COUNTING VOTES 2012:

A State by State look at Voting Technology Preparedness

Executive Summary

Susannah Goodman

Common Cause Education Fund

Michelle Mulder

Rutgers School of Law - Newark Constitutional Litigation Clinic

Pamela Smith

Verified Voting Foundation

*COMMON CAUSE EDUCATION FUND * THE VERIFIED VOTING FOUNDATION
* *THE RUTGERS LAW SCHOOL CONSTITUTIONAL LITIGATION CLINIC*

Counting Votes 2012: A State by State Look at Voting Technology Preparedness

EXECUTIVE SUMMARY

On Election Day, Nov. 6, the stakes will be high. A number of critical races will be very close, and some might be decided by very few votes. At the same time, it is highly likely that voting systems will fail in multiple places across the country.[i] In fact, in every national election in the past decade, computerized voting systems have failed – machines haven't started, machines have failed in the middle of voting,[ii] memory cards couldn't be read be read,[iii] votes were mistallied[iv] or lost.[v]

Our elections are so complex, with so many different jurisdictions and varying technologies, that problems are inevitable. And, as the technology used for elections has become more complicated, the opportunity for error has substantially increased.

This report reviews how prepared each state is to ensure that every eligible voter can vote, and that every vote is counted as cast. Because we cannot predict where machines will fail during the upcoming national election, every state should be as prepared as possible for system failures.

The Verified Voting Foundation, the Rutgers Law School Constitutional Litigation Clinic and Common Cause surveyed states' voting equipment and ranked the states according to their preparedness. The rankings are based on how states compare to a set of best practices already being used in some places.

The report ranks states from worst to best (inadequate, needs improvement, generally good, good and excellent) in these five areas of evaluation:

1) **Does the state require paper ballots or records of every state?** When computer failures or human errors cause machines to miscount, election officials can use the original ballots to determine correct totals. Additionally, paper ballots or records can be used to audit machine counts to determine if outcomes are correct.

2) **Does the state have adequate contingency plans at each polling place in the event of machine failure?** Machine repair should occur quickly and emergency paper ballots should be made available.

3) **Does the state protect military and overseas voters by ensuring that marked ballots are not cast online?** Voting system experts at the National Institute of Standards and Technology and cyber security experts at the Department of Homeland Security warn that even state-of-the-art online voting technology lacks adequate security and privacy protections. Ballots cast over the Internet can be subject to alteration and voters may lose the right to a secret ballot.

4) **Has the state instituted a post-election audit that can determine whether the electronically reported outcomes are correct?** Simply voting on paper ballot systems does not increase the

accuracy and integrity of election results; the ballots or records must be used to independently audit the vote count. Mandatory comparison of a random sample of the paper ballots to electronic totals is one of the best ways to ensure that the reported outcomes are correct. A well designed audit should use statistical sampling methods tied to the margin of victory and should be able to correct the outcome if it is wrong.

5) **Does the state use robust ballot reconciliation and tabulation practices?** These basic procedures help ensure that no ballots are lost or added as the votes are tallied and aggregated from the local up to the state level.

The five measures listed above protect against machine failures that can change election outcomes and disenfranchise voters. Listed below are examples of past machine failures and how they impacted various elections:

- Following a June 2009 election, officials in Pennington County, South Dakota, discovered a software malfunction that **added thousands of non-existent votes to the county totals.**[vi]

- In a municipal election in Palm Beach County, Florida, in March 2012, a problem with election management software **allotted votes to the wrong candidate and the wrong contest.** The official results were only changed after a court-sanctioned public hand count of the votes.[vii]

- In the 2008 Republican presidential primary in Horry County, South Carolina, **touch screen voting machines in 80 percent of the precincts temporarily failed,** and when precincts ran out of paper ballots, voters could not cast ballots in their home precinct.

- In a test-run for an online election in the September 2010 Washington, D.C., primary, a **hacker team was able to change all of the votes to "elect" their own candidates.** The online voting system was days away from being launched in a real election for use by overseas and military voters. After the incident, the Internet voting system was canceled.[viii]

Similar vote-counting errors may go undetected during the 2012 elections unless the mistake is so large and obvious – like the software malfunction in South Dakota – that it can't be ignored, *or* the state has adopted procedures – like the post-election audit done in Florida – as recommended in this report.

Findings

The report assessed each state based on how its laws and procedures matched up to best practices in the categories identified above. These metrics were developed in consultation with leading election officials and security experts — in each of these areas. We rated each state on a five-tier scale, from inadequate through excellent. We determined that five states – Minnesota, New Hampshire, Ohio, Vermont and Wisconsin – are the **best prepared** to catch voting system problems and to protect voters from disenfranchisement due to equipment failures. On the other hand, Colorado, Delaware, Kansas, Louisiana, Mississippi and South Carolina are the six **least-prepared** states. The rest of the states were missing one, two or three key procedures or systems that would adequately protect voters.

Here is a more detailed breakdown of findings in the five categories we assessed:

1) Sixteen states use **paperless machines in some or all counties,** prompting an "inadequate" grade. In other words, these machines produce **no independent record of the vote cast,** which is necessary for recounts or audits. These states are: Arkansas, Colorado, Delaware, Georgia, Indiana, Kansas, Kentucky, Louisiana, Maryland, Mississippi, New Jersey, Pennsylvania, South Carolina, Tennessee, Texas and Virginia. The other 35 states use systems which either produce a paper record or ballot.

2) **On contingency preparation for possible equipment failures,** three states – California, Indiana and Ohio – ranked "excellent," none were ranked "inadequate" and seven states – Colorado, Delaware, Louisiana, Mississippi, Nevada, Utah and West Virginia – rated a "needs improvement." The rest of the 41 states ranked "good," "generally good" or the ranking was not applicable because of the type of equipment used.

3) Twenty states protect voters by **prohibiting electronic return of marked ballots over the Internet** and instead **require the voter's original paper ballot to be returned:** Alabama, Arkansas, Connecticut, Georgia, Illinois, Kentucky, Maryland, Michigan, Minnesota, New Hampshire, New York, Ohio, Pennsylvania, South Dakota, Tennessee, Utah, Vermont, Virginia, Wisconsin, and Wyoming. One state, New Jersey, **permits electronic return** of votes for military and overseas voters, but **requires the physical ballot to be returned as well.** Twenty-four states permit electronic return of votes for military and overseas voters without restrictions, **subjecting the ballots to the risk of corruption:** Alaska, Arizona, California, Delaware, District of Columbia, Florida, Idaho, Indiana, Kansas, Louisiana, Massachusetts, Mississippi, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, Rhode Island, South Carolina, Washington and West Virginia. Six states seek to **contain the risk** by making electronic return of voted ballots available only to a restricted group of voters (e.g., military voters in combat zones): Colorado, Hawaii, Iowa, Maine, Missouri and Texas.

4) Twenty-two states have **paper-based voting systems and conduct audits.** These states either received a "good" or a "needs improvement" depending on the quality of their audits: Alaska, Arizona, California, Connecticut, District of Columbia, Florida, Hawaii, Illinois, Minnesota, Missouri, Montana, Nevada, New Mexico, New York, North Carolina, Ohio, Oregon, Utah, Vermont, Washington, West Virginia and Wisconsin. Four states **require audits but do not use paper-based voting systems statewide and so a portion of their ballots go unaudited.** These states – Colorado, Kentucky, Pennsylvania and Texas – received a "needs improvement" rating. And 25 states conduct **no audits at all** and received an "inadequate" rating: Alabama, Arkansas, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Nebraska, New Hampshire, New Jersey, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Virginia and Wyoming.

5) Four states – Iowa, New Hampshire, North Dakota and Vermont – have **excellent ballot accounting and reconciliation practices,** while another **18 received a "good" ranking:** Alaska, Arkansas, California, Florida, Hawaii, Idaho, Indiana, Kansas, Kentucky, Maine, Massachusetts, Minnesota, Montana, Nevada, North Carolina, Oregon, Washington and Wyoming. Three states received a **"needs improvement"** rating – New Jersey, South Dakota and Utah. The **remaining 26 states ranked as "generally good,"** and none were ranked "inadequate."

Recommendations

Although it takes effort and resources to do so, our best practices have already been implemented in a number of states, with overwhelmingly positive results. We recommend that every state adopt the best practices in this report in order to safeguard our democracy.

We hope that this report serves as a resource guide to election officials, policy makers and concerned citizens alike. Election officials can see and discuss what their peers across the nation are doing to make elections secure and reliable. Similarly, citizens can work with election officials to implement the best practices discussed in the report. Citizens can also use the report to identify and help solve problems that might arise on Election Day.

Overall Voting System Preparedness:

The Best Prepared and the Least Prepared

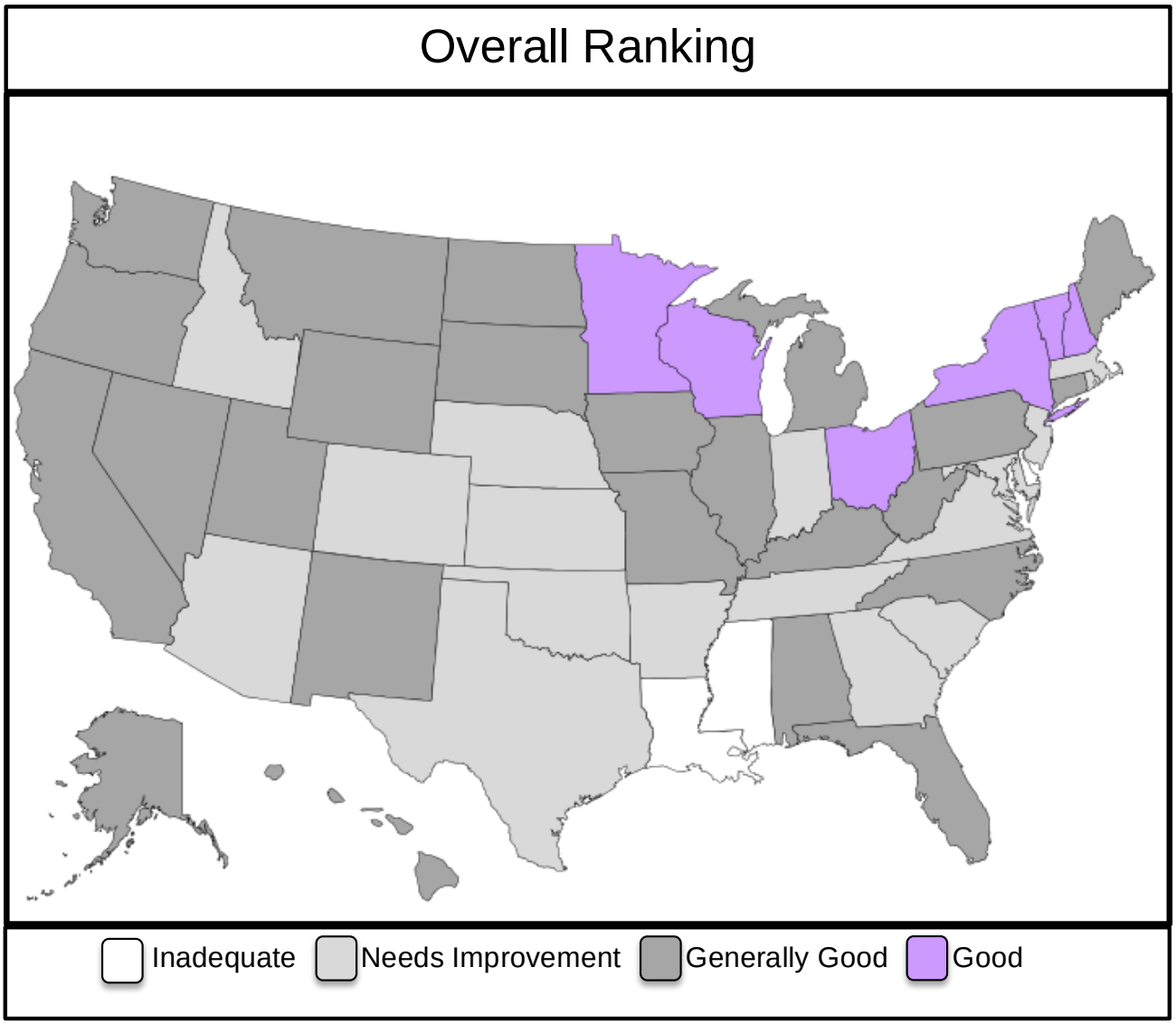

CHART OF STATE RANKINGS

State (Electoral College Votes)*	Overall Rating	Paper Ballots and Records	Polling Place Contingency Plans	Voted Ballot Return for UOCAVA Voters	Post-Election Audits	Ballot Accounting and
AL (9)	Generally Good	Paper Ballots	N/A	Excellent	Inadequate	Generally Good
AK (3)	Generally Good	Paper Ballots	N/A	Inadequate	Good	Good
AZ (11)	Needs Improvement	Paper Ballots	N/A	Inadequate	Needs Improvement	Generally Good
AR (6)	Needs Improvement	Inadequate	Generally Good	Excellent	Inadequate	Good
CA (55)	Generally Good	Combination	Excellent	Inadequate	Good	Good
CO (9)	Needs Improvement	Inadequate	Needs Improvement	Needs Improvement	Needs Improvement	Generally Good
CT (7)	Generally Good	Paper Ballots	N/A	Excellent	Needs Improvement	Generally Good
DE (3)	Inadequate	Inadequate	Needs Improvement	Inadequate	Inadequate	Generally Good
DC (3)	Generally Good	Paper Ballots	N/A	Inadequate	Good	Generally Good
FL (29)	Generally Good	Paper Ballots**	N/A	Inadequate	Needs Improvement	Good
GA (16)	Needs Improvement	Inadequate	Generally Good	Excellent	Inadequate	Generally Good
HI (4)	Generally Good	Paper Ballots	N/A	Needs Improvement	Needs Improvement	Good
ID (4)	Needs Improvement	Paper Ballots***	N/A	Inadequate	Inadequate	Good
IL (20)	Generally Good	Combination	Good	Excellent	Needs Improvement	Generally Good
IN (11)	Needs Improvement	Inadequate	Excellent	Inadequate	Inadequate	Good
IA (6)	Generally Good	Paper Ballots	N/A	Needs Improvement	Inadequate	Excellent
KS (6)	Needs Improvement	Inadequate	Good	Inadequate	Inadequate	Good
KY (8)	Generally Good	Inadequate	Good	Excellent	Needs Improvement	Good
LA (8)	Inadequate	Inadequate	Needs Improvement	Inadequate	Inadequate	Generally Good
ME (4)	Generally Good	Paper Ballots	N/A	Needs Improvement	Inadequate	Good
MD (10)	Needs Improvement	Inadequate	Generally Good	Excellent	Inadequate	Generally Good
MA (11)	Needs Improvement	Paper Ballots	N/A	Inadequate	Inadequate	Good
MI (16)	Generally Good	Paper Ballots	N/A	Excellent	Inadequate	Generally Good
MN (10)	Good	Paper Ballots	N/A	Excellent	Good	Good
MS (6)	Inadequate	Inadequate	Needs Improvement	Inadequate	Inadequate	Generally Good
MO (10)	Generally Good	Paper Ballots	N/A	Needs Improvement	Good	Generally Good
MT (3)	Generally Good	Paper Ballots	N/A	Inadequate	Good	Good
NE (5)* **	Needs Improvement	Paper Ballots	N/A	Inadequate	Inadequate	Generally Good
NV (6)	Generally Good	VVPAT DRE	Needs Improvement	Inadequate	Generally Good	Good
NH (4)	Good	Paper Ballots	N/A	Excellent	Inadequate	Excellent

State (Electoral College Votes)*	Overall Rating	Paper Ballots and Records	Polling Place Contingency Plans	Voted Ballot Return for UOCAVA Voters	Post-Election Audits	Ballot Accounting and Reconciliation
NJ (14)	Needs Improvement	Inadequate	Good	Generally Good	Inadequate	Needs Improvement
NM (5)	Generally Good	Paper Ballots	N/A	Inadequate	Excellent	Generally Good
NY (29)	Good	Paper Ballots	N/A	Excellent	Generally Good	Generally Good
NC (15)	Generally Good	Combination	Generally Good	Inadequate	Good	Good
ND (3)	Generally Good	Paper Ballots	N/A	Inadequate	Inadequate	Excellent
OH (18)	Good	Combination	Excellent	Excellent	Needs Improvement	Generally Good
OK (7)	Needs Improvement	Paper Ballots	N/A	Inadequate	Inadequate	Generally Good
OR (7)	Generally Good	Paper Ballots	N/A	Inadequate	Generally Good	Good
PA (20)	Generally Good	Inadequate	Good	Excellent	Needs Improvement	Generally Good
RI (4)	Needs Improvement	Paper Ballots	N/A	Inadequate	Inadequate	Generally Good
SC (9)	Needs Improvement	Inadequate	Good	Inadequate	Inadequate	Generally Good
SD (3)	Generally Good	Paper Ballots	N/A	Excellent	Inadequate	Needs Improvement
TN (11)	Needs Improvement	Inadequate	Generally Good	Excellent	Inadequate	Generally Good
TX (38)	Needs Improvement	Inadequate	Generally Good	Needs Improvement	Needs Improvement	Generally Good
UT (6)	Generally Good	VVPAT DRE	Needs Improvement	Excellent	Needs Improvement	Needs Improvement
VT (3)	Good	Paper Ballots	N/A	Excellent	Needs Improvement	Excellent
VA (13)	Needs Improvement	Inadequate	Good	Excellent	Inadequate	Generally Good
WA (12)	Generally Good	Paper Ballots	N/A	Inadequate	Needs Improvement	Good
WV (5)	Generally Good	Combination	Needs Improvement	Inadequate	Good	Generally Good
WI (10)	Good	Paper Ballots	N/A	Excellent	Generally Good	Generally Good
WY (3)	Generally Good	Paper Ballots	N/A	Excellent	Inadequate	Good

* Electoral College Votes may be split in Maine and Nebraska
** Paperless DREs are only used for disability access in Florida, and are still used in 64 of 67 counties
*** Idaho also uses punch cards in four counties
****Where DREs are used in Missouri, paper ballots are also available for the general election. In Wisconsin, a handful of jurisdictions use DREs as the standard voting system in the polling place, but also make paper ballots available as an option to voters. One county in Wyoming uses DREs.

[i] Our Vote Live Election Incidents, Voting Equipment Problems, 2010 General Election, *available at* http://electionawareness.appspot.com/reports?election=247001&subset=252001&state=--&followup=-1&sortBy=created&sortOrder=desc&county=--&user=-1
http://electionawareness.appspot.com/reports?election=247001&subset=252001&state=--&followup=-1&sortBy=created&sortOrder=desc&county=--&user=-1 (last visited June 28, 2012).

[ii] *See*, *e.g.*, Cameron W. Barr, *Md. Election Problems Fuel Push for Paper Records,* WASHINGTON POST, Sept. 17, 2006, at A4; Michael Scherer, *Electronic Voting Machine Problems in Myrtle Beach*, TIME, SWAMPLAND BLOG, (Jan. 19, 2008), http://swampland.time.com/2008/01/19/electronic_voting_machine_prob/.

[iii] *See*, *e.g.*, Brian C. Mooney, *Voting Errors Tallied Nationwide*, BOSTON GLOBE, Dec. 1, 2004; Mary Pat Flaherty, *Ohio Voting Machines Contained Programming Error That Dropped Votes*, WASHINGTON POST, Aug. 23, 2008. *See also* Josh Sweigart, *Ohio Officials Prepare for Voting-Machine Breakdowns*, HAMILTON JOURNAL-NEWS, Aug. 28, 2008.

[iv] *See*, *e.g.*, John Archibald & Brett J. Blackenridge, *Early Printout Was Only Source of Wrong Tally,* BIRMINGHAM NEWS, Nov. 10, 2002; Nedra Linsey, *McComish's District 20 2nd-place Finish Confirmed,* ARIZ. REPUBLIC, Sept. 24, 2004; Ben Cunningham, *Malfunction Delays Hasting Results*, GRAND RAPIDS PRESS, May 4, 2006.

[v] *See*, *e.g.*, *More than 4,500 North Carolina Votes Lost Because of Mistake in Voting Machine Capacity,* USA TODAY, Nov. 4, 2004; Tim O'Meilia, *State Faults Elections Office for Lost Votes*, PALM BEACH POST, July 2, 2008.

[vi] Emilie Rusch, *Scanner Glitch Blamed for Election Miscounts*, RAPID CITY JOURNAL, June 3, 2009, http://rapidcityjournal.com/news/local/scanner-glitch-blamed-for-election-miscounts/article_02049da8-257a-51d4-a6c3-295fa0ec0da6.html.

[vii] Jaikumar Vijayan, *E-voting System Awards Election to Wrong Candidates in Florida Village,* COMPUTERWORLD, (Apr. 4, 2012), http://www.computerworld.com.au/article/420523/e-voting_system_awards_election_wrong_candidates_florida_village/?fp=4&fpid=18

[viii] Wheaton, Sarah, *Voting Test Falls Victim to Hackers,* The New York Times, (Oct. 8, 2010), http://www.nytimes.com/2010/10/09/us/politics/09vote.html

Verified Voting Foundation
Common Cause
Holding Power Accountable
Rutgers
School of Law | Newark