as northern NSW residents urged to seek shelter

RELATED STORY: 'Everything is gone': Residents face the devastation as NSW fires remain out of control

Key points:

- More than 260 animals were lost in fires covering 95,000 hectares
- More than 1,000 bales of hay have been supplied to farmers
- Farmers are being forced to sell stock to conserve remaing fodder



FROM ABC MID NORTH COAST

- 'People will bounce back': Drought-affected farmers determined to rebuild after fires
- 'It will take years to recover': Drought-affected farmers lose crop in hailstorm
- Making Indigenous language 'cool' to reconnect kids with country
- Recovered alcoholic calls on troubled young men to help communities affected by fire
- Nomadic coffee van couple put down wheels in Port Macquarie
- Trash for treasure: Garbage exchanged for clothes at seaside scavenge
- Striking images captured of rare 'Dalmatian' magpie

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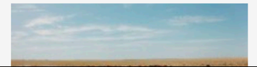
Water supplies drying up as drought continues to ravage rural Australia



A few examples of the **importance** of water systems and how they can **change**.

Some of which are related to your **literature review** topics.

Lecture question #1

Have you ever thought about *where* the water you drink comes from and its *quality*?

If so, why? If not, why not?



1. Why should we care about water and conflict?



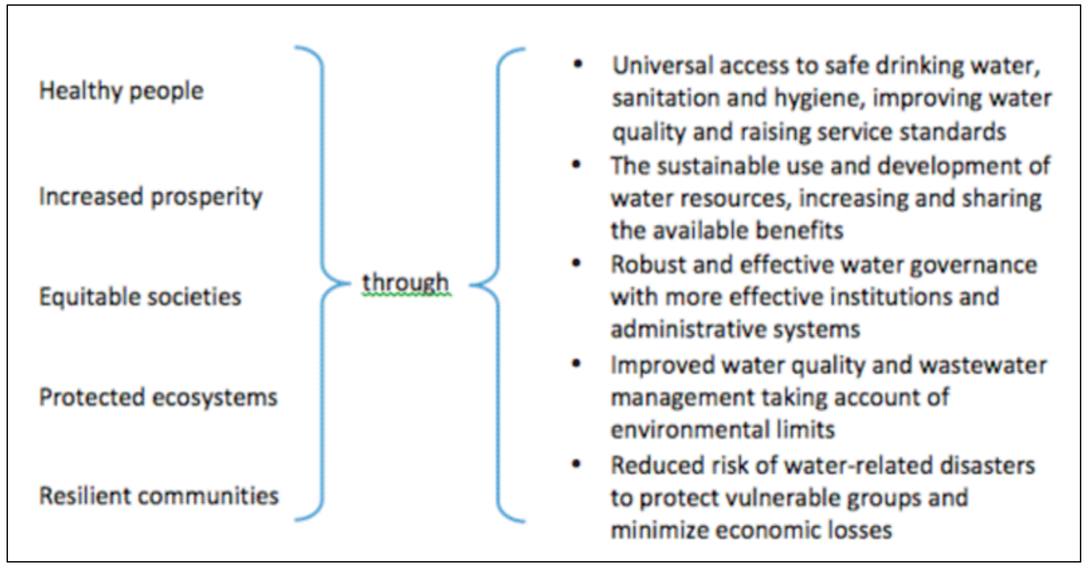
2. Why water matters



Image source: Getty (http://news.getty.edu/images/9036/Los%20Angeles%20Aquaduct_Cascades.jpg)

Water and development

Access to clean drinking water is a crucial development goal.



Water and development

Millennium Development Goal 7C: "Halve, by 2015, the proportion of the population without sustainable safe drinking water and basic sanitation."

- Target met in 2010.
- Between 1990 and 2015, 2.6 billion people gained access to improved drinking water sources—from 76% to 91%.
- 663 million people are still without access.

http://www.un.org/millenniumgoals/environ.shtml

Water and development

Sustainable Development Goal # 6: Ensure access to water and sanitation for all.



Source: http://www.slideshare.net/EPAIreland/epa-h2020-sc5-info-day-united-nations-sustainable-development-goals-federico-properzi-unwater

There are still clear problems (I)

"By 2050, at least **one in four** people is likely to live in a country affected by chronic or recurring shortages of fresh water."

Water scarcity affects more than **40% of the global population**.

Over 1.7 billion people are currently living in river basins where **water use exceeds recharge.**

At least 1.8 billion people use a source of drinking water that is **fecally contaminated.**

2.4 billion people lack access to **basic sanitation services**, such as toilets or latrines.

>80% of wastewater resulting from human activities is discharged into rivers or seas **without any pollution removal.**

Sources: http://www.un.org/sustainabledevelopment/water-and-sanitation/ http://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/6_Why-it-Matters_Sanitation_2p.pdf

There are still clear problems (II)

Daily nearly **1,000 children** die due to preventable water and sanitation-related diarrheal diseases.

Worldwide, more than **2 million people** die every year from diarrheal diseases.

Hydropower is the most widely-used renewable source of energy (in 2011 it was 16% of electricity production).

~70% of all water taken from rivers, lakes and aquifers is used for **irrigation**.

Floods and other water-related disasters account for 70% of all deaths related to **natural disasters**.

The economic impact of not investing in water and sanitation costs **4.3%** of **sub-Saharan African** GDP.

6.4% of **India's** GDP is lost due to adverse economic impacts and costs of inadequate sanitation.

Sources: http://www.un.org/sustainabledevelopment/water-and-sanitation/ http://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/6_Why-it-Matters_Sanitation_2p.pdf

This is not a new problem…



Source: https://upload.wikimedia.org/wikipedia/commons/thumb/b/b8/Noah%27s_Ark_on_Mount_Ararat_by_Simon_de_Myle.jpg/2048px-Noah%27s_Ark_on_Mount_Ararat_by_Simon_de_Myle.jpg

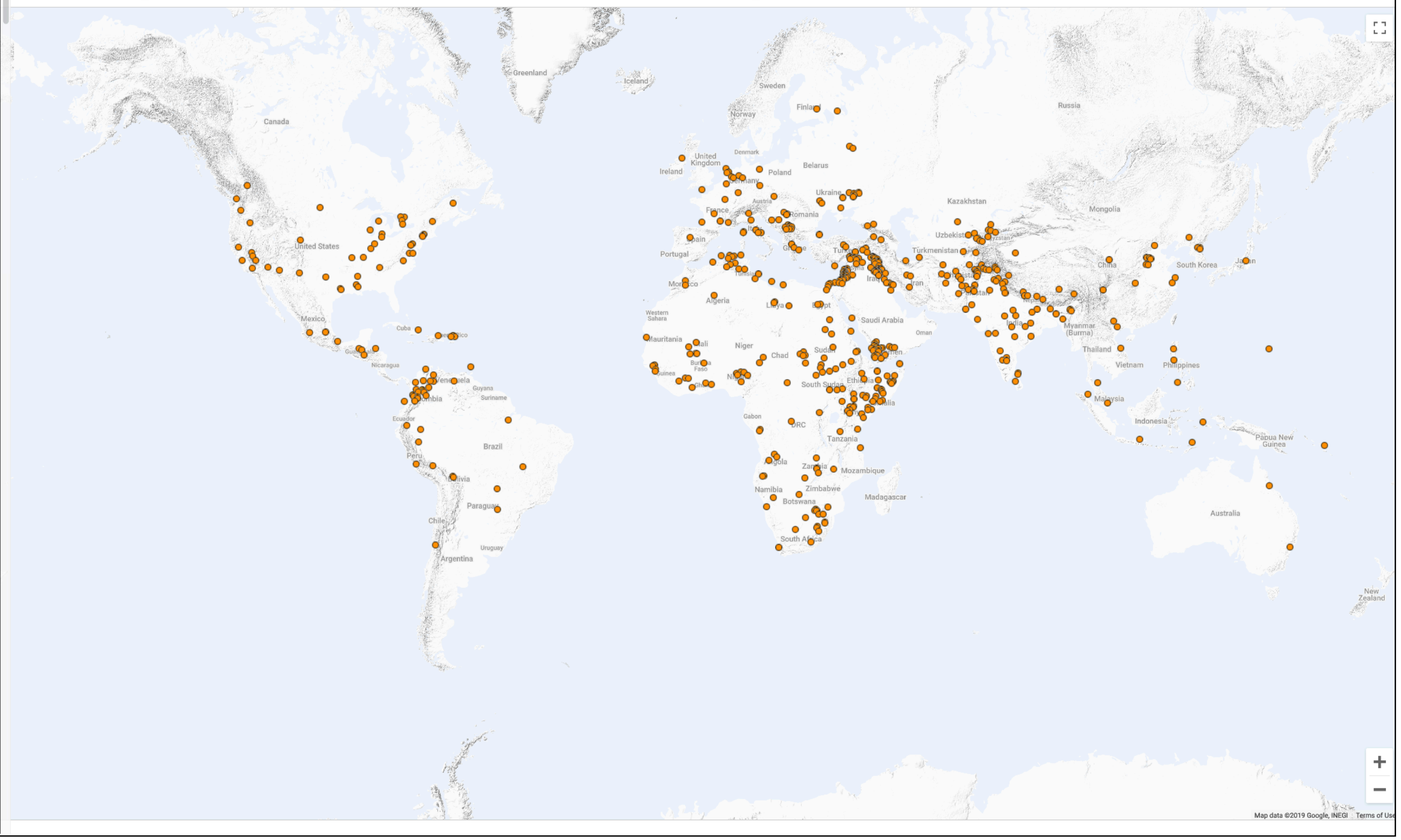
www.worldwater.org/conflict/map/

Water Conflict Chronology

Conflict Type: | Region: | Search | 655 Conflicts

Date Range:

1. God Punishes Man with Six-Day Storm (3000 BC)
2. Lagash-Umma border dispute (2500 BC)
3. Tigris River dammed (1720-1684 BC)
4. Kishon River flooded in defeat of Sisera (circa 1300 BC)
5. Moses parts the Red Sea (1200 BC)
6. Assyrian king destroys Armenian irrigation network (720-705 BC)
7. Sennacherib razes Babylon (705-682 BC)
8. Hezekiah stops springs in advance of Assyrian Invasion (701 BC)
9. Assyrian king cuts off water of enemy (681-699 BC)
10. Assyrian king dries up enemy's wells (669-626 BC)
11. Khosr River diverted by Babylonians (612 BC)
12. Nebuchadnezzar uses Euphrates River as defense (605-562 BC)
13. Athens poisons enemies' water (590-600 BC)
14. Assyrians poison wells of enemies (6th Century BC)
15. The use of water as a weapon in the ancient Middle East (596 BC)
16. Cyrus diverts the Diyalah River (558-528 BC)
17. Cyrus diverts the Euphrates (539 BC)
18. Spartans poison cisterns of Piraeus (430 BC)
19. Water as a weapon in the battle of Delium, 424 BC (424 BC)
20. Alexander tears down Persian dams (355-323 BC)
21. Parthian king Arsaces III destroys water supply system (210 BC)
22. Wei River dams in China are breached in 204 BC (204 BC)
23. The Achaeans use water as a weapon in the siege of Phana (2nd century BC)
24. Water is used as a weapon in 101 BC China (101 BC)
25. Caesar constructs ditches in Siege of Alesia (52 BC)
26. Caesar attacks water supplies during siege of Uxellodunum (51 BC)
27. Marseille uses water to defend against Roman siege (49 BC)
28. Jewish protestors killed by Roman troops in protest over stream diversion (30 AD)
29. Goths cut Roman aqueducts (537)
30. Saladin cuts off Crusaders' water (1187)
31. Intentional Drying Up of Canals in Mughal, India (1260)
32. Florence plan to cut Pisa's water (1503)
33. Dutch flood land to repel Spaniards (1573-1574)
34. Spain attempts to re-route Rhine River to harm Dutch (1626-1629)
35. China floods rebel peasants (1642)
36. 300,000 deaths when Yellow River dikes are breached in 1642. (1642)
37. Dutch flood land to repel French (1672)



worldwater.org/conflict/list/

Water Conflict Chronology

2020 - present | All Regions | All Conflict Types | Search

201 Conflicts

Date	Headline	Conflict Type	Country	Region	Description	Sources
2020	An attack on a water pumping station in Libya cuts of the water supply to 2 million people in the capital of Tripoli	Weapon	Libya	Northern Africa	An armed group attacked a control station at Shwerif, Libya, cutting off the water supply to more than 2 million people in the capital Tripoli. The UN condemns the attack as "reprehensible."	Al Jazeera 2020
2020	Protestors injured in Tripoli, Libya, while protesting water shortages and other deplorable living conditions	Trigger	Libya	Northern Africa	Several hundred people hold a protest of deplorable living conditions, including from water shortages, in Tripoli, Libya. Some protestors are injured from shots by security forces working to disperse the demonstrations.	Aslan 2020
2020	Mexican military forces and farmers clash over water releases from a dam	Trigger, Casualty	Mexico	Latin America and the Caribbean	Farmers protest at the Las Virgines dam in northern Mexico where water is being held to repay a water debt to the U.S. Several hundred overtake control of the dam, causing property damage estimated at $4.6 million. The farmers say that without the water, they will no longer be able to farm.	Associated Press (AP) 2020a, AP News 2020
2020	Clashes over shared water point kills at least 10 in northern Uganda	Trigger	Uganda	Sub-Saharan Africa	Clashes between South Sudanese refugees and local community members in Tika village near the Rhino refugee settlement in northern Uganda over access to a shared water source leave at least 10 dead, 19 injured, and several missing.	Athumani 2020
2020	White supremacists in the United States plot to poison water supplies	Weapon	United States	North America	In secret surveillance, the US Federal Bureau of Investigation records neo-Nazis recruiting	MacFarquhar and Goldman 2020

The Last Stand of the Wild West: Twenty-First Century Water Wars in Southern California

by Shannon Baker-Branstetter

Editors' Summary: In 2003, the Imperial Irrigation District (IID) of California agreed to transfer water from rural Imperial County to urban southern California cities as part of a quantitative settlement agreement (QSA). The Colorado River water that the IID transferred to the wealthy coastal cities was held in trust for the residents of the Imperial Valley, the poorest county in the state. In this Article, Shannon Baker-Branstetter asserts that the IID Board of Directors breached its trust to the residents and farmers of Imperial County when it sold water rights to municipal districts in southern California. The IID leased the water for less-than-market price for an unreasonable length of time, and the IID Board of Directors did not insist on adequate compensation and a formalized plan to mitigate damage to the public health that will result when the reduced runoff from agriculture exposes the Salton Sea lakebed. Thus, the IID exacerbated the poor economic conditions of residents of the county.

"No other resource is as vital to California's cities, agriculture, industry, and environment as this liquid gold," wrote Justice Vance W. Raye of water.[1] Indeed, the centrality of water is far from unique to California. Violent conflicts over water resources predate written history, and the first documented account in 2500 B.C. told of a water diversion by Urlama, King of Lagash, to deprive his enemy, Umma, of water.[2] Water is the essence of life, and like other natural resources, a requisite element of development.

Americans imagine their country as a civilized nation, and subsequent to bombings of the Los Angeles Aqueduct and retaliatory attacks between 1924 and 1927, the conflicts over water in the United States have moved civilly to the courts.[3] However, the incongruence between the location of urban development and natural water resources in California has created an ongoing imbalance rife with conflict. Although no blood has been shed in the current conflict over the water of the Imperial Valley and "economic harm" has been euphemistically substituted for "stealing," the approval of the distribution of water has been driven by political, rather than equitable considerations.

Historically, legal principles in California water law have evolved to meet the demands of hegemonic interests of the era. The "first in time" principle, or appropriation doctrine, of water ownership was instigated by the Gold Rush and other mining operations. In the late 1800s, the rise of agriculture influenced the California Legislature to grant farmers special authority to accumulate water rights, and the Bureau of Reclamation continued to subsidize agriculture's water through vast infrastructure projects throughout the first half of the 20th century. Now the thirst and political clout of California's coastal cities are eroding agriculture's previously formidable hold on 90% of the state's water.[4]

Shannon Baker-Branstetter is a J.D. candidate at Georgetown University Law Center. She thanks Malissa McKeith and her colleagues, Nicole Wilson and Maya Grasse, at Lewis Brisbois Bisgaard & Smith LLP for their knowledgeable assistance on the pending quantitative settlement agreement cases; the Salton Sea State Park Visitor Center staff for providing background materials and local insight; Prof. William Butler of Georgetown University Law Center for his guidance and invaluable feedback; and Jennifer Davitt, librarian at Georgetown Law Library, and librarians at the Witkin California State Law Library for their research support and assistance.

1. County of Imperial v. Superior Court, 61 Cal. Rptr. 3d 145, 148 (Cal. Ct. App. 2007).
2. Peter H. Gleick, Water Conflict Chronology 1 (Pacific Inst. for Studies in Dev., Env't & Security 2006), *available at* http://www.worldwater.org/conflictchronology.pdf.
3. Local ranchers and farmers in the Owens Valley, desperate to preserve water for their valley, launched several bombings along key points of the Los Angeles Aqueduct. Supported by developers' financing, the Los Angeles Department of Water and Power had purchased all the land adjacent (riparian) to the Owens River, so that it would not have to pay Owens Valley residents directly for their water. "Riparian" water rights are acquired by virtue of owning land adjacent to a water source. *See William Mulholland*, PBS New Perspectives on the West, http://www.pbs.org/weta/thewest/people/i_r/mulholland.htm (last visited Aug. 21, 2008).
4. The public trust doctrine is also, on occasion, a powerful counterweight to other water rights, especially when applied in combination with the Endangered Species Act of 1973. *See* National Audubon Soc'y v. Superior Court, 658 P.2d 709 (Cal. 1983) (applying the public trust doctrine to order the California Department of Water Resources (DWR) to reconsider the allocation of the waters of Mono Lake); California Trout, Inc. v. Superior Court, 266 Cal. Rptr. 788, 804 (Cal. Ct. App. 1990) (mandating that the DWR's licenses for Los Angeles be conditioned upon the release of "sufficient water into the streams from its dams to reestablish and maintain the fisher-

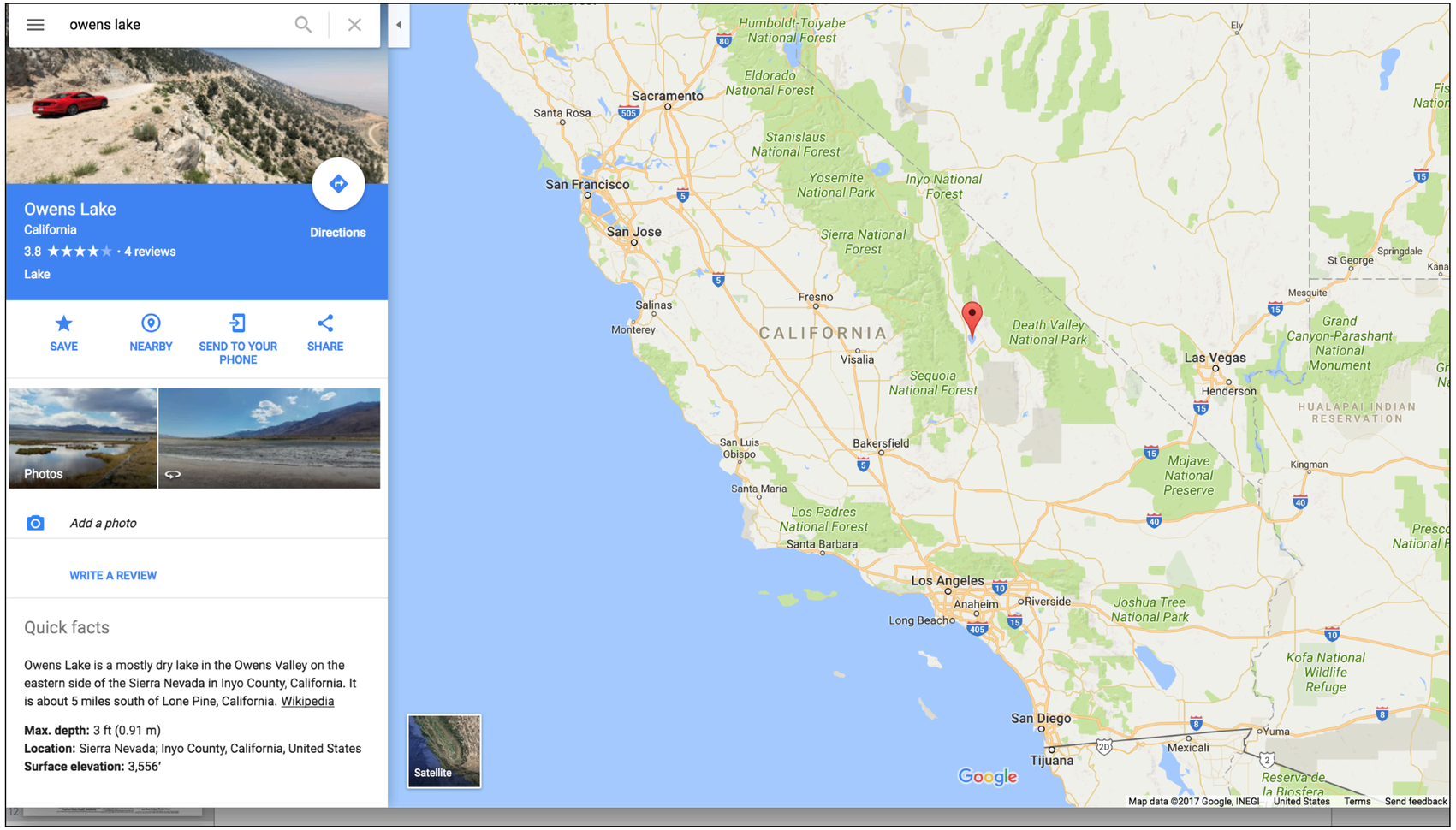

owens lake
Owens Lake
California
3.8 ★★★★☆ · 4 reviews
Lake
Directions
SAVE
NEARBY
SEND TO YOUR PHONE
SHARE
Photos
Add a photo
WRITE A REVIEW
Quick facts
Owens Lake is a mostly dry lake in the Owens Valley on the eastern side of the Sierra Nevada in Inyo County, California. It is about 5 miles south of Lone Pine, California. Wikipedia
Max. depth: 3 ft (0.91 m)
Location: Sierra Nevada; Inyo County, California, United States
Surface elevation: 3,556'
Satellite
Humboldt-Toiyabe National Forest
Eldorado National Forest
Sacramento
Santa Rosa
Stanislaus National Forest
Yosemite National Park
Inyo National Forest
San Francisco
San Jose
Sierra National Forest
Fresno
Salinas
Monterey
CALIFORNIA
Visalia
Death Valley National Park
Sequoia National Forest
Las Vegas
Henderson
Grand Canyon-Parashant National Monument
HUALAPAI INDIAN RESERVATION
Mesquite
St George
Springdale
Ely
San Luis Obispo
Bakersfield
Santa Maria
Los Padres National Forest
Santa Barbara
Mojave National Preserve
Kingman
Los Angeles
Anaheim
Riverside
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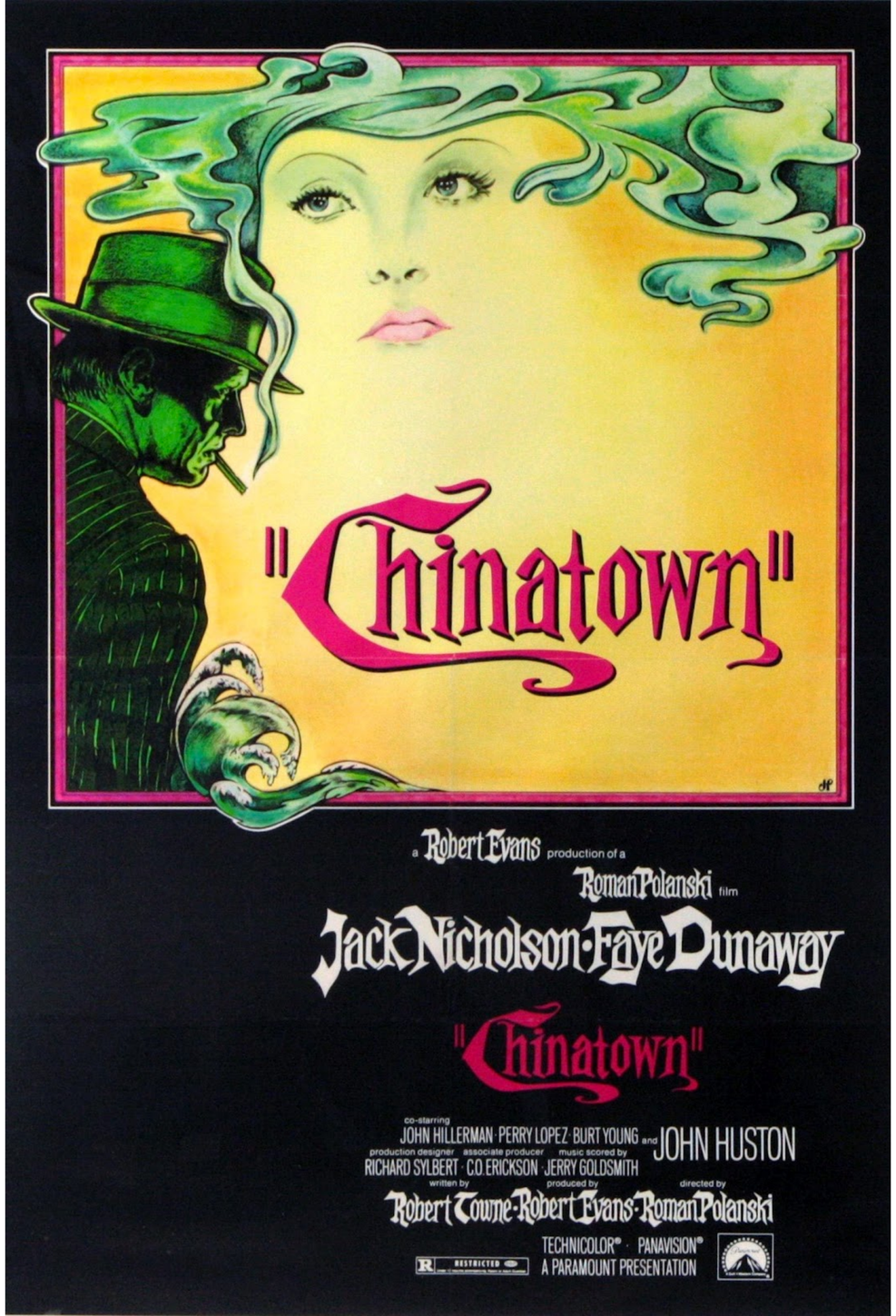
Image source: Getty (http://news.getty.edu/images/9036/Los%20Angeles%20Aquaduct_Cascades.jpg)


"Chinatown"
a Robert Evans production of a
Roman Polanski film
Jack Nicholson · Faye Dunaway
"Chinatown"
co-starring
JOHN HILLERMAN · PERRY LOPEZ · BURT YOUNG and JOHN HUSTON
production designer RICHARD SYLBERT · associate producer C.O. ERICKSON · music scored by JERRY GOLDSMITH
written by Robert Towne · produced by Robert Evans · directed by Roman Polanski
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Owens Valley aqueduct, 1924



St. Francis Dam, 1926



Image source: https://www.smithsonianmag.com/history/occasions-i-envy-dead-st-francis-dam-disaster-180954543/

The St. Francis dam burst in 1928.



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Vol. XLVII. WEDNESDAY MORNING, MARCH 14, 1928. DAILY, FIVE CENTS SUNDAY, TEN CENTS

200 DEAD, 300 MISSING, $7,000,000 LOSS IN ST. FRANCIS DAM DISASTER





Plane Views Give Idea of Magnitude of Catastrophe

Left—View of the wrecked St. Francis Dam taken from the air at a point just below the dam. Right—Santa Paula, as seen from the air. Directly in the path of the raging torrents, portions of the city were inundated. [Photographs taken by Harry C. Anderson, Times staff photographer.]

THOUSANDS RUSH TO AID IN WORK OF RESCUE AND RELIEF

Red Cross Directs Gigantic Task of Succor in Devastated Area; Water Board Appropriates $25,000; Food and Shelter Needed Immediately

PARTIAL LIST OF PERSONS DEAD, INJURED AND MISSING IN FLOOD

The following is a partial and best obtainable list of identified dead, unidentified dead, missing and injured in the St. Francis dam break yesterday.

As well as the below listed persons the authorities are searching for hundreds of missing men, women and children in San Francisquito Canyon, Fillmore, Saugus region, Piru, Ventura, Santa Paula, Castaic, Oberg, Camulos and other sections.

According to figures from improvised morgues in the stricken area and from the Sheriff's office and police department more than 200 bodies of men, women and children have been recovered of which in the neigh-

SCORES MORE THOUGHT BURIED IN DEBRIS OF WILD WATERS

Darkness Halts Rescue as Crews Sight Other Bodies; Hundreds of Homes Crushed by Fatal Torrent and Many Bridges Washed Away

Approximately 200 persons dead, 300 others unaccounted for, and property damage estimated

NICK STOCKTON SCIENCE 04.13.16 3:47 PM

CALIFORNIA'S WATER WARS FLARE UP AS SOCAL MAKES A LAND GRAB



The Webb Tract, top, Bouldin Island, lower right, were part of a deal over water rights in the Sacramento River delta. BOB PEPPING/CONTRA COSTA TIMES/ZUMA

THE ONE BIG thing to understand about water in California is this: The north has it, the south wants it. Yes, sure, pedants will say it's more complicated. That you need to consider pre-1914 water rights, and which federal or state agencies have jurisdiction over which reservoirs, and whether it was an El Niño year, and if it is an El Niño year, is it a stereotypical El Niño or is it a weird outlier El Niño … and so on.

Which is why it is so, I'm going to say it, *exciting* when a

2. Why water matters



Image source: Getty (http://news.getty.edu/images/9036/Los%20Angeles%20Aquaduct_Cascades.jpg)

3. Water and conflict



Image source: https://commons.wikimedia.org/wiki/File:Battle_of_Arica_(1880),_Juan_Lepiani.jpg


ESTRATEGIA Y HEROÍSMO EN EL CONFLICTO DE 1879
NAVESPACIAL
PRODUCCIONES
GUERRA
EN EL
PACÍFICO
EL JUEGO DE MESA
10 AÑOS EN ADELANTE
Un juego de Andrés Paredes
2 A 4 JUGADORES

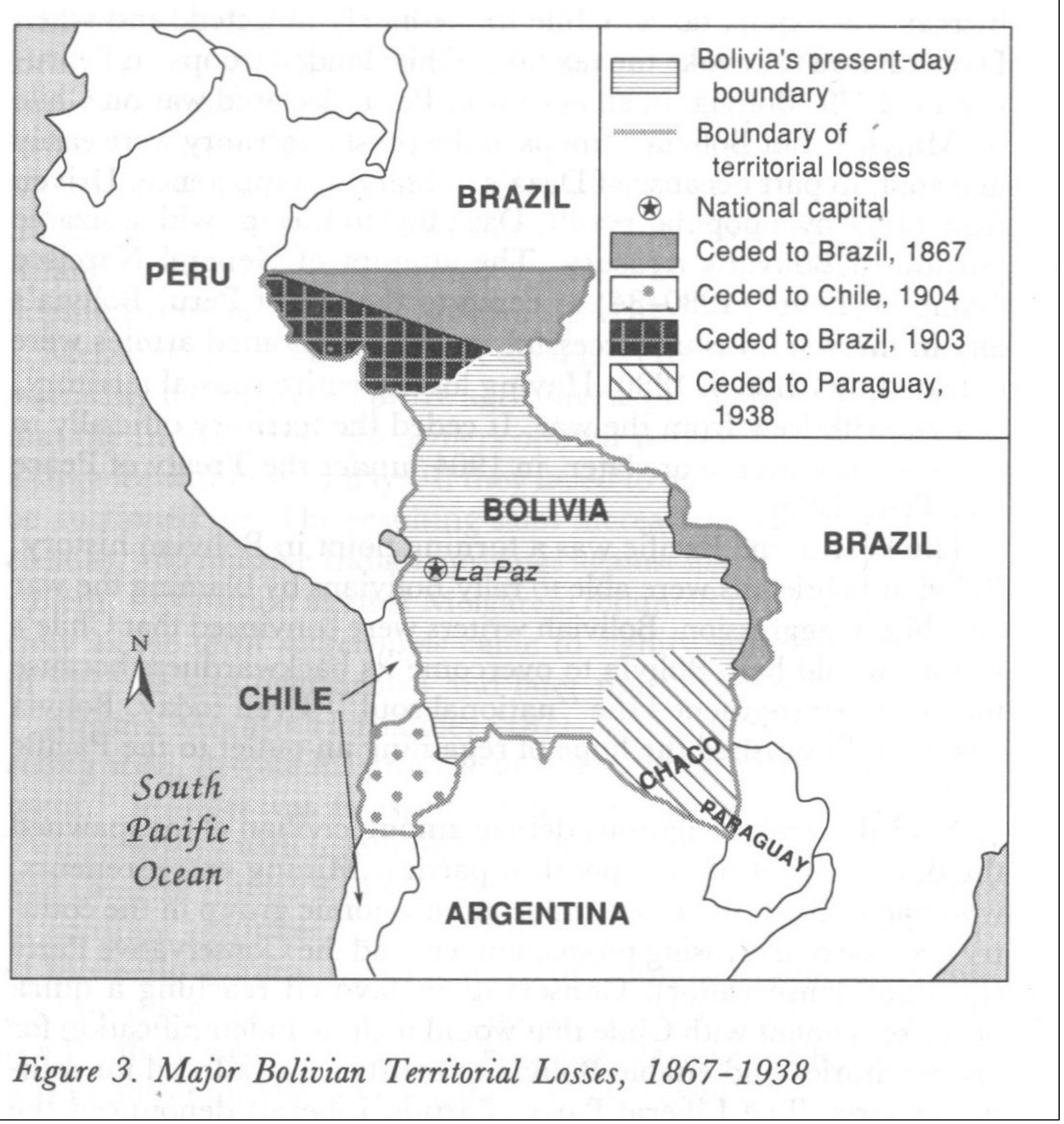
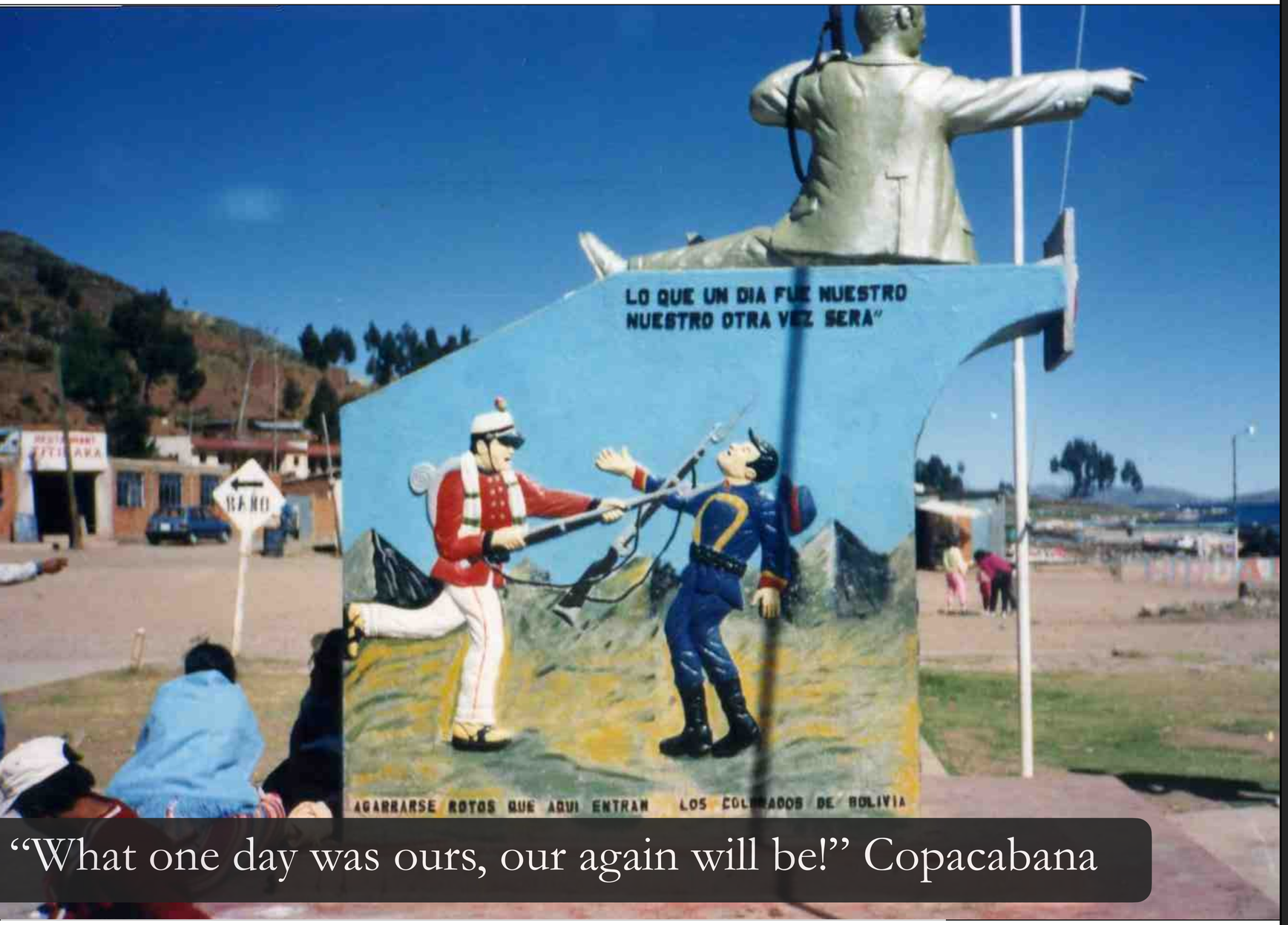


Figure 3. Major Bolivian Territorial Losses, 1867–1938

Image source: Colin Snider (https://americasouthandnorth.wordpress.com/2013/02/09/on-the-chilean-navys-nationalisticxenohobic-naval-chants-and-historical-context/)



"What one day was ours, our again will be!" Copacabana

Image source: Colin Snider (https://americasouthandnorth.wordpress.com/2013/02/09/on-the-chilean-navys-nationalisticxenohobic-naval-chants-and-historical-context/)

Water and subnational conflict

Possible causal processes

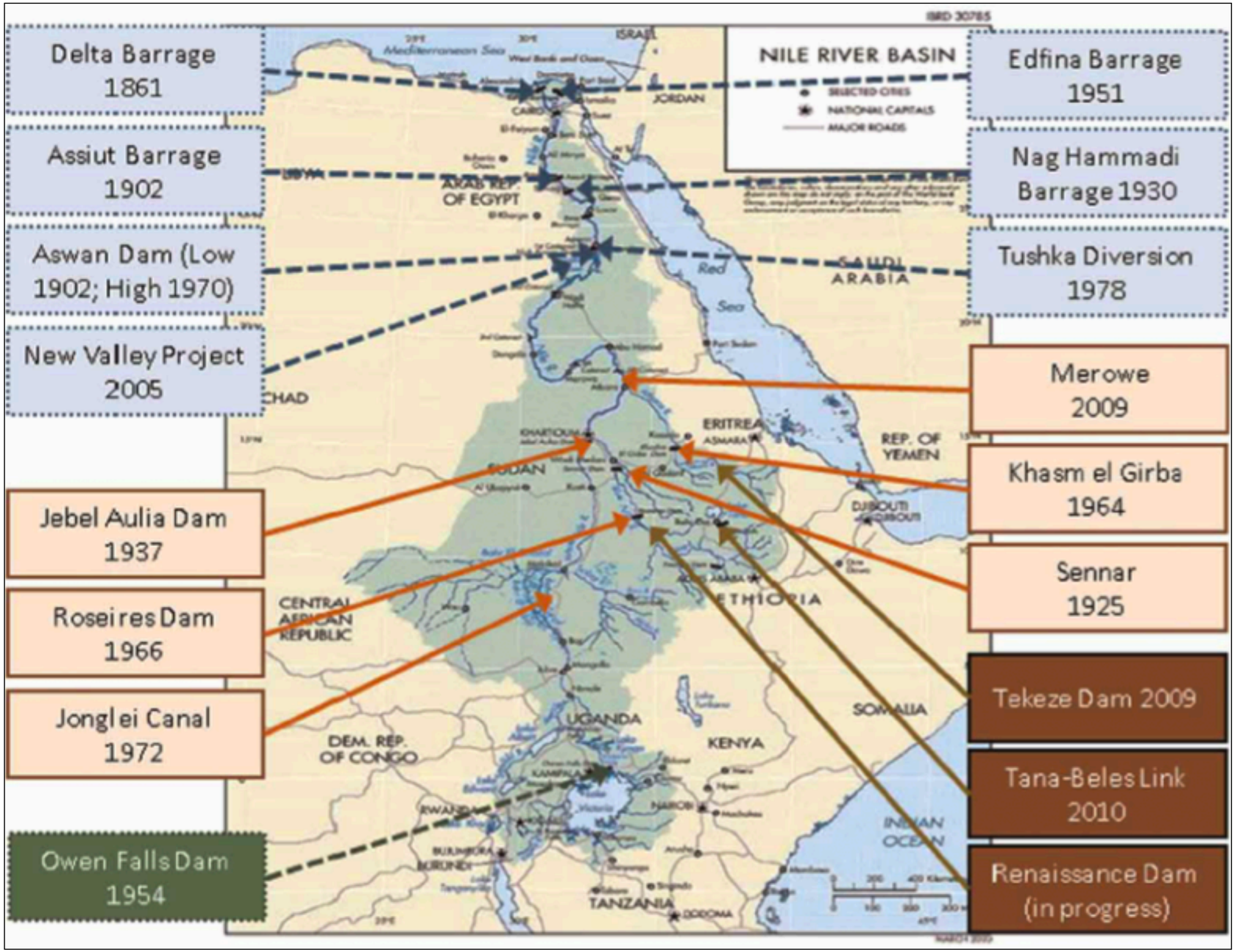
Accentuate societal **divides**

Human suffering and the **grievances** it can cause lead to motivations for violence.

Lowers **opportunity costs** to joining rebel movement

Risks highest where scarcity **overlaps** with political and economic marginalisation (Theisen, Holtermann, & Buhaug (2011-2)

Example of nomadic pastoralists along the Omo river in Ethiopia and Kenya.



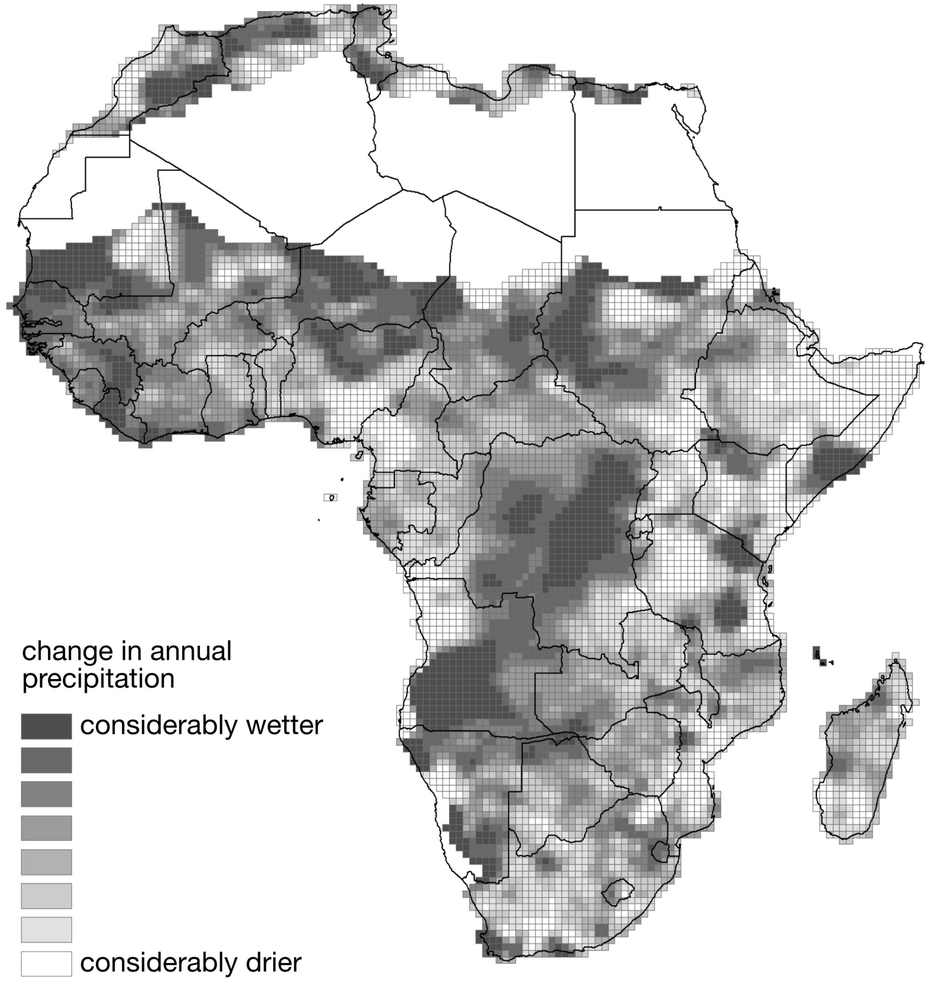
Source: InternationalRivers.org

“Sic utter tuo ut alienum non laedas”

“Use your property in a way not to injure others.”
(Gleick 1993: 107)



Figure 1. Changes in Mean Annual Precipitation from 1952–61 to 1995–2004

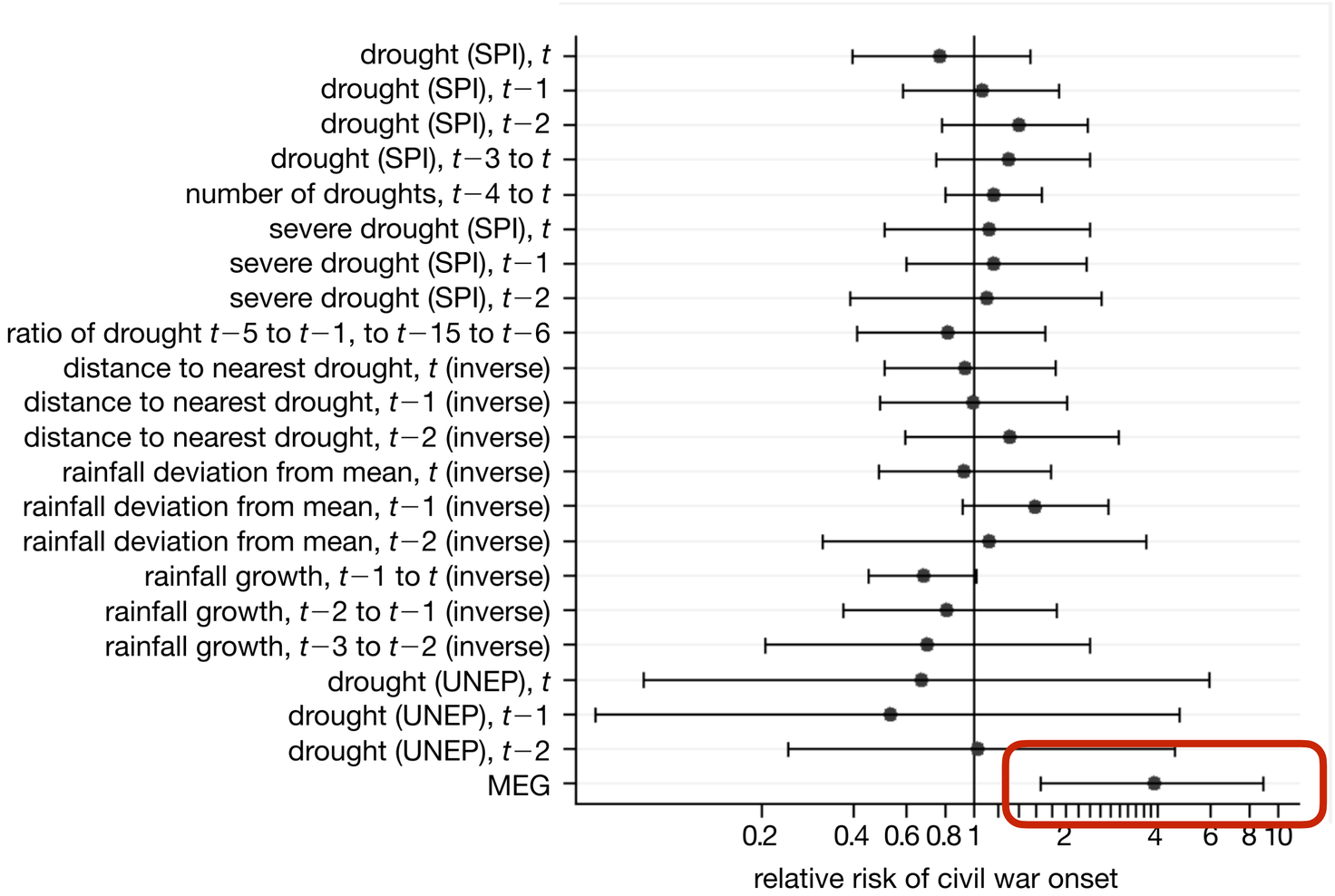


NOTE: The map shows changes in mean annual precipitation from the first to the most recent decade of precipitation data (1952–61 and 1995–2004, respectively). White areas are deserts with mean annual precipitation of less than 100 millimeters. See data and measurements section for further details.

Source: Theisen et al 2011: 84.

Effect of drought (10th -> 90th percentile)

Figure 3. Relative Risk for Alternative Drought Measures



Source: Theisen et al 2011: 101.

Water and international conflict

Possible causal processes

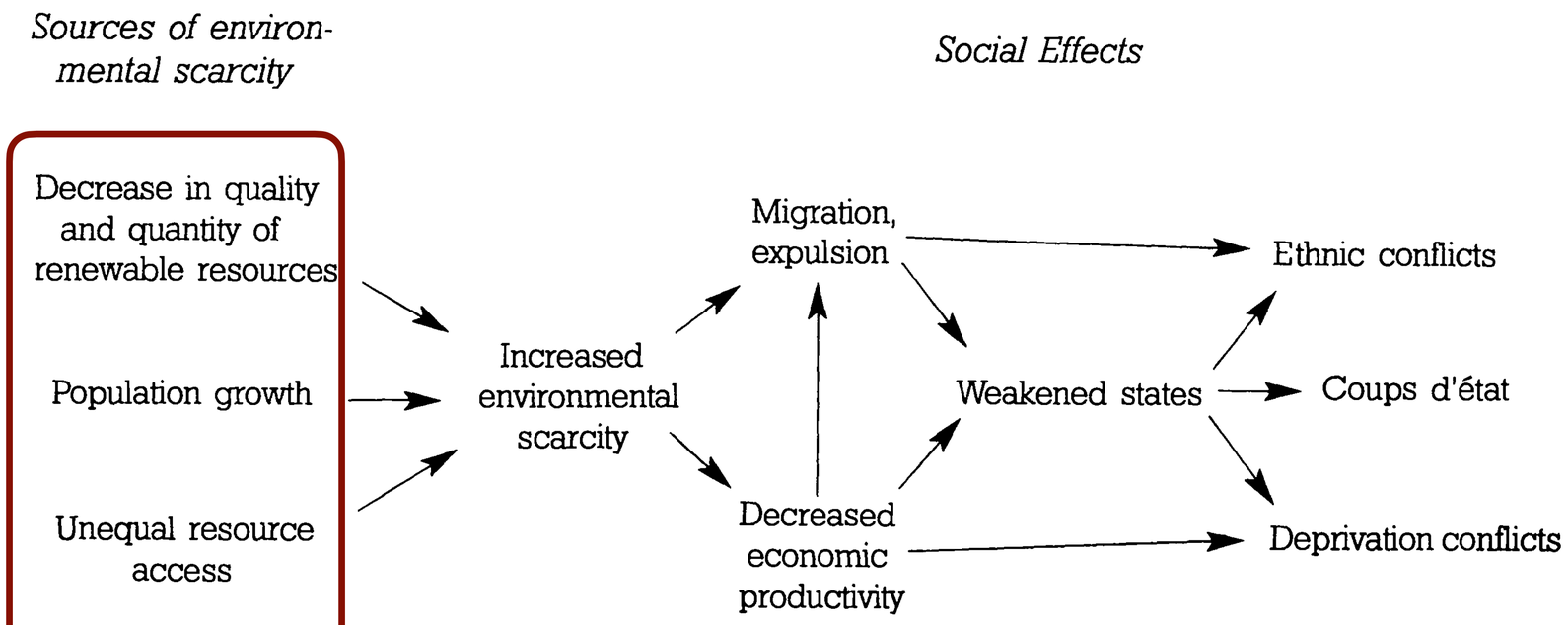
Rivers can lead to **fuzzy boundaries** and conflicts over territory. (Gleditsch et al. 2006)

Water scarcity can lead to conflict over **access** or equitable **distribution.**

This risk is higher in areas of changing patterns of **rainfall** or political governance.

As with civil conflict, levels of **development** also matter.

Figure 2. Some Sources and Consequences of Environmental Scarcity.



Source: Homer-Dixon (1994: 31)

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Conflicts over shared rivers: Resource scarcity or fuzzy boundaries?☆

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Abstract

Countries that share rivers have a higher risk of military disputes, even when controlling for a range of standard variables from studies of interstate conflict. A study incorporating the length of the land boundary showed that the shared river variable is not just a proxy for a higher degree of interaction opportunity. A weakness of earlier work is that the existing shared rivers data do not distinguish properly between dyads where the rivers run mainly across the boundary and dyads where the shared river runs along the boundary. Dyads with rivers running across the boundary would be expected to give rise to resource scarcity-related conflict, while in dyads where the river forms the boundary conflict may arise because river boundaries are fluid and fuzzy. Using a new dataset on shared water basins and two measures of water scarcity, we test for the relevance of these

☆ The work reported here was supported by the Research Council of Norway. Earlier versions of the article were presented at the 45th Annual Convention of the International Studies Association, Montreal, 17–20 March 2004, the Fifth Pan-European International Relations Conference, The Hague, 9–11 September 2004, and the 13th Norwegian National Meeting in Political Science, Hurdalssjøen, 5–7 January 2005. We are grateful to Aysegul Aydin, Helga Malmin Binningsbø, Glenn Palmer, and other participants in these meetings for comments and to Kristian S. Gleditsch, Jan Ketil Rød, and Lars Wilhelmsen for help at various stages of our work. Aaron Wolf generously provided us with the International River Basin GIS layers. The codebook for the rivers basin data can be found on www.prio.no/cscw/envi/rivers. The data are found in the same location. Replication data for this article are found on www.prio.no/cscw/datasets.

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doi:10.1016/j.polgeo.2006.02.004

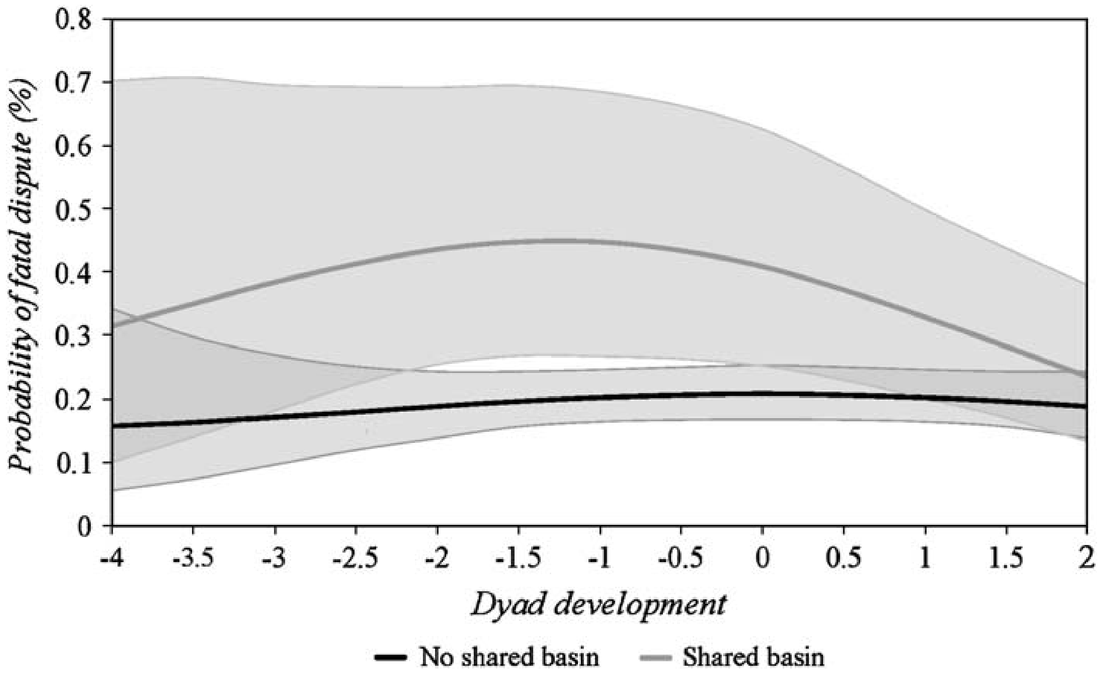

Fig. 3. Estimated probability of fatal dispute by shared basin and dyad development, 1880–2001. The shaded area around each line represents a 90% confidence interval.

Source: Gleditsch et al. 2006: 378.

Factors shaping the probability of water being a source of rivalry (Gleick 1993: 84-5)

Degree of **scarcity**

The extent to which water is **shared** by more than one state or region

The **relative power** of the states involved

Ease of **alternatives** to fresh water sources

Secondary impacts related to **water developments**.

Lecture question #2

Linking these factors to the graph two slides ago from Gleditsch et al. (2016), do you think the relationship between the degree of scarcity (x) and water conflict (y) is **linear** (i.e., the relationship can be plotted as a straight line) or **non-linear** (i.e., the relationship looks like a U or an upside-down U)?

Why?

Central Asia videos



TAJIKISTAN, Water with borders Part 1 of 2

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TAJIKISTAN, Water with borders Part 2 of 2

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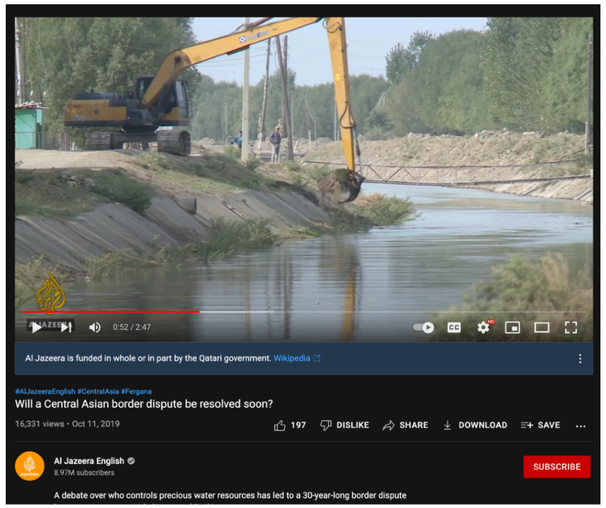


3. Water and conflict



Image source: https://commons.wikimedia.org/wiki/File:Battle_of_Arica_(1880),_Juan_Lepiani.jpg

4. Case study: Central Asia



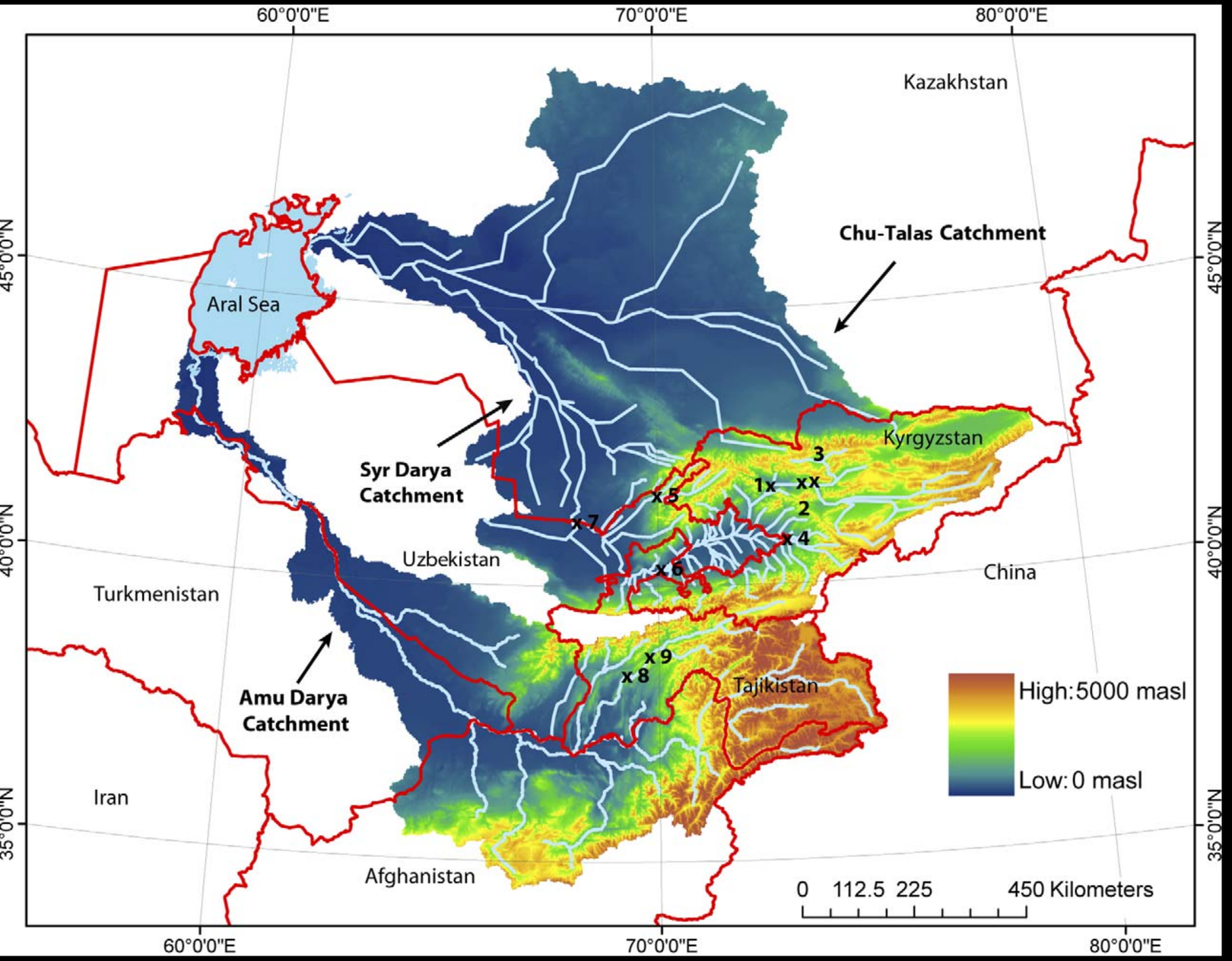
Lecture question #3

After watching the videos about the Tajikistan/ Kyrgyz border villages, do you think the Kyrgyz wells would be more likely to be maintained by increasing **institutional spending and support** (a top-down approach) or by spending on **public information campaigns** describing who the water belongs to (a bottom-up approach)?

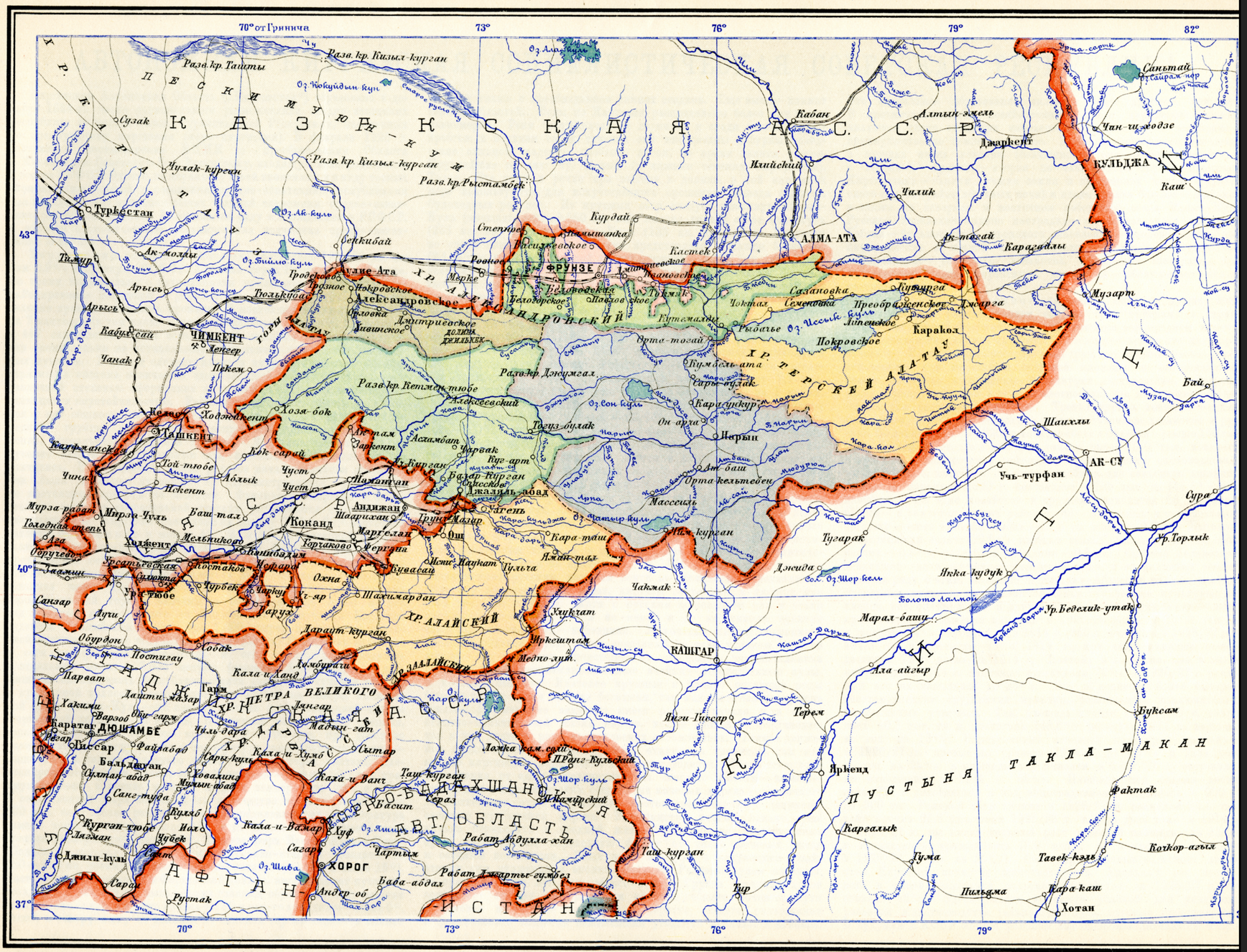
Why?



Source: UNEP. Environment and Security in the Amu Darya Basin. http://www.zoinet.org/web/sites/default/files/publications/Amu



urce: Bernauer and Siegfried. 2012. "Climate change and international water conflict in Central Asia" Journal of Peace Research: 229.


70° от Гринича
73°
76°
79°
82°
43°
40°
37°
К А З А Х С К А Я А. С. С. Р.
Ю Ж Н О - К И Р Г И З С К А Я
Т У Р К М Е Н С К А Я
У З Б Е К С К А Я
Т А Д Ж И К С К А Я
А Ф Г А Н И С Т А Н
Разв. кр. Кизыл-курган
Разв. кр. Таштыбулак
Разв. кр. Рыстамбек
Разв. кр. Джумгал
Разв. кр. Кетмень-тюбе
Оз. Кокуйдын-куль
Оз. Ак-куль
Оз. Биилю-куль
Оз. Сон-куль
Оз. Иссык-куль
Оз. Шор-куль
Оз. Яшилькуль
Оз. Шива
Оз. Алаколь
Оз. Тайгарак-нор
Оз. Чатыр-куль
Оз. Шор-кель
Оз. Шор-куль
Старое русло Чу
Сузак
Чулак-курган
Туркестан
Тимур
Арысь
Кабулы-сай
Чанак
Чимкент
Ленгер
Перкем
Ходжент
Ташкент
Чиназ
Голодная степь
Мирза-Чуль
Мирза-рабат
Хавастская
Мелькиколь
Ходжибакир
Чаадан
Чирчик
Ахангаран
Аблык
Чуст
Наукент
Баш-тал
Коканд
Маргелан
Горчаково
Фергана
Кувасай
Андижан
Шахрихан
Ош
Ак-сай
Кара-таш
Ак-курган
Ак-баш
Орта-кельтебек
Массесык
Ак-сай
Учь-турфан
Ак-су
Шайхлы
Бай
Сура
Ур. Торлык
Ур. Беделик-утак
Болото Лайлон
Марал-башы
Якка-Кудук
Джида
Тугарак
Чакмак
Кашгар
Ала-айгыр
Терем
Буксам
Яркенд
Фактак
Такла-Макан
Пустыня
Каргалык
Гума
Тавек-кель
Котюр-агыл
Пильдма
Кара-каш
Хотан
Тир
Таш-курган
Рабат-Абдулла-хан
Рабат-Джартыгумбез
Баба-аббал
Чартым
Сагарм
Хорог
Кала-и-Вамар
Кала-и-Ванч
Кала-и-Хумб
Ломка кам. соли
Ярдан-Кульский
Каир-Кумский
Сераз
Васит
Хуф
Ямчун
Сытар
Мадын-гат
Чиль-дара
Файзабад
Каратаг
Дюшамбе
Гарм
Ланги-мазар
Обигарм
Варзоб
Ланхар
Хакима
Обурдон
Постигау
Кобак
Парват
Кала-и-Ханд
Ламбургаи
Ханбургаи
Ханбургаи
Хан

A bit of background

1917-1930s—Stalin **divides** Central Asia.

1991—15 Soviet republics declare **independence** from the USSR.

1992—Inter-State Commission for Water **Coordination** (ICWC) is created.

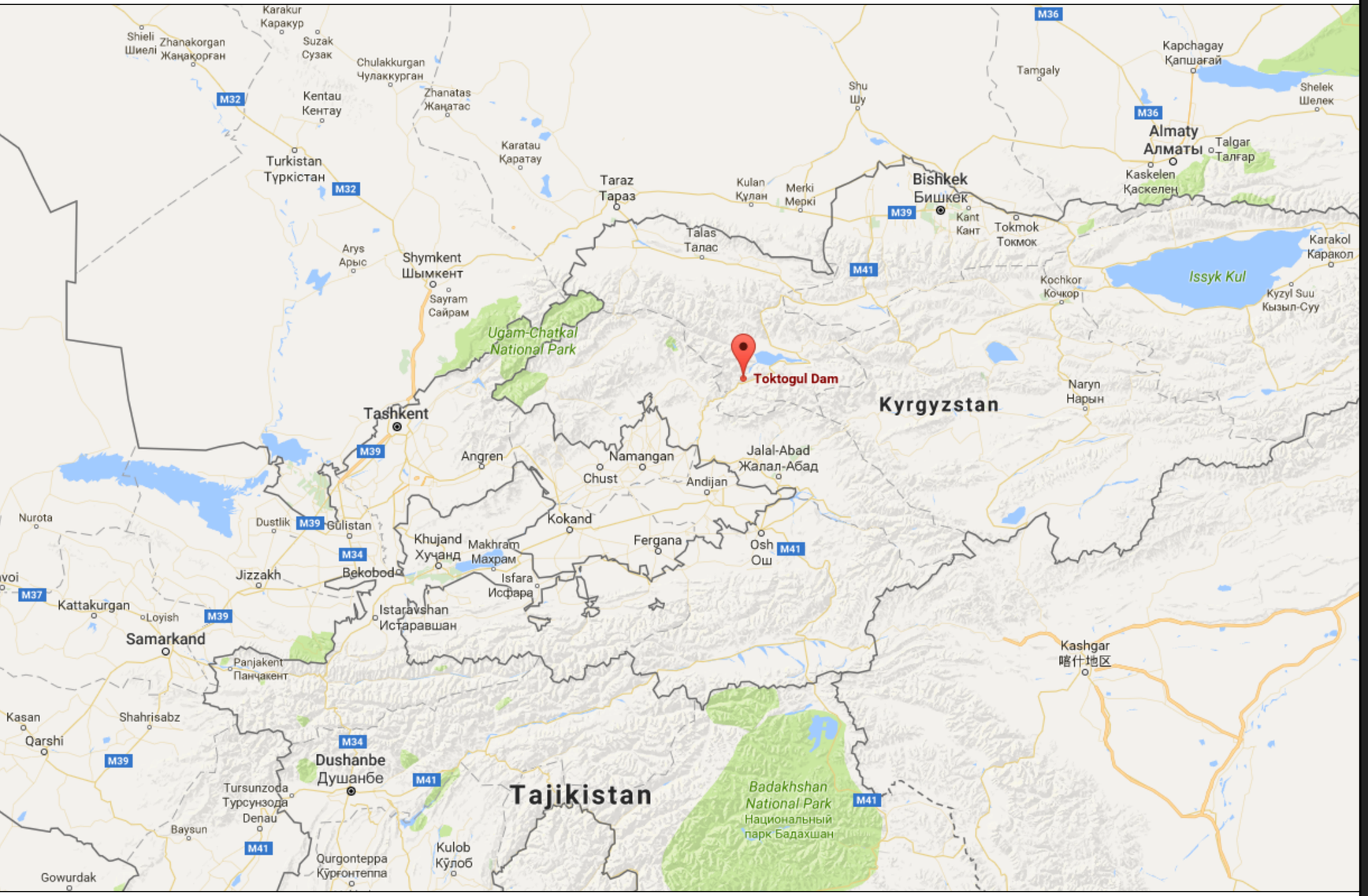
- **Kyrgyzstan** wants to store water in spring to autumn and release this water in **winter to spring** for hydropower production when demand for electricity is highest.
- **Uzbekistan** and **Kazakhstan**, by far the largest consumers of irrigation water in the basin, are interested in enough water during the growing season from **April to September**.

1998—Kazakhstan, Krygzstan, and Uzbekistan signed an agreement setting **monthly water release targets** from Toktogul reservoir.

1999—Tajikistan joined agreement.

Toktogul reservoir, Kyrgyzstan




Toktogul Dam
Kyrgyzstan
Tajikistan
Tashkent
Bishkek
Бишкек
Almaty
Алматы
Issyk Kul
Ugam-Chatkal National Park
Badakhshan National Park
Национальный парк Бадахшан
Samarkand
Dushanbe
Душанбе
Andijan
Namangan
Kokand
Fergana
Osh
Ош
Jalal-Abad
Жалал-Абад
Chust
Angren
Khujand
Хучанд
Makhram
Махрам
Isfara
Исфара
Istaravshan
Истаравшан
Bekobod
Gulistan
Jizzakh
Kattakurgan
Loyish
Panjakent
Пенджикент
Shahrisabz
Qarshi
Kasan
Turkistan
Түркістан
Kentau
Кентау
Shymkent
Шымкент
Arys
Арыс
Sayram
Сайрам
Taraz
Тараз
Karatau
Қаратау
Zhanatas
Жаңатас
Chulakkurgan
Чулаккурган
Suzak
Сузак
Karakur
Каракур
Shieli
Шиели
Zhanakorgan
Жаңақорған
Shu
Шу
Tamgaly
Kapchagay
Қапшағай
Shelek
Шелек
Talgar
Талғар
Kaskelen
Қаскелен
Kulan
Құлан
Merki
Меркі
Talas
Талас
Kant
Кант
Tokmok
Токмок
Karakol
Қарақол
Kochkor
Кочкор
Kyzyl Suu
Кызыл-Суу
Naryn
Нарын
Kashgar
喀什地区
Tursunzoda
Турсунзода
Denau
Baysun
Kulob
Кӯлоб
Qurgonteppa
Кӯрғонтеппа
Gowurdak
Nurota
Dustlik
M32
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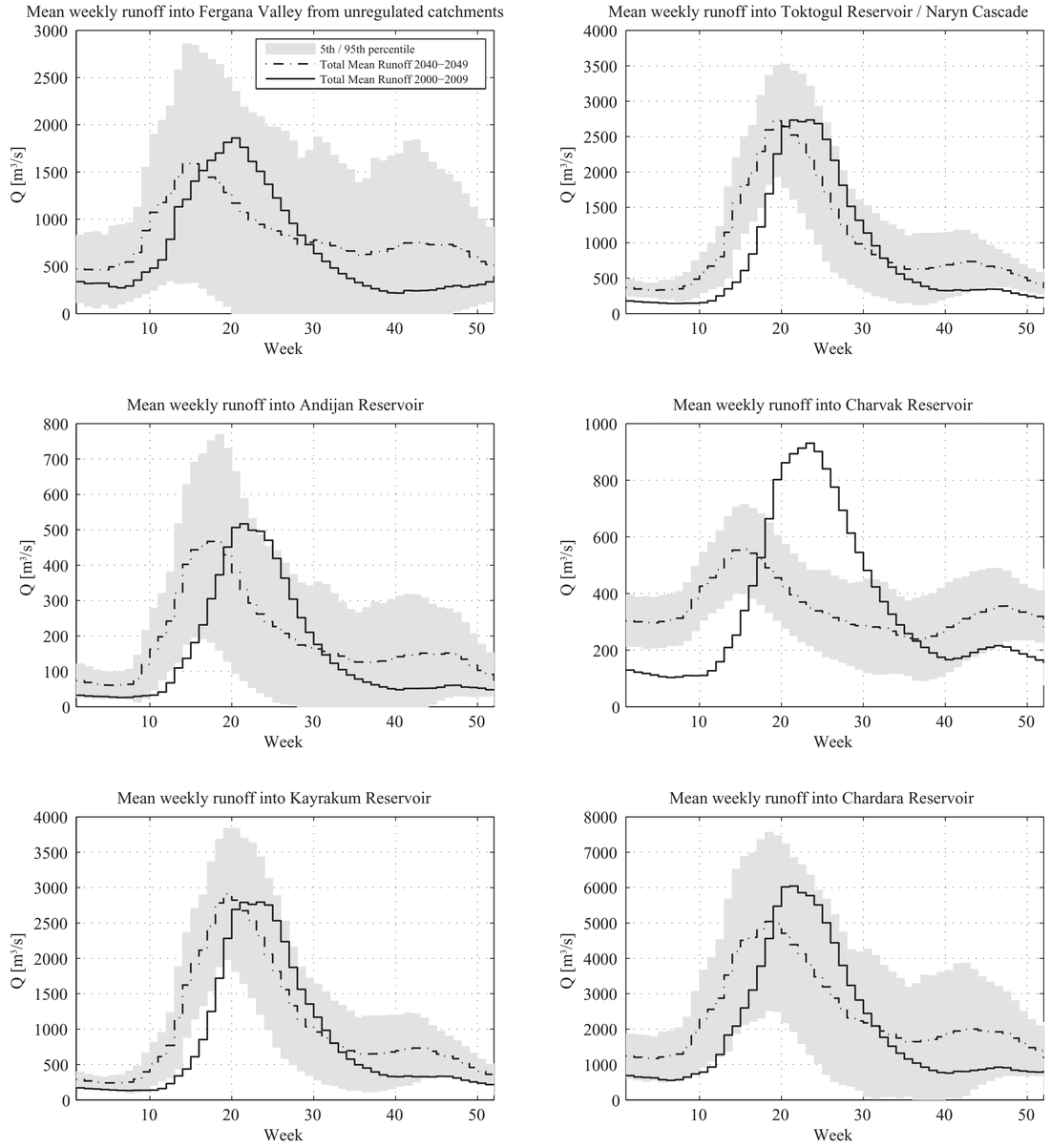
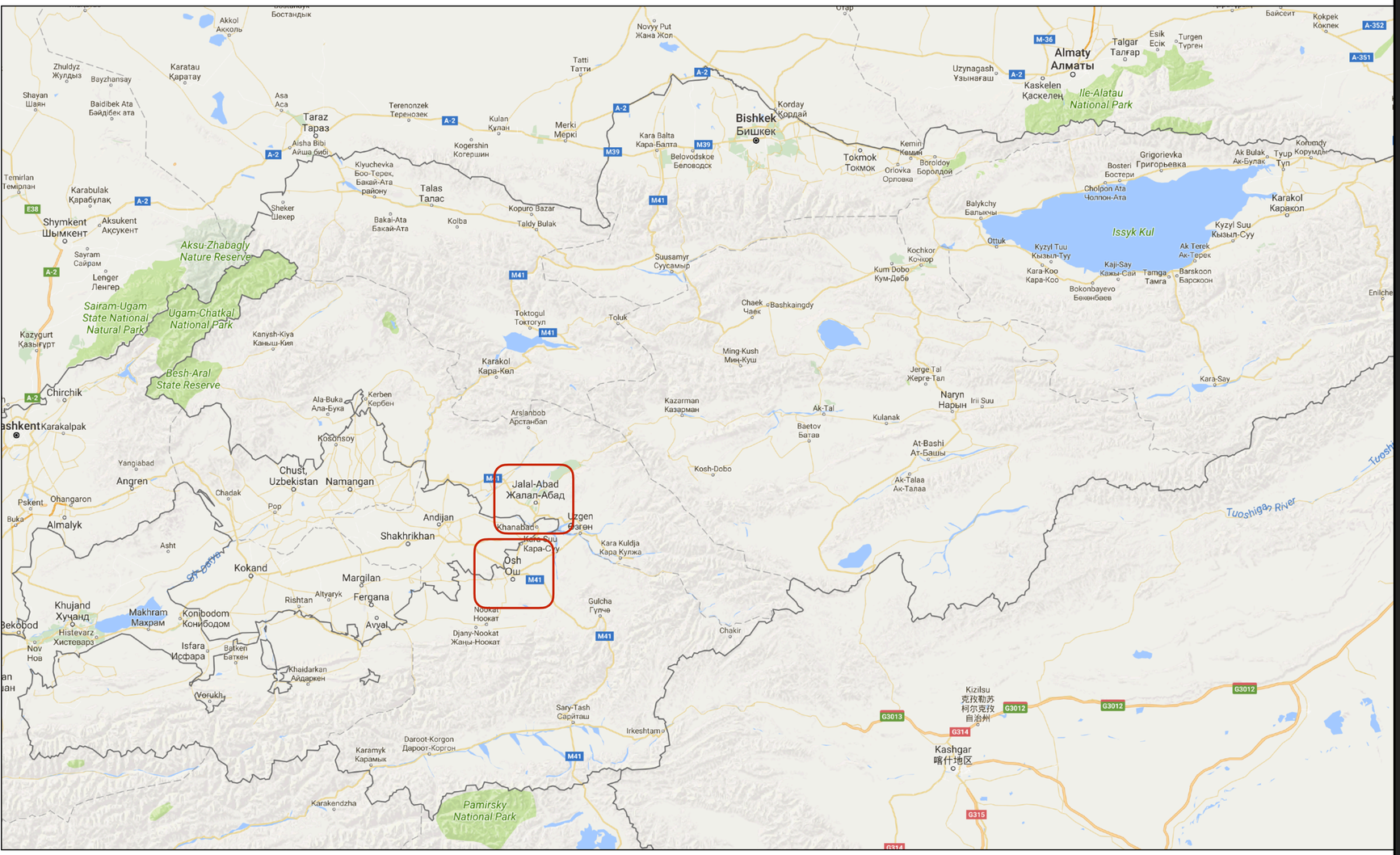


Figure 4. Seasonality of runoff (mean weekly runoff in m3/s) for selected locations in the Syr Darya catchment
Figures for the first decade of the 21st century and for 2040-49 are shown for the A2 scenario (see also Siegfried et al., 2011). The upper left plate shows total unregulated flows into the Fergana Valley, i.e. runoff from catchments that have no or only insignificant man-made surface water storage. The other plates show mean weekly runoffs into the major reservoirs in the basin (see Figure 1 for the location of these dams). Mean runoff for 2000–09 is the solid black line, expected mean runoff in 2040–49 is the dotted black line, with corresponding uncertainty bands (2 standard deviations).

Source: Bernauer and Siegfried. 2012. "Climate change and international water conflict in Central Asia" *Journal of Peace Research.*



Bishkek
Бишкек
Almaty
Алматы
Ile-Alatau National Park
Issyk Kul
Taraz
Тараз
Talas
Талас
Shymkent
Шымкент
Aksu-Zhabagly Nature Reserve
Sairam-Ugam State National Natural Park
Ugam-Chatkal National Park
Besh-Aral State Reserve
Chirchik
Karakalpak
Chust, Uzbekistan
Namangan
Angren
Almalyk
Andijan
Shakhrikhan
Kokand
Margilan
Fergana
Khujand
Хучанд
Makhram
Махрам
Konibodom
Конибодом
Isfara
Исфара
Khaidarkan
Vorukh
Jalal-Abad
Жалал-Абад
Uzgen
Өзгөн
Osh
Ош
Kara Kuldja
Кара Кулжа
Gulcha
Гүлчө
Nookat
Ноокат
Djany-Nookat
Жаңы-Ноокат
Chakir
Naryn
Нарын
At-Bashi
Ат-Башы
Kashgar
喀什地区
Kizilsu
克孜勒苏柯尔克孜自治州
Pamirsky National Park
Karakendzha
Karamyk
Карамык
Daroot-Korgon
Дароот-Коргон
Sary-Tash
Сарйташ
Irkeshtam
Kara-Say
Tuoshigan River
Karakol
Каракол
Kyzyl Suu
Кызыл-Суу
Ak Terek
Ак-Терек
Barskoon
Барскоон
Tamga
Тамга
Kaji-Say
Кажы-Сай
Kara-Koo
Кара-Коо
Kyzyl Tuu
Кызыл-Туу
Ottuk
Balykchy
Балыкчы
Kochkor
Кочкор
Kum Dobo
Кум-Дөбө
Bokonbayevo
Бөкөнбаев
Cholpon Ata
Чолпон-Ата
Bosteri
Бостери
Grigorievka
Григорьевка
Ak Bulak
Ак-Булак
Tyup
Туп
Korumdy
Корумды
Kara Balta
Кара-Балта
Belovodskoe
Беловодск
Kemin
Кемин
Boroldoy
Боролдой
Orlovka
Орловка
Tokmok
Токмок
Korday
Кордай
Merki
Мерки
Kulan
Кулан
Kogershin
Когершин
Terenozek
Теренозек
Kara-Say
Kazarman
Казарман
Ak-Tal
Baetov
Батав
Kulanak
Jerge Tal
Жерге-Тал
Ming-Kush
Мин-Куш
Chaek
Чаек
Bashkaingdy
Toluk
Toktogul
Токтогул
Suusamyr
Суусамыр
Kopuro Bazar
Taldy Bulak
Kolba
Bakai-Ata
Бакай-Ата
Klyuchevka
Боо-Терек, Бакай-Ата
Sheker
Шекер
Kanysh-Kiya
Каныш-Кия
Ala-Buka
Ала-Бука
Kerben
Кербен
Kosonsoy
Arslanbob
Арстанбап
Kosh-Dobo
Kara Suu
Кара-Суу
Khanabad
Asht
Pop
Chadak
Yangiabad
Ohangaron
Pskent
Buka
Nov
Нов
Histevarz
Хистеварз
Bekobod
Altyaryk
Rishtan
Avval
Batken
Баткен
Karakalpak
Kazygurt
Қазығұрт
Lenger
Ленгер
Sayram
Сайрам
Aksukent
Ақсукент
Karabulak
Қарабулақ
Temirlan
Темірлан
Shayan
Шаян
Zhuldyz
Жулдыз
Bayzhansay
Baidibek Ata
Байдібек ата
Karatau
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Asa
Аса
Aisha Bibi
Айша бибі
Novyy Put
Жана Жол
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Uzynagash
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Kaskelen
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Talgar
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Esik
Есік
Turgen
Түрген
Байсеит
Kokpek
Кокпек
Kara-Say
Enilchek
Tuoshigan River
A-2
A-351
A-352
M-36
M39
M41
E38
G3012
G3013
G314
G315

May-June 2010—S. Kyrgyzstan ethnic clashes

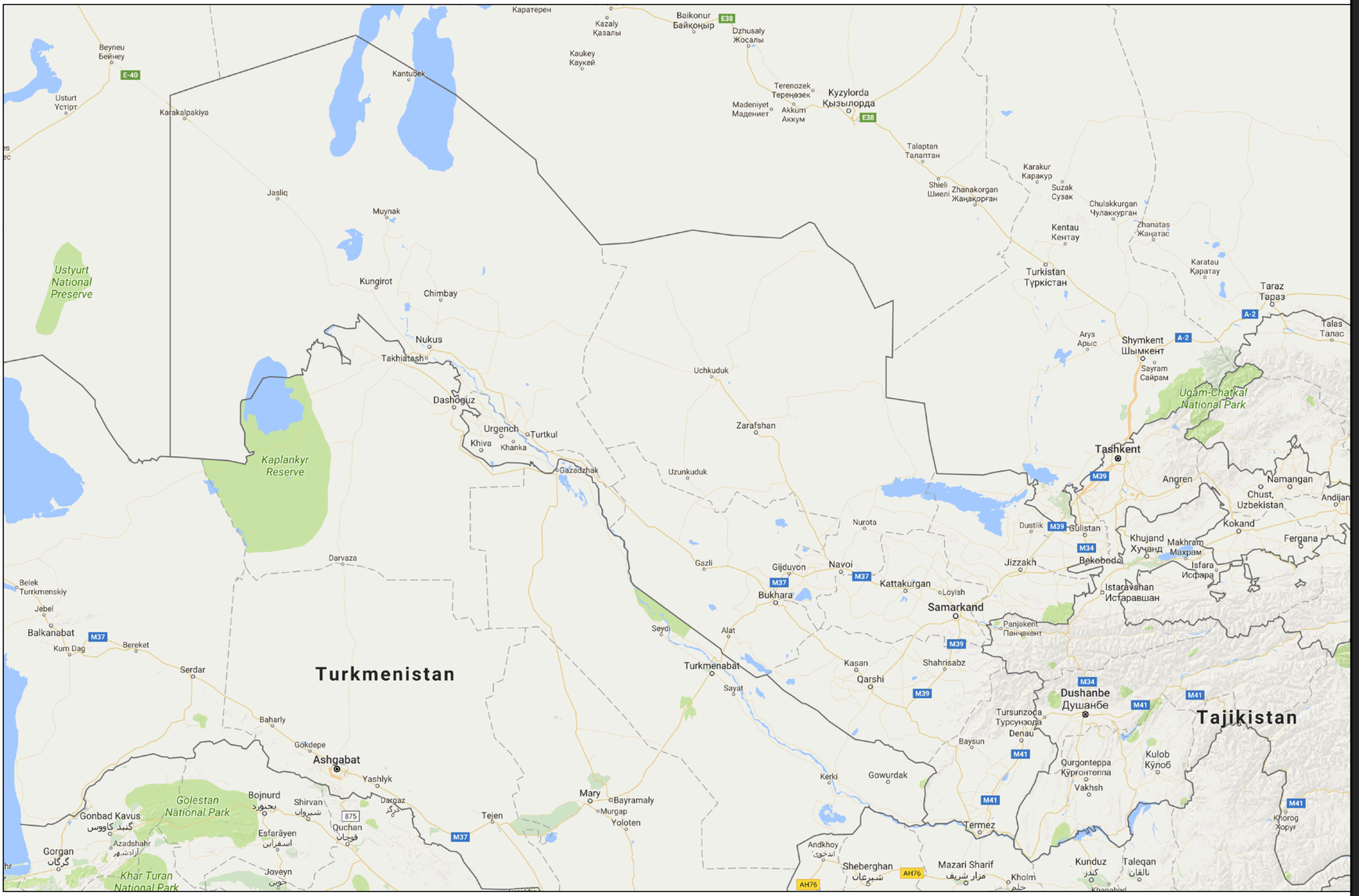
June 1990 violence over **land**—an Uzbek collective farm.

Clashes between ethnic Kyrgyz and Uzbeks entering on **Osh** and **Jalal-Abad** in aftermath of former President Kurmabek Bakiyev fled office on 7 April 2010.

Killed about 420 people (276 Uzbeks and 105 Kyrgyz) and 80,000 **displaced**

Uzbekistan sent **troops** over the border and opened border to Uzbek refugees.

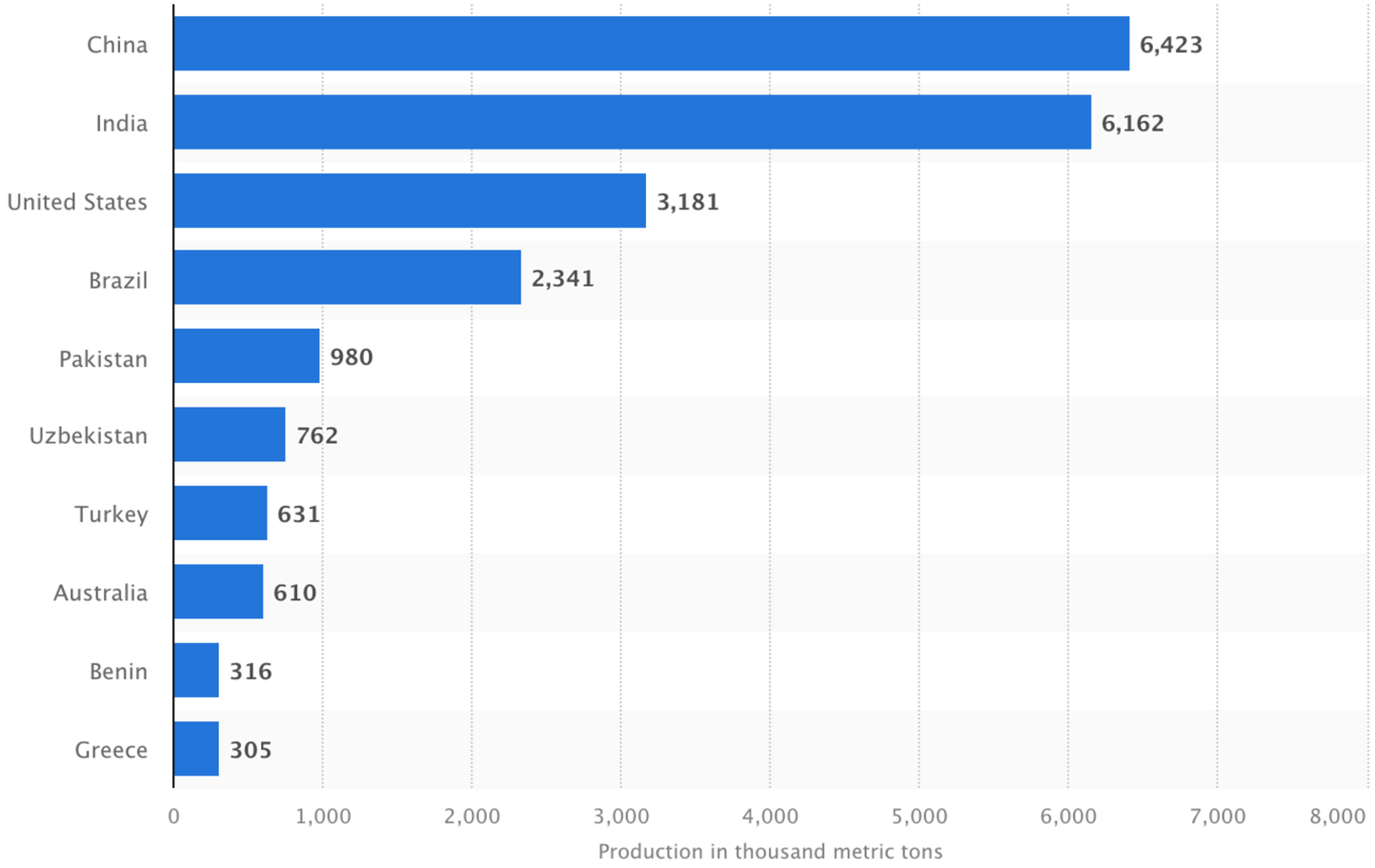
Shifting now to Uzbekistan



Agriculture › Farming

Leading cotton producing countries worldwide in 2020/2021

(in 1,000 metric tons)



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Additional Information

Show source

Source: Statista (https://www.statista.com/statistics/263055/cotton-production-worldwide-by-top-countries/)



Source: http://gdb.rferl.org/87dc3dc9-220d-4f60-9b9d-a0e647757f6e_mw1024_mh1024_s.jpg


Turkmenistan
Ashgabat
Turkmenabat
Dashoguz
Urgench
Khiva
Turtkul
Khanka
Gazadzhak
Nukus
Takhiatash
Kungirot
Chimbay
Muynak
Jasliq
Karakalpakiya
Kantubek
Beyneu
Бейнеу
Usturt
Устюрт
E-40
Kaukey
Кауқей
Kazaly
Қазалы
Baikonur
Байқоңыр
E38
Dzhusaly
Жосалы
Terenozek
Тереңөзек
Akkum
Аққум
Madeniyet
Мадениет
Kyzylorda
Қызылорда
Talaptan
Талаптан
Shieli
Шиелі
Zhanakorgan
Жаңақорған
Karakur
Қаракур
Suzak
Сузак
Chulakkurgan
Чулаккурган
Kentau
Кентау
Zhanatas
Жаңатас
Turkistan
Түркістан
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Арыс
Shymkent
Шымкент
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Сайрам
Uchkuduk
Zarafshan
Uzunkuduk
Gazli
Gijduvon
Navoi
Nurota
Bukhara
Kattakurgan
Loyish
Samarkand
Jizzakh
Dustlik
Gulistan
Bekobod
Khujand
Хуҷанд
Makhram
Махрам
Istaravshan
Истаравшан
Panjakent
Панҷакент
Tashkent
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Darvaza
Kaplankyr Reserve
Ustyurt National Preserve
Belek
Turkmenskiy
Jebel
Balkanabat
Kum Dag
Bereket
Serdar
Seydi
Alat
Sayat
Kasan
Qarshi
Shahrisabz
Dushanbe
Душанбе
Tursunzoda
Турсунзода
Denau
Baysun
Kulob
Кӯлоб
Qurgonteppa
Кӯрғонтеппа
Vakhsh
Kerki
Gowurdak
Termez
Baharly
Gokdepe
Yashlyk
Bojnurd
بجنورد
Shirvan
شیروان
Dargaz
درگز
875
Quchan
قوچان
Esfarāyen
اسفراین
Golestan National Park
Gonbad Kavus
گنبد کاووس
Azadshahr
ازادشهر
Gorgan
گرگان
Khar Turan National Park
Joveyn
جوین
Tejen
Mary
Bayramaly
Murgap
Yoloten
Andkhoy
اندخوی
Sheberghan
شبرغان
AH76
Mazari Sharif
مزار شریف
Kholm
خلم
Kunduz
کندز
Taleqan
تالقان
Khanabad

"Poisonous dust storms kicked up by strong winds across the dried and polluted seabed give rise to a multitude of chronic and acute illnesses among the few residents who have chosen to remain."





The Top 9 Most Inhospitable Places in the World

We tend to take our surroundings for granted. You're probably reading this in relative comfort - you don't need to wear breathing apparatus, you're within a few steps of a cold drink and you aren't at the beck and call of a totalitarian regime bent on oppressing its population. The Tripbase team have drawn up a list of the most horrendous places to live, in order from dreadful to impossible. We have nothing but respect for the hardy human beings who make their homes in the most brutal places on Earth.

9. Yakutsk, Russia



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Population: 2.000.000

How do I get there? It is possible to travel there by plane.

1. Vozrozhdeniya Island, Kazakhstan/Uzbekistan



photo source

Where is it? In the Aral Sea, an area drained by mismanaged Soviet irrigation plans. The island is now a sort of peninsular, shared by Kazakhstan and Uzbekistan.

What can I see there? An abandoned settlement in an arid, lifeless landscape. The drying of the Aral Sea (arguably the worst environmental disaster in the history of humankind) left countless boats high and dry. Their skeletal remains are visible in the middle of what is now a desert.

Vozrozhdeniya Island

- a.k.a. “Anthrax Island “
- **What's so bad about it?** It was the site of Soviet **biowarfare** experiments. The whole area is contaminated with anthrax, smallpox and bubonic plague.
- Local rodents are thought to have picked up some super-resilient strains of these diseases.
- The laboratory was established in **1948**. At its height, the facility housed 1,500 people.
- It is currently uninhabited. The site was completely abandoned in 1992.

Vozrozhdeniya Island



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Aralsk 7: The USSR's Anthrax Island

693,755 views • Nov 12, 2019

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Turkmenistan is more known for oil than cotton, but it is the 9th largest source of cotton.

This production is made possible by Turkmenistan's 36% allocation of the Amu Darya's runoff.



The Arch of Neutrality, Ashkebat, Turkmenistan with 12m tall statue of Saparmurat Niyazov (Turkmenbashi, 1940-2006)

NEWS

Turkmenistan: Autocrat president's son claims landslide win

The son of Turkmenistan's autocrat leader Gurbanguly Berdymukhamedov won the presidential elections by a considerable margin. The result was announced after an unusual vote-counting delay.



Turkemenistan has a poor human rights record

Serdar Berdymukhamedov, whose father has run Turkmenistan since 2006, was elected president with nearly 73% of votes cast, according to the country's electoral commission.

The switch of presidents is the first hereditary succession in the former Soviet region of Central Asia and comes after a dizzying rise through the ranks for the younger Berdymukhamedov.

Today's motivating question

In what ways can **water affect conflict**?

- Where it is
- How it comes and goes,
- How it is treated
- Who uses it

Conclusions

Water scarcity creates **challenges** both to **intrastate** as well as **interstate** stability.

Most empirical studies find **limited historical evidence** for systematic direct effects.

More evidence for **interactive effects** with political and economic development & stability

“The most obvious, ubiquitous, important **realities**
are often the ones that are the **hardest to see and talk about**.”

-David Foster Wallace



4. Case study: Central Asia

