



*Only skilled candidates who know how to communicate find jobs!*



QUERCUS GR

# GRØN DYST

## What the jury evaluates on:

- Is the project well-structured and **clearly communicated?**
- Is the project **technology useful** and **realization probable?**
- To what extent is the **project visionary** and/or innovative?
- To what extent is the project's **positive environmental** and energy impact probable?

# Outline

1. Purpose
2. Content
3. Design
4. Construction
5. Tips
6. Summary/Checklist
7. Q&A

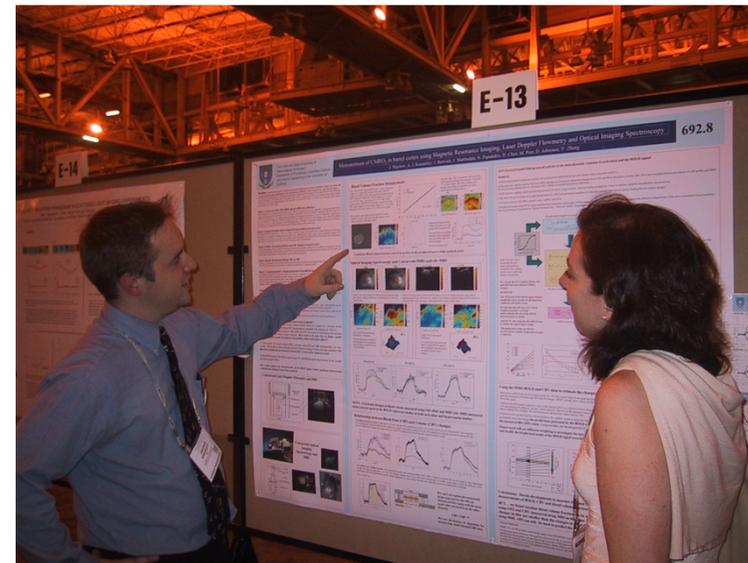
...including: 8 poster mistakes you should  
AVOID!



# Purpose

# WHY USE POSTERS?

1. A summary in a format that is **easily** and widely **accessible**
2. Reach a **large audience**
3. Allow **many people** to **report** findings in a **single session**
4. Allow people with similar interests to **meet and discuss** detailed topics or ideas



# Purpose

## – On the surface:

- To inform
- To communicate findings and ideas to peer
- Network

## – Beneath the surface:

- To **persuade**, influence, compeed

# An efficient poster is:

## Focused, Graphic & Ordered

Focused

Focused on a single message.

Graphic

Lets graphs and images tell the story; uses text sparingly.

Ordered

Keeps the sequence well-ordered and obvious.

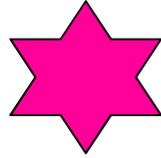
# It must talk to the audience

Consider:

- Who is your audience?
- What is your key message?
- What content do you need to target and persuade them?
- What design elements will work best for your purpose?

Avoid..

Mistake 1



**Unclear message**



Do not expect that the audience  
will try to **GUESS** your message!

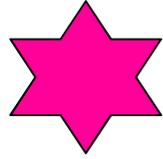


# Ask yourself :what is my message?

✓ 1 sentence



## Mistake 2



# Not addressing your target audience!



**Select your  
target audience!**



- Who are you talking to?
- Peers?
- Specialists?
- Customers?
- Investors?
- Other?



**Don't rely on** everyone understanding your message!  
**Make it targeted!**



$$S_{12}^2 = c^2 \Delta t_{12}^2 - \Delta z_{12}^2 = c^2 (\Delta t_{12})^2 - (\Delta z_{12})^2 \equiv (S'_{12})^2$$

$$\Delta t_{12} = (t_2 - t_1); \Delta t'_{12} = (t'_2 - t'_1); \Delta z_{12} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2};$$

$$c^2 \Delta t_{12}^2 - \Delta z_{12}^2 = c^2 (\Delta T_{12})^2; \Delta t'_{12} \left(1 - \frac{\Delta z_{12}^2}{\Delta t_{12}^2 c^2}\right) = (\Delta T_{12})^2$$

$$S_{12}^2 = c^2 \Delta t_{12}^2 - v^2 \Delta t_{12}^2 = \Delta t_{12}^2 (c^2 - v^2) > 0$$

$$\Delta t'_{12} \left(1 - \frac{v^2}{c^2}\right) = (\Delta T_{12})^2$$



# Content







## Southern Flounder Exhibit Temperature-Dependent Sex Determination

J. Adam Luckenbach<sup>1</sup>, John Godwin and Russell Borski  
 Department of Zoology, Box 7617, North Carolina State University, Raleigh, NC 27695



### Introduction

Southern flounder (*Paralichthys lethostigma*) support valuable fisheries and show great promise for aquaculture. Female flounder are known to grow faster and reach larger adult sizes than males. Therefore, information on sex determination that might increase the ratio of female flounder is important for aquaculture.

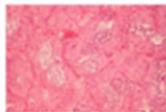
### Objective

This study was conducted to determine whether southern flounder exhibit temperature-dependent sex determination (TSD) and if growth is affected by rearing temperature.

### Methods

- Southern flounder broodstock were strip spawned to collect eggs and sperm for *in vitro* fertilization.
- Hatched larvae were weaned from a natural diet (postlarv *Artemia*) to high protein pelleted feed and fed until satiation at least twice daily.
- Upon reaching a mean total length of 40 mm, the juvenile flounder were stocked at equal densities into one of three temperatures 18, 23, or 28°C for 245 days.
- Gonads were preserved and later sectioned at 2-6 microns.
- Sex-distinguishing markers were used to distinguish males (spermatogenesis) from females (oogenesis).

### Histological Analysis

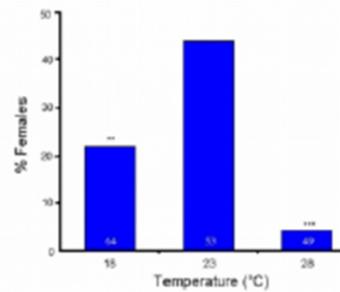


Male Differentiation



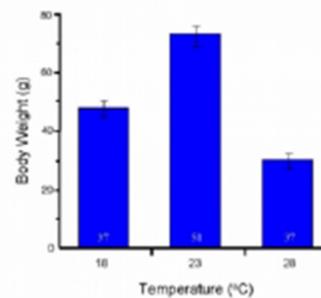
Female Differentiation

### Temperature Affects Sex Determination

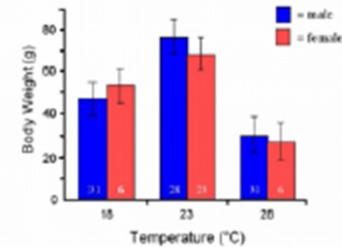


(\*\*P < 0.01 and \*\*\*P < 0.001 represent significant deviations from a 1:1 male:female sex ratio)

### Rearing Temperature Affects Growth



### Growth Does Not Differ by Sex



### Results

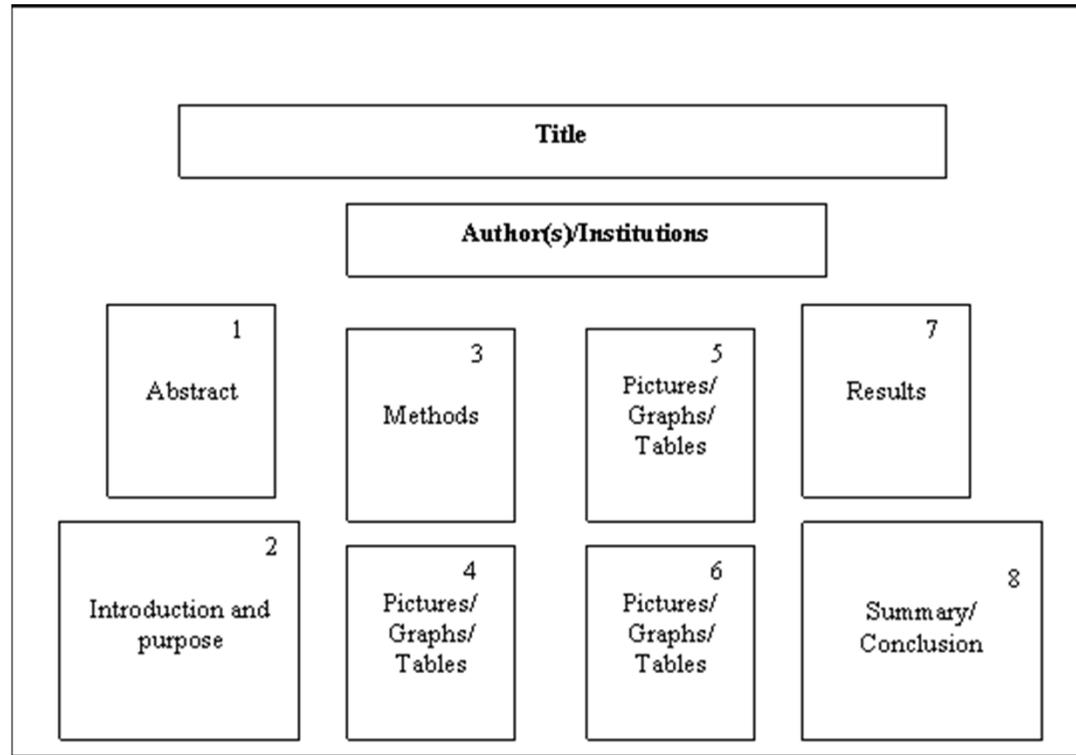
- Sex was discernible in most fish greater than 120 mm long.
- High (28°C) temperature produced 4% females.
- Low (18°C) temperature produced 22% females.
- Mid-range (23°C) temperature produced 44% females.
- Fish raised at high or low temperatures showed reduced growth compared to those at the mid-range temperature.
- Up to 245 days, no differences in growth existed between sexes.

### Conclusions

- These findings indicate that sex determination in southern flounder is temperature-sensitive and temperature has a profound effect on growth.
- A mid-range rearing temperature (23°C) appears to maximize the number of females and promote better growth in young southern flounder.
- Although adult females are known to grow larger than males, no difference in growth between sexes occurred in age-0 (< 1 year) southern flounder.

### Acknowledgements

The authors acknowledge the National Kennedy Program of the National Marine Fisheries Service and the University of North Carolina Sea Grant College Program for funding this research. Special thanks to Len Wase and Darin Shingo for help with the work.



# Content

- Typical components of a poster:
  - Title
  - Author(s) - names & affiliations
  - Abstract or Summary - approach & main findings
  - Introduction
  - Materials & Methods - describing experimental or field research, background theory or historical overview
  - Results - key findings
  - **Conclusions**
  - Acknowledgements, References & Sources



# Your Ingenious Teaser Right Here to Woo Them Down to the Body

Thorswede@karolinska.se

## Conclusions first: 44 pt bold

Always put the most important part - your conclusions - first! Place your conclusions in the upper left hand corner of your poster.

Prepare your material from the reader's perspective. What was done, by who and your conclusion has to be understood within a couple of second's reading! Use active voice when writing the text. **Textsize: 34 pt regular**



© Department of Neurology  
Image captioned below

## Introduction

Posters are primarily visual presentations. Your poster should be dominated by self-explanatory illustrations such as graphs and pictures while the amount of text should be kept to the minimum.

## Your aim

Your poster is an advertisement for your research and as such it needs to be eye-catching and straight to the point. You only have seconds, or at best a few minutes to attract the attention of the visitor to a poster session. Keep your message short and clear

## Your message

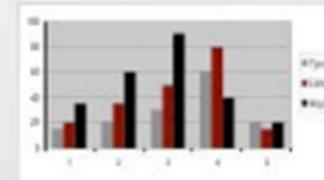
Keep your message clear and your text concise. Decide what is relevant for this poster and try to get your message across to your target group.

## Layout, photos and print

Contact [Mediahygien](#) at University Library for help with layout and Image enhancement. For printouts and professional photographers contact [Bildmakarna](#). For more information: [www.h.karolinska.se/ky/ky.asp](http://www.h.karolinska.se/ky/ky.asp)



Always write your title caption below



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## Tips:

The best font for text blocks that are as short as they should be on a poster is a Sans Serif typeface family. Therefore, use sans serif fonts such as Arial or **Verdana** rather than serif fonts like Times or Courier. **AVOID CAPITAL LETTERS IN TEXTS THAT ARE LONGER THAN ONE LINE, SINCE THEY ARE MORE DIFFICULT TO READ.**

## Handouts

If you succeed in getting the reader's attention, provide her/him with more detailed information in the form of handouts or printed articles. Include references on your handout instead of your poster.

It is always nice to put in a picture and write some few short notes of what's going on in the future. Put handouts, business cards, nearby - on a table or in an envelope hung with the poster.



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Department of Neurology  
Tel: 08 888 6666

Mediahygien: Mediahygien  
Tel: 08 888 6666



# Focus your content

- What is the one **main point** you want to make?
- Use a **statement**, diagram or image that will **grab** your audience's **attention**
- Make it **clear** what your **topic or theme** is from a **distance of 2 - 3 meters**
- In most situations, your audience will have a **limited time** to view posters



# Your Ingenious Teaser Right Here to Woo Them Down to the Body

Thorswede@karolinska.se

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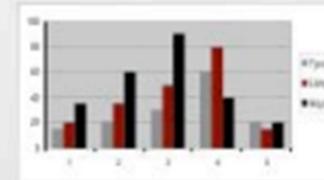
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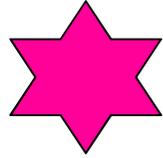
Department of Neurology  
Tel: 08 883 6000

Mediahygien: Mediahygien  
Tel: 08 883 6000



Avoid..

## Mistake 3



Not having an  
**ATTRACTIVE** title



Mistake

4

# Too much information





Don't display ALL your knowledge and information in the poster.

# Avoid **Meaningless** data

WHERE? ME? How? Are you sure?  
How? How? What?  
Why? WHERE?  
WHEN?

Support your **key message!**

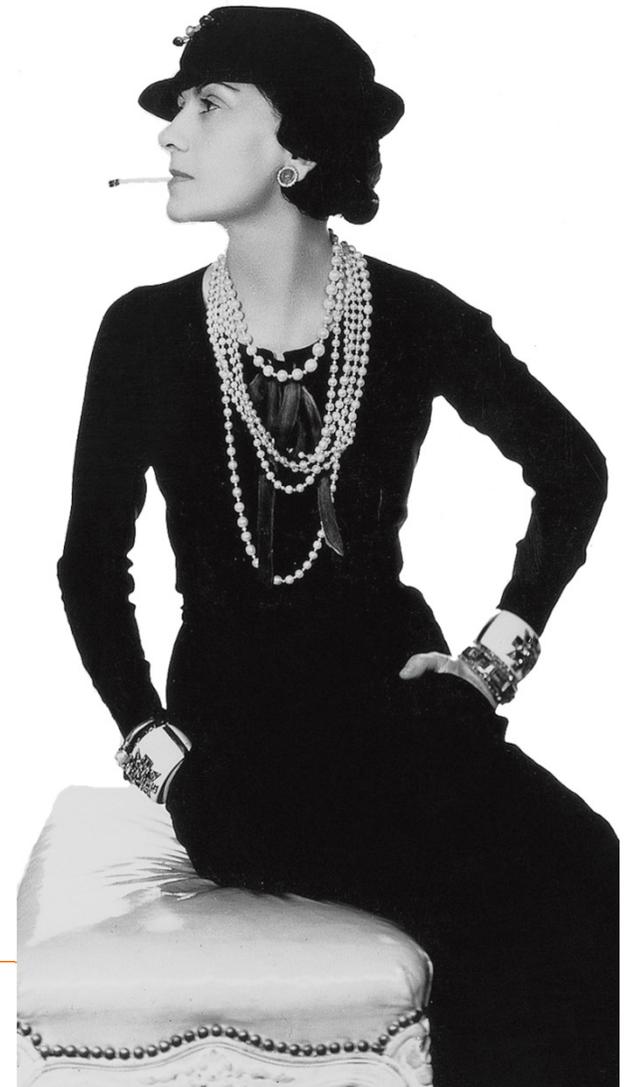


**Delete** everything  
that doesn't support  
your key message!



*"Less is more."*  
- Coco Chanel

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Transform your  
data into  
something  
**meaningful.**

Work on your **conclusion!**

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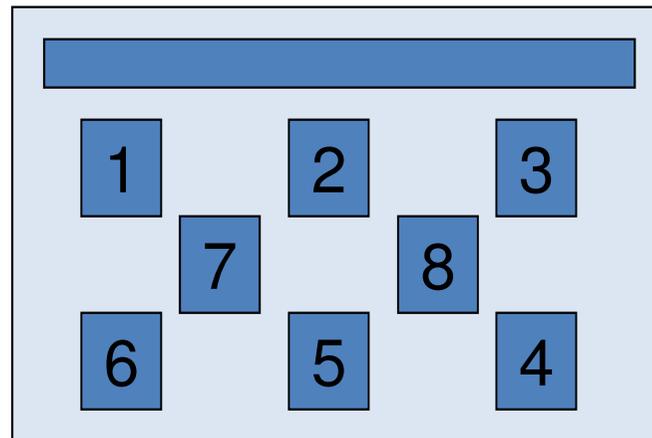
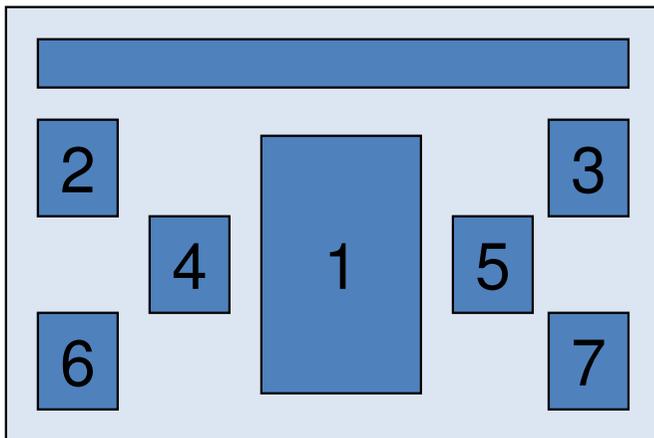
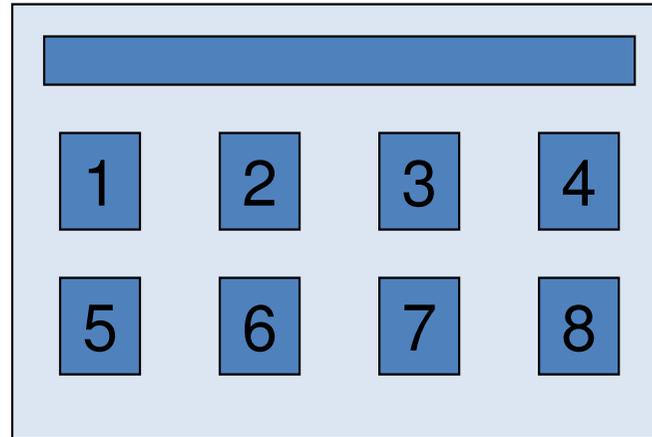
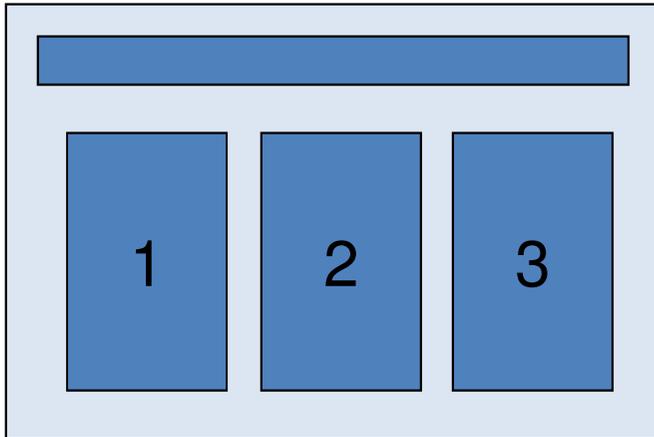


# Design

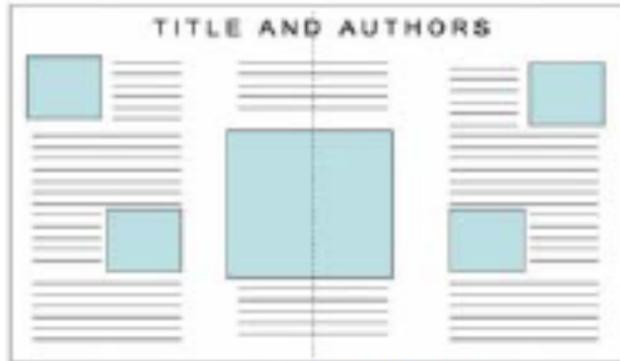
How do you want your viewers to read your poster?



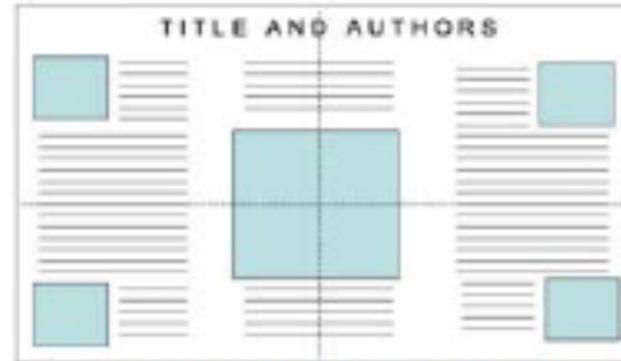
# Content Paths



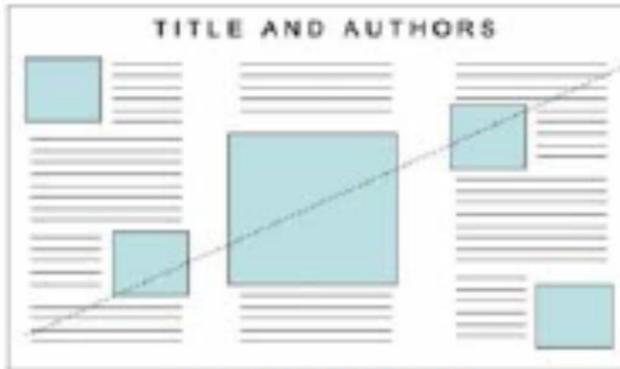
# Symmetry



Horizontal Symmetry



Horizontal & Vertical Symmetry



Diagonal Symmetry



Asymmetry

# Design: Visual

- **Overall design**
  - consider an overall striking **design, related to the topic.**
- **Colour**
  - use sparingly to emphasize, **make distinct,** or **connect** information.
  - keep **proper contrast** between background and text.
- **Fonts**
  - use **large, simple** fonts (24pt+) to make text readable from at least 2 meters
- **White Space**
  - adequate **clear space** will direct attention to key elements

# Design: Visual

- **Focal point**
  - Create **focal point** by e.g. headline, picture, graph or text
- **Guidelines**
  - Provide **guidelines** such as **arrows** from one panel to another, or **numbering** your headings
- **Balance**
  - Provide a **balance** of text, graphics, and other visual elements (colour, white space, etc.)
  - **40% graphics** is suggested

# HOW A COMMON SPECIES

# WENT EXTINCT

THE STORY OF THE **PASSENGER PIGEON**  
(*ECTOPISTES MIGRATORIUS*)

JESSICA STANTON  
STONY BROOK UNIVERSITY, New York

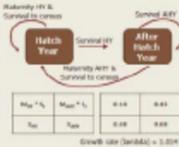
## INTRODUCTION

Once the most abundant land species in North America, the passenger pigeon (*Ectopistes migratorius*) was so numerous many observers did not believe they could ever be at risk of extinction. Over-harvest and habitat loss have each been proposed as the primary factor leading to the extinction of the passenger pigeon. I developed a temporary dynamic and spatially explicit modeling framework incorporating multiple lines of historical and biological evidence in order to quantitatively explore the likelihood of different extinction scenarios involving habitat loss and harvest.

## THE MODELS:

### POPULATION MODEL

I constructed a matrix-based model to simulate the effects of risk factors faced by the population during the 19<sup>th</sup> century including habitat loss and commercial hunting. I parameterized the model as much as possible from historic accounts (primarily Schorger 1955). When parameter data was not available for *E. migratorius* data from similar extant relatives were used. I created a female-only model run using RAMAS GIS (Alcazar 2005).



### DISTRIBUTION MODEL



Variable*	Rationale
Temperature seasonality	Species distribution
Total annual growing season	--
Max 1d/30d/60d/90d	--
Most long, coldest quarter	Nest preservation
Total snowy coldest quarter	--
Start growing season	--
April temperature range	Nest resolution
Historical human pop.	Forest type
Slope resolution	--

\* Values available are based on data from 1980



## THE RISK FACTORS:

### COMMERCIAL HARVEST

Although long prized by both Native Americans and settlers, a commercial industry based on passenger pigeons was only made possible with the expansion of the railroad and telegram communication in the mid 1800<sup>s</sup>. I modeled commercial harvest at two levels based on witness and rail records:

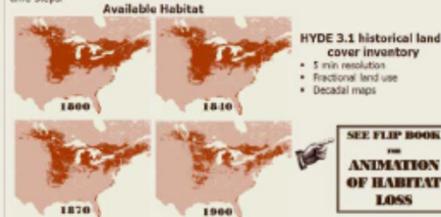
- Best estimate: average annual estimates > 900,000 females
- High: highest ever recorded estimates applied to all years > 5 million females

### NEST DISTURBANCE

Passenger pigeons nested in densely packed colonies which were the primary location where the commercial harvest took place. This also made the colonies susceptible to high incidence of nest failure due to this disturbance on the breeding grounds. Catastrophic nest disturbance was modeled as the probability of a loss of 70% of hatch year birds. In most scenarios the probability of this event was 5% before 1850 and 20% afterwards. Under a high nest disturbance scenario, the probability after 1850 was increased to 30%.

## HABITAT LOSS

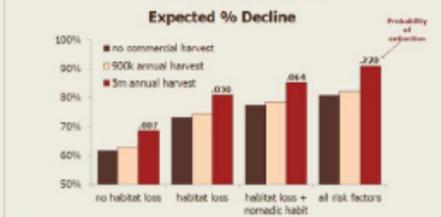
Baseline habitat suitability was proportionally reduced each year to simulate conversion of forest to cropland and pasture. Land conversion was based on the HYDE 3.1 historical land-cover inventory (Klein Goldewijk et al. 2010, 2011) which uses a spatial allocation algorithm based on population, available technology, suitability of land for agriculture (soil, slope, distance to water), and climate. Decadal maps were linearly interpolated to annual time-steps.



## NOMADIC COLONIAL NESTING

A successful nesting colony depended on the birds' ability to locate forests with high productivity of mast. The massive colonies roved the landscape in search of maturing deciduous forests and rarely nested in the same location two years in a row. I simulated this stochastic process by randomly assigning a mast location within the breeding range for each year and weighting the habitat within the mast area so that it contributed the majority to the overall carrying capacity for that year. This resulted in an increase in variability of reproductive success from year to year.

## THE RESULTS:



- ♦ Likely that **multiple factors** (commercial hunting, habitat loss and reliance on stochastic resources) contributed to the fate of this species.
- ♦ Better harvest management might not have **prevented** extinction, but perhaps it might not have been as rapid.
- ♦ Species facing **multiple threats**, even if **common** and **abundant**, may decline extremely rapidly; frequent evaluation of their status may be warranted.

### ACKNOWLEDGEMENTS

For helpful comments and suggestions: H. Scott Gillingham and the Rutgers LUP group, Catherine Goodrich, Lori Grunberg, Hollie Anne Lammiman, Kevin Thompson, Ben Grunberg and Ben Marston. See <http://www.rutgers.edu/~ecampus/academic/department/departmental-services/> for Acknowledgement with illustrative graphics. Dan Meloy and the Department of Conservation Forest Services.



### REFERENCES

Alcazar, H. S. 2005. RAMAS GIS: linking spatial data with population viability analysis. *Ecology Modelling* 183: 401-412.  
 Klein Goldewijk, K. J., S. Stepputat, and T. Sauer. 2010. Using the HYDE 3.1 historical land-cover inventory and population data to assess the impact of land use change on the environment. *Ecology Modelling* 223: 1-15.  
 Schorger, W. W. 1955. *The Passenger Pigeon: Its History and Extinction*. University of Wisconsin Press.



# Avoid...

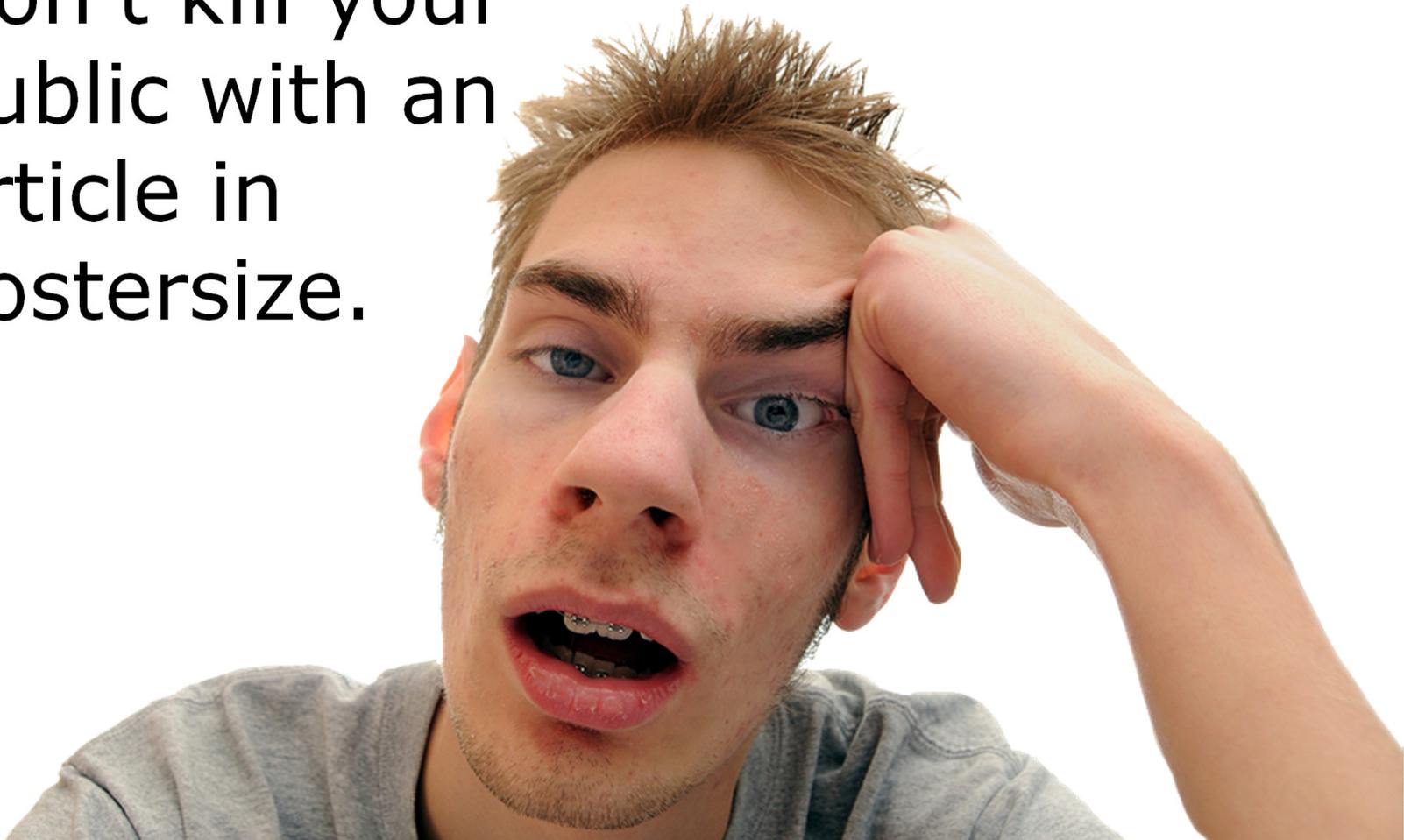


Mistake



Few visual elements!

Don't kill your  
public with an  
article in  
postersize.





Use a "***boxing impact***" with strong visual elements.



**Mistake**



**Bad Quality**



Do **NOT** use  
pixellated  
pictures!



Do **NOT** use  
tables!

**Table 5**  
*Simulation results for using full data, CRs only, and proposed method under four missing mechanisms*

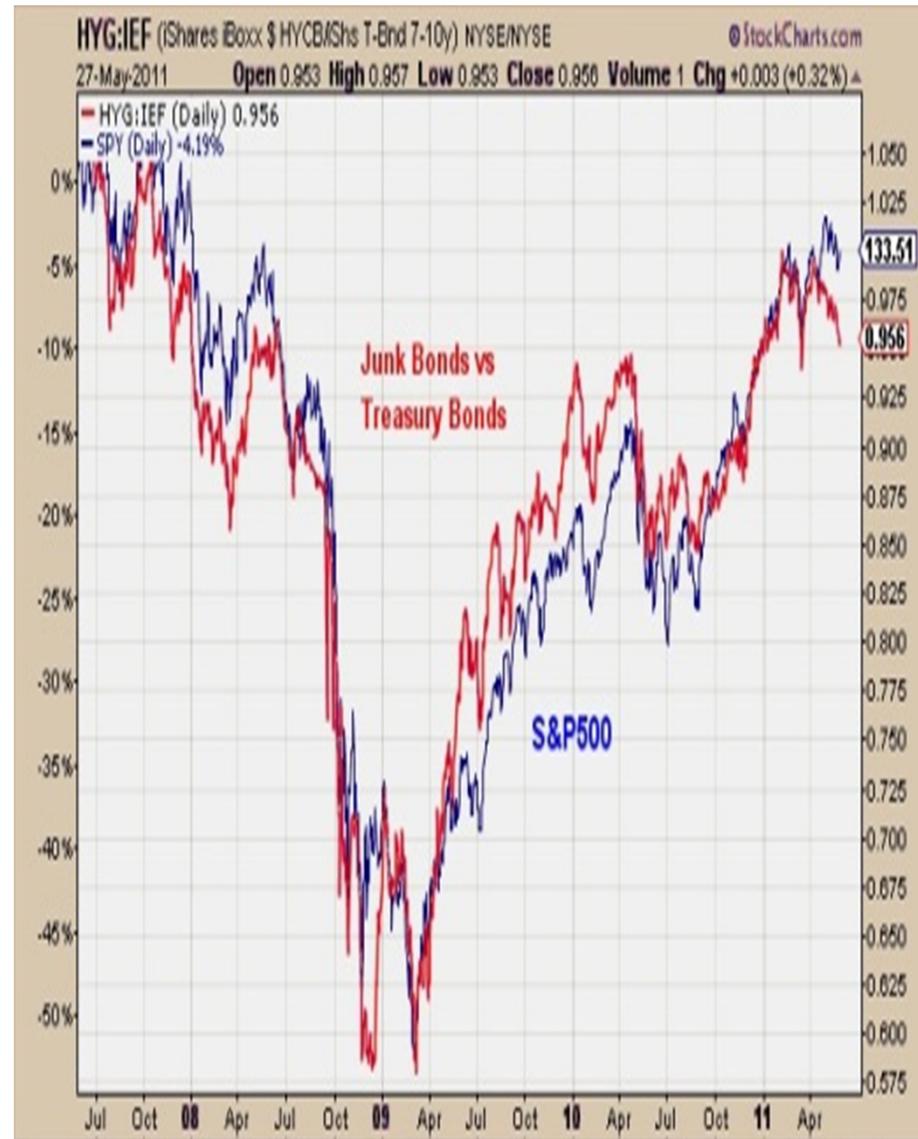
Method	Bias <sup>a</sup>		Variance <sup>b</sup>		95% CI <sup>c</sup>	
	( $\hat{\beta}_W$ )	( $\hat{\beta}_X$ )	( $\hat{\beta}_W$ )	( $\hat{\beta}_X$ )	( $\hat{\beta}_W$ )	( $\hat{\beta}_X$ )
(M.1) $P(R = 1) = 0.66$						
Full	0.01346	0.02229	0.04008	0.03685	0.955	0.950
Comp	0.03062	-0.003561	0.1149	0.06732	0.960	0.955
Impu	0.01431	0.021	0.04088	0.05169	0.980	0.975
(M.2) $\text{logit } P(R = 1) = 2Y$						
Full	0.007908	-0.02116	0.03838	0.03624	0.975	0.925
Comp	0.01945	0.07096	0.107	0.06581	0.960	0.950
Impu	0.006966	0.01597	0.04227	0.05226	0.975	0.985
(M.3) $\text{logit } P(R = 1) = 2X$						
Full	0.007908	-0.02116	0.03838	0.03624	0.975	0.925
Comp	0.01225	0.0589	0.08856	0.06818	0.980	0.975
Impu	0.009563	-0.04699	0.03865	0.04923	0.985	0.970
(M.4) $\text{logit } P(R = 1) = X + Y$						
Full	0.01346	0.02229	0.04008	0.03685	0.955	0.950
Comp	0.02404	1.613	0.1102	0.08202	0.955	0.580
Impu	0.01814	0.08289	0.0578	0.06075	0.955	0.970

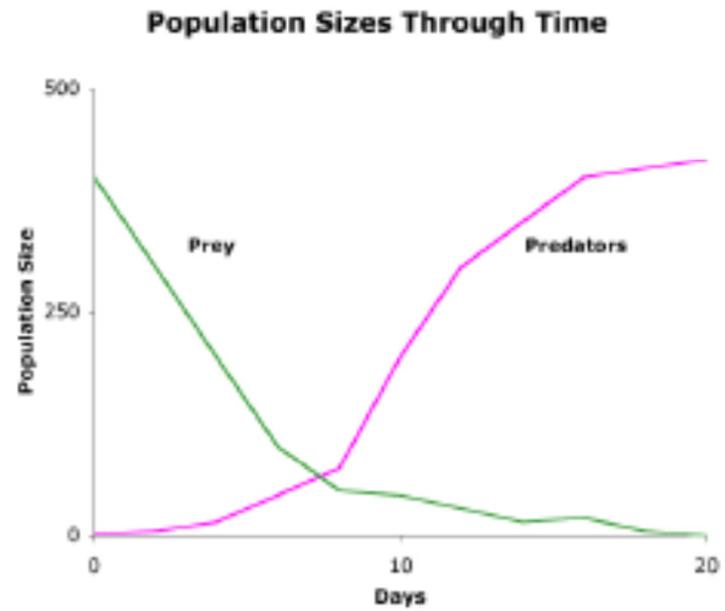
<sup>a</sup>Bias =  $(\hat{\beta} - \beta_0)/\beta_0$ .

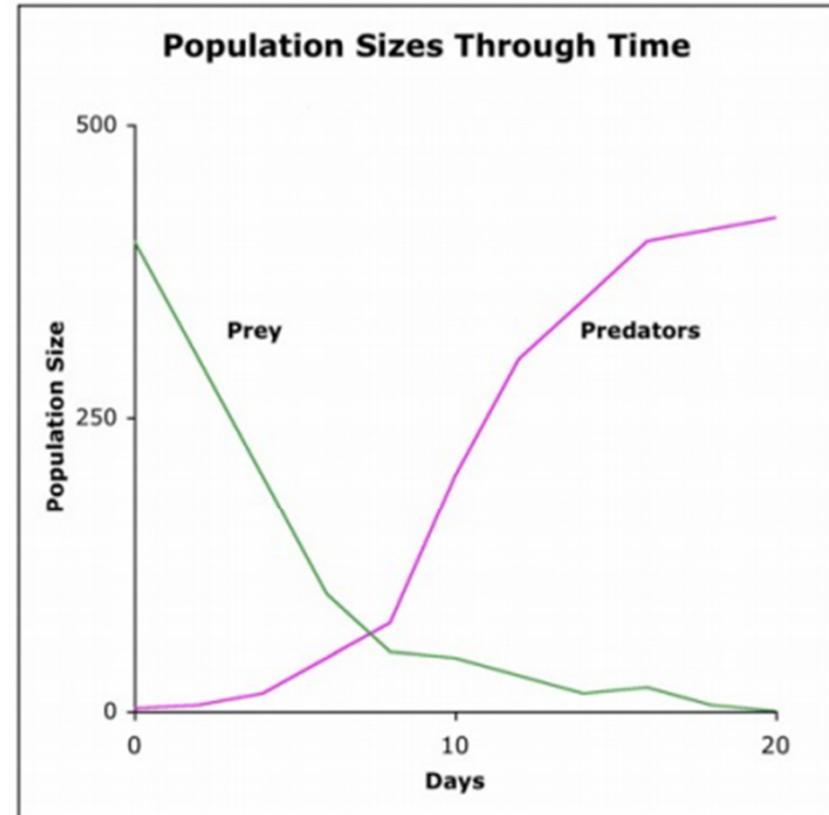
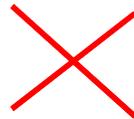
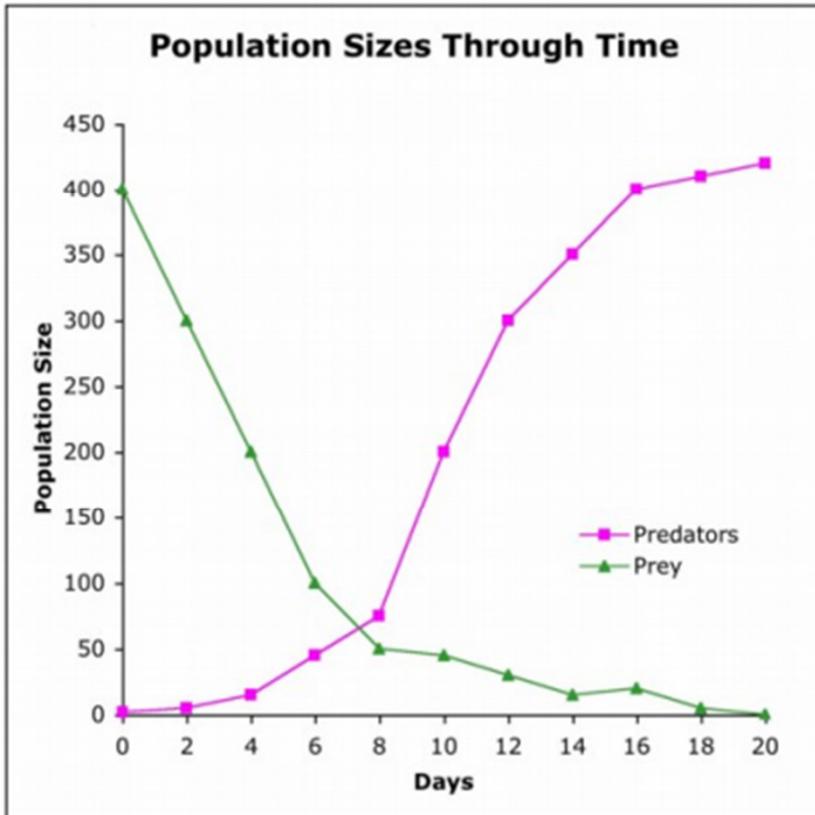
<sup>b</sup>Simulation variance.

<sup>c</sup>Confidence interval using jackknife standard error.

Do **NOT** use diagrams and graphs with "chart junk"!







Do **NOT**  
use Clipart!



Do **NOT** use complex signs:

\$\*#&§%œ

... or complex fonts:

Comic Sans MS

Bradley Hand ITC

*Blackadder ITC*

**ALGERIAN**

**Bauhaus 93...**

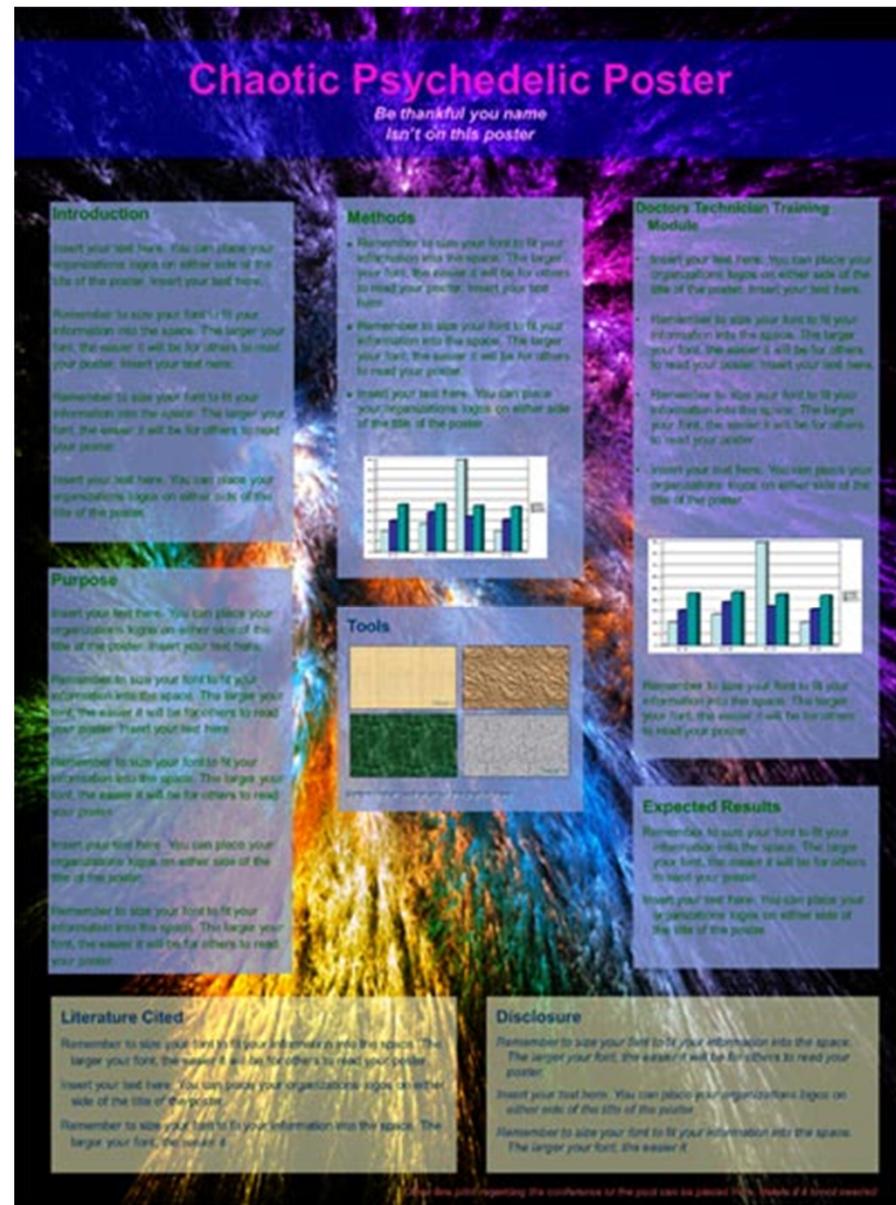
**Mistake**



**Visual vomit**



An example of visual vomit



Also this one!

# H1N1 Vaccines Production in Tobacco Plants

Raymond Yeow Sin Keet

### ABSTRACT

H1N1 Vaccines production in tobacco, *Nicotiana benthamiana*, is one of the most efficient approaches to face with the widespread of swine flu in 2009. Such an approach is made possible by Project GreenVax to produce H1N1 flu vaccine known as HAC1, a type of virus-like particles (VLP), hemagglutinin (HA) based Recombinant Subunit Vaccines in tobacco. HAC1 can trigger sufficient immunogenic response for vaccination without the presence of entire viral cell. Non-transgenic tobacco plants are cultivated through hydroponic methods to express VLP through *Agrobacterium tumefaciens*-mediated transient expression by vacuum infiltration technique. Localization and accumulation of vaccine antigen in the leaves of plants can be purified. Comparing to vaccine production in eggs, plant-based approach is easily up-scaled and cheaper. The vaccine is currently at the end of clinical trial phase 1.

### INTRODUCTION

- Started by Project GreenVax by G-CON for H1N1 plant based vaccine production.
- Vaccine Name : HAC1, VLP HA based Recombinant Subunit Vaccines in tobacco.
- Launch Vector name : iBioLaunch
- Now focus in H1N1 and other influenza.
- Reason: H1N1 caused 12,200 deaths in 208 countries in 2009.
- Vaccines conventionally produced using chicken eggs injected with influenza virus.
- GreenVax's initial run = 10million doses in 12 months.
- Upscale possibility = 100million / year

### MECHANISM

- Agrobacterium* = Transient Expression System.
- Somatic transfection – Infiltrate intracellular space (T-DNA transfer to plants).
- VLP localized at membrane surface.
- N. benthamiana* – The only host for *Agrobacterium* infiltration.

### METHODOLOGY

- Gene Screening**
  - Gene for antigen protein is isolated from H1N1 viral genome.
  - Antigen sequences are obtained from WHO Database.
- Antigen coding VLP is introduced into *Agrobacterium tumefaciens*.**
- Growing Tobacco**
  - Nicotiana benthamiana* is grown in hydroponics for 46 days.
  - Lead by robotics system for automated seedling planting.
- Vacuum Infiltration**
  - Mature tobacco plants are infected by launch vector with VLP gene.
- Purification**
  - VLPs accumulated are purified from tobacco biomass.

### ADVANTAGES

- Compared to eggs, total production timeline of vaccine in tobacco is 3 times faster.
- Tobacco produce 2g recombinant vaccines/m<sup>2</sup>
- Safer, less human or animal pathogens.
- Tobacco extensively studied.

### CHALLENGES

- No FDA approved plant-based vaccines yet.
- Efficacy and reliability = Many clinical trials.
- Many tobacco needed, relative to eggs (More Space).
- Relatively high cost for setting up the facilities and research.
- Complicated protocols and regulatory factors.

### CONCLUSION

- 2009 : Production timeline = 3 weeks
- Scalable 145,000 R<sup>2</sup> G-con proprietary pods = 3m vaccines in 12 weeks.
- 13<sup>th</sup> Sept. 2010 : Started Human Trial Phase 1 till end of 2011.
- No adverse reaction. Only mild pain & tenderness.
- High percentage to be approved by FDA.

### REFERENCES

Marc, A.D., Mason, M.-J.C., Nathanael, C., Senik, T., Mathias, L., Frederic, G. & Louis P. V. (2010) The Production of Hemagglutinin Based Virus-Like Particles in Plants: A Rapid, Efficient and Safe Response to Pandemic Influenza. *Plant Biotechnology Journal*, 8: 492-499. doi: 10.1111/j.1472-7652.2009.00498.x

Marc, D., O'Keefe, M. A., Lewis, P. G., Condore, M.M., J. The 'poster', S., Comp, J. M., Dargatz, M., Manganand, S., Landry, N., Ward, B.J. & Ye, R. (2008). Influenza Virus-Like Particles Produced by Transient Expression in *Nicotiana benthamiana* Induce a Protective Immune Response Against a Lethal Viral Challenge in Mice. *Plant Biotechnology Journal*, 6: 530-540.

And this!

Geofysik og rumteknologi  
Ingeniørarbejde 2013/2014

DTU

## DEN EFFEKTIVE VIDENSKABSPLAKAT

Birte Kronbak Andersen, Studie- og uddannelseskoordinator, DTU Space

En rundspørge foretaget af arkitekterne bag uddannelsen "Geofysik og rumteknologi" hos højt teknologiske virksomheder, nationale myndigheder og virksomheder inden for geo- og rådgivningsbranchen giver et klart billede: Kun formidlingsdygtige kandidater får job! Bortset fra de så ikke uvæsentlige årsag, er det også i andre sammenhænge gavnligt at kunne formidle sin forskning klart og præcist - også selvom den er kompleks - og redde sig for, hvorfor den er relevant og vigtig. Og plakater er et centralt element i kommunikationen af videnskab og benyttes i mange sammenhænge som primær præsentationsplatform, så derfor er det godt at mestre kunsten at lave en effektiv videnskabsplakat.

**God og effektiv plakatformidling er kendetegnet ved:**

**Ingeniørstuderende skal rustes til kampen om jobbene**  
Kun formidlingsdygtige kandidater får job! Det er udmeldingen fra højt teknologiske virksomheder, nationale myndigheder og virksomheder inden for geo- og rådgivningsbranchen. DTU uddannelseskoordinator Birte Kronbak Andersen har derfor uddannet sig til at formidle forskning effektivt og professionelt og er rustet til kampen om jobbene.

**Hvordan kendetegnes en effektiv plakatformidling? Afklare sig med budskabet ud!**

**Research, track down**  
Jeg har udarbejdet en plakat med titlen "Research, track down", og jeg har haft en stor succes. Jeg har fået en erklæring med, som jeg ikke vil give sig ikke viker. Det er en plakat, som jeg studeret og har brugt til at sælge mine egne projekter. Det er en plakat, som er effektiv og professionel. Det er en plakat, som er effektiv og professionel. Det er en plakat, som er effektiv og professionel.

**Min erfaring og research viser, at overskriften er afgørende for om nogen gider stoppe op og se nærmere på plakaten. Den velegnede titel og effektive titel tiltrækker læsere ved at opsummere forskerens arbejde og formidle plakaterns væsentligste indhold. Budskabet!**

**Enkle budskaber er de mest mindeværdige - især når man skræddersyer en klart afgrænset målgruppe.**

**Et billede af en eller to hundrede år og derfor er det formidlingsplatformen. Det er et billede af en eller to hundrede år og derfor er det formidlingsplatformen. Det er et billede af en eller to hundrede år og derfor er det formidlingsplatformen.**

**For at tiltrække en effektiv plakat skal man undersøge og forstå den, som vil se den. Man skal forstå den, som vil se den. Man skal forstå den, som vil se den. Man skal forstå den, som vil se den.**

**For at tiltrække en effektiv plakat skal man undersøge og forstå den, som vil se den. Man skal forstå den, som vil se den. Man skal forstå den, som vil se den. Man skal forstå den, som vil se den.**

**Hvis den fornødne tilføjelse og plakatvejledningens anvisninger og tips følges, er det ingen sag at formidle sin forskning effektivt og professionelt. Formidlingssuccesen er inden for rækkevidde, og chancen for at komme øverst i buksen, når drømmesamfundet søger nye medarbejdere, er langt større.**

**Referencer**

- Thomas C. Erren, Ten Simple Rules for a Good Poster Presentation.
- Hess, G.R., K. Tosney, and L. Liegel, 2013. Creating Effective Poster Presentations.
- Morten Munster, 3 enkle metoder til at skrive som Fleming.
- Colin Parrington, Designing posters.

JTU Space  
Institut for Rumforskning

Do not give your audience  
nausea and a headache!

Too much?  
Too messy?

= No Impression!



White space is a good thing.

**Attention!**

Text alignment?

Line spacing?

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Keep things simple  
and "clean".

## A Search for Minor Bodies in the Jovian Tenuous Ring System

Anastassia Malinnikova Bang<sup>1</sup>, John Leif Joergensen<sup>1</sup>, Jack Connerney<sup>2</sup>, Matthias Benn<sup>1</sup>, Troelz Denver<sup>1</sup>, Ron Oliverson<sup>2</sup>, Patricia Lawton<sup>2</sup>

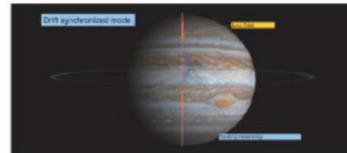
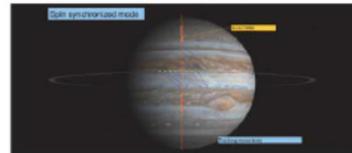
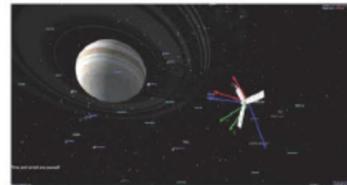
<sup>1</sup>DTU Space, National Space Institute, Technical University of Denmark, Tel. (+45) 4525 3465, e-mail: am@space.dtu.dk; <sup>2</sup>NASA Goddard Space Flight Center, USA

### JUNO star tracker scans Jupiter rings and searches for new "moonlets"

The star tracker is capable of identifying non stellar objects (NSO) and acquiring images in two different modes.

**Spin synchronized mode**, which scans the skies in a certain inertial direction for the duration of the mode activation. The Juno trajectory will in this mode result in a slow scanning of the Jovian tenuous rings.

**Drift synchronized mode**. In this mode the camera is programmed to take an image for every nth spin of Juno (n=1,2,3,...) starting at a given inertial direction. Adding a certain inertial angle change for each image will result in a slow drift in inertial pointing of each image. Using the Juno trajectory this allows for the same portion of the rings to be viewed for the duration of the imaging.



#### Juno star tracker, fact sheet

- 3.0 orbits
- Scanning from -22 to +22 degrees from equatorial plane
- Up to 50 images per orbit
- Up to 10000 tracking frames per orbit at 4 Hz
- 152x680 pixel CCD
- 62°x62° per pixel
- Images taken at ranges of 67-500 to 1,100,000 km
- Observed in both sunlight and planet shadowed sections of the rings

#### Search for minor bodies in Jovian ring system:

- Inner part of rings
  - Distance covered: 285 000 km
  - Max observation time: 25 min per orbit
  - Up to 30 images per orbit
  - Up to 3000 samples of a minor body per orbit
- Outer part of rings:
- Distance covered: 700000 km
  - Max observation time: 50 min per orbit
  - Up to 50 images per orbit
  - Up to 10000 samples of a minor body per orbit

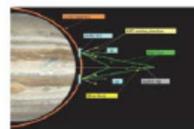
Table presents comparison between the Earth's Moon and the known Jovian moons with respect to their minimum distance to the JMW SC, their relevant characteristics and the max. number of pixels as seen by the Juno star tracker.

Star trackers are capable of identifying and tracking minor bodies with sizes less than 1 km, provided their apparent magnitude is brighter than V=9.2, i.e. substantially smaller and fainter than the known moons of Jupiter.

	Moon	Io	Europa	Ganymede	Callisto
Dist. (km)	377	421,700	493,000	1,069,800	1,882,800
Order to JMW SC	198-403	47-50	8-58	16-30	91-93
Max. app. magnitude	-12.7	-4.7	-2.8	-3.1	-1.3
Area	3.2	0.81	0.1	0.9	0.97
Dist. to JMW SC (km)	1,020	319	214	2637	333
Max. pixels	1	2	0.5	1	2

The observations of Earth's Moon obtained during the EF8, was used to validate the auto-acquisition system and calibrate its detection sensitivity. Using these parameters, the study plan for the Jovian moon system has been optimized, and the OPD performance used to confirm the expected performance, since the known moons are comparable with the Moon seen by the tracker during EF8.

Juno star tracker is capable of tracking objects as faint as V=9.2, creating an opportunity for tracking minor bodies with a very wide range of possible apparent magnitudes in Jovian ring system. A sequence of 5 images is sufficient for the tracker to lock on an object and to start tracking it.



The Juno star tracker viewing directions are offset from the spin axis. Therefore the distance to a detected object can be defined by simple triangulation of the apparent direction as observed before, under and after passage under the rings. The star tracker drift mode also enables a tomographic profiling of Jovian tenuous ring system. 60Hz design and star tracker geometry permit studying various parts of the ring system during 3.0 orbits.



An example of the planning environment used for the Jovian ring observation study: Anethas seen by the star tracker near perijove of the insertion orbit.

### Conclusion

The Juno star tracker will provide unique tomographic data on ring's structure and will search various parts of the ring system for minor bodies with wide variety of characteristics.

OPD calibration confirmed the excellent capability of the star tracker to determine, track and acquire images of an object similar to the ones undetected in the Jovian tenuous ring system.



# Construction

# What software to use?

# Power Point

- Ok
- Easy to use
- A little inflexible
- You will find templates on the DTU-portal

# Adobe Illustrator or Indesign

- Excellent tool
- More difficult to learn
- Costs a lot, but 30 day free trial
- Other/Freeware?
- You will find templates on the DTU-portal





# Guides

- There are **printed folders** in Danish & English on the DTU web portal:



## Den effektive videnskabsplakat

Vejledning udarbejdet af Birte K. Andersen, Studie- og Uddannelseskoordinator på DTU Space, til førsteårskurset "Ingeniørarbejde - Geofysik og Rumteknologi".

DTU Space  
Institut for Rumforskning og -teknologi

Link til dansk version: [http://portalen.dtu.dk/Institutter/DTU\\_Space/~media/DRC/Kommunikation/Vejledninger/Den\\_effektive\\_videnskabsplakat.ashx](http://portalen.dtu.dk/Institutter/DTU_Space/~media/DRC/Kommunikation/Vejledninger/Den_effektive_videnskabsplakat.ashx)

Link for English version: [http://portalen.dtu.dk/Institutter/DTU\\_Space/~media/DRC/Kommunikation/Vejledninger/MakingEffectiveScientificPosters.ashx](http://portalen.dtu.dk/Institutter/DTU_Space/~media/DRC/Kommunikation/Vejledninger/MakingEffectiveScientificPosters.ashx)



## Making Efficient Scientific Posters

Manual prepared by Birte Kronbak Andersen, Study Coordinator at DTU Space, for the freshman course "Engineering Practices - Earth and Space Physics and Engineering".

DTU Space  
National Space Institute

# Other guides

- Good inspirational stuff on the web:
- <http://ww.ncsu.edu/project/posters/CreatePosterOverview.html>
- <http://www.cns.cornell.edu/documents/ScientificPosters.pdf>

# Tips

# Handouts ?

- Provide a handout for interested visitors?
  - Include a summary of your poster
    - Title
    - Abstract
    - Key figures and findings
  - Include text, tables and graphics you weren't able to include on your poster
  - Include your contact details
    - Name, address, phone, e-mail, etc.

# At the **venue**

- Arrive early
- Bring tools needed (e.g. tape, pencil, pointer?)
- Have handouts ready
- Practice your oral stuff
- Dress appropriately
- Show **positive** energy 😊



Avoid..

**Mistake**

**8**

# **Lack of preparation**



Most posters are  
bad because  
there's been too  
little time spent  
to make them.  
**Period.**

---



# Remeber the 4 P 's

- Preparation
- Production
- Practice
- Presentation

Takes **time!**

# No time?





# Summary

# Summary

- Consider:
  - What is your key **message**?
  - Who is your **audience**?
  - What **content** do you need to target and persuade them?
  - What **design** elements will work best for your purpose?
  - How are you going to **construct** it and get it printed?
  - What do you need on the day of the **presentation**?

# Checklist:

<b>Planning</b>	Before starting work on your poster, consider message, space, budget, format (single sheet or multi-panel), and deadlines.
<b>Focus</b>	Stay focused on your message and keep it simple. Create a mock-up and dispense with unneeded details.
<b>Layout</b>	Use a clearly defined visual grammar to move readers through your poster. <a href="#">E.g. DTU-templates</a>
<b>Headings</b>	Use headings to orient readers and convey major points.
<b>Graphics</b>	Clear graphics should dominate your poster.
<b>Text</b>	Text should be minimized in favor of graphics, and large where used.
<b>Colors</b>	Colors can make a poster attractive and improve readability, but be cautious.
<b>Editing</b>	Edit ruthlessly to reduce the amount of text and focus on a results-oriented message.
<b>Software</b>	There are many packages you can use to create your poster.

# Questions?

# Thank you!

For more information:

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