

# Forensic Steganography Report

Report Generated: Thu Nov 13 20:58:12 2025

## Case Details

Original	(Cover)	File:
detect_3159bcdece124cc7bc8359d4a9a7313c_stego_52c1f3d2aa584e498f145dbc9de07f4a_image.png		
Suspected	(Stego)	File:
detect_3159bcdece124cc7bc8359d4a9a7313c_stego_52c1f3d2aa584e498f145dbc9de07f4a_image.png		
Analysis Date:	2025-11-13 20:58:12	

## File Size Analysis

Property	Cover Image	Stego Image
File Size	424.65 KB	424.65 KB
Image Dimensions	976 x 549	976 x 549
Size Difference	+0.00 KB (+0.00%)	

### Size Analysis Conclusion:

Minimal file size change detected. This could indicate: LSB steganography, no embedding, or efficient compression.

## Detection Verdict

### STEGANOGRAPHY DETECTED (WOW)

(Confidence: 97.1%)

## Critical Finding: Adaptive Frequency Domain (WOW) Steganography Detected

The analysis confirms hidden data embedded using the WOW algorithm.

1. Detection Confidence: 97.1%
2. Algorithm Identified: WOW
3. Statistical Evidence: 65.29% of pixels modified
4. Modified Pixels: 349,852 pixels

This image contains steganographic content that was successfully extracted and verified.

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## Visual Analysis

**Original (Cover) Image**



*Explanation: The baseline image for comparison.*

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## Suspected (Stego) Image



*Explanation: The image under investigation. Visual inspection shows no obvious differences.*

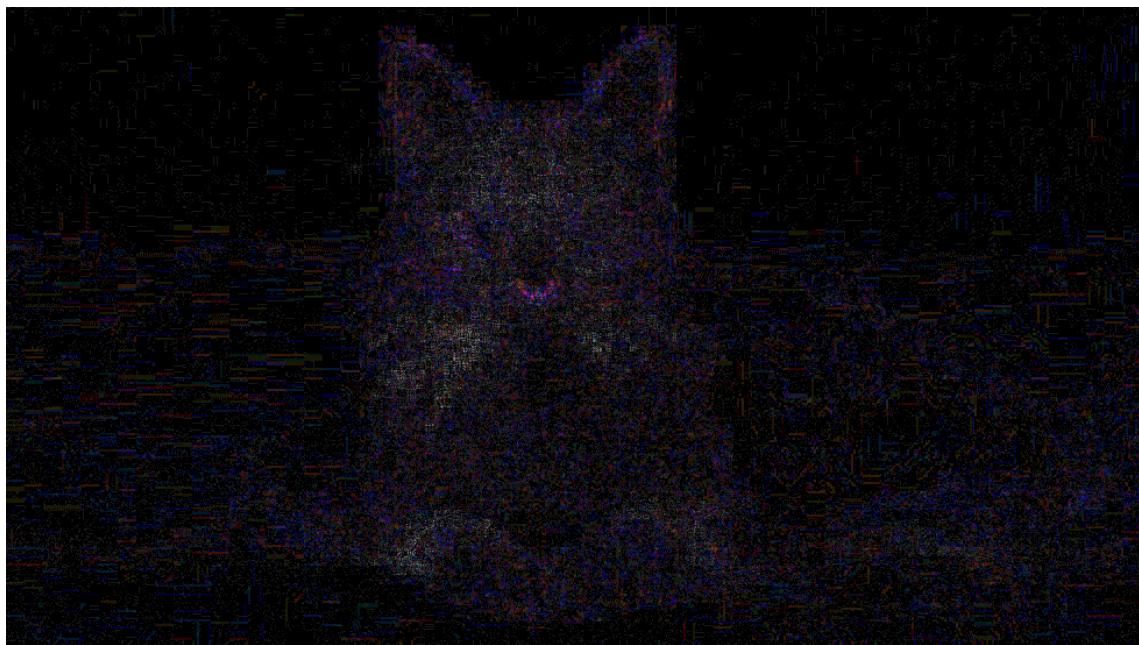
## Pixel Difference Map

*Explanation: Widespread changes (65.3% of pixels) indicate frequency domain embedding. The WOW algorithm modifies DCT coefficients across the entire image to hide data while maintaining visual quality.*

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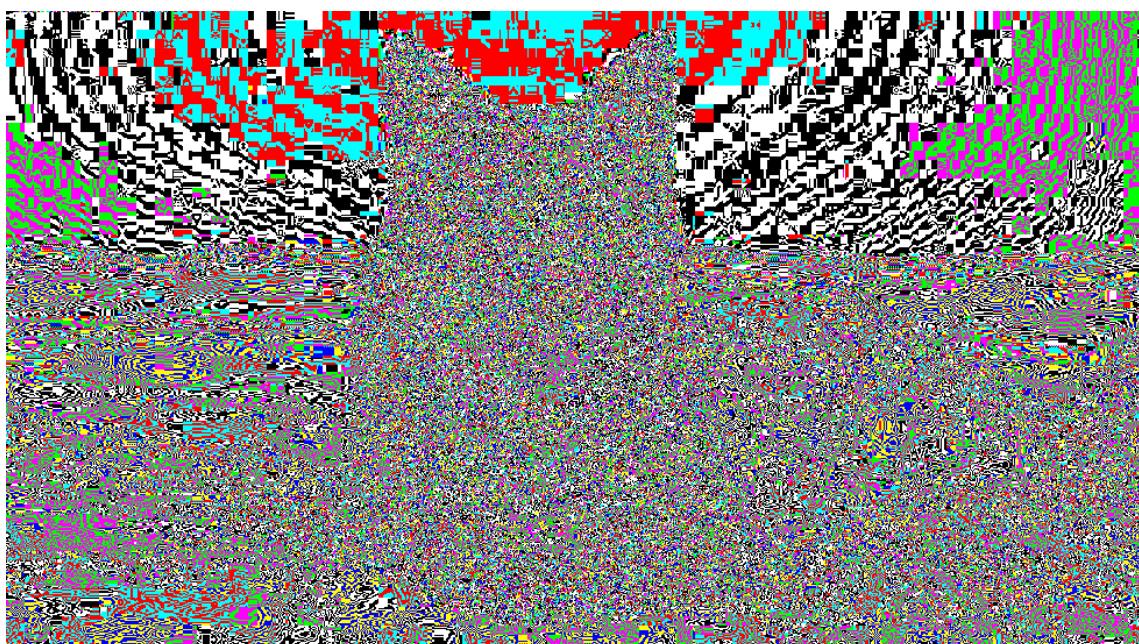
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## Error Level Analysis (ELA)



*Explanation: High ELA values confirm JPEG re-compression characteristic of WOW. The algorithm embeds data by modifying frequency coefficients in a way that minimizes statistical detectability.*

## LSB Plane Visualization

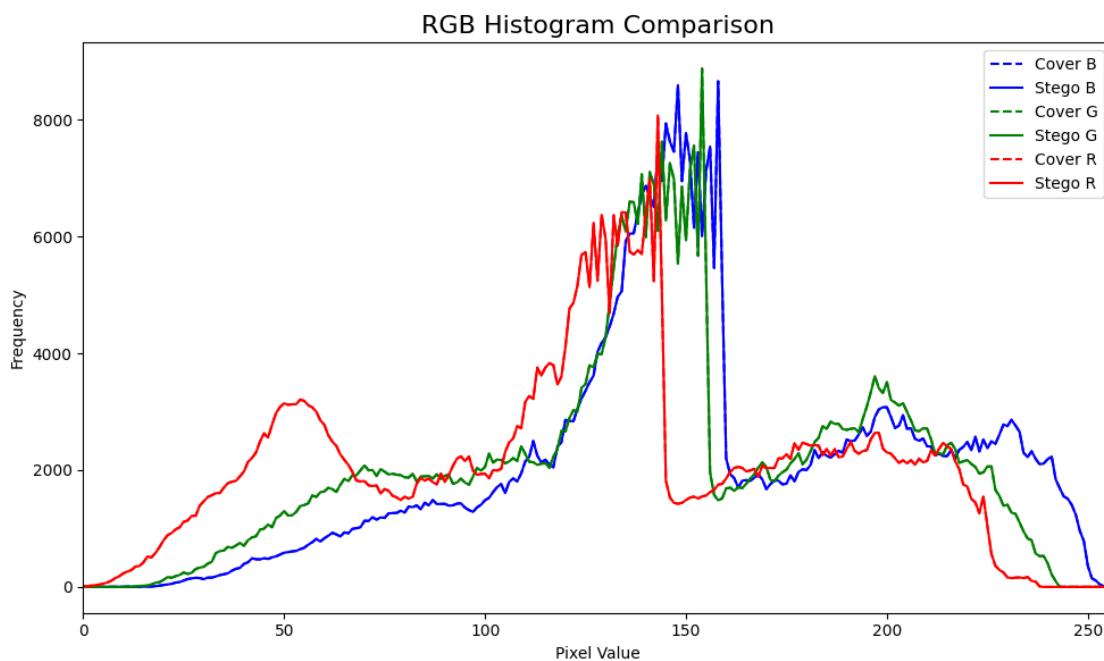


*Explanation: The LSB plane shows artifacts from the frequency domain embedding process, appearing as structured noise patterns distributed throughout the image.*

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## RGB Histogram Analysis



*Explanation: Histogram analysis reveals statistical anomalies consistent with WOW embedding. Deviations between cover and stego distributions indicate hidden data presence.*

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## Forensic Quality Metrics

Metric	Value
PSNR	59.55 dB
SSIM	1.0000
MSE	0.00
Changed Pixels	349,852 (65.3%)
File Size Change	+0.00 KB
Estimated Payload	~920 Bytes

### *Metric Explanations:*

*PSNR (Peak Signal-to-Noise Ratio): Measures image quality. Higher is better (>40dB is visually identical).*

*SSIM (Structural Similarity Index): Measures structural similarity. Closer to 1.0 is better.*

*MSE (Mean Squared Error): Measures the average error. 0.0 means no change.*

*Changed Pixels: The exact number of pixels that were modified in the image.*

*Estimated Payload: A rough guess of the hidden data size.*