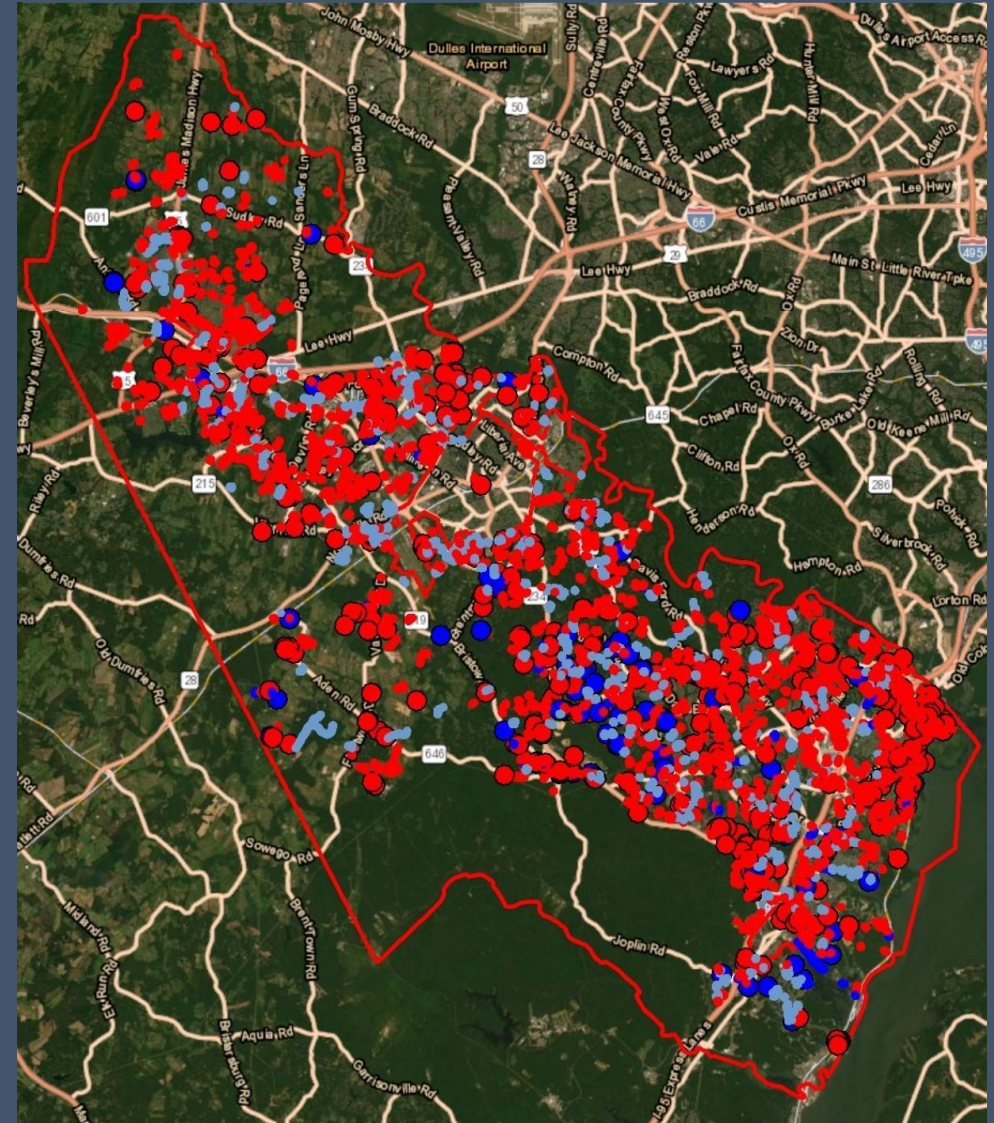


Mindfulness and Cognition in Inspections, Treatments, and Communication

Eli Hosen

Inspecting and Larviciding

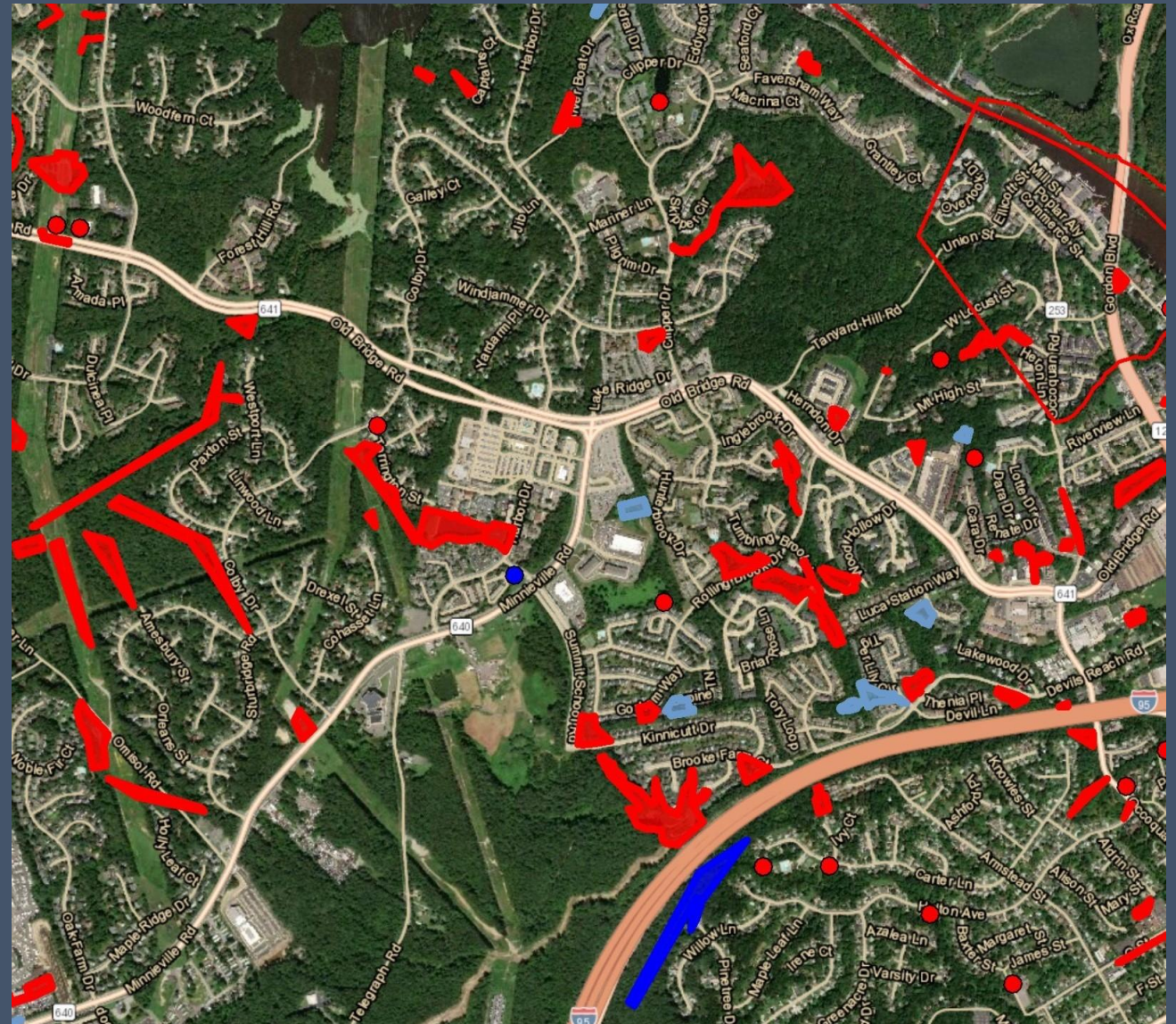
- 5 Field Biologists focused on inspections and larval treatments
- 21 distinct classifications of habitat
- Applications range from 1 ft² to 1 acre
- Average: 500 ft²
- Median: 225 ft²
- Standard deviation: 2,213 ft²
- 2215 sites in total



Sites of every shape, material, and size

- | | | |
|---------------|-----------------|-------------|
| MS4 SWM | Flooded Woods | Pipes |
| Non-MS4 SWM | Puddle/Tire Rut | Tree Fall |
| Stream Bed | Concrete Flood | Aquaduct |
| Wetland | Control Channel | Tree Hole |
| Woodland Pool | Pond | Flooded Bay |
| Ditch | Cattails | Junkyard |
| Artificial | Storm-drain | Tire Pile |
| Container | BMP | |

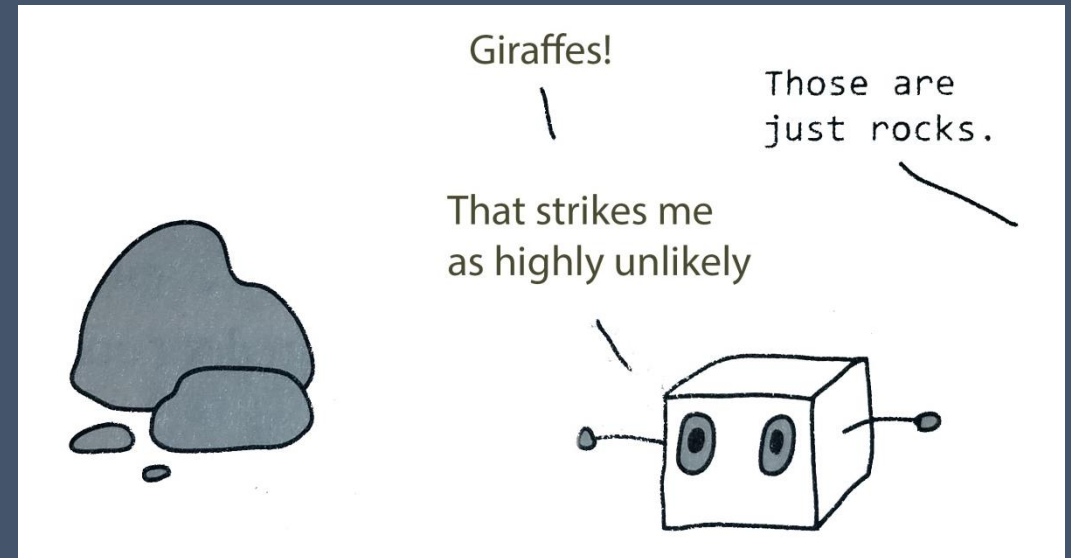
Imagery is just a guide; Field Biologists make a wide variety of judgement calls and estimations throughout any given day



The Brain is Lazy

- Schemas and heuristics are built up in brains to organize, codify, ease recall, and structure problem-solving and learning
- When these processes fail us in some way they are typically described as a sort of 'Cognitive Bias'
- Repetitive tasks over a day, weeks, months especially susceptible to 'attentional shearing'
- Multitasking is a misnomer - actually "mental juggling"
 - Each task is slower or with more errors
 - The easier or more habitual task is performed even slower
 - Long-term memory encoding is worse

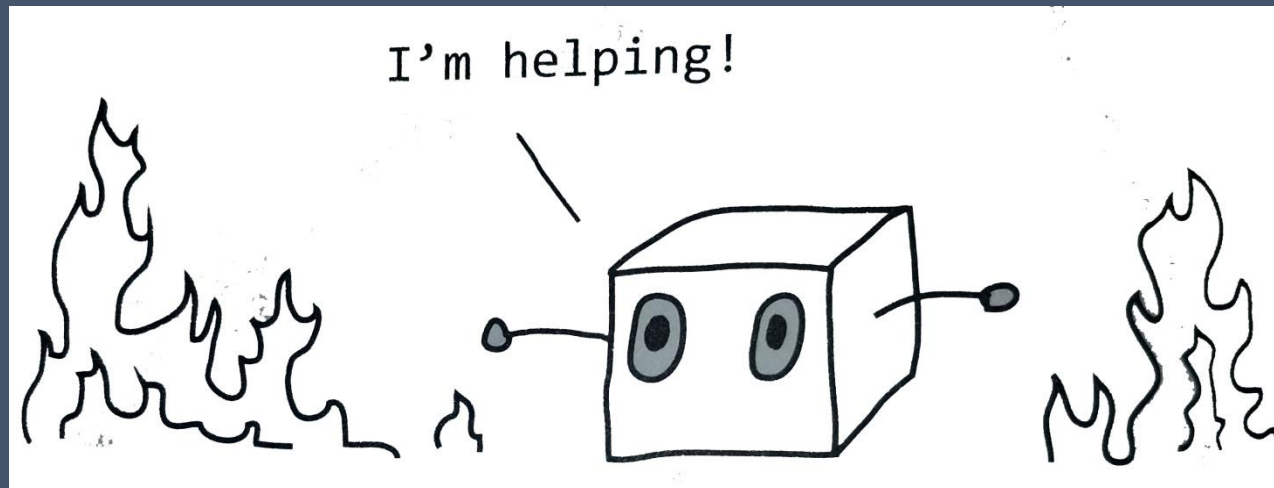
- Machine Learning & Artificial Intelligence (AI) generally accurately reflect base aspects of human brains
 - AI will do *exactly* what you tell it to. Or at least it will try its best
 - AI will take the path of least resistance
 - Mysterious black boxes



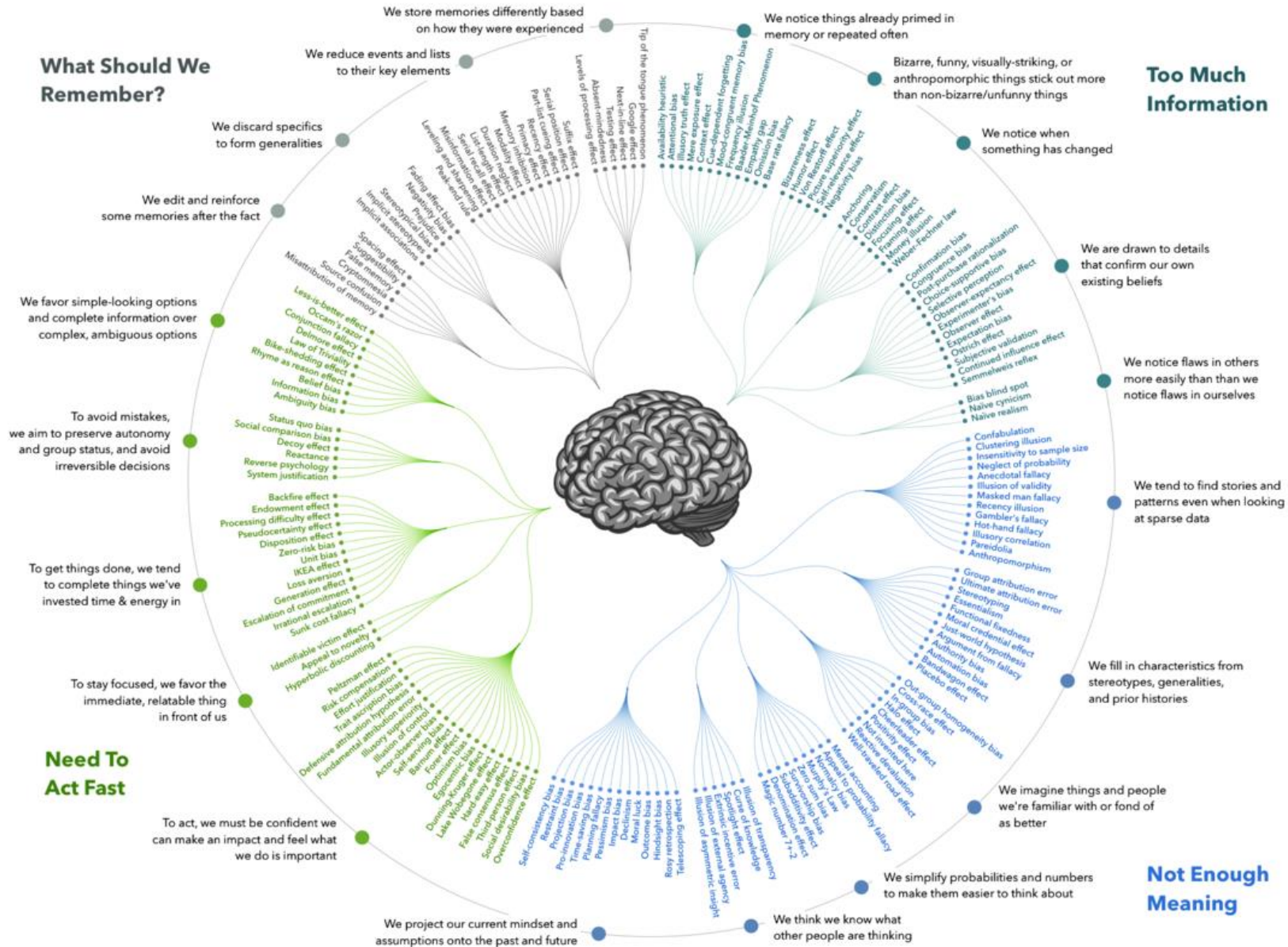


What and Why

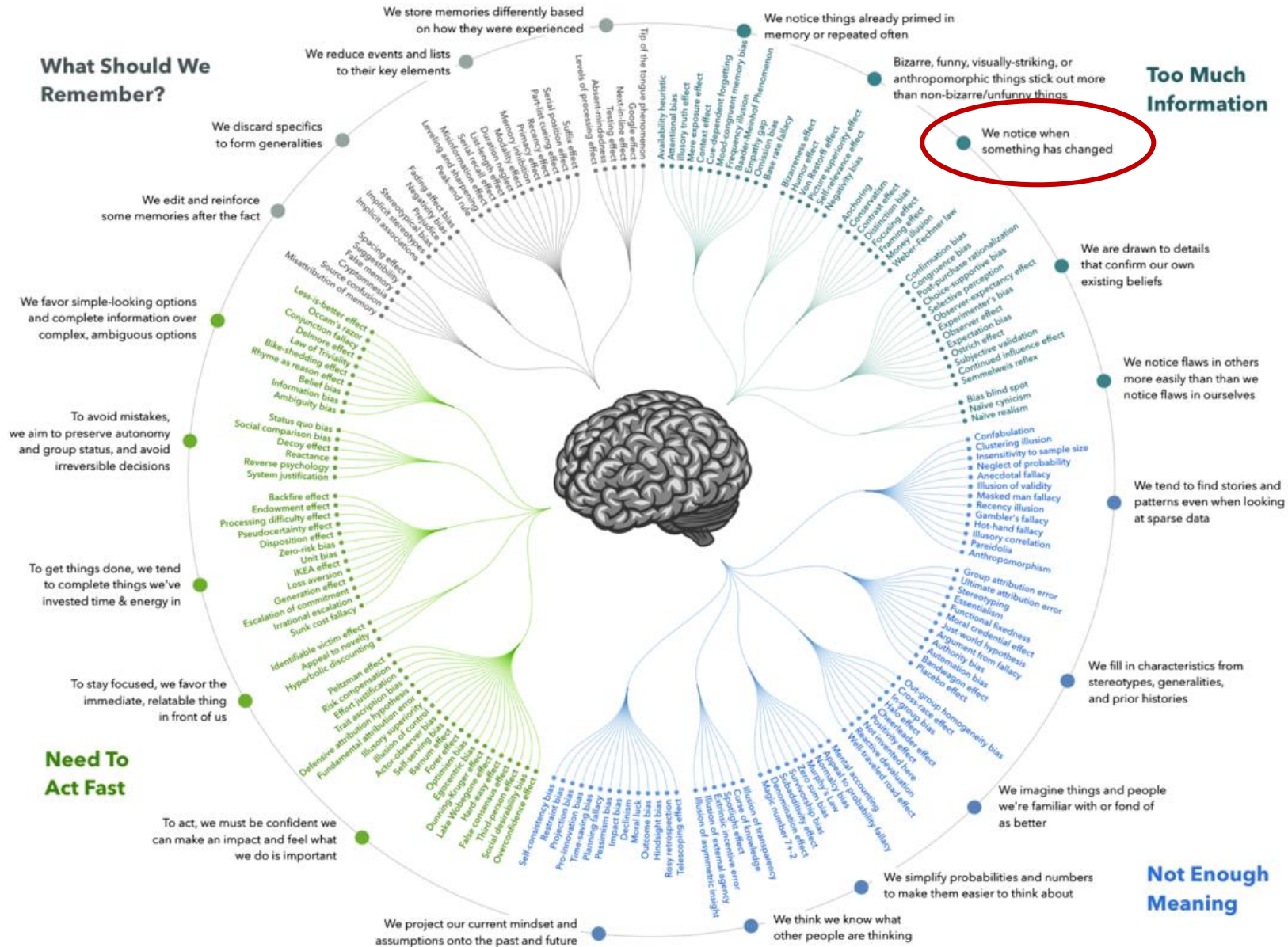
- Regulatory
- Increase efficacy
- Economics & Budget
- Training & Education
- Confidence in communication
 - Oversight requirements
 - Citizen assurances



COGNITIVE BIAS CODEX



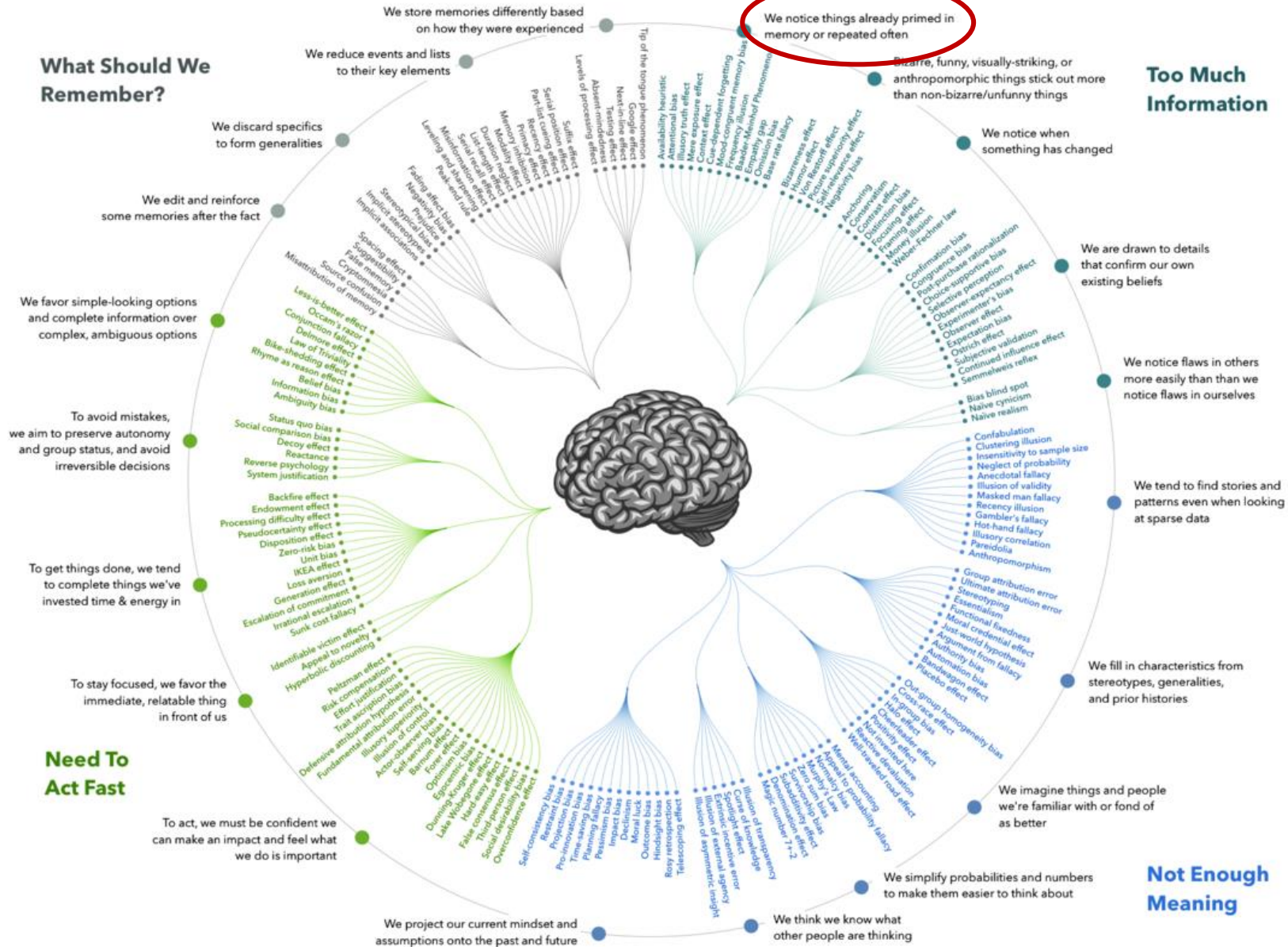
COGNITIVE BIAS CODEX



Anchoring

- Overreliance on the first or biggest piece of information available
- When asked to guess the result of $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$ the guess is typically 4x – 8x the estimation of $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$
- Data analyses tend to skew to the mean when normed
- Looking at a previous inspection's numbers before looking at the site
- Awareness and practice is the best bias mediation

COGNITIVE BIAS CODEX



Priming

- Similar to anchoring
- Activating a domain of thinking/memory that affects subsequent thought and info recall
- Conceptually like ‘if you have a hammer [that is closest], every problem is a nail’
- Read the brief description of a person (only one list or the other)

- Intelligent
- Skillful
- Industrious
- Warm
- Determined
- Practical
- Cautious

- Intelligent
- Skillful
- Industrious
- Cold
- Determined
- Practical
- Cautious

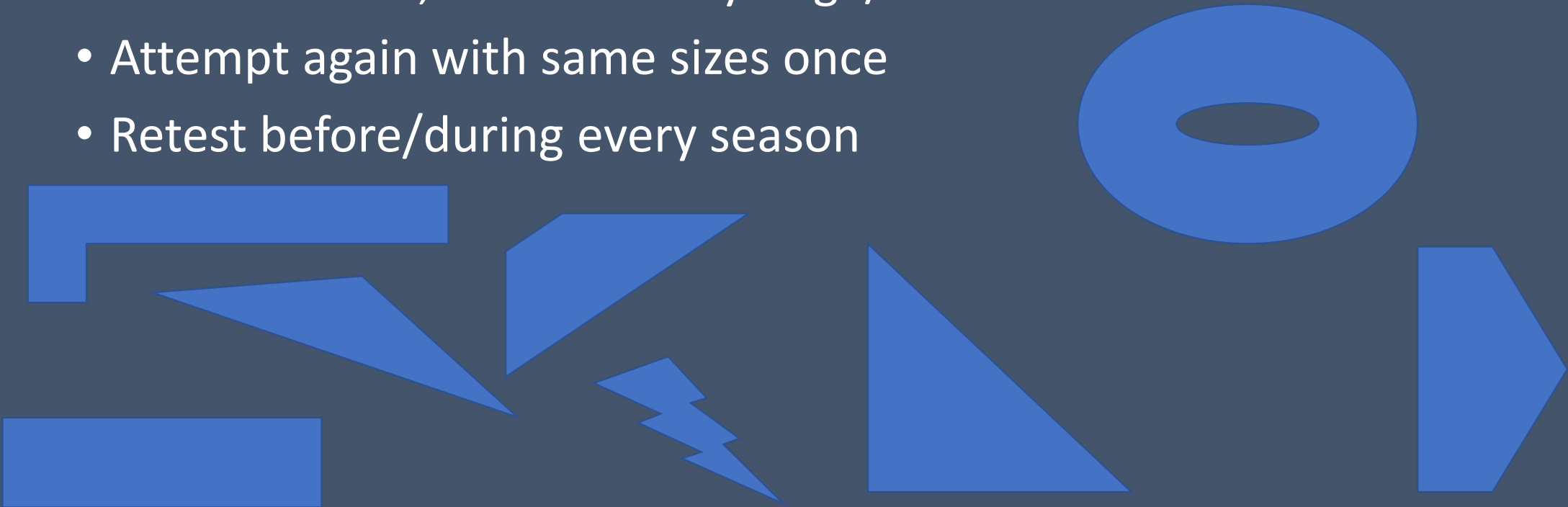
Priming

- Circle one word in each set that best describes the person you just read about.

Generous	—	Ungenerous
Shrewd	—	Wise
Unhappy	—	Happy
Irritable	—	Good-natured
Humorous	—	Humorless
Sociable	—	Unsociable
Popular	—	Unpopular
Unreliable	—	Reliable
Important	—	Insignificant

Calibration of visual sensory information

- Set up different shapes of different areas from 5 ft² to 1,800 ft²
- Everyone takes turns measuring and estimating the square footage
- See how close, if consistently large/small
- Attempt again with same sizes once
- Retest before/during every season



Calibration of knowledge estimates

- 1) Which is closer to the office?
 - a. Quantico town
 - b. **Town of Occoquan?**50% 60% 70% 80% 90% 100%
- 2) Which trap site has the higher average Culex pip-res catch?
 - a. **Kerrydale**
 - b. Colombia50% 60% 70% 80% 90% 100%
- 3) Do unborn Great White Sharks eat each other in utero?
 - a. **True**
 - b. False50% 60% 70% 80% 90% 100%
- 4) Which is larger?
 - a. Volleyball
 - b. **Basketball**50% 60% 70% 80% 90% 100%
- 5) Which is bigger
 - a. **Earth**
 - b. Mars50% 60% 70% 80% 90% 100%
- 6) Which is bigger
 - a. **Canada**
 - b. Brazil50% 60% 70% 80% 90% 100%
- 7) A dipper can hold a max of 20 oz of liquid
 - a. True
 - b. **False**50% 60% 70% 80% 90% 100%
- 8) Which Ash has leaflets closer to the rachis?
 - a. White
 - b. **Green**50% 60% 70% 80% 90% 100%
- 9) Which is closer to the office
 - a. **Nate's house**
 - b. Evergreen Deli50% 60% 70% 80% 90% 100%
- 10) Can dolphins recognize themselves in a mirror?
 - a. **Yes**
 - b. No50% 60% 70% 80% 90% 100%
- 11) What is the scientific name of the Barred Grass Snake?
 - a. Natrix tessellate
 - b. **Natrix helvetica**50% 60% 70% 80% 90% 100%
- 12) What is the margherita pizza style name after?
 - a. **Person**
 - b. Place50% 60% 70% 80% 90% 100%
- 13) What temperature in Celsius does water boil?
 - a. 200
 - b. **100**50% 60% 70% 80% 90% 100%
- 14) Dragonflies and Damselflies are part of the Odonata order of insects
 - a. **True**
 - b. False50% 60% 70% 80% 90% 100%

Calibration of knowledge estimates

- Each question has a confidence self-rating
 - 50% reflects a pure guess, a 50-50 chance between the options
 - 100% (should) reflect no doubt knowledge

	Knowns	Unknowns
Knowns		
Unknowns		

After a full round of questions (20+), if a person is 'well-calibrated' in what they know they know; then the proportion of questions answered correctly for each confidence rating should match up.

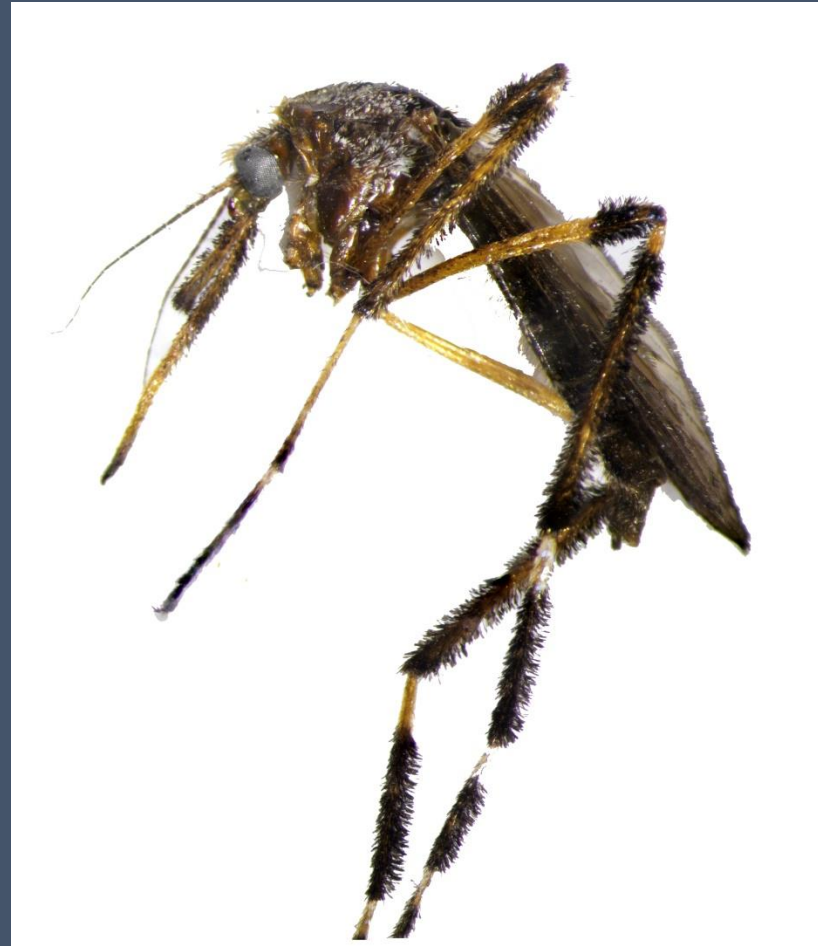
- All questions that a person rated their confidence as 100% for should be answered correctly
- 90% of questions with a 90% confidence rating should be correct and on and on
- This is almost never the case
- Difference factors can influence one's confidence in their knowledge

Confirmation bias

- People are more likely to look for, use, and recall information that matches what they already believe
 - Increasing their confidence in erroneous beliefs
- Negative/wrong/erroneous activities are more likely to be perpetuated
- Encountered when interacting with citizens who 'have done their research'
- Pretty much the internet

Serial Recall

- People can generally hold at most 7 different items in their head
- Primacy-recency effect
 - When remembering a list, one is more likely to easily recall the first and last items
- Susceptible to priming in cued recall



Focus and Mindfulness Exercise Examples

- Meditation
- Yoga/stretching
- Exercise
- Get a second pair of eyes on data and inspections
 - Quality control inspections behind treatments
- Planning and writing stuff down
- Practice makes *permanence*



Stay safe out there!

