# Was the 2016 Election Hacked?

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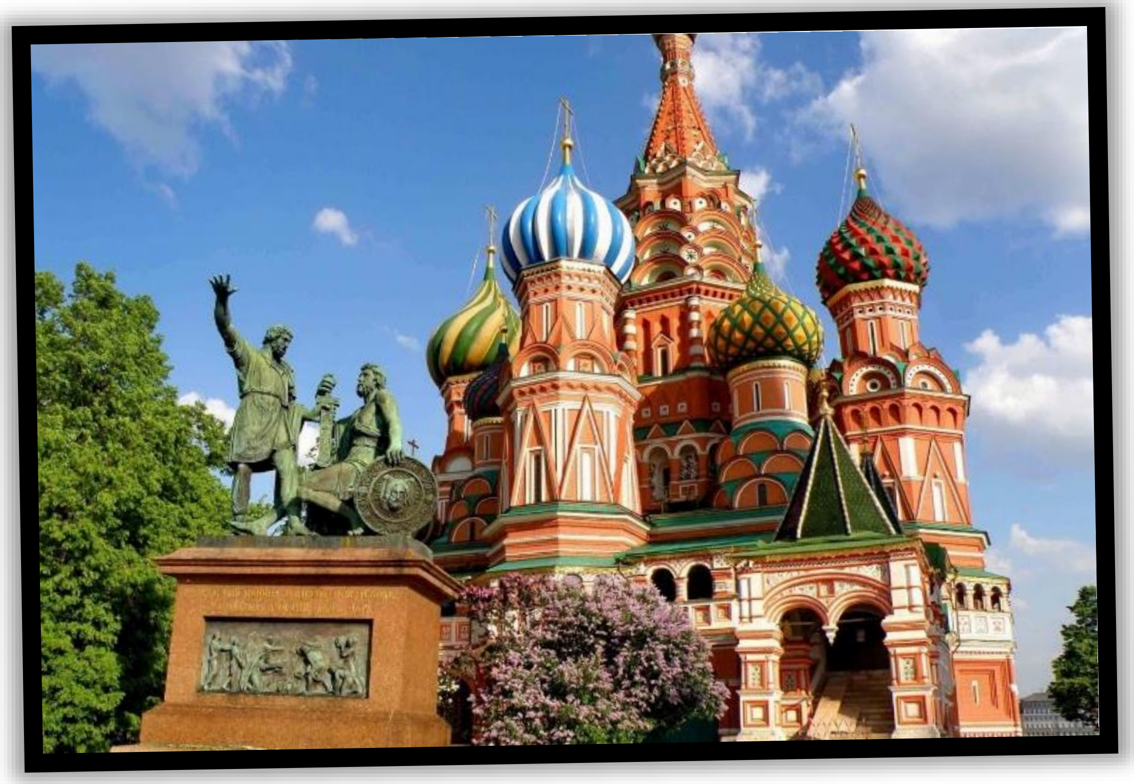
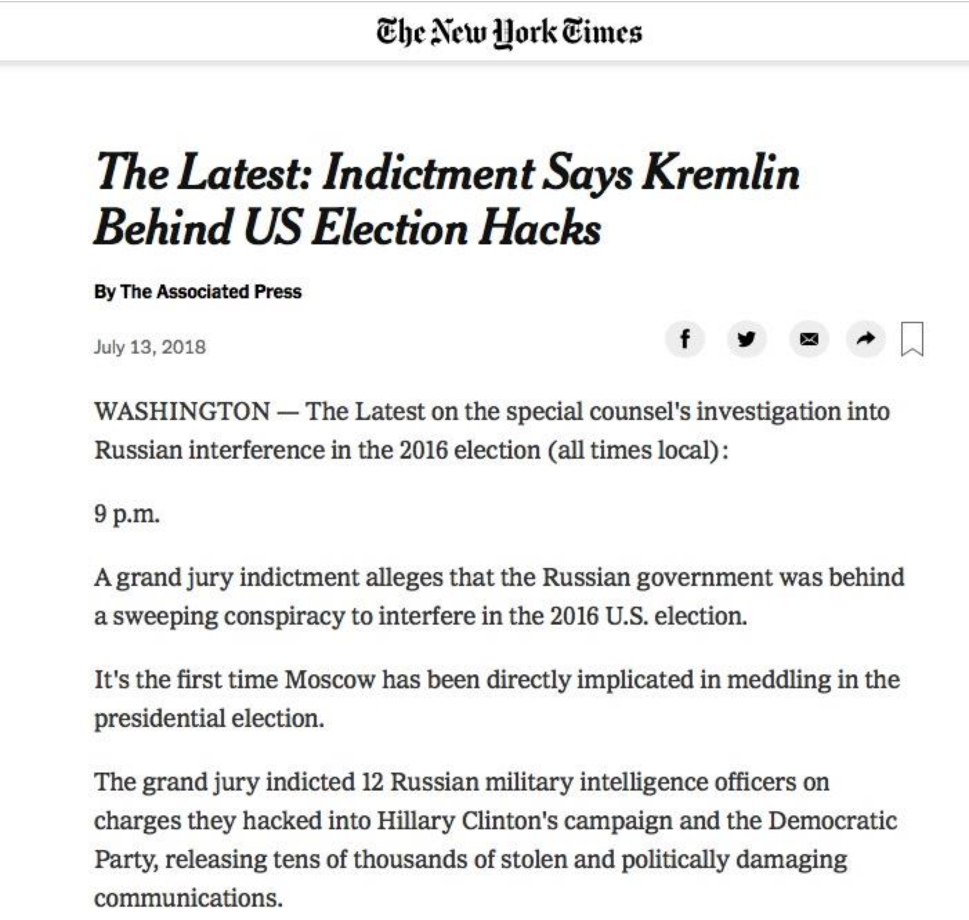


# What do we know about Russian Influence?

*online propaganda (fake news, botnets)*
*political hacks (expose emails)*
*hack into state election systems (ddos, e-pollbooks, websites)*

"Assessing Russian Activities and Intentions in Recent US Elections"
NSA, FBA and CIA, Jan 6 2017.

# Hot off the Press!



The New York Times

## *The Latest: Indictment Says Kremlin Behind US Election Hacks*

**By The Associated Press**

July 13, 2018

WASHINGTON — The Latest on the special counsel's investigation into Russian interference in the 2016 election (all times local):

9 p.m.

A grand jury indictment alleges that the Russian government was behind a sweeping conspiracy to interfere in the 2016 U.S. election.

It's the first time Moscow has been directly implicated in meddling in the presidential election.

The grand jury indicted 12 Russian military intelligence officers on charges they hacked into Hillary Clinton's campaign and the Democratic Party, releasing tens of thousands of stolen and politically damaging communications.

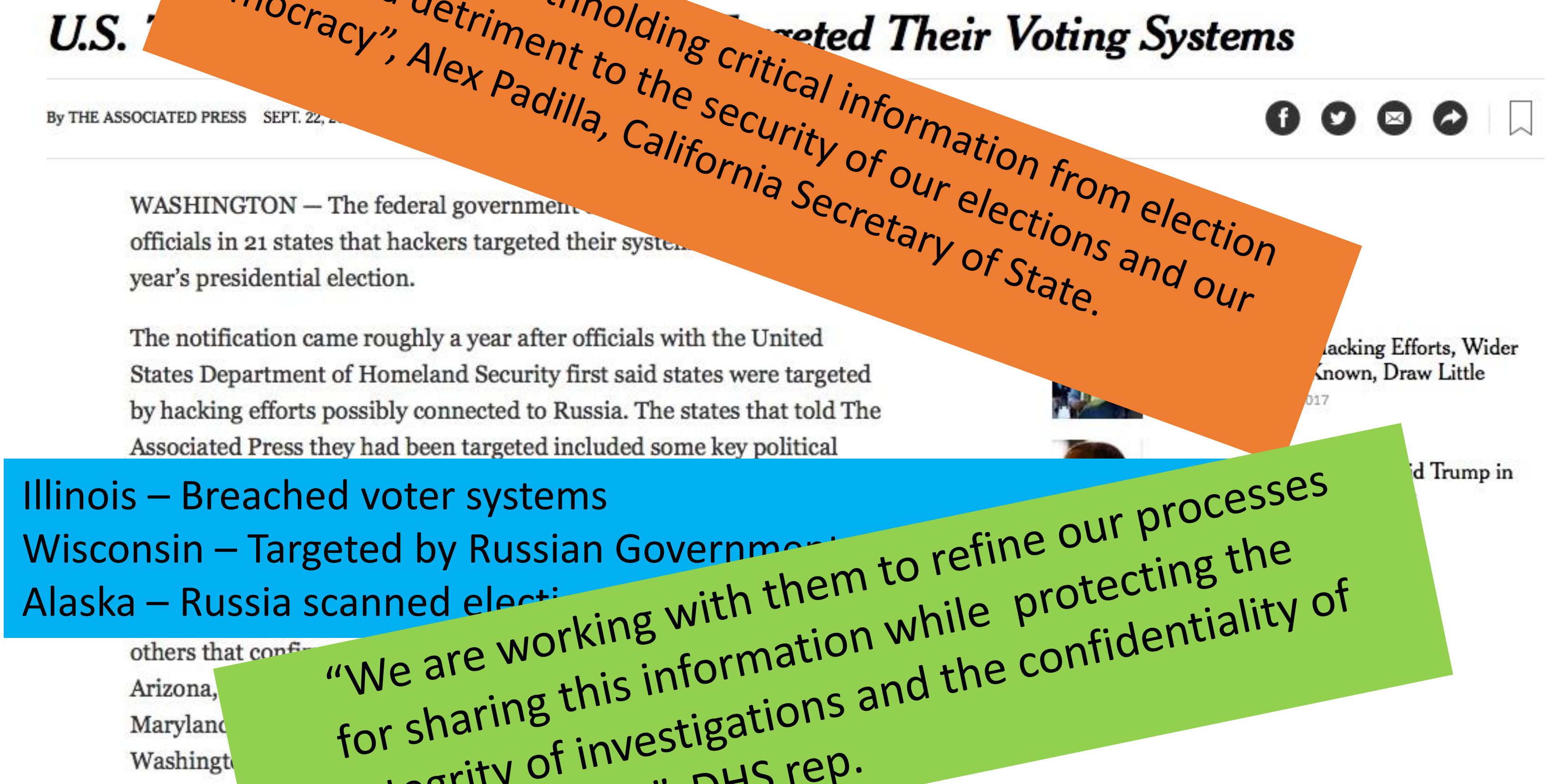
# Voting Village

DefCon 2017 – July 27-30 2017

*DEFCON 25 Voting Machine Hacking Village – Report on Cyber Vulnerabilities in U.S. Election Equipment, Databases, and Infrastructure, September 2017, M. Blaze, J. Braun, H. Hursti, J. Hall, M. MacAlphine, J. Moss.*

# DHS Warns States
*(11 months after Election)*

“The practice of withholding critical information from election officials is a detriment to the security of our elections and our democracy”, Alex Padilla, California Secretary of State.



U.S. T

geted Their Voting Systems

By THE ASSOCIATED PRESS SEPT. 22, 2

WASHINGTON — The federal governmen

officials in 21 states that hackers targeted their syste

year’s presidential election.

The notification came roughly a year after officials with the United States Department of Homeland Security first said states were targeted by hacking efforts possibly connected to Russia. The states that told The Associated Press they had been targeted included some key political

others that conf

Arizona,

Marylanc

Washingt

acking Efforts, Wider

Known, Draw Little

017

d Trump in

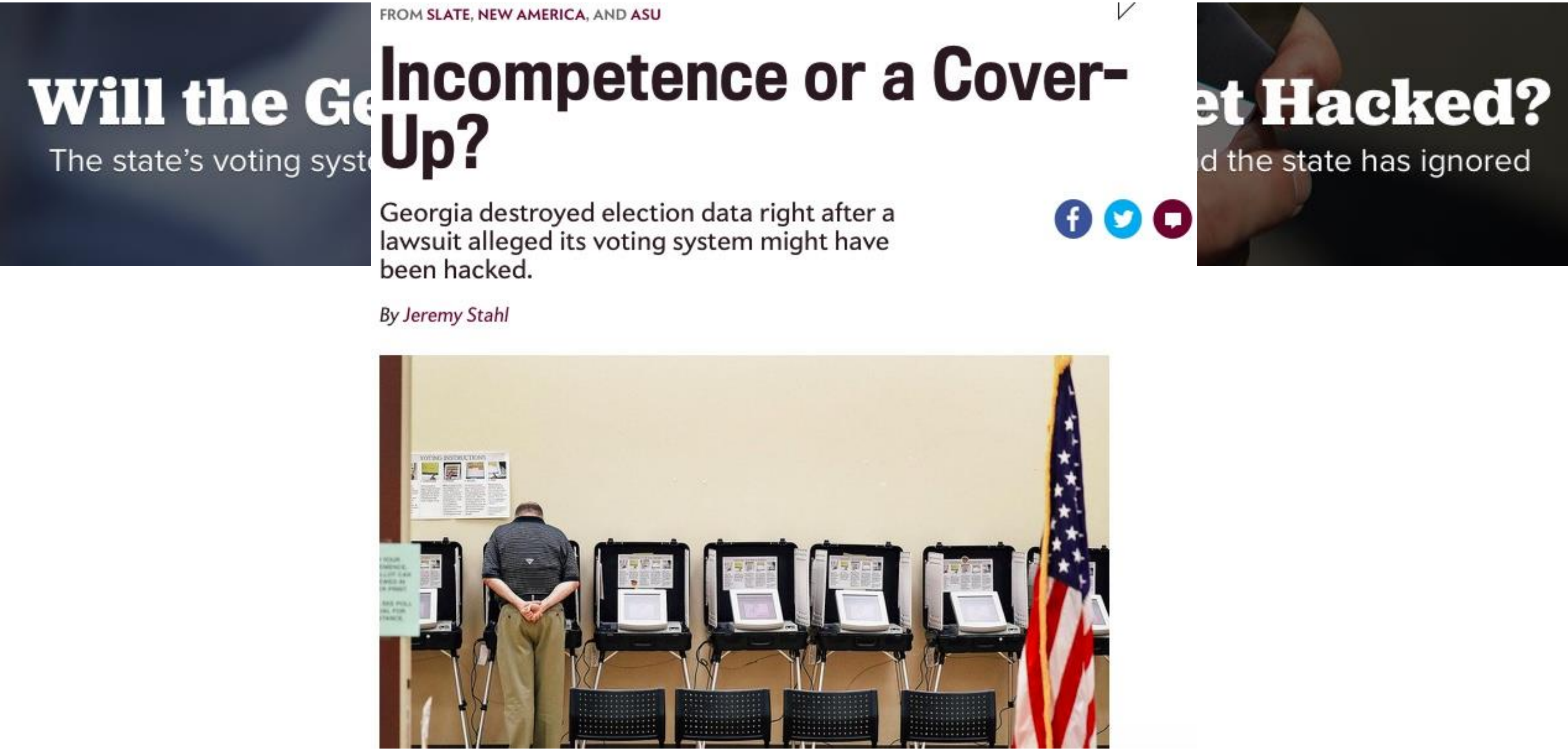
Illinois – Breached voter systems

Wisconsin – Targeted by Russian Governmen

Alaska – Russia scanned electi

“We are working with them to refine our processes for sharing this information while  protecting the integrity of investigations and the confidentiality of system owners”, DHS rep.

# Kennesaw State University’s Center for Election Systems



Will the Ge

et Hacked?

The state’s voting syst

d the state has ignored

FROM SLATE, NEW AMERICA, AND ASU

## Incompetence or a Cover-Up?

Georgia destroyed election data right after a lawsuit alleged its voting system might have been hacked.

By Jeremy Stahl

New Bill (Feb 9) – Georgia Bill SB315 – A crime to take data from their website.

# And also this year…..

- Pennsylvania Mandates Paper!
    - But now how are they going to pay for it?

- Georgia (no audits until 2024, barcode voting) bill didn't pass (SB403)

- Omnibus Spending Bill – 380 million to states to strengthen election infrastructure – not enough to replace paperless machines, conduct audits and increase security

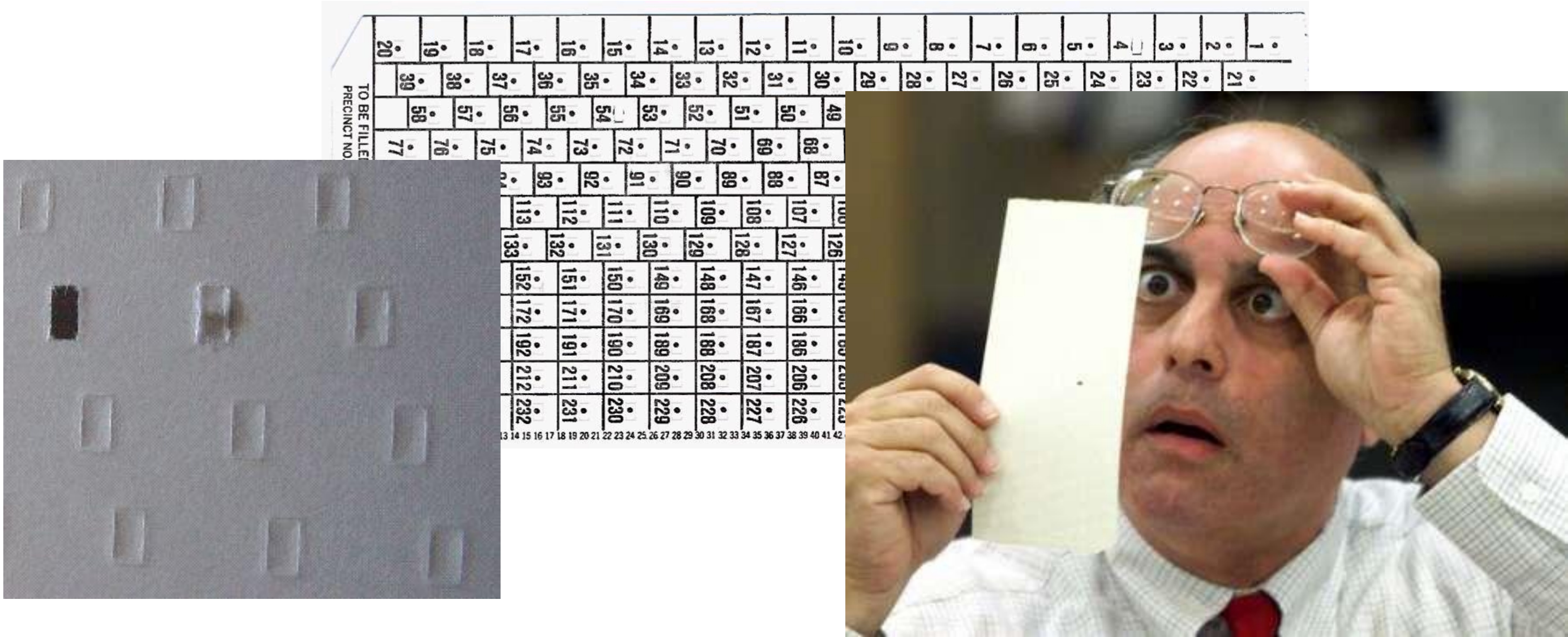
- I hacked the election – so can the Russians –
- https://thevotingnews.com/verified-voting-hacks-into-voting-machine-in-new-video-from-the-new-york-times/

- Grant! elections research initiative is an effort that is funded by 7 foundations - the John and Laura Arnold Foundation, Democracy Fund, the William and Flora Hewlett Foundation, the John S. and James L. Knight Foundation, the Charles Koch Foundation, the Omidyar Network, and the Alfred P. Sloan Foundation.

- Senate Hearing – Last Week July 11

# Election History – How did we get here?

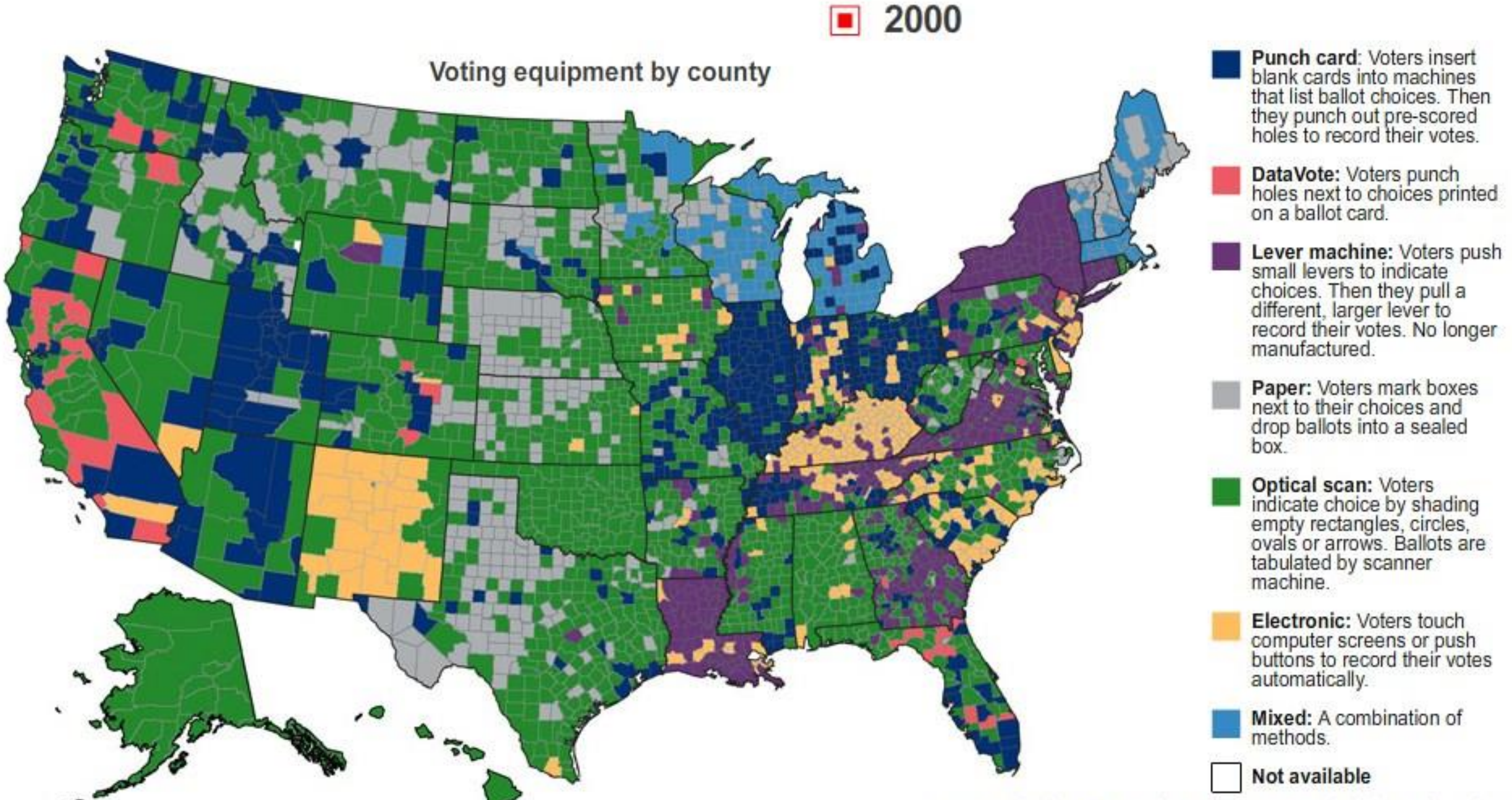
- 2000 Election Fiasco - Gore/Bush
- Circa 1960, based on computerized punch card
- Now illegal (HAVA, Help America Vote Act, 2002)



# Help America Vote Act of 2002 (HAVA)

- In direct response of the 2000 election fiasco in Florida…..hanging chad?
- Created the US Election Assistance Commission (EAC)
- Created first voting certification program
- EAC put out first Voluntary Voting System Guidelines (VVSG). Currently (according to HAVA) adoption at state level is voluntary
- Must maintain a database of all registered voters
- Lots of money to buy new machines – 3 Billion!

# Voting Equipment in 2000



🟦 **Punch card**: Voters insert blank cards into machines that list ballot choices. Then they punch out pre-scored holes to record their votes.

🟥 **DataVote:** Voters punch holes next to choices printed on a ballot card.

🟪 **Lever machine:** Voters push small levers to indicate choices. Then they pull a different, larger lever to record their votes. No longer manufactured.

⬜ **Paper:** Voters mark boxes next to their choices and drop ballots into a sealed box.

🟩 **Optical scan:** Voters indicate choice by shading empty rectangles, circles, ovals or arrows. Ballots are tabulated by scanner machine.

🟨 **Electronic:** Voters touch computer screens or push buttons to record their votes automatically.

🟦 **Mixed:** A combination of methods.

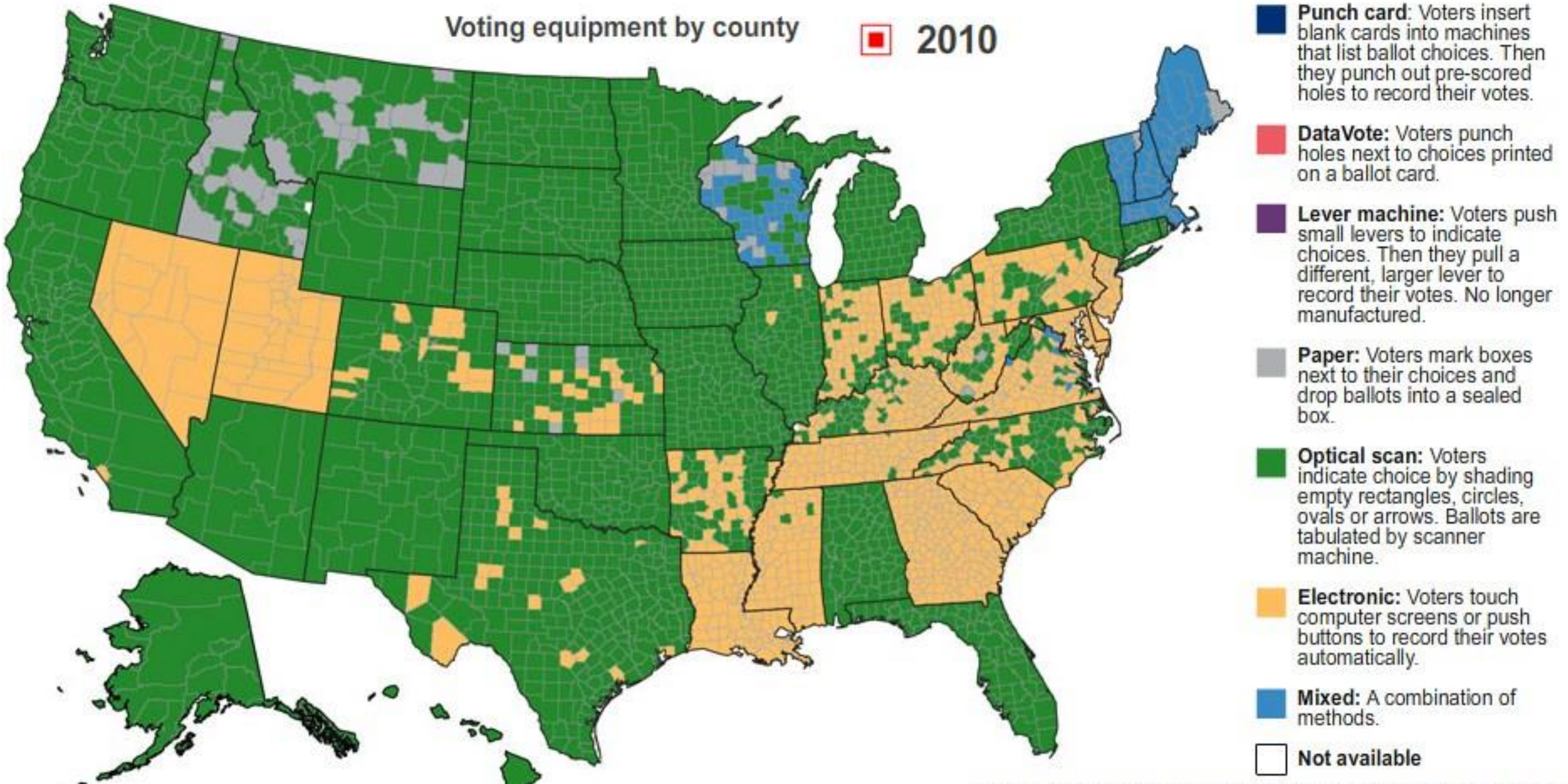
□ **Not available**

*Source: Election Data Services, USA TODAY analysis by Paul Overberg*

# Direct Recording Electronic (DREs)

No Paper Trail, No Audit, No Recount – But it’s New Fangled Machine!

# Voting Equipment in 2010



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# What are we doing about it?

- National Level
  - Federal Effort needs to be Bipartisan
  - Secure Elections Act (Dec 2017) (Lankford (R-OK), Klobucker (D-MN) 3 democrats, 2 republicans
    - 360 Million in Grants
    - Replace DREs, Instill Best Cybersecurity Practices, Conduct Post Election Audits
    - If a state takes the money, must have Risk Limiting Audit pilot by 2022.
  - The Democrat's Election Security Act (Feb 14 2018)
    - 1 Billion Funding, funding in following years

# Rhode Island

- Paper Ballots
- Off the Internet (mostly) – UOCAVA mails blank ballots, allowed electronic return
- Sept 2017 – Post-Election Audit Law – Conduct Risk-Limiting Audits – Pilot in 2018, Mandated in 2020
  - First in Country! (Colorado is mail-in state)
  - Experimenting with ways to do it
  - Leading Student Project
- Created new line items in RI Budget
    - Penetration Testing of online voter system and other election environments
    - Implementation of a security framework to improve overall security practices

# Overall Goals of Research

- Address need for understanding voting equipment/Improve Transparency
- Present Forensically Sound Audit Process for Post Election
- Explore Techniques used in Digital Forensics and apply to Election Technology
- Make Recommendations for Future Elections/Voting Technology

# Metric Goals

- Forensic Benchmark
  - Provide a measurement baseline
  - Can aim to improve the post election audit process
  - Discover relationships between forensic capability and election anomalies
- Begin a Risk Assessment -Measure and Manage Risk
  - Risk framework - Access, Monitor, Respond
  - Identity threats to eliminate and control
  - It’s a cycle - Improve and feed back into process
- Increase Awareness of forensic tools
- Define Language/vocabulary

# Metric Calculation

- Analyzed election process and found threats
- Applied forensic techniques that are relevant in safeguarding election technology
- Mapped forensic technique to threat it prevents, forensic evidence it supplies
- Assigned weight to component
- Assigned components to logical groups
- It’s a cycle - understand that this is a first pass and what we learn from the process will be fed back in and begun again

# Toward a Metric for Forensic Analysis of Governmental Elections

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| **Component** | **Maximum Percentage** | **Percentage Procured** |
|---|---|---|
| **Transparency** ($T$) | **30%** | **11%** |
| Software ($S_T$) | 10 | 0 |
| Hardware ($H_T$) | 10 | 3 |
| Election Process ($E_T$) | 10 | 8 |
| **Chain of Custody** ($C$) | **30%** | **16%** |
| Software ($S_C$) | 10 | 5 |
| Hardware ($H_C$) | 10 | 5 |
| Ballot ($B_C$) | 10 | 6 |
| **Audit Capability** ($A$) | **40%** | **15%** |
| Paper Trail ($P_A$) | 10 | 10 |
| Ballot Casting Assurance ($A_A$) | 10 | 0 |
| Universal Verification ($V_A$) | 10 | 0 |
| Error Detection Capability ($E_A$) | 10 | 5 |
| **Total** ($F$) | **100%** | **42%** |

# Thank you!