

# ICYCLONE CHASE REPORT

storm	Hurricane ORLENE		
location	Sinaloa, Mexico		
date	03 October 2022		
chasers	Josh Morgerman, Erik Sereno	author	Josh Morgerman

## Overview

Hurricane ORLENE struck the W coast of Mexico, in the state of Sinaloa, early on 03 October 2022.

The author was at the landfall point to observe the cyclone's passage and collect data. **Highlights:**

- The author was in **Caimanero** (22.8786N 106.0716W), which was the apparent landfall point:
  - **The eye passed over this location from ~8:20 to ~8:45 am MDT (1420Z to 1445Z)**, bringing a “stadium effect” and calming, followed by an almost perfect 180-degree shift in the wind direction. These observations suggest the hurricane’s surface center made landfall at—or very near—this point (22.9N 106.1W when rounded to nearest tenth).
  - This location is **~14 n mi NW of the NHC’s operational landfall point** (indicated in the 7:45 am MDT update)—a discrepancy likely due to the decoupling of the hurricane’s surface center (observed by the author in Caimanero) from the mid-level center.
  - The author unfortunately doesn’t have complete data from this location. However, his partner, Erik Sereno, measured **991.3 mb at 8:11 am MDT (1411Z)**. This reading was taken just before the eye arrived, so it’s unlikely the lowest pressure was sampled.
- The author deployed devices at multiple points along the coast to the NW of the landfall point:
  - **La Guasima** (22.9384N 106.1222W), ~3 n mi NW of the analyzed landfall point
    - Min pressure: **997.5 mb** at 1437Z & 1439Z
  - **Los Pozos** (22.9919N 106.1744W), ~7 n mi NW of the analyzed landfall point
    - Min pressure: **1001.6 mb** at 1351Z, 1401Z, 1416Z, 1425Z
  - **Mazatlan** (23.2838N 106.4504W), ~30 n mi NW of the analyzed landfall point
    - Min pressure: **1007.2 mb** at 1116Z, 1120Z, 1158Z, 1214Z



“Stadium effect” inside the eye of Hurricane ORLENE in Caimanero, Sinaloa, Mexico—at 8:37 am MDT 03 October.

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## Locations

The author documented the passage of Hurricane ORLENE from multiple locations along the coast.

### Chase Location A—Caimanero

The author observed the passage of the hurricane at **22.8786N 106.0716W**. This is a beachfront restaurant where the coastal highway bends inland. This location was squarely in the hurricane's eye and close to the author's **analyzed** landfall point of 22.9N 106.1W (see **Observations & Analysis**, below). However, it's ~14 n mi NW of the NHC's **operational** landfall point (from 7:45 am MDT).

### Sensor Location B—La Guasima

Before positioning at Location A, the author deployed a sensor at **22.9384N 106.1222W**. This is a sheltered storefront in the town of **La Guasima**, ~3 n mi NW of the analyzed landfall point.

### Sensor Location C—Los Pozos

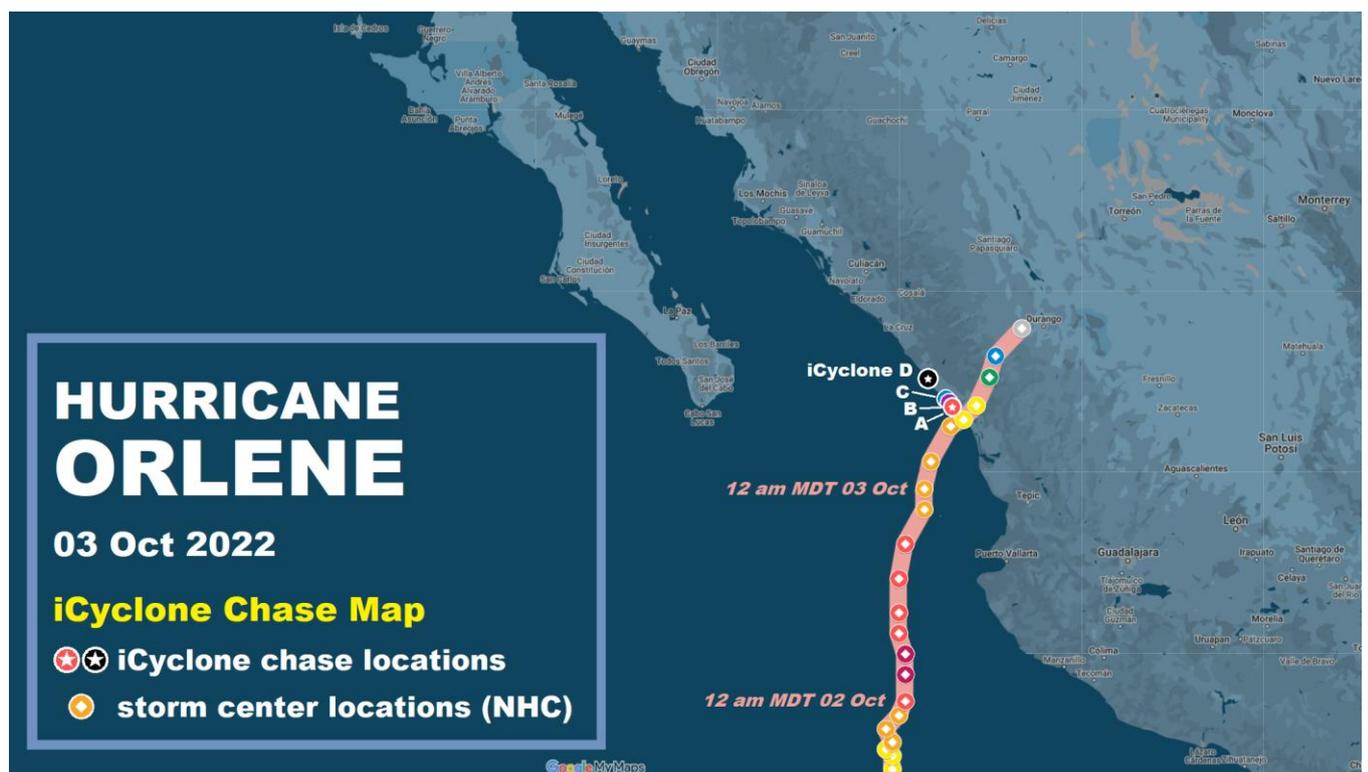
Also before positioning at Location A, the author deployed a sensor at **22.9919N 106.1744W**. This is an abandoned beachfront restaurant near **Los Pozos**, ~7 n mi NW of the analyzed landfall point.

### Sensor Location D—Mazatlan

Also well before the hurricane, the author deployed a data sensor at **23.2838N 106.4504W**. This location is a hotel in Mazatlan, ~30 n mi NW of the analyzed landfall point.

**Figure 1** shows the hurricane's track at landfall. **Figure 2** is a zoomed-in view. The Chase Location (A) is marked with a **red star**, the Sensor Locations (B, C, D) with **purple, blue,** and **black stars**.

### Figure 1: Chase Map



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Figure 2: Chase Map (CLOSE)



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## Observations & Analysis

The author observed the passage of Hurricane ORLENE's core near a beachfront restaurant in Caimanero (**Location A**: 22.8786N 106.0716W). He arrived at this location at 7:08 am MDT.

### Observations in Caimanero (Location A)

- **Eye Passage.** The calm eye passed over this location from ~8:20 to ~8:45 am MDT. The calming of the winds was gradual, with video clips from 8:27 to 8:37 am showing a light breeze.
- **Wind Direction.** Destructive winds preceding the calm seemed to blow from the **E or ESE**. Powerful winds following the eye blew in apparently the **exact-opposite direction: W or WNW**. The moment of reversal happened during the eye, at just around 8:35 am MDT. (Using the motion of the palm fronds as a reference, a video clip from 8:32 am shows the wind still blowing offshore, whereas a clip from 8:37 am shows winds blowing the opposite way—onshore.)
- **Precipitation.** There were periods of heavy rain earlier in the morning—for example, the author observed heavy rain and lightning at 6:30 am MDT a few miles up the coast, near La Guasima. But, overall, **ORLENE's core was quite "dry."** On the front side of the cyclone, there was light rain or no rain during the apparent strongest winds, from around 7:30 am until the eye arrived. The backside of the hurricane was also relatively dry—however, there was a brief period of heavy rain during a particularly vigorous, howling squall at 8:51 am, just after the eye passed.
- **Air Pressure.** Unfortunately, the author did not collect continuous, quality-controlled air-pressure data in Caimanero (**Location A**). However, he did deploy a sensor in La Guasima, less than 5 n mi to the NW (**Location B**: 22.9384N 106.1222W). This device recorded its minimum pressure of **997.5 mb at 8:37 and 8:39 am MDT (1437Z and 1439Z)**. (See more about this below, under **Air Pressure Data**.)

### Analyzed Landfall Point

The above surface observations and data suggest Hurricane ORLENE made landfall near **22.9N 106.1W** (rounding to the nearest tenth of a degree) at **8:35 am MDT (1435Z)**. **Figure 3** marks this point in relation to the NHC's operational track and landfall point. The discrepancy is ~16 n mi.

**Figure 3: Analyzed Landfall**



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## Air Pressure Data

The author collected quality-controlled air-pressure data at multiple locations along the coast of Sinaloa. All data (except at **Location A**) were collected using Kestrel 4500s.

### Chase Location A—Caimanero

- **Coordinates:** 22.8786N 106.0716W

Unfortunately, the author did not collect continuous, quality-controlled air-pressure data at this location, which was in the hurricane's eye and likely very near the true center. However, his partner, Erik Sereno, measured **991.3 mb** at about 8:11 am MDT (1411Z), just before the eye arrived. His device, a Kestrel 5500, malfunctioned after this moment, so he was not able to sample the air pressure in the eye. Given this, it's unlikely the lowest pressure at this location was recorded.

### Chase Location B—La Guasima

- **Coordinates:** 22.9384N 106.1222W
- **Reference elevation:** 6 ft (per app)
- **Sampling rate:** 1 reading per 30 seconds (2/min)

The minimum recorded sea-level pressure was **997.5 mb** at 8:37 and 8:39 am MDT (1437Z and 1439Z). This minimum occurred while the eye was passing over **Location A**, ~5 n mi to the SE.

### Sensor Location C—Los Pozos

- **Coordinates:** 22.9919N 106.1744W
- **Reference elevation:** 12 ft (per visual estimate)
- **Sampling rate:** 1 reading per 30 seconds (2/min)

The minimum recorded sea-level pressure was **1001.6 mb** at 7:51, 8:01, 8:16, and 8:25 am MDT (1351Z, 1401Z, 1416Z, and 1425Z).

### Sensor Location D—Mazatlan

- **Coordinates:** 23.2838N 106.4504W
- **Reference elevation:** 33 ft (per app)
  - **Note:** 51 ft was used for calibration—to account for the device's height above ground (on a bathroom counter on the second floor of a hotel).
- **Sampling rate:** 1 reading per 30 seconds (2/min)

The minimum recorded sea-level pressure was **1007.2 mb** at 5:16, 5:20, 5:58, and 6:14 am MDT (1116Z, 1120Z, 1158Z, and 1214Z).

## Comparison of Data from All Four Locations

To recap the minimum values:

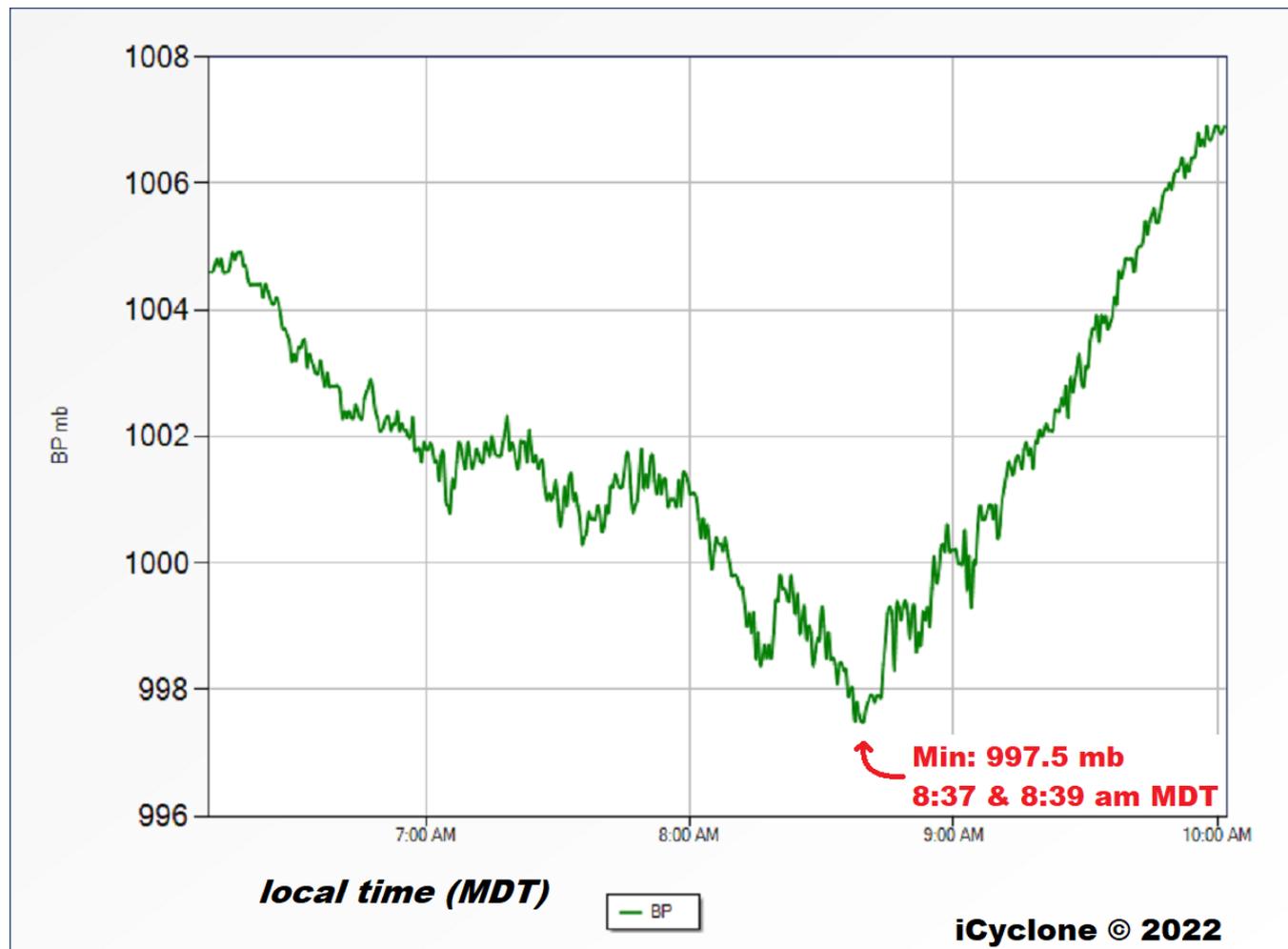
- Location A (Caimanero): **991.3 mb** (*true minimum was likely lower*)
- Location B (La Guasima): **997.5 mb**
- Location C (Los Pozos): **1001.6 mb**
- Location D (Mazatlan): **1007.2 mb**

These minimum values make sense in relation to each other, showing an expected increase with distance from the hurricane's center.

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**Figure 4: Barogram—Location B—La Guasima, Sinaloa**

The minimum value of 997.5 mb occurred at 8:37 and 8:39 am MDT (1437Z and 1439Z). At this time, the eye was passing over Caimanero, ~5 n mi to the SE. It is not known whether this location was also inside the eye.



## **HURRICANE ORLENE: 03 Oct 2022**

**La Guasima, Sinaloa, Mexico**

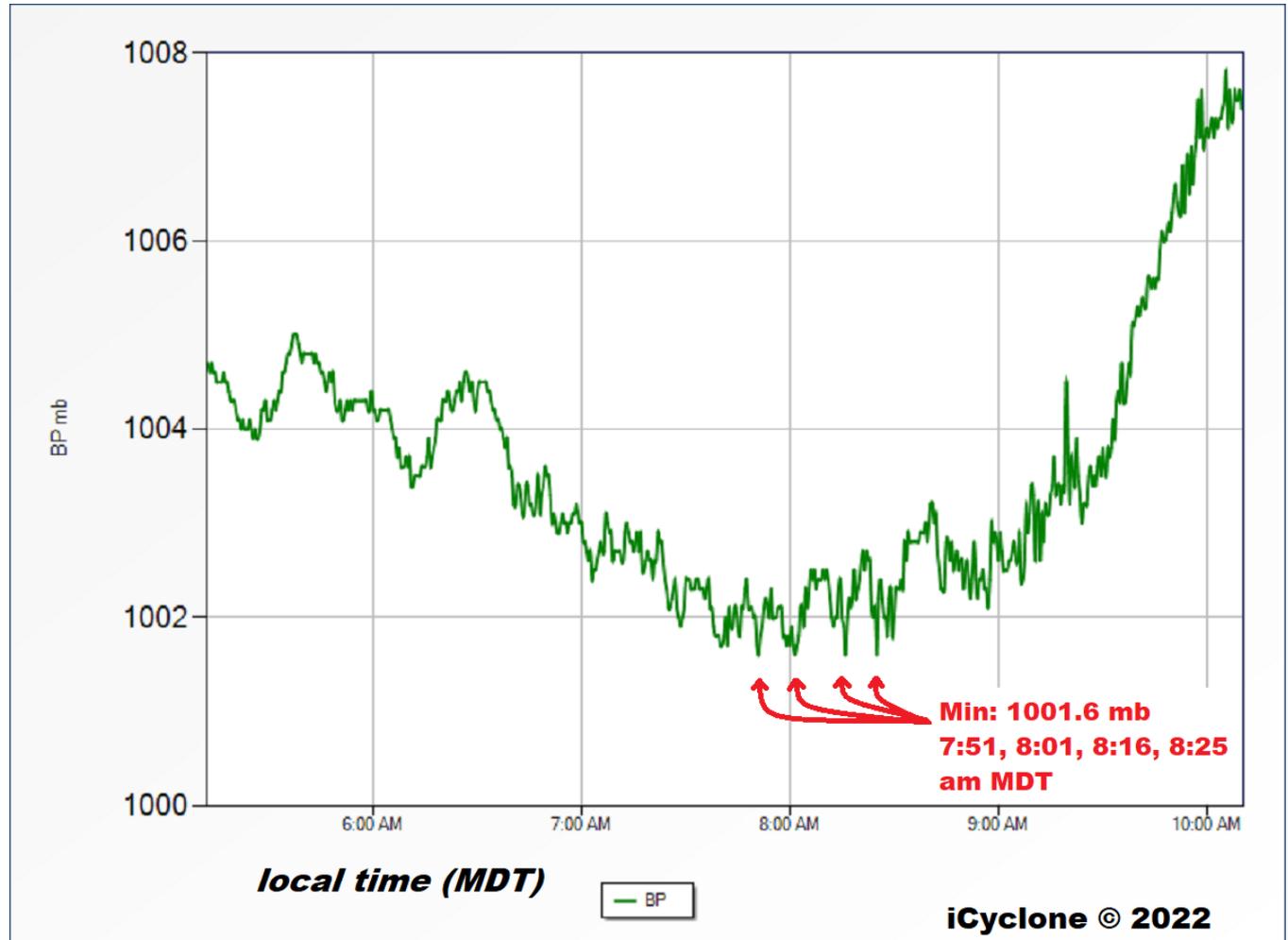
**22.9384N 106.1222W – ref el 6 ft**

**LOCATION B**

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Figure 5: Barogram—Location C—Los Pozos, Sinaloa

The minimum value of 1001.6 mb occurred at 7:51, 8:01, 8:16, and 8:25 am MDT (1351Z, 1401Z, 1416Z, and 1425Z).



## HURRICANE ORLENE: 03 Oct 2022

Loz Pozos, Sinaloa, Mexico

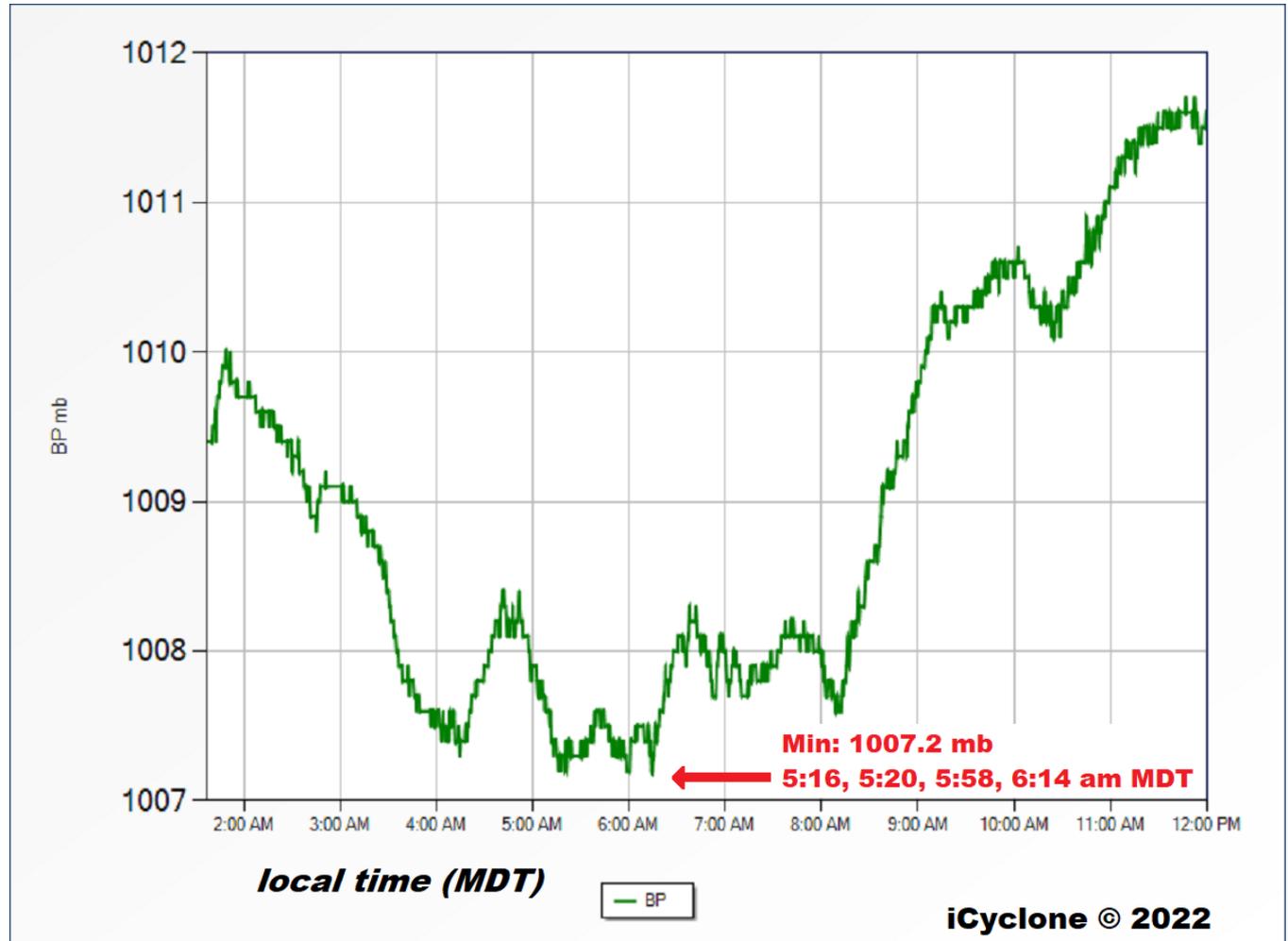
22.9919N 106.1744W – ref el 12 ft

**LOCATION C**

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Figure 6: Barogram—Location D—Mazatlan, Sinaloa

The minimum value of 1007.2 mb occurred at 5:16, 5:20, 5:58, and 6:14 am MDT (1116Z, 1120Z, 1158Z, and 1214Z).



## HURRICANE ORLENE: 03 Oct 2022

Mazatlan, Sinaloa, Mexico

23.2838N 106.4504W – ref el 33 ft

**LOCATION D**

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## Aftermath

Damage from Hurricane ORLENE was light to moderate.

In the landfall zone, **strong winds** downed power poles, with some of them blocking roads. Winds also damaged roofs, scattered debris, and sent loose objects like patio furniture flying.

**Storm surge inundation** near and N of the landfall point was apparently minor—however, it was likely more significant S of the landfall point, where the flow was onshore. (The author was unable to get down there due to blocked roads.)

After the hurricane had passed, the author noted minor **freshwater flooding** of some roads and intersections on the drive from Caimanero back to Mazatlan.



***Caimanero at 8:34 am MDT. Looking straight up, into the blue-sky center of Hurricane ORLENE's stadium eye.***

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***On the highway near La Guasima at 6:26 am MDT. Very heavy rain and strong winds were pelting the coast, with occasional brilliant lightning illuminating the predawn sky.***



***On the beach near Caimanero at 7:22 am MDT. Seas and skies were dramatic, but storm surge inundation in this area was minimal, likely because winds were blowing mostly offshore.***

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***Near Caimanero at 7:45 am MDT. Strong winds felled several power poles in the area, with some—like this one—blocking major roads.***



***Caimanero at 8:01 am MDT. Just minutes before the calm eye arrived, winds were very strong—however, by this point there was little rain. The hurricane’s core was quite “dry.” Note the fallen power pole in the foreground.***

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***Caimanero at 8:37 am MDT—inside Hurricane ORLENE's stadium-like eye. A small circle of blue sky was visible directly overhead at this time (see the first photo in this set).***



***El Walamo at 10:56 am MDT. On the drive back to Mazatlan, the author noted minor freshwater flooding of roads and intersections in some communities.***

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## Video

The passage of Hurricane ORLENE in Sinaloa—as described in this report—will be documented in an upcoming video on the author's YouTube channel: <https://www.youtube.com/icyclone>.

For easy analysis, all the footage will be timestamped in local time (MDT).

## Questions or Feedback?

Get in touch:

**Josh Morgerman**

[josh.morgerman@symbblaze.com](mailto:josh.morgerman@symbblaze.com)

[info@icyclone.com](mailto:info@icyclone.com)