

# ICYCLONE CHASE REPORT

storm	Hurricane RICK		
location	Ixtapa, Guerrero, Mexico		
date	24-25 October 2021		
chasers	Josh Morgerman, Nicola Rustichelli	author	Josh Morgerman

## Overview

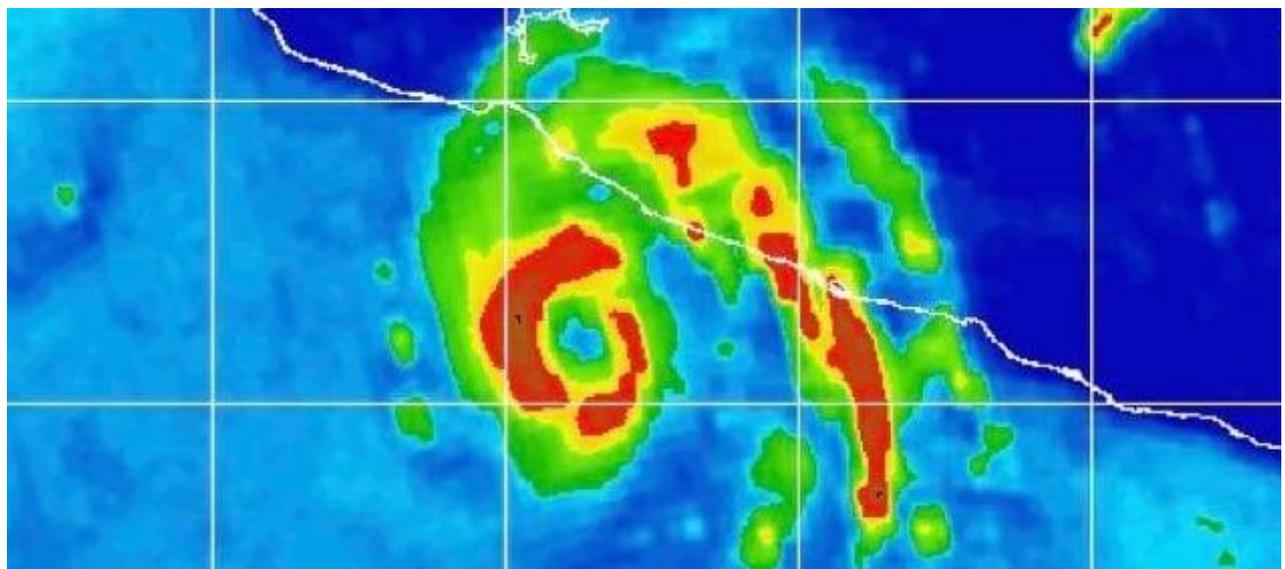
**Hurricane RICK** was a Category-2 hurricane that struck the Pacific coast of Mexico, in the state of Guerrero, very early on 25 October 2021.

The author was in **Ixtapa, Guerrero** (17.6593N 101.6035W)—**E** of the landfall point—to collect data and document this event.

Prior to landfall, the author also deployed a data sensor in a hotel in **Lazaro Cardenas, Michoacan** (17.9645N 102.2019W)—just **W** of the landfall point.

### Highlights:

- **Observation Points & Track.** RICK's center passed **between** the two observation points.
  - **The Ixtapa location was ~15 n mi E of the hurricane's track.** The right eyewall raked this location between 2 and 4 am CDT.
  - **The Lazaro Cardenas location was ~12 n mi W of the hurricane's track.** This location was apparently in the left eyewall.
- **Minimum Pressures.** Since the hurricane's center passed between the two observation points, neither recorded a central pressure.
  - The minimum sea-level pressure at the **Ixtapa** location was **1001.5 mb at 2:24 am CDT (0724Z) 25 Oct**—measured as the hurricane's center passed to the W.
  - The sensor at the **Lazaro Cardenas** location registered a minimum of **995.7 mb at 6:08 am CDT (1108Z) 25 Oct.**
- **Impact.** Although the center of the hurricane passed between Ixtapa and Lazaro Cardenas, **both cities went through the core of destructive winds and saw extensive wind damage.**



*Microwave shot of Hurricane RICK approaching the Pacific coast of Mexico.*

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## Locations

The author documented the passage of Hurricane RICK's core in two locations, one on either side of the hurricane's center.

### Location A (Chase Location)

The author observed the passage of the hurricane (and collected data) in **Ixtapa, Guerrero**, at **17.6593N 101.6035W**. This location is the Holiday Inn Resort Ixtapa, a beachfront hotel.

This location was **~15 n mi E of the track of the hurricane's center** (per National Hurricane Center advisory positions) and went through the **right eyewall**.

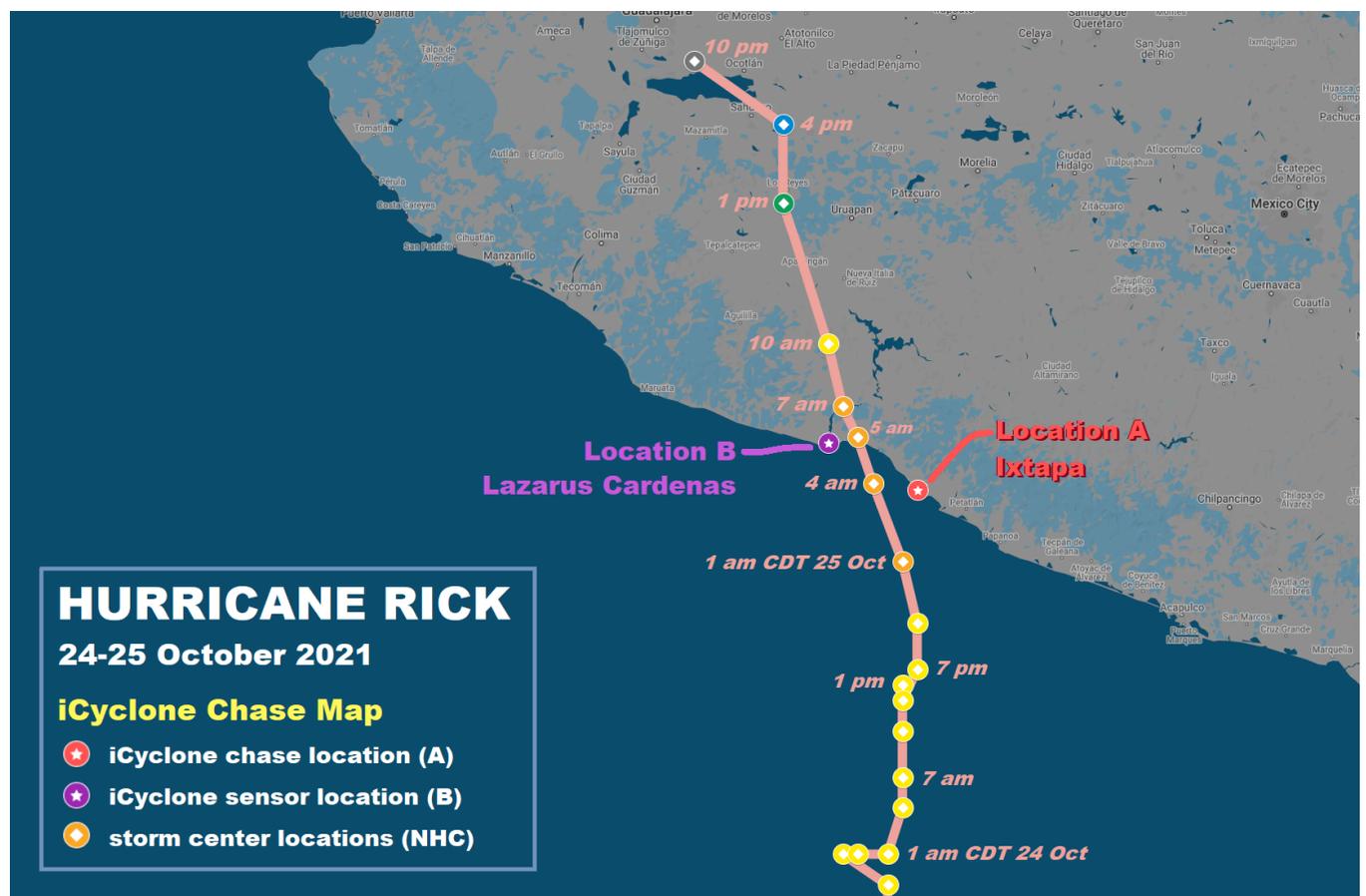
### Location B (Sensor Location)

On the day before the hurricane struck, the author deployed a data sensor at an additional location in **Lazaro Cardenas, Michoacan**, at **17.9645N 102.2019W**. This location is the Baymont Inn & Suites.

This location was **~12 n mi W of the track of the hurricane's center** (per NHC advisory positions) and apparently went through the **left eyewall**.

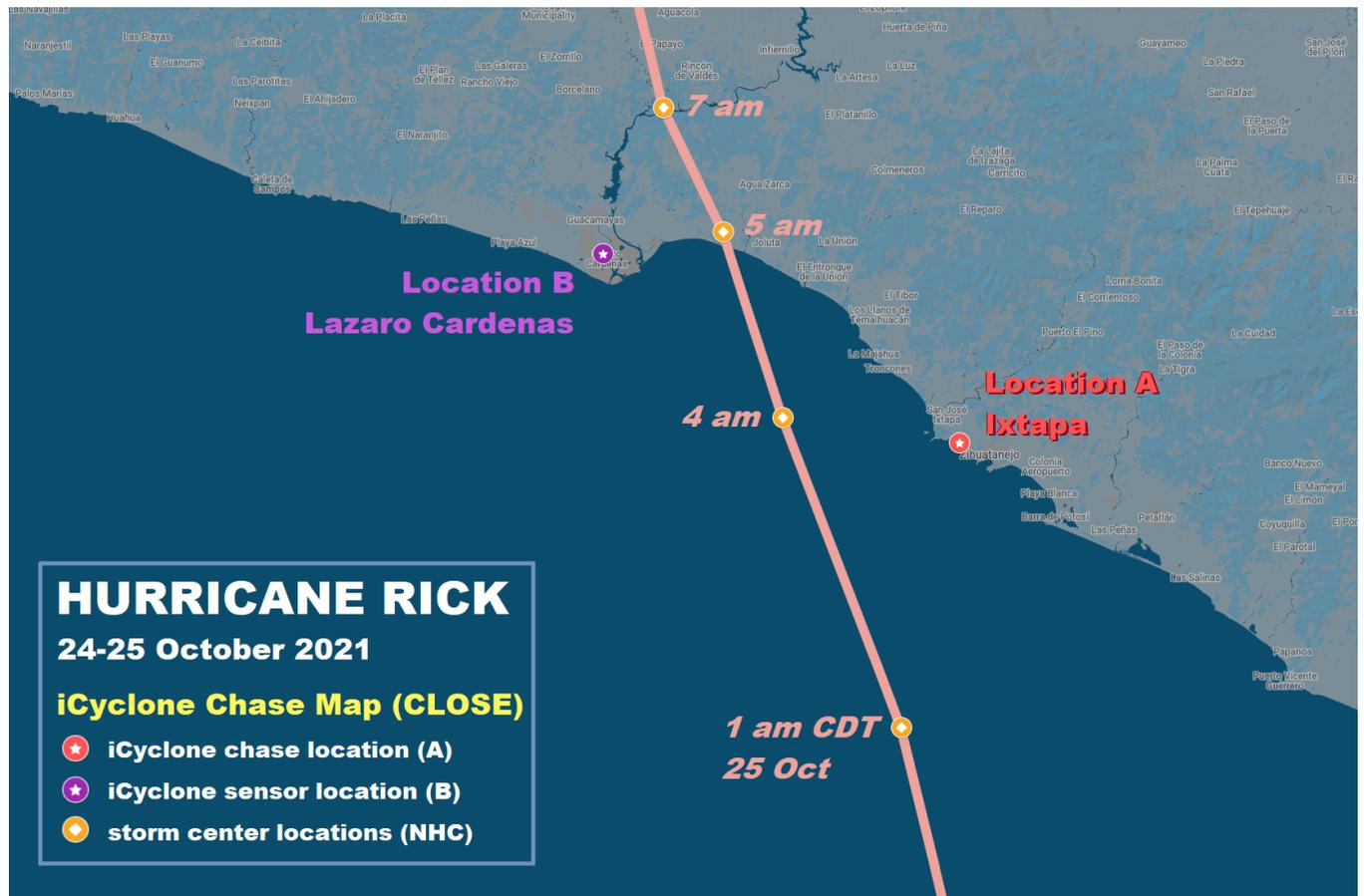
**Figure 1** shows **Chase Location (A) (red star)** and **Sensor Location (B) (purple star)** in relation to **RICK's center (orange points)**, per NHC advisory positions. (**Figure 2** is a closer view.)

**Figure 1: Chase Map**



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Figure 2: Chase Map (CLOSE)



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## Air Pressure Data & Observations

The author collected quality-controlled air-pressure data at both locations using Kestrel 4500s.

- **Location A (Ixtapa, Guerrero).** One device was deployed on the third floor of a beachfront hotel. The author placed the device on a countertop in his room and left it essentially undisturbed during the passage of the hurricane.
- **Location B (Lazaro Cardenas, Michoacan).** One device was deployed on a countertop in a ground-floor hotel room.

The sampling rate for both devices was one reading per minute (1/min).

### Calibration

The devices were calibrated for **sea-level pressure readings** as follows:

- **Location A (Ixtapa, Guerrero).** The author used a reference altitude of **26 ft**, which is the elevation at this location (**5 ft**, which the author estimated visually) plus additional height to account for the device being on a countertop on the third floor.
- **Location B (Lazaro Cardenas, Michoacan).** The author used a reference altitude of **27 ft**, which is the elevation at this location (**23 ft**, estimated by geographer James Hyde) plus additional height to account for the device being on a countertop on the ground floor.

### Minimums (& Observations)

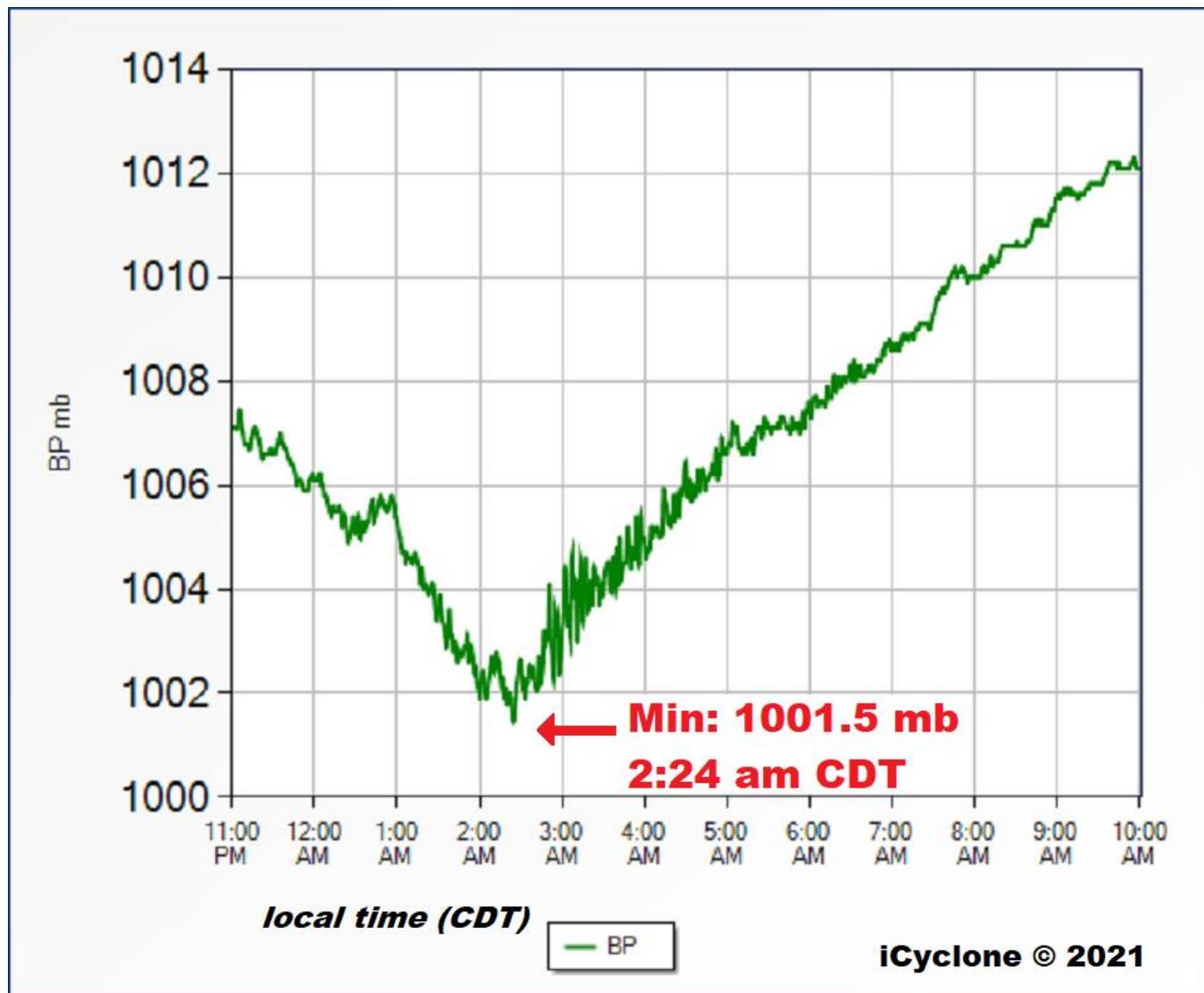
As follows:

- **Location A (Ixtapa, Guerrero)**—which went through the right (E) eyewall, never penetrating the eye: **1001.5 mb at 2:24 am CDT (0724Z) 25 October.** (See **Figure 3**, below.)
  - The stormiest conditions occurred between 2 and 4 am CDT, with the apparent peak winds happening **approximately** 2:30 to 3:30 am. (Please note this is a subjective estimate.) At 3:13 am, the glass doors of the room next to the author's tore out of their frames violently, and the howling of the wind was especially loud at this time.
  - These apparent peak winds coincided with a period of especially volatile air-pressure fluctuations. (Refer to **Figure 4**, below, to see how these apparent peak winds coincided with the most “jagged” phase of the pressure trace.)
- **Location B (Lazaro Cardenas, Michoacan)**—which went through the left (W) eyewall, apparently never penetrating the eye: **995.7 mb at 6:08 am CDT (1108Z) 25 October.** (See **Figure 5**, below.)
  - The timing of the minimum pressure seems somewhat late given the NHC's advisory positions (showing landfall E of Lazaro Cardenas at 5 am CDT)—suggesting perhaps the operational best track was a little fast.
  - The pressure trace is quite irregular between around 6 and 7 am CDT, showing a sudden, sharp plunge preceding the minimum value, followed by a sudden rise and then another sharp plunge within the hour. This jagged pressure trace, along with freakishly heavy damage to the building (much worse than the damage to nearby buildings), hints at the occurrence of a mesovortex or other localized disturbance. (See **Figure 6**, below, for a more detailed view of these pressure irregularities, and see **p. 12** for a photo of the building damage.)

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Figure 3: Barogram—Location A—Ixtapa, Guerrero

The minimum value of 1001.5 mb occurred at 2:24 am CDT, as the center of the hurricane passed ~15 n mi W of this location.



## HURRICANE RICK: 24-25 Oct 2021

Ixtapa, Guerrero, Mexico

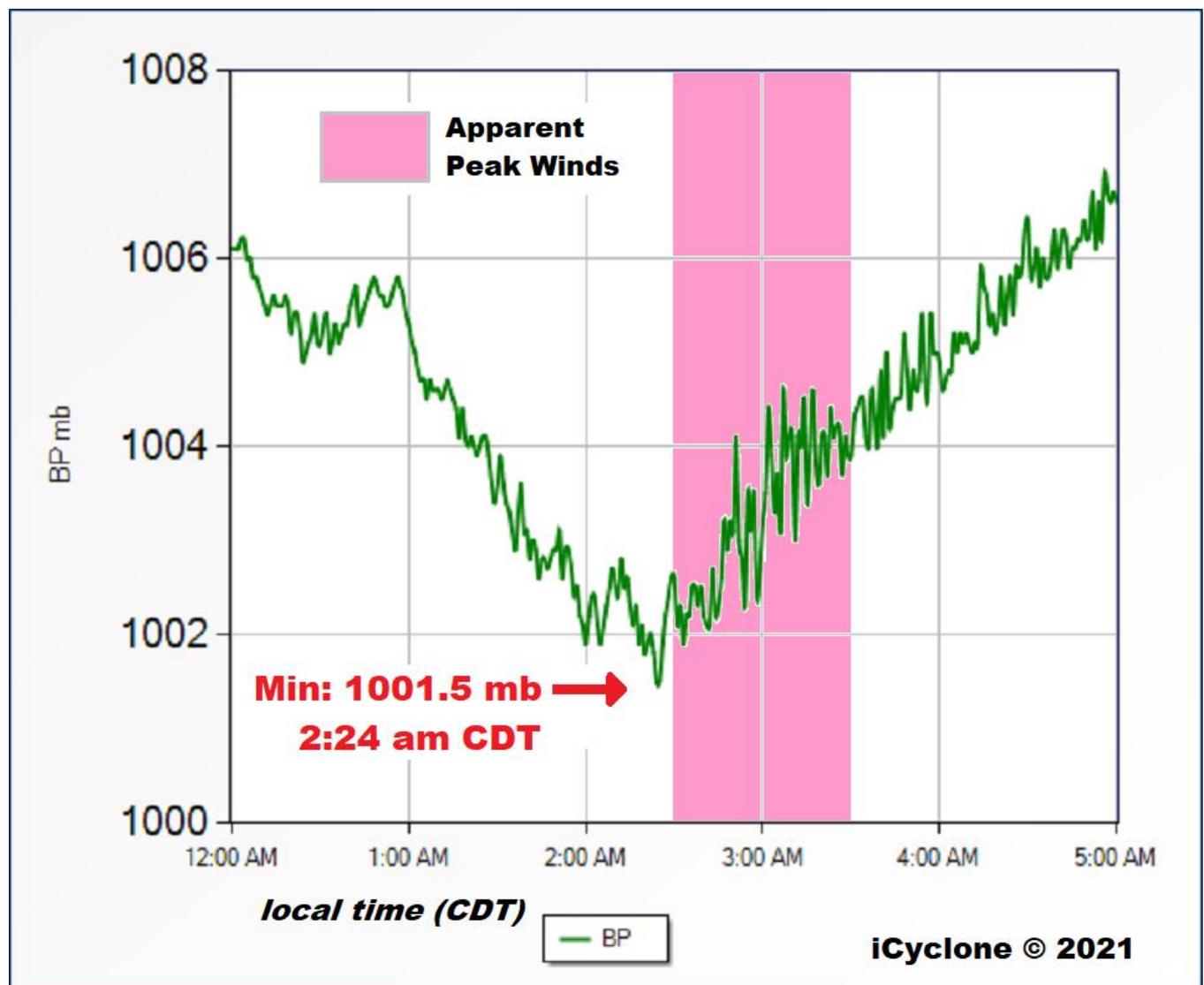
17.6593N 101.6035W – ref el 5 ft

**LOCATION A**

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Figure 4: Barogram—Location A—Ixtapa, Guerrero (DETAILED)

A more detailed view of the Ixtapa pressure data. The apparent peak winds—from around 2:30 to 3:30 am CDT—coincided with a period of especially volatile air-pressure fluctuations. At 3:13 am, the glass doors of the room next to the author's blew out of their frames violently.



## HURRICANE RICK: 25 Oct 2021

Ixtapa, Guerrero, Mexico

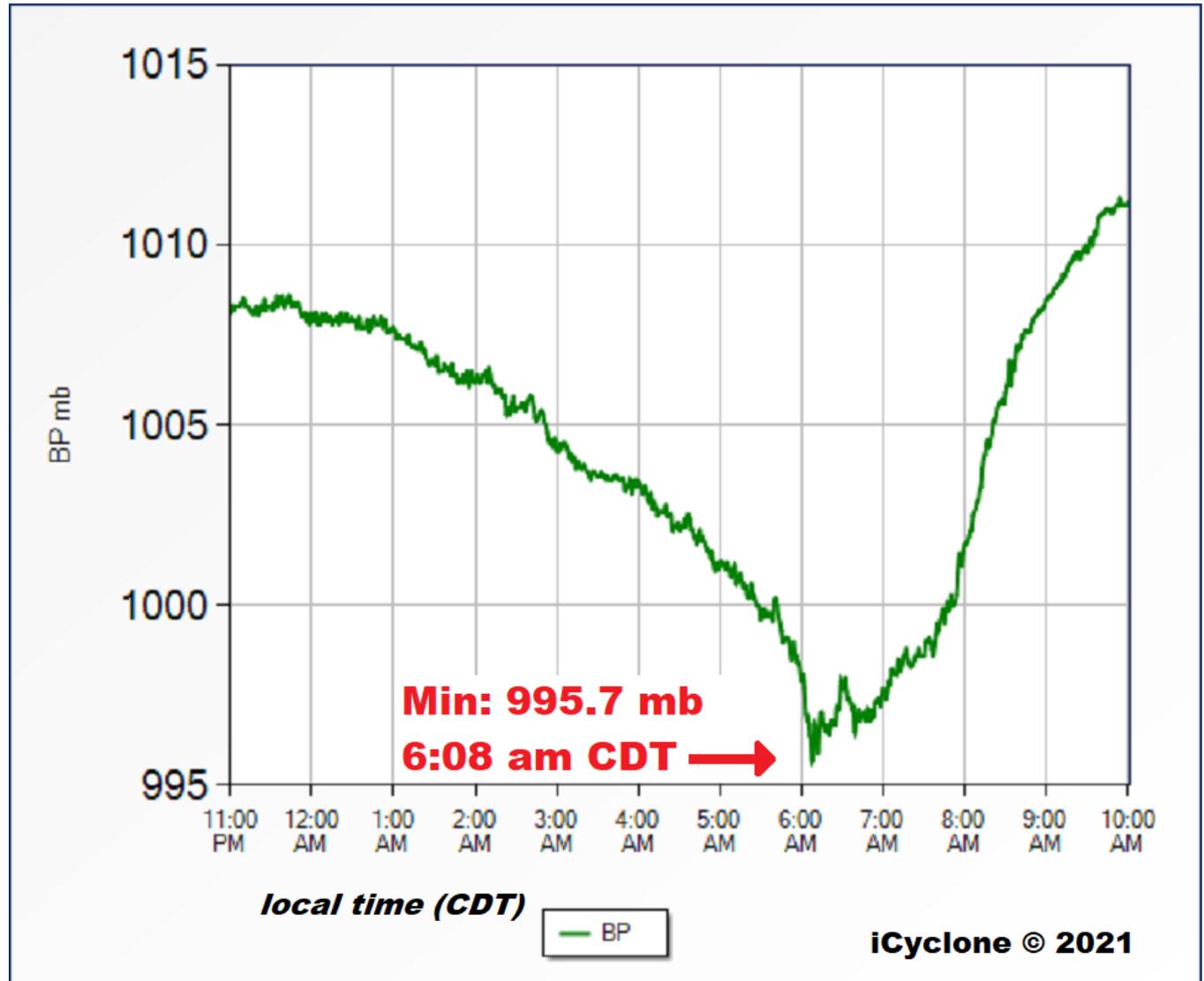
17.6593N 101.6035W – ref el 5 ft

**LOCATION A**

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Figure 5: Barogram—Location B—Lazaro Cardenas, Michoacan

This device registered a minimum value of 995.7 mb at 6:08 am CDT, apparently as the center of hurricane passed ~12 n mi E of this location.



## HURRICANE RICK: 24-25 Oct 2021

Lazaro Cardenas, Michoacan, Mexico

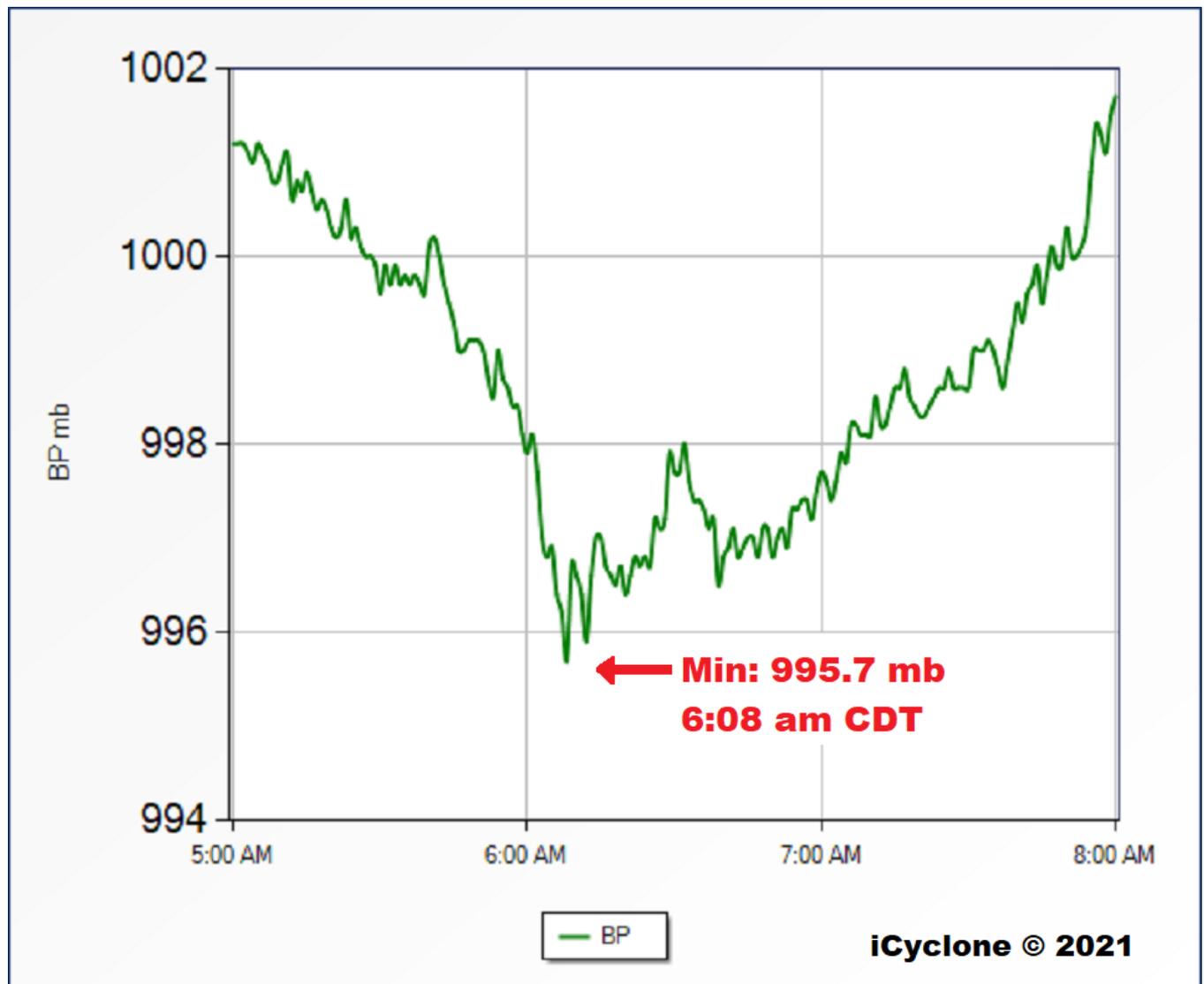
17.9645N 102.2019W – ref el 23 ft

**LOCATION B**

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**Figure 6: Barogram—Location B—Lazaro Cardenas, Michoacan (DETAILED)**

*A more detailed view of the Lazaro Cardenas pressure data shows an extremely sharp dip preceding the minimum value, followed by a sharp rise and then another big dip within the hour. This jagged pressure trace, along with heavy damage to the building, suggests the possible occurrence of a mesovortex.*



## **HURRICANE RICK: 25 Oct 2021**

**Lazaro Cardenas, Michoacan, Mexico**

**17.9645N 102.2019W – ref el 23 ft**

**LOCATION B**

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## Aftermath

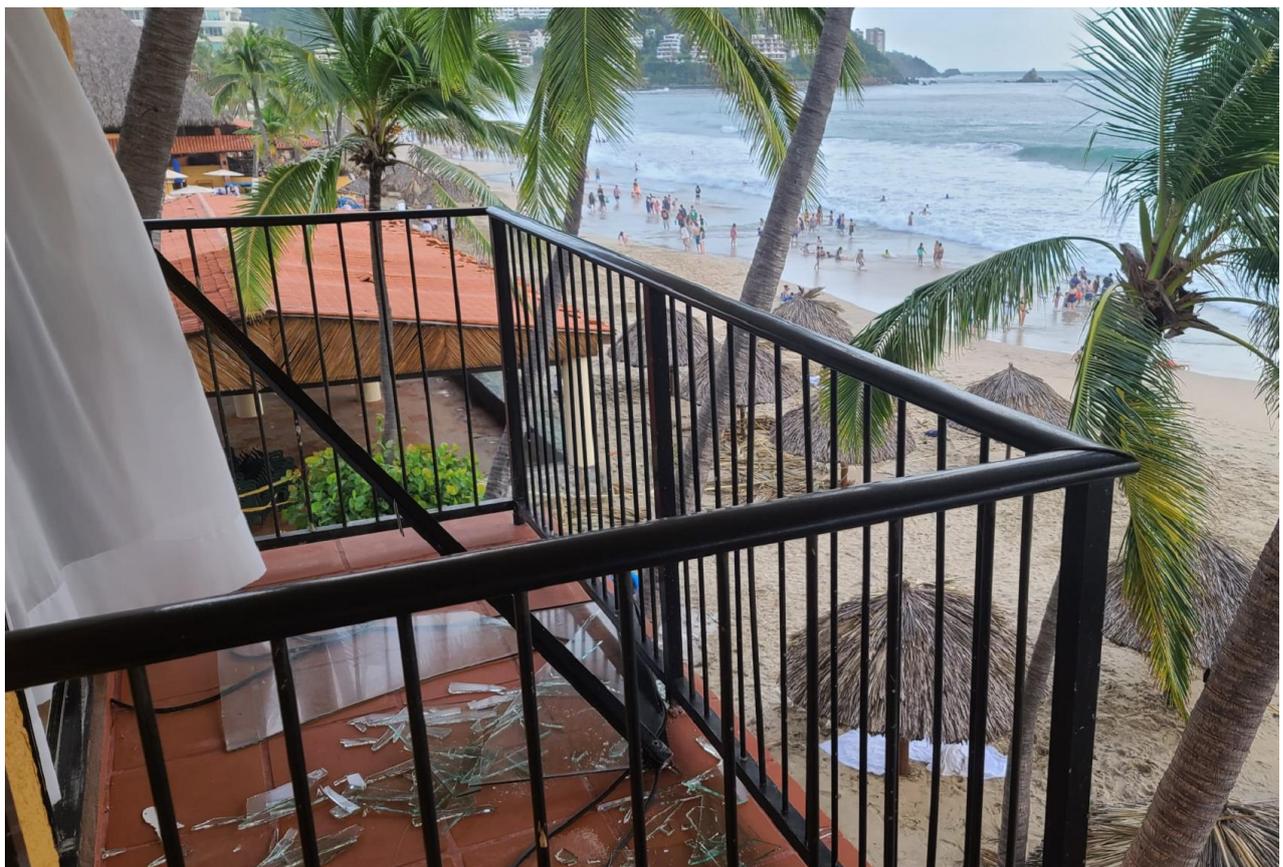
There was widespread wind damage across Hurricane RICK's landfall zone—from W portions of Guerrero into the E end of Michoacan.

In **Ixtapa, Guerrero**—which was apparently in the right eyewall—many, many trees went down. These included not just shallow-rooted, decorative trees but also older, larger ones. After the storm passed, every street around Ixtapa was blocked. Furthermore, the seaside resort where the author rode out the hurricane (Location A) lost about 20 windows (out of 431 units).

Based on what the author saw, wind damage in nearby **Zihuatanejo**—just a few miles to the E of Ixtapa—seemed less extensive. It's possible the core of the hurricane may have **just** missed that city.

Driving **W along the Guerrero coast**—across the hurricane's landfall zone—into Michoacan the next day, the author observed that the wind damage (at least along the highway) was no worse than it was in Ixtapa.

Across the state line in Michoacan, **Lazaro Cardenas**—which was in the left eyewall—took a beating. Like Ixtapa, the city lost many trees, and power was out across the area. While most buildings seemed to withstand the hurricane winds satisfactorily, the hotel where the author planted his sensor (Location B) had serious exterior damage—possibly caused by highly localized winds.



***Ixtapa: The glass doors of the room next to the author's (Location A) were torn out of their frames and smashed at the height of the storm.***

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***Ixtapa: Shallow-rooted decorative trees were no match for Hurricane RICK's winds.***



***Ixtapa: This huge tree went down and heavily damaged the building next to it.***

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*Ixtapa: Another uprooted tree.*



*Ixtapa: Another uprooted tree.*

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***Lazaro Cardenas: An exterior wall of this hotel (Location B) was heavily damaged by Hurricane RICK's winds. Most buildings in the city performed much better. This damage, along with a highly irregular air-pressure trace from this site, suggests the possible occurrence of a mesovortex or other localized disturbance.***

## Video

The passage of the hurricane in Ixtapa—as described in this report—can be seen in the author's 8-minute video of the event: <https://youtu.be/pTGESyNU77Q>

For easy analysis, all the footage is timestamped in local time (CDT).

## Questions or Feedback?

Get in touch:

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