科學製圖與表達技巧

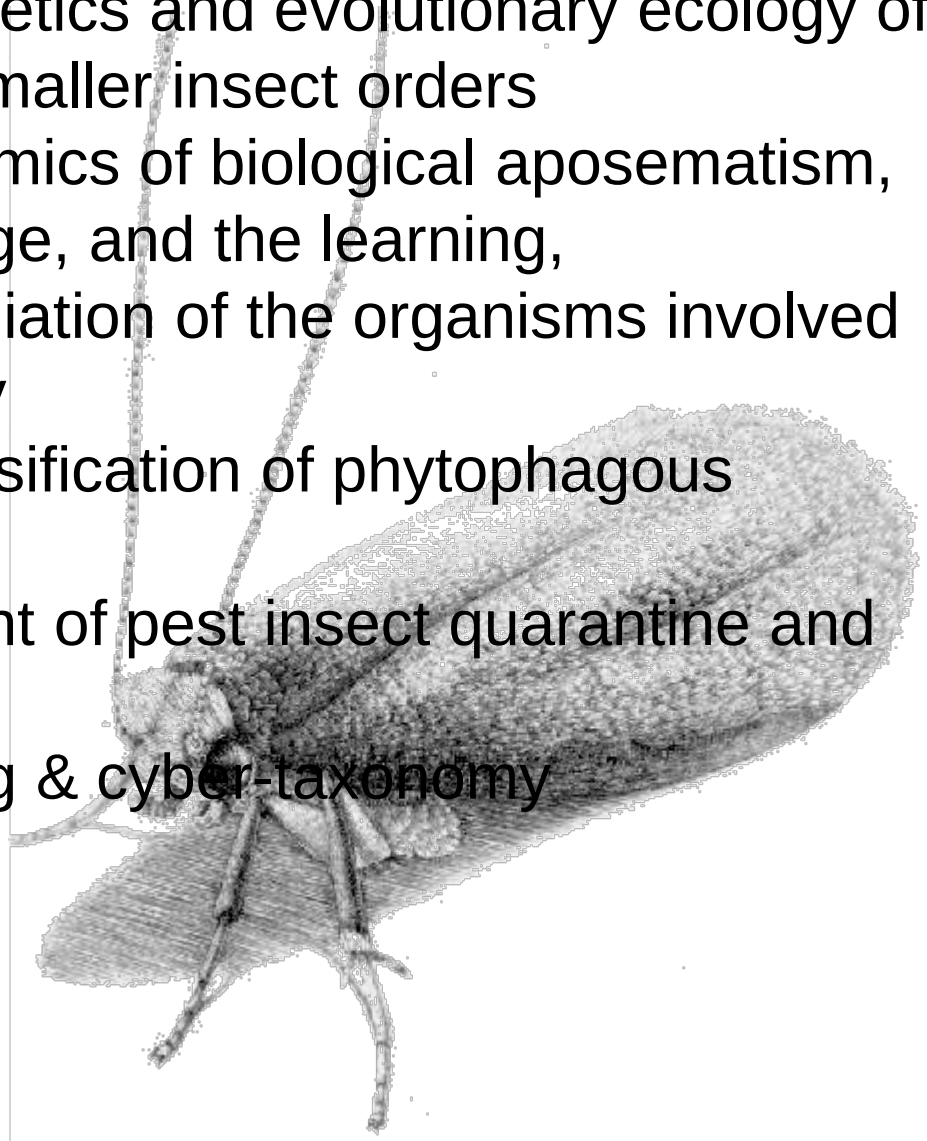
Scientific Illustration & Presentation Skills

Systematics
Evolution
Ecology
Databasing

YEN Shen-Horn
Laboratory of Insect Systematics & Evolution
Department of Biological Sciences
National Sun Yat-Sen University

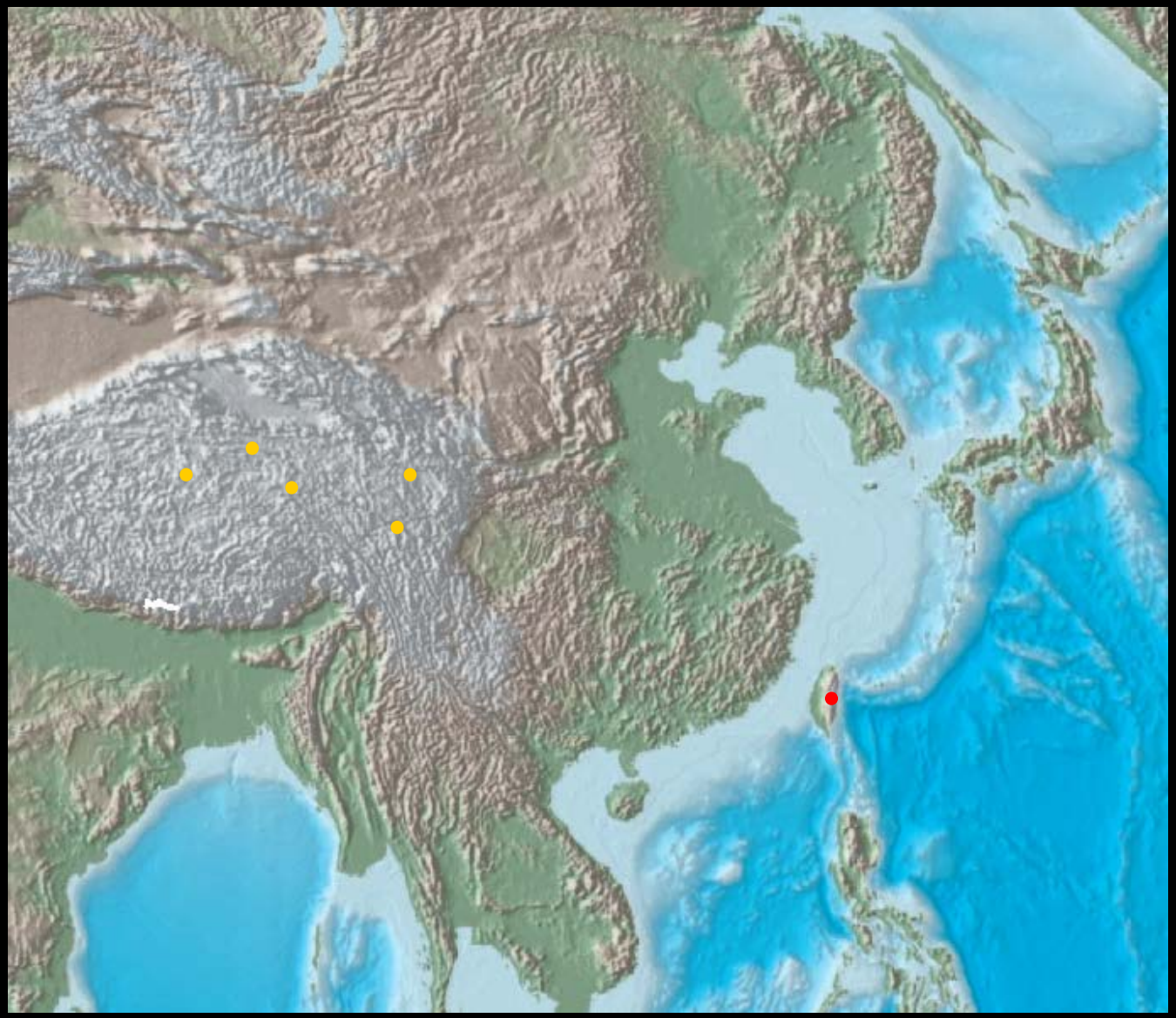
Interests What we have been doing

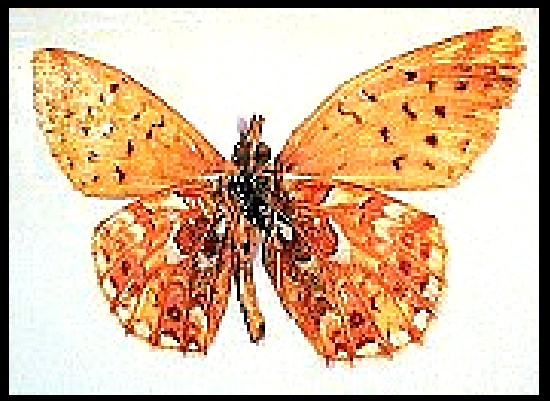
- Systematics, phylogenetics and evolutionary ecology of the Lepidoptera and smaller insect orders
- The evolutionary dynamics of biological aposematism, mimicry and camouflage, and the learning, memorability and cogniation of the organisms involved
- Functional morphology
- Colonization and diversification of phytophagous insects on plants
- Technique development of pest insect quarantine and inspection
- Biodiversity databasing & cyber-taxonomy



Disjunctive distribution btw E & W Palaeartic

High mountain relict: Neo-endemism vs Palaeo-endemism



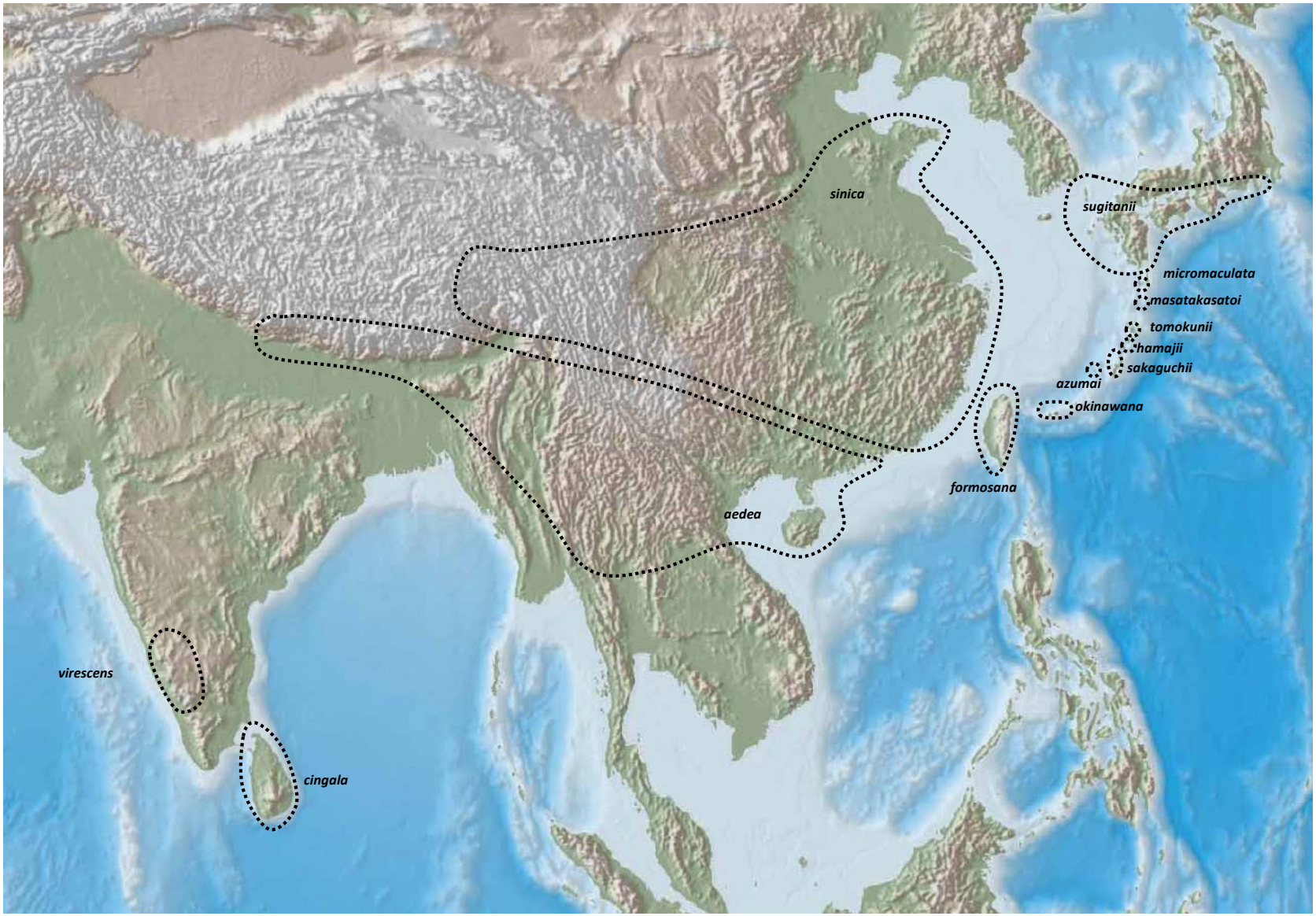


Boloria pales yangi Hsu & Yen

Minois nagasawara Matsumura

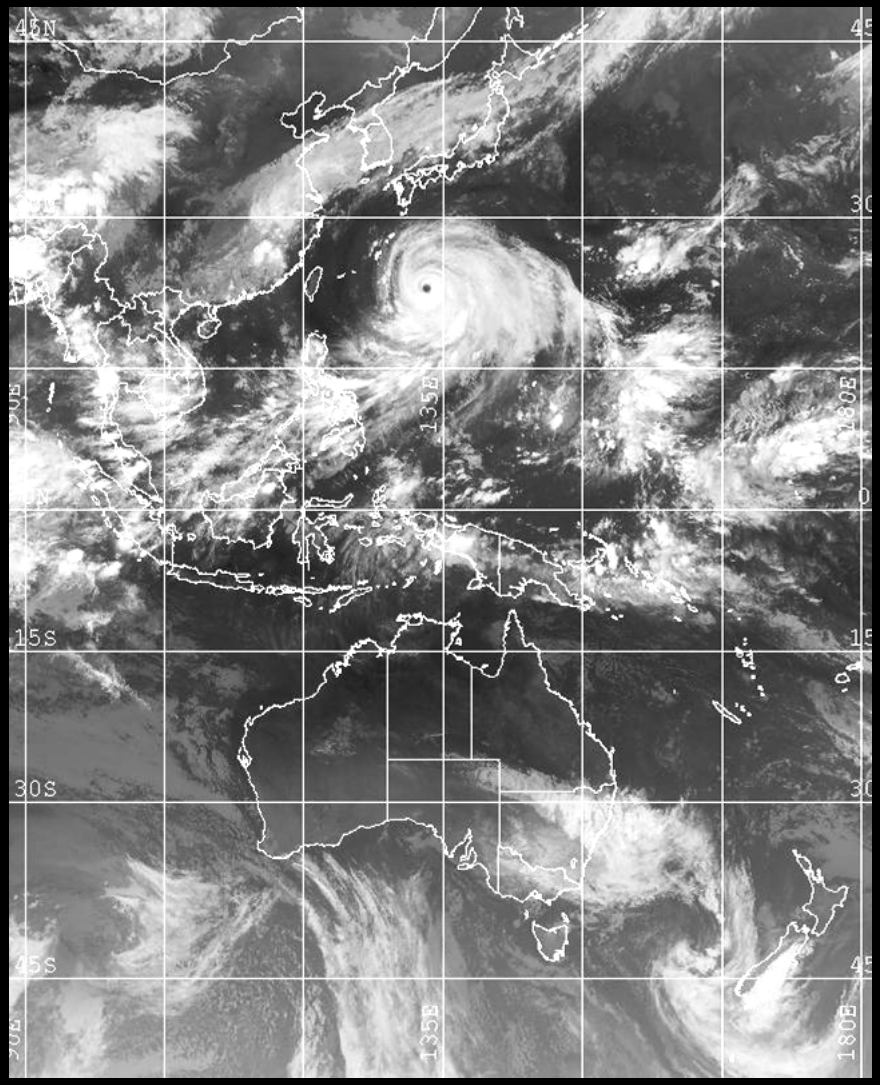
Insular differentiation in E Asian island arc

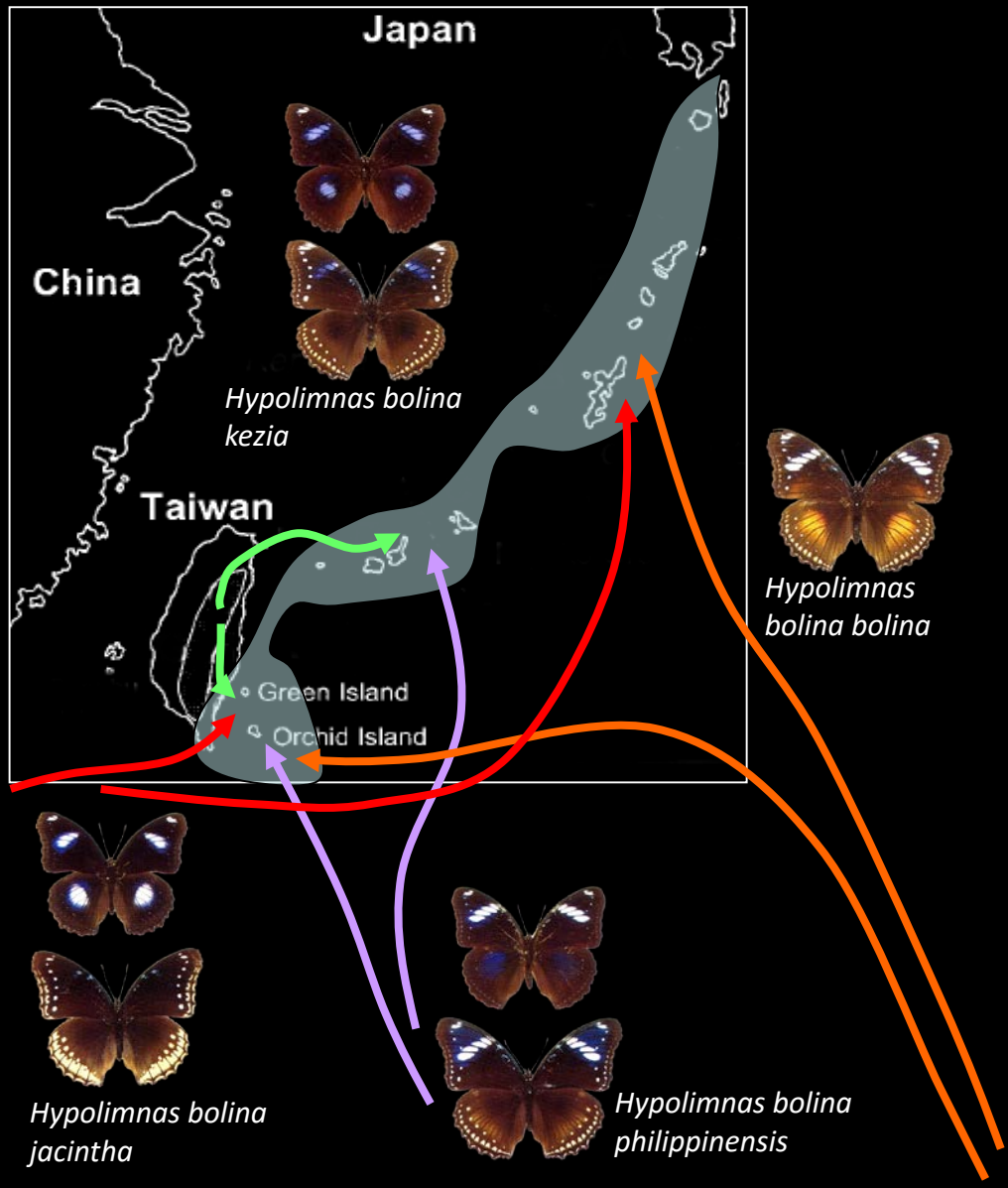
High insular differentiation - *Eterusia aedea* (Zygaenidae, Chalcosiinae)



Hybridization zone & regional climatic features

Hybridization between “subspecies” caused by typhoon



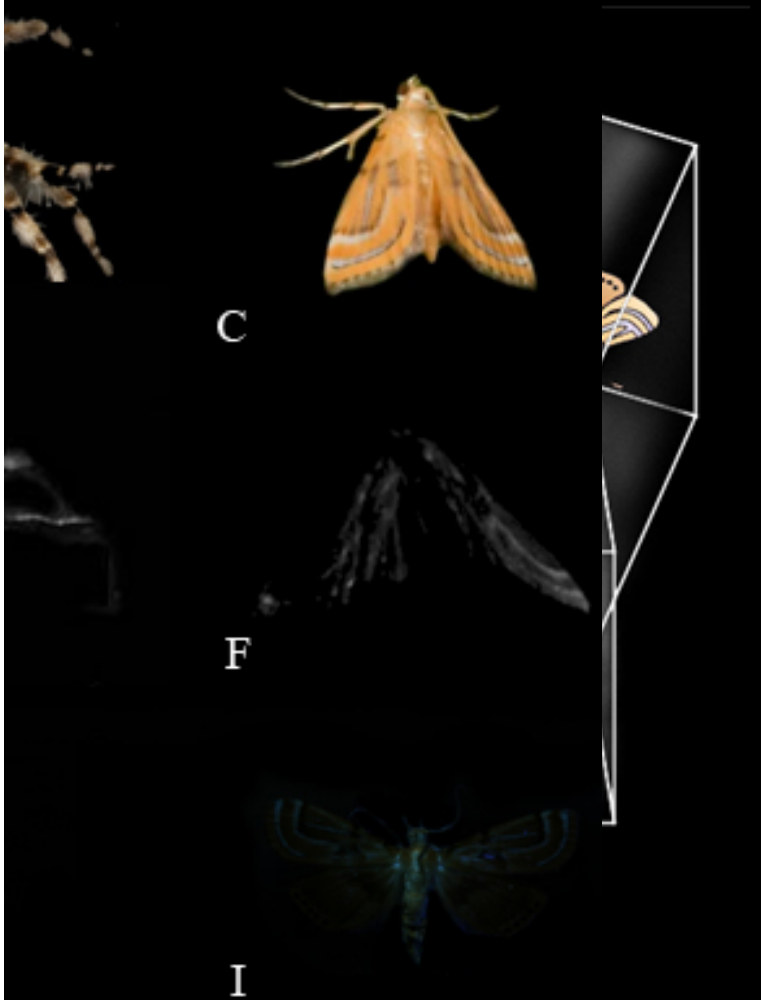


Biological mimicry & camouflage

How to deceive predators?

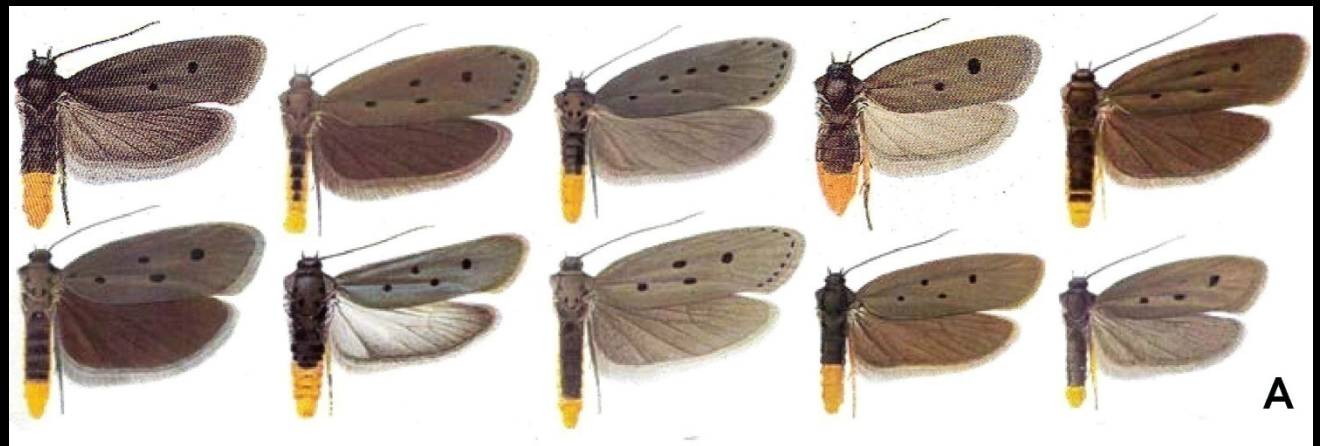
Figure 1. Mimicry and polymorphism in *Papilio memnon*.
The butterflies on the left column are toxic species (*Pachliopta* and *Astrophaneura*). The butterflies on the right are females of the palatable species *Papilio memnon*. Each female form of *P. memnon* is a precise mimic of a specific chemically-defended model. Notice however the red "shoulders" of female *P. memnon* which cause the mimicry to look imperfect to us. Males of *P. memnon* are all black, not mimetic, and not polymorphic (bottom). The entire variation of pattern in *P. memnon* is inherited at one single supergene locus, which the proposed research sets out to locate and identify.

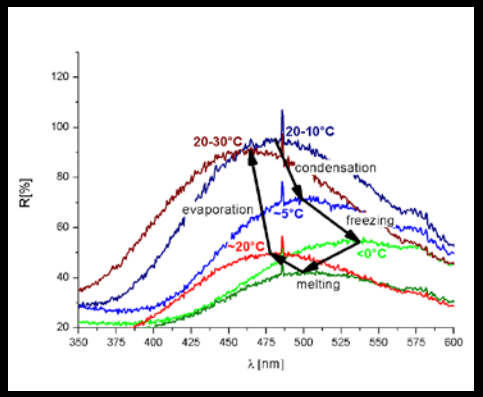
Figure 2. Specimens of *P. memnon heronus*, the subspecies found in Taiwan.
Several female forms coexist (male at the bottom), most notably a tailed yellow form and an untailed whitish form, which we propose to cross in order to produce segregating families for the molecular mapping of the supergene.

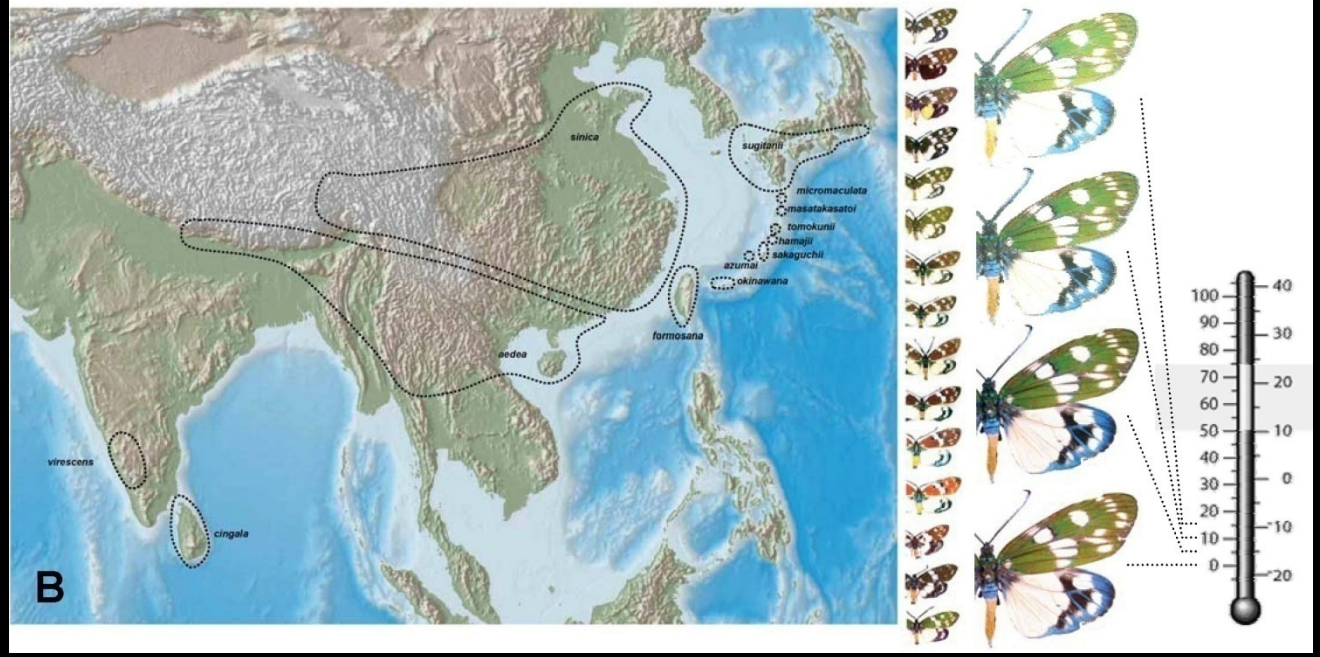


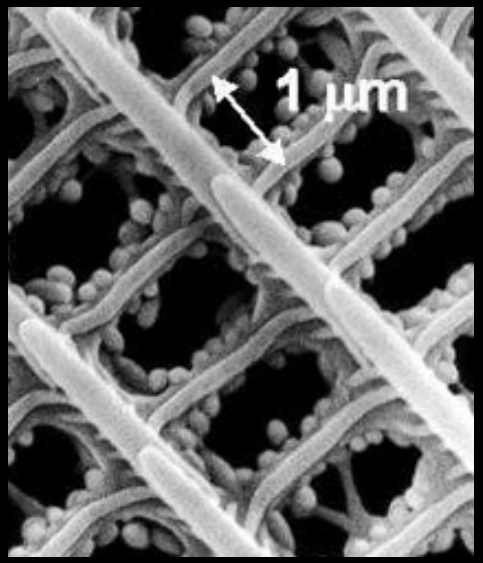
Functional morphology

Photonic features of the insect wing colouration subjective to temperature & humidity









Digital archive & biodiversity databasing

Integrating museum collection, literature & cyber-systematics

Fun projects

Evolutionary histories of primitive fish & exploring mimicry in freshwater environments

Phylogenetics of bichirs (Actinopterygii: Cladista: Polypteridae) reveals a recent speciation of this ancient vertebrate lineage

LIN Si-Min[1], CHEN Ying-Rong[2], YEN Shen-Horn[3]
[1]Department of Life Science, Chinese Culture University. [2]Department of Life Science, National Taiwan Normal University

MOTIVATION & RESEARCH BACKGROUND

- The family Polypteridae comprises at least 18 extant species and subspecies of primary freshwater fishes restricted to the African continent (Gosse 1984; Berra 2001; Britz 2004). The fossil record of polypterids could be dated back to Cretaceous period. They are commonly considered the most basal group of recent actinopterygians and show a puzzling combination of primitive and highly derived characters (Patterson 1982; Gardiner 1984; Greenwood 1984l Gardiner & Schaeffer 1989). Their interesting, and unusual anatomy has drawn the attention of morphologists since their discovery at the start of the 19th century (Geoffroy 1802) until the present (Britz & Johnson 2003).
- Recent studies reveal their similarity with amphibians in their neuroreceptors and genomic structures. Systematically, polypterids appeared to be a well known group for two reasons: (1) most of polypterid diversity was discovered fairly early during the explorations of African freshwaters by European collectors, and (2) several systematic synopses of bichirs have been published (Boulenger 1909; Poll 1941-42; Gosse 1988, 1990; Hanssens et al 1995; Schliewen & Schäffer 2006). Surprisingly, the internal phylogeny of polypterids, however, was largely based on Daget's morphological survey in 1983, and has never been investigated using modern methodology.
- The present study aims to resolve the phylogeny of bichirs, test the species membership of several undescribed taxa, and estimate the divergence time of the major clades.

RESEARCH STRATEGY

Material acquisition

- In total 48 bichir individuals representing 15 taxa, of which the collection localities were roughly known, were obtained from tropical fish traders. Identification of bichir's taxonomy consulted all the original literature, AquaLog's series and Ralf Britz's (The Natural History Museum, London) personal advise.

Protocol of molecular work

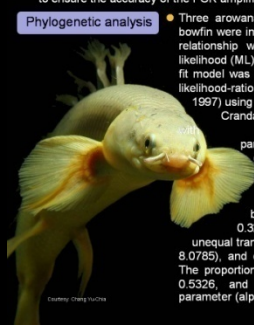
- Genomic DNA was extracted from caudal fin tissues using a standard phenol/chloroform protocol. Complete sequences of mitochondrial cytochrome *b* (CYTB), cytochrome *c* oxidase subunit I (COI), and 12S rRNA fragments were amplified by polymerase chain reaction (PCR). Primers were designed from the consensus sequences of several other basal fish orders. The sequences are listed as follows:

CYTBL1: 5'-GCAAAATAAGGAGCAGGATTAGA-3'
CYTBH1: 5'-GTAGAATTTTAGCTTTGGGAG-3'
COIL1: 5'-AATGCAACTCAAACACTTTAATTAAGC-3'
COIH1: 5'-GCTCGGGTATCWACRTCTATACCAACTG-3'
12SL1: 5'-GCATAACACTGAARATGTTAAGAYR-3'
12SH1: 5'-GCTAGCTATAATGCTCAAAATG-3'

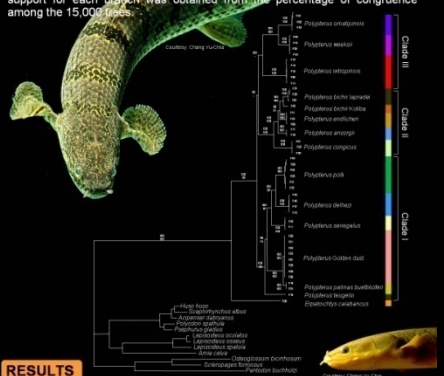
- PCR (including negative controls) was performed in 20-ml reaction volumes, with the following thermal cycles: 1 cycle at 94 ˚C (3 min); 35 cycles at 94 ˚C (30 sec), 55 ˚C (40 sec), and 72 ˚C (70 sec); and 1 cycle at 72 ˚C (10 min). Sequences were determined by using ABI 3730 automated DNA sequencer (Biorad). All PCR templates were sequenced in both directions. Original signals were manually checked and modified with SEQUENCHER 4.0.5 (Gene Codes Corp.). The sequences obtained were compared to those *P. senegalus* (AP004352) and *P. ornatipinnis* (U62532) available in GenBank to ensure the accuracy of the PCR amplifications.

Phylogenetic analysis

- Three arowanas, 5 sturgeons, 3 gars, and the bowfin were included as outgroups. Phylogenetic relationship was constructed using maximum-likelihood (ML) and Bayesian inference. The best-fit model was chosen by performing hierarchical likelihood-ratio tests (Huelsenbeck and Crandall, 1997) using Modeltest 3.0 (Posada and Crandall, 1998). Tamura-Nei's model parameters for invariable sites and gamma distribution (TrN+I+G) was suggested as the most appropriate evolutionary model. Parameters were set to unequal base frequencies (G = 0.1359, A = 0.3252, T = 0.2802, C = 0.2587), unequal transition rates (G-A = 12.4428, T-C = 8.0785), and equal transversion rates (1.0000). The proportion of invariable sites (I) was set to 0.5326, and the gamma distribution shape parameter (alpha) was 0.6794.

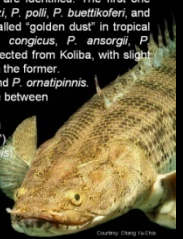


A maximum-likelihood search was performed using PAUP4.0b10 (Swofford, 2002). A heuristic search with starting-tree option and TBR branch swapping was carried out where the starting trees were obtained by neighbor joining. Bayesian inference was performed using MrBayes 3.2 (Huelsenbeck and Ronquist, 2001) adopting the general time reversal model with a proportion of invariable sites (I) and a gamma-shaped parameter estimated for eight rate categories. We sampled a tree every 100 generations, and calculated a consensus topology for 7,500 trees by omitting the first 2,500 trees (burn-in). The entire procedure was independently repeated two times. The statistical support for each branch was obtained from the percentage of congruence among the 15,000 trees.



RESULTS

- In total 3227 bps sequence data, including 1352 parsimonious informative one, was obtained from cytb (1215), COI (1080) and 12S rRNA (932), respectively. Both Maximum likelihood and Bayesian analyses generated identical phylogenetic relationships.
- *Erpetoichthys calabaricus* differentiated from all the other bichirs between 0.1487 to 0.1650.
- Three major clades of the genus *Polypterus* are identified. The first one comprises *P. teugelsi*, *P. senegalus*, *P. delhezi*, *P. polli*, *P. buettikoferi*, and a cryptic species *Polypterus* sp., tentatively called "golden dust" in tropical fish market. The second one includes *P. congicus*, *P. ansorgii*, *P. endlicheri*, *P. bichir lapradei*, and *P. bichir* collected from Koliba, with slight morphological and genetically differences from the former. The third includes *P. retropinnis*, *P. weeksii*, and *P. ornatipinnis*. The p-distances among the three clades range between 0.1180 and 0.1197. Genetic divergence of species within the same clade ranges between 0.0206 (*P. buettikoferi* versus the "golden dust") and 0.1187 (*P. retropinnis* versus *P. ornatipinnis*).
- None of the species-groups proposed by Frank Schäffer is proved as monophyletic in the present study. This also corroborates the anticipation by Ralf Britz (2004).



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Berra TM. 2001. Freshwater fish distribution. Academic Press. Boulenger GA. 1909. Catalogue of the Freshwater Fishes of Africa in the British Museum (Natural History). Vol. I. British Museum of Natural History. Britz R & Johnson GD. 2003. Zoological Journal of Linnean Society 138. 495-504. Britz R. 2004. Ichthyological Exploration of Freshwaters 15. 179-186. Daget J & Desoutter M. 1983. Bulletin de la Museum Nationale Histoire Natur 5(A). 661-674. Gardiner BG & Schaeffer B. 1989. Zoological Jounal of the Linnean Society 97. 135-187. Gemmell NJ & Akiyama S. 1996. *Trends in Genetics* 12. 338-339. Geoffroy E. 1802. Bulletin de la Societas Philomatique 1: 97-98. Gosse JP. 1984. Checklist of the freshwater fishes of Africa 1: 18-29. Ditto. 1988. Cybium 12: 239-245. Ditto. 1990. Faune des poissons d'eaux douces et saumatres de l'Afrique de l'Quest 1: 79-87. Hanssens MM, Teugels GG, Thys van den Audenaerde DFE. 1995. Copeia 1995: 694-705. Huelsenbeck JP & Crandall KA. 1997. Annual Review of Ecology and Systematics 28: 437-466. Poll M. 1941. Revue Zoologique et Botanique Afrique 35: 141-179. Ditto. 1942. Ditto 35: 269-317. Posada D & Crandall KA. 1998. Bioinformatics 14: 817-818. Ronquist F & Huelsenbeck JP. 2003. Bioinformatics 19:1572-1574. Schliewen U & Schäffer F. 2006. Zootaxa 1129: 23-36. Swofford DL. 2002. PAUP 4.0b10: Phylogenetic Analysis Using Parsimony and Other Methods. Sinauer Associates.

亞馬遜盆地共棲性麗甲鯰間驚人的斑紋相似性究竟肇因於系統發育限制？微棲地分割？或穆氏擬態？

The striking resemblance in colour pattern of symtopic corydoridine catfishes in Amazon: phylogenetic constraint? microhabitat segregation? or Müllerian mimicry?

顏聖紘[1]、陳殷麒[2]、陳薇云[3]、曹暐智[4]、林思民[3]
[1]國立中山大學生物科學系 [2]私立中國文化大學生命科學系 [3]國立台灣師範大學生命科學系 [4]國立中興大學昆蟲學系

The *Corydoras* catfishes: great diversity & puzzled morphology

- The South American catfishes of the genus *Corydoras* represents the most speciose Siluriformes member of the world, with more than 300 species ranging throughout the Amazon basin and the adjacent tributaries. All the members of the genus as well as the entire subfamily Corydoradinae have been very popular in tropical fish hobbyists and play a significant role in tropical fish trade in S America and aquaculture in SE Asia.
- For long it has been noticed that different tributaries in Amazonia harbour different assemblages of symtopic corydoridine catfishes exhibiting extremely similar colour pattern, but dissimilar body and snout shapes. The assemblages are not only participated by the corydoradine species, but also catfishes of other families and even characiform species.
- Several hypotheses have been proposed to interpret this extraordinary phenomenon
  - ✓ all the symtopic species with similar colour pattern share a common ancestry, and thus the differences in body and snout shapes are possibly due to microhabitat segregation;
  - ✓ different body shapes and snout types are caused by morphological plasticity along the development, and thus the so-called different species in fact may represent a polymorphic species;
  - ✓ and each style of body shape and snout length suggest earlier divergence of these catfishes in external morphology followed by multiple convergences in colouration, and this suggests potential mimicry occurring between symtopic species.
- To address these questions, we selected the symtopic corydoradine species sharing same colour patterns from aquarium fish traders, and used cytb sequence data to test if these striking resemblances are driven by niche partitioning, phylogenetic constraint, or mimicry. The preliminary results suggest that the mimicry hypothesis is more likely to explain this peculiar resemblance, but the predator-prey dynamics and the visual signals sent by the catfishes to their predators need further investigation.

Material and Methods

Taxon sampling & sample acquisitio

- Up to January 2009, more than 350 specimens representing more than 80 species were obtained for DNA extraction and morphological work. We specially focused on the species of which the collection localities and the syntopic situation of the "colouration group" were known.
- All the material were purchased via reliable tropical fish traders. Identifications were based on literature and confirmation with local exporters mainly in Peru, Brazil and Colombia.
- Most of the specimens were kept alive in NSYSU, and the dead or ill specimens were immediately preserved in 95-100% EtOH for DNA extraction. One of the pectoral spins of each specimen was removed for comparing the ultrastructure relevant to defensive mechanisms.

Molecular technique

- The genomic DNA was extracted from pelvic fin using a standard phenol/chloroform protocol. Complete sequences of mitochondrial cytochrome b (CYTB) with flanking sequences were amplified by polymerase chain reaction (PCR). Primers were designed from the consensus sequences of several families from Siluriformes. The sequences are listed as follows:

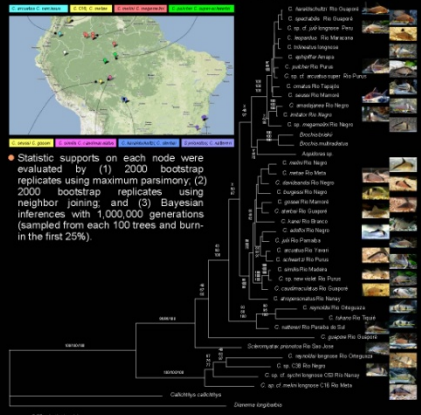
L1: 5' – AAATA CgaCg CaggA TTAgA AgCAA C – 3' (26 mer)
H1: 5' – AgAAT CCTAg CTTTg ggAgT TAgg – 3' (24 mer)

- PCR (including negative controls) was performed in 20-μl reaction volumes, with the following thermal cycles: 1 cycle at 94 ˚C (3 min), 35 cycles at 94 ˚C (30 sec), 52 ˚C (40 sec), and 72 ˚C (70 sec); and 1 cycle at 72 ˚C (10 min). Sequences were determined by using ABI 3730 automated DNA sequencer (Biorad). All PCR templates were sequenced in both directions. Original signals were manually checked and modified with SEQUENCHER 4.0.5 (Gene Codes Corp.).

Phylogenetic analyse

- Sequences from GenBank, including *Brochis multiradiatus* (DQ119381), *Callichthys callichthys* (DQ119448), *Dianema longibarbis* (DQ119359), were included in this analysis. The latter two species served as outgroup. Phylogenetic relationship was constructed using maximum-likelihood (ML).
- Sequences from GenBank, including *Brochis multiradiatus* (DQ119381), *Callichthys callichthys* (DQ119448), *Dianema longibarbis* (DQ119359), were included in this analysis. The latter two species served as outgroup. Phylogenetic relationship was constructed using maximum-likelihood (ML)

- The best-fit model was chosen by Akaike information criterion (AIC) using Modeltest 3.0 (Posada and Crandall, 1998). TIM model with parameters for invariable sites and gamma distribution (TIM+I+G) was suggested as the most appropriate evolutionary model. Parameters were set to unequal base frequencies (G=0.0765, A=0.3447, T=0.2185, C=0.3603), unequal transition rates (G-A = 22.2603, T-C = 15.4180), and two kinds of transversion rates (0.8332 and 1.0000). The proportion of invariable sites (I) was set to 0.5212, and the gamma distribution shape parameter (alpha) was 1.0204.



- Statistic supports on each node were evaluated by (1) 2000 bootstrap replicates using maximum parsimony; (2) 2000 bootstrap replicates using neighbor joining; and (3) Bayesian inferences with 1,000,000 generations (sampled from each 100 trees and burn-in the first 25%).

Results & Discussio

- The total 1153 bps sequence dataset included 437 parsimonious informative sites. Maximum likelihood, neighbor joining and Bayesian analyses yielded quite similar phylogenetic relationships.
- The phylogenetic pattern shows that the syntopic/sympatric species sharing similar colour patterns have evolved independently. This result conjectures the hypothesis that differentiation of snout shape has evolved convegently in different "colouration group" due to segregation of microhabitats at the same locality.
- The "mimicry" hypothesis seems to have been supported by the present data. However, the mimicry type, via. Batesian or Müllerian, and the predators involved in this putative mimicry relationship needs further investigations.
- Not all the 'colouration group' that is supposed to participate in a mimicry complex exhibit "conspicuous colour pattern" at their habitat background. It is intriguing to investigate if those "cryptic coloured groups" could avoid lower attack risk from predators or the cryptic signals are sent to the predators that are different from those involved in more "conspicuous" mimicry complexes.

Acknowledgements

We are indebted to the following people and traders who helped us in various aspects during the process of this preliminary study: Tai Tzu Aquarium Co., Basil Aquarium, Huayang Aquarium, AquaProjectTaiwan, Tzen Wei-Chieh and Gu Chun-Yih.

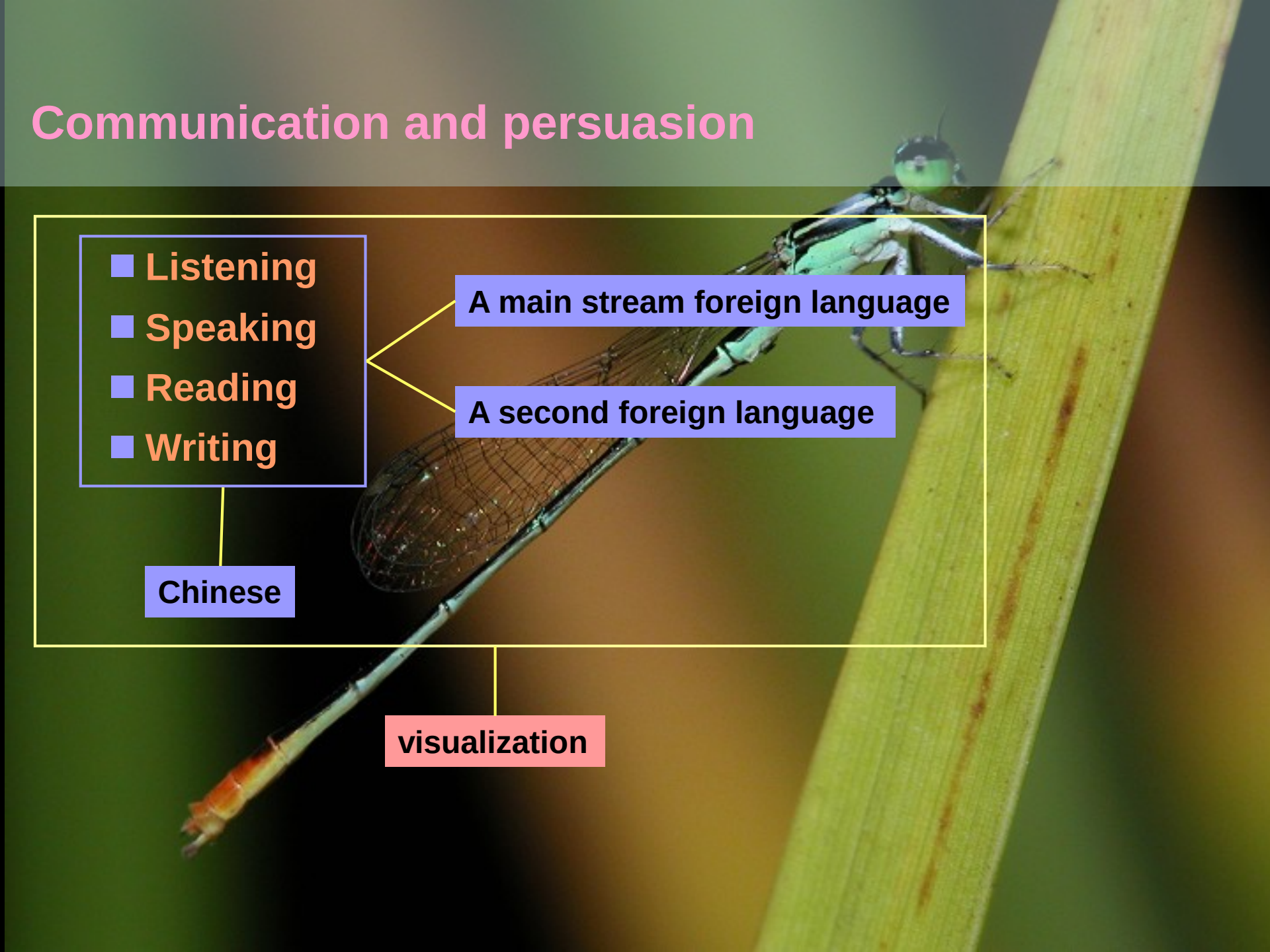
Our blogs


奇獸飼育學
care of magical creatures

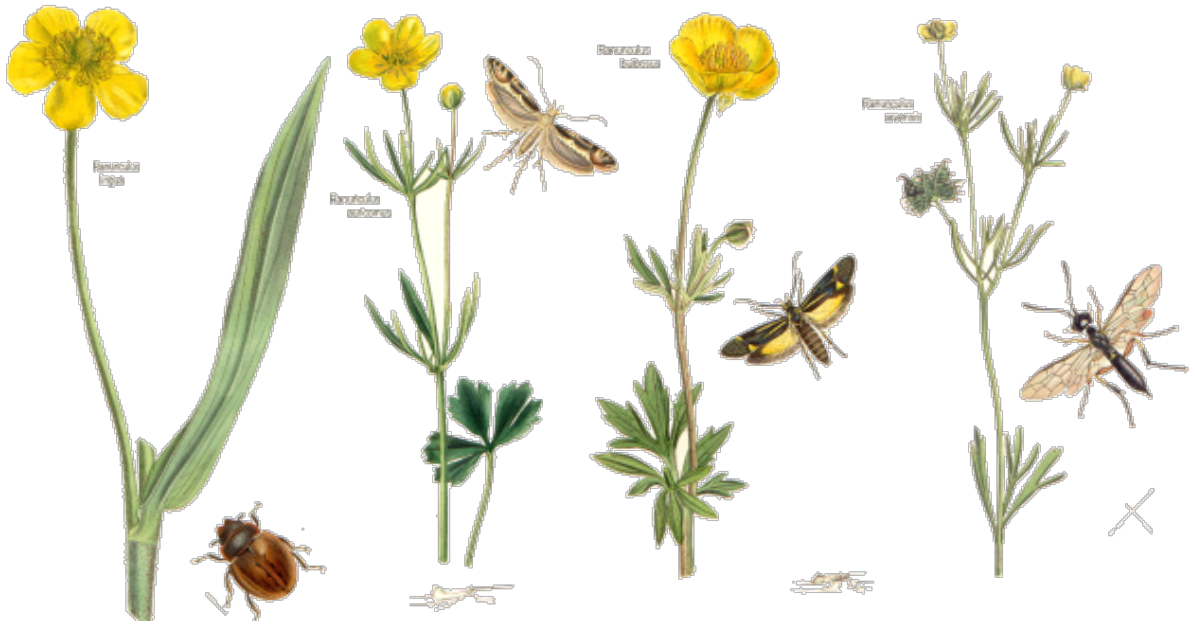

這是什麼啊? 可以吃嗎?
Aposematism & Mimicry
a mind battle between predator & prey


Cladistic Biogeography

Communication and persuasion



Text or Image?



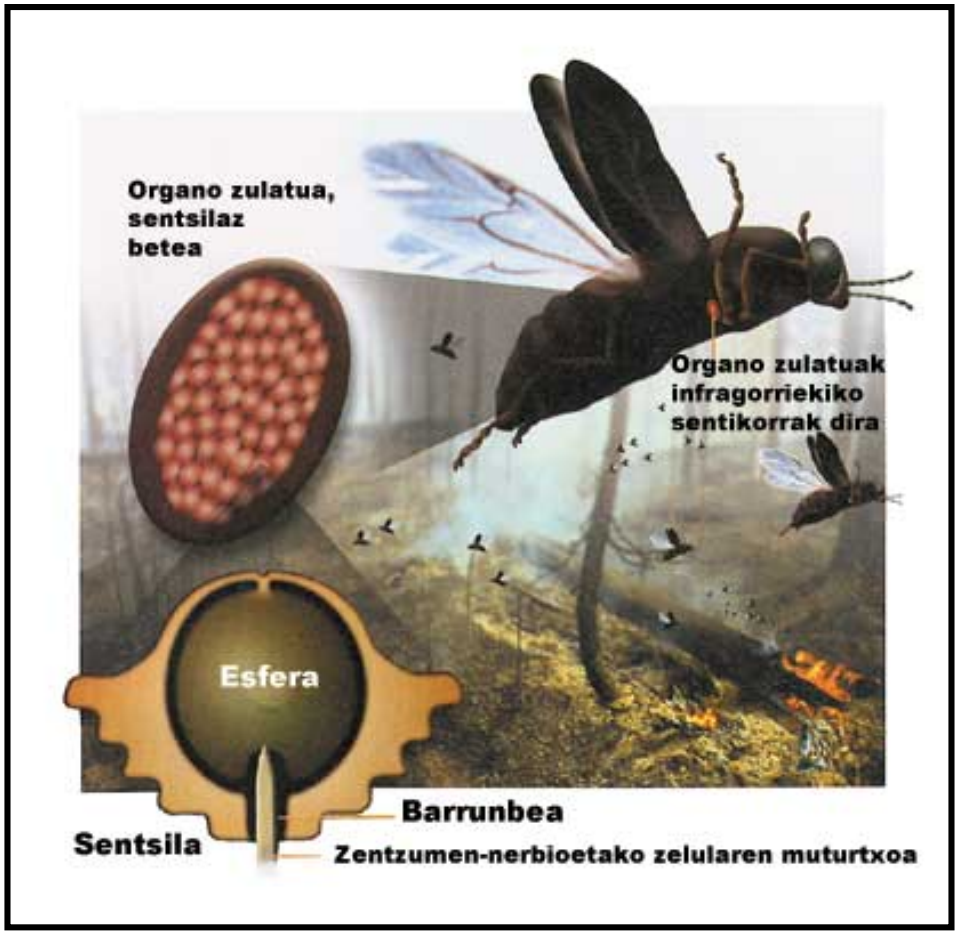
THERMAL STIMULI

Thermoreception

◆多數昆蟲觸角可感覺溫度

◆美洲蜚蠊(小強)之溫度受器位於跗節中葉及褥盤上

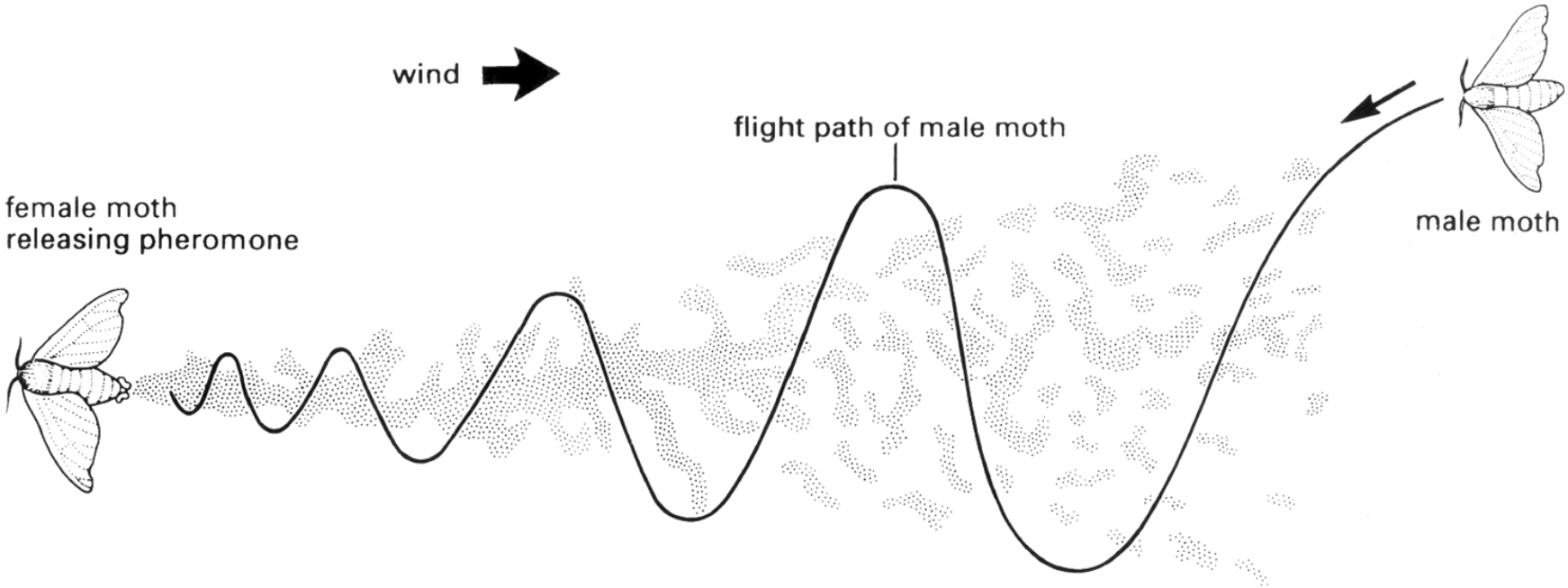
◆某些吉丁蟲可藉紅外線受器偵測森林火災的發生



CHEMICAL STIMULI

Semiochemicals-pheromones

- Sex pheromones-sex attraction pheromone, courtship pheromones
- Aggregation pheromones
- Spacing pheromones
- Trail-marking pheromones
- Alarm pheromones



CHEMICAL STIMULI

Semiochemicals: kairomones, allomones and synonymones

◆ 訊息物質(semiochemicals)作用在同一物種不同個體時稱費洛蒙(pheromones)

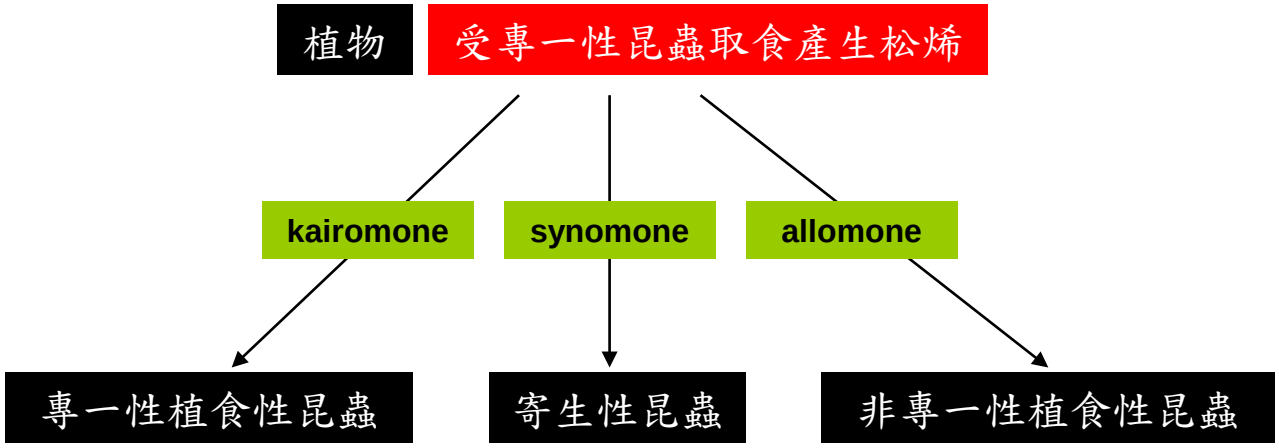
◆ 作用於不同種類時稱為它感作用物(allelochemicals)

◆ 種間訊息物質可分為：

→對接收者有利但對製造者有害時稱kairomones

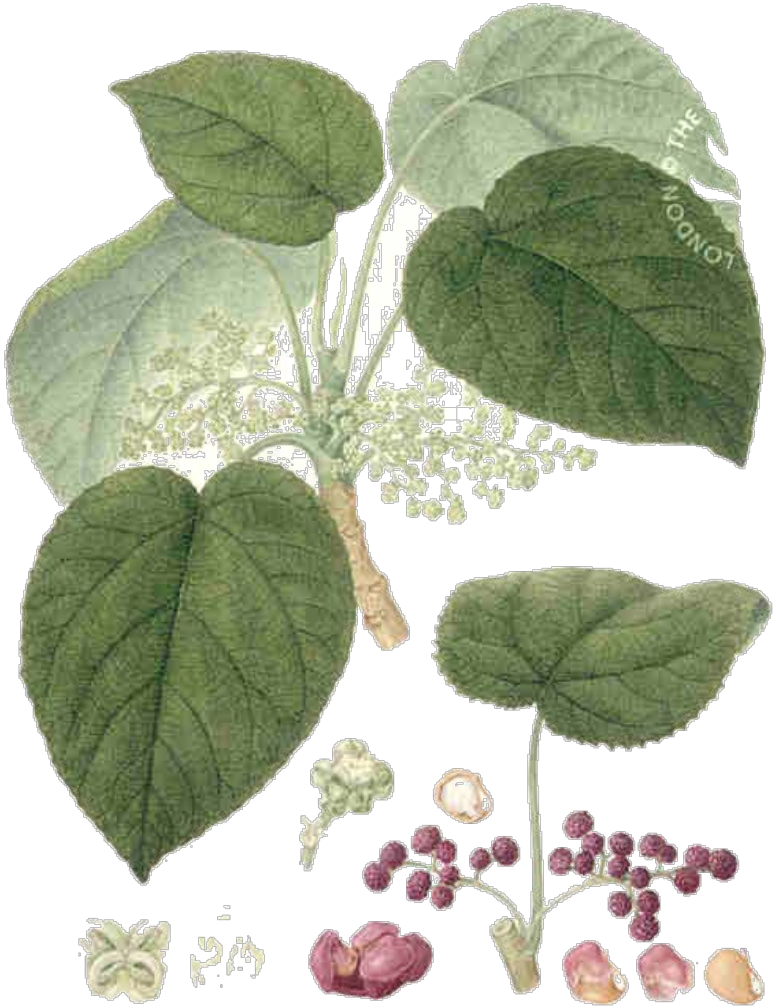
→藉改變接收者的行為而讓製造者獲利, 但對接收者無明顯利弊allomones

→對製造者與接收者雙方接有利synomones



什麼是科學繪圖的概念?

- 是一種科學性的視覺溝通
- 繪圖者必須提供精確且具邏輯的訊息給觀看者以避免誤解
- 繪圖者必須充份瞭解繪圖主體的特性及其背景知識
- 繪圖者必須將科學的精確性與藝術性加以整合



你是一個善於溝通的科學家嗎?

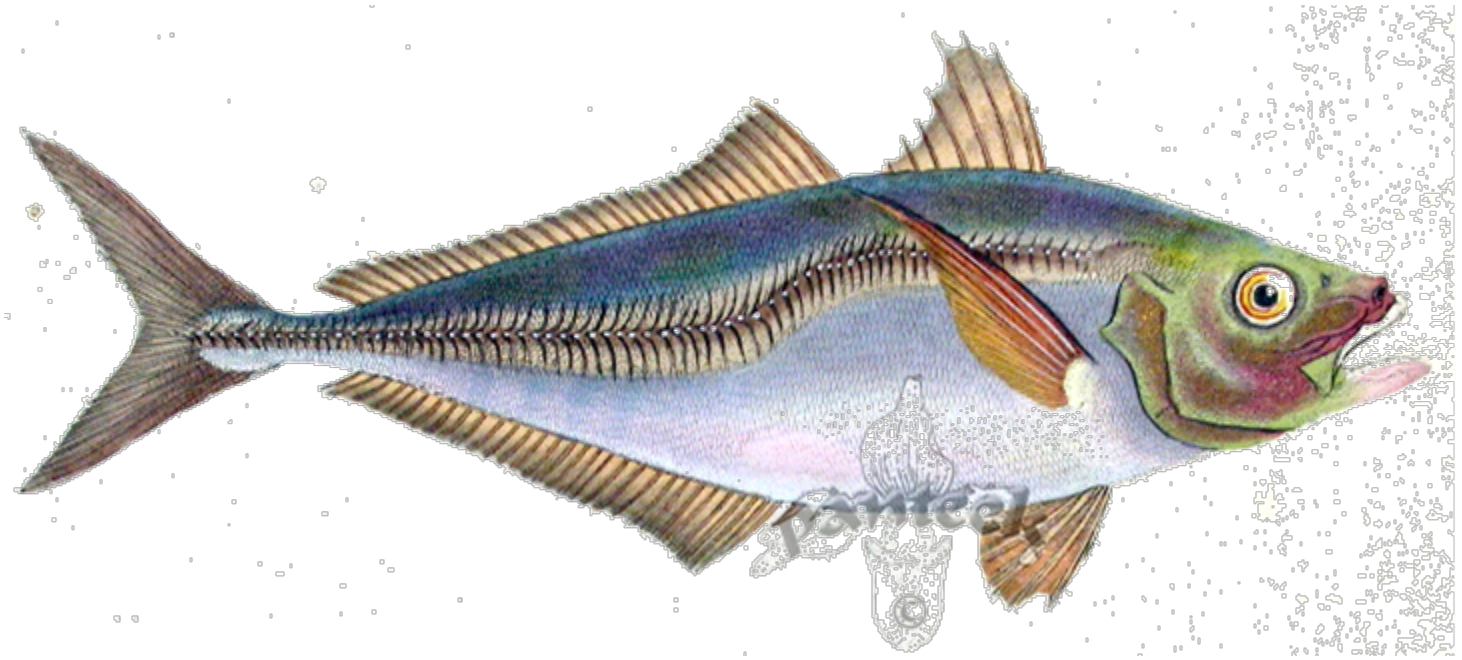
- 反正沒有人看得懂?
- 你們瞧瞧我懂得真多?
- 我太忙了這種小事不必麻煩我去做?
- 你想知道什麼自己看著辦?
- 我生性內向害羞不善表達....

什麼是良好的製圖?

- 良好的繪圖可幫助科學家所說所寫能夠被充份理解
- 良好的繪圖可幫助科學家分享其研究成果
- 並且說服"金主" 提供經費
- 並使大眾瞭解科學研究成果的價值
- 良好的繪圖必須考量圖案的種類與數量, 所涵蓋的資訊是否充份, 繁簡是否恰當, 觀眾是否可理解
- 良好的繪圖需配合適當的媒介(如紙張, 投影片, 軟體, 海報)以及適切的尺吋, 格式等
- 良好的繪圖對於觀者具有合宜 的視覺效果並可吸引其注意

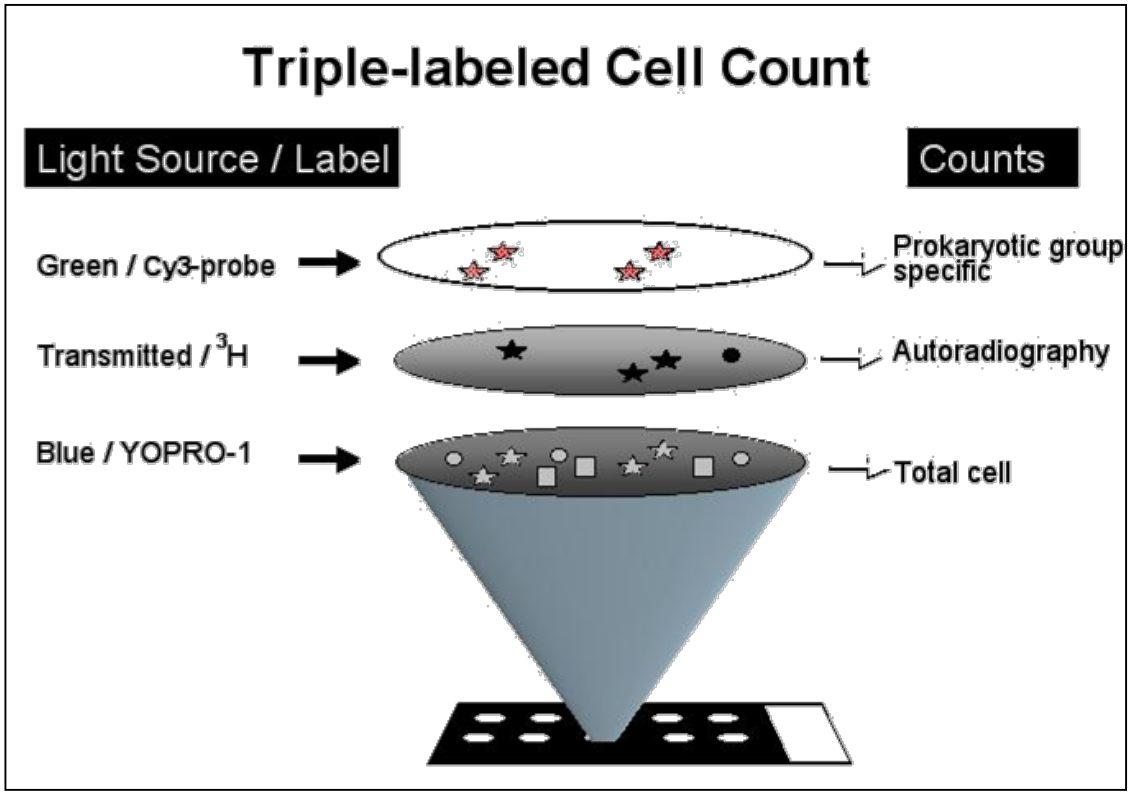
如何構思一幅好圖?

- 再好的構想也需要整合/理
- 極為複雜的構想必須要釐清輕重緩急與表達的重點, 並使對該議題不熟悉的讀者/聽眾容易進入狀況
- 構思為繪圖最重要的步驟, 良好的計畫可以省時省錢省力



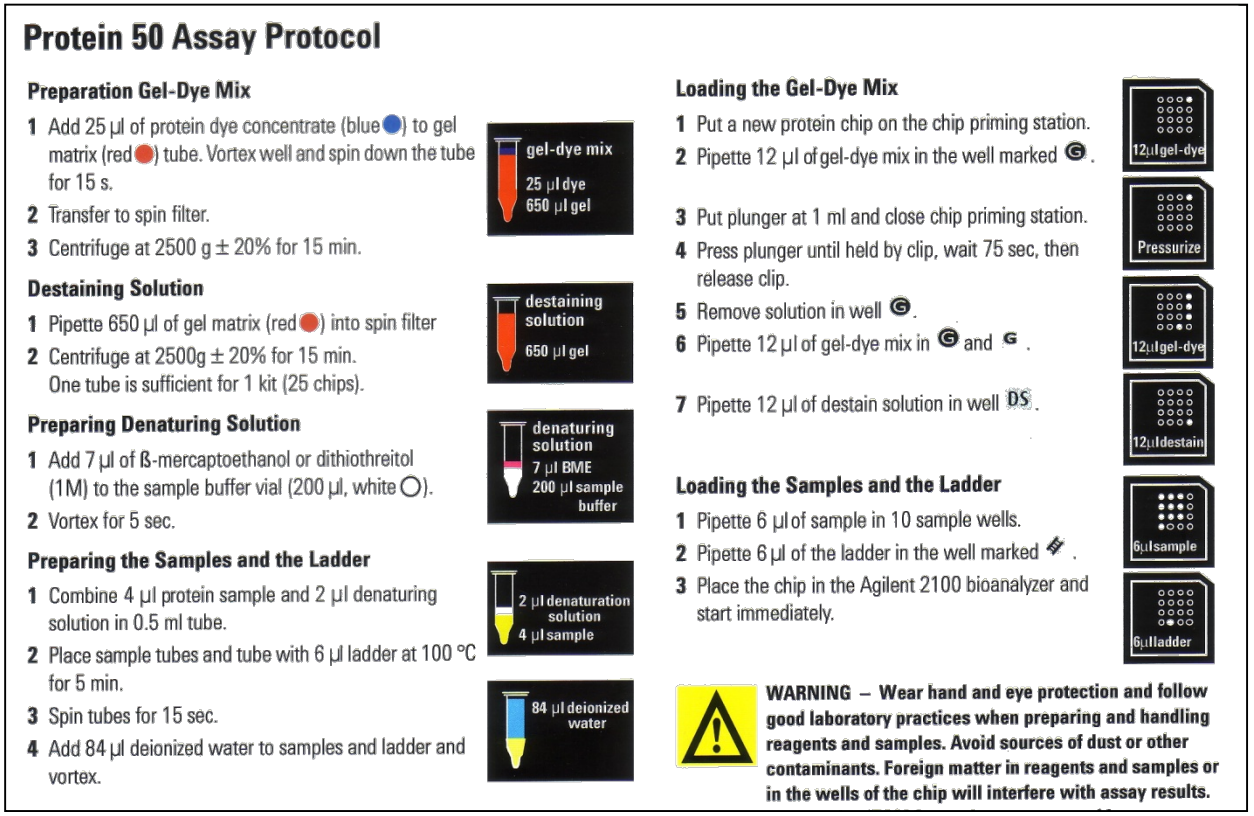
何時該使用圖?

- 文字說明言有未逮時
- 需要佐證時
- 須提供讀者用以理解難度較高的分析時
- 釐清, 簡化與總結資訊
- 強化資訊
- 提供背景資訊



應包含多少資訊?

- 一張圖有太多資訊是一種毀滅性的災難
- 一張圖有太多資訊會讓讀者/觀眾霧煞煞
- 一張圖包含多少東西取決於使用的媒介
- 資訊的容量取決於觀者/聽眾的特性以及資訊本身的特質



Protein 50 Assay Protocol

Preparation Gel-Dye Mix

1 Add 25 µl of protein dye concentrate (blue) to gel matrix (red) tube. Vortex well and spin down the tube for 15 s.
2 Transfer to spin filter.
3 Centrifuge at 2500 g ± 20% for 15 min.

gel-dye mix
25 µl dye
650 µl gel

Destaining Solution

1 Pipette 650 µl of gel matrix (red) into spin filter
2 Centrifuge at 2500g ± 20% for 15 min.
One tube is sufficient for 1 kit (25 chips).

destaining solution
650 µl gel

Preparing Denaturing Solution

1 Add 7 µl of ß-mercaptoethanol or dithiothreitol (1M) to the sample buffer vial (200 µl, white).
2 Vortex for 5 sec.

denaturing solution
7 µl BME
200 µl sample buffer

Preparing the Samples and the Ladder

1 Combine 4 µl protein sample and 2 µl denaturing solution in 0.5 ml tube.
2 Place sample tubes and tube with 6 µl ladder at 100 °C for 5 min.
3 Spin tubes for 15 sec.
4 Add 84 µl deionized water to samples and ladder and vortex.

2 µl denaturation solution
4 µl sample

84 µl deionized water

Loading the Gel-Dye Mix

1 Put a new protein chip on the chip priming station.
2 Pipette 12 µl of gel-dye mix in the well marked G.
3 Put plunger at 1 ml and close chip priming station.
4 Press plunger until held by clip, wait 75 sec, then release clip.
5 Remove solution in well G.
6 Pipette 12 µl of gel-dye mix in G and G.
7 Pipette 12 µl of destain solution in well DS.

12µl gel-dye
Pressurize
12µl gel-dye
12µl destain

Loading the Samples and the Ladder

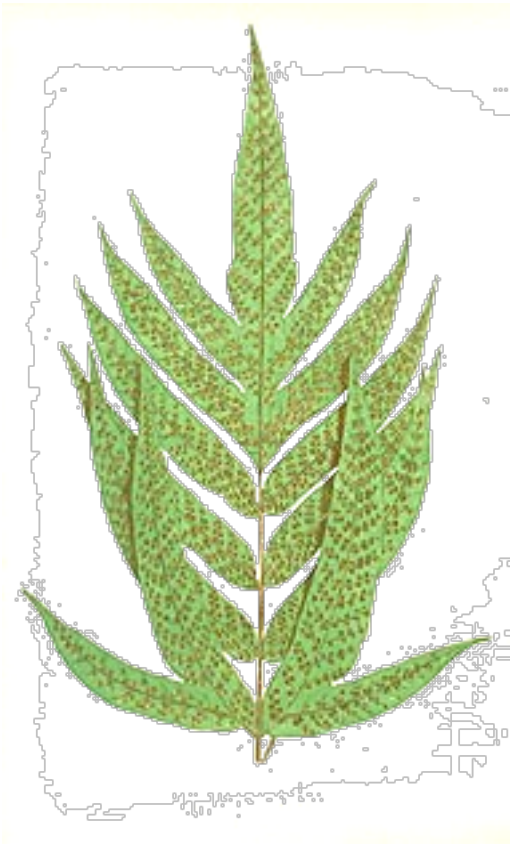
1 Pipette 6 µl of sample in 10 sample wells.
2 Pipette 6 µl of the ladder in the well marked.
3 Place the chip in the Agilent 2100 bioanalyzer and start immediately.

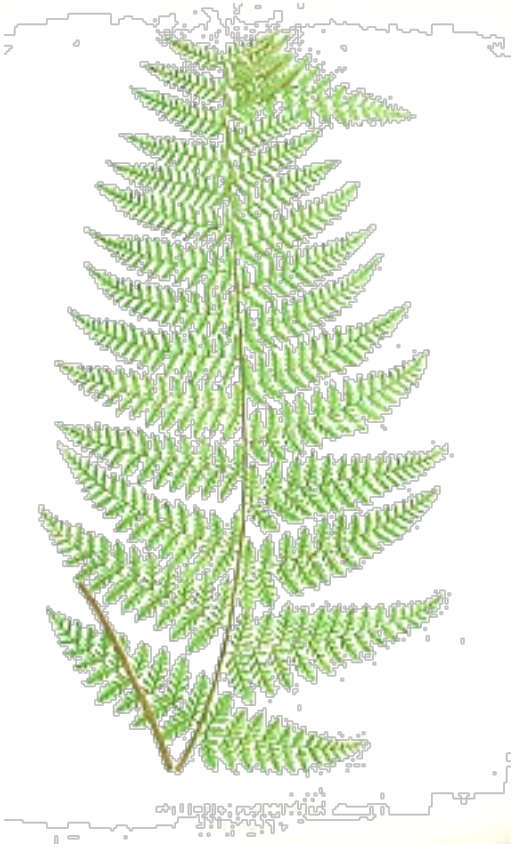
6µl sample
6µl ladder

WARNING – Wear hand and eye protection and follow good laboratory practices when preparing and handling reagents and samples. Avoid sources of dust or other contaminants. Foreign matter in reagents and samples or in the wells of the chip will interfere with assay results.

如何為讀者/聽眾作準備?

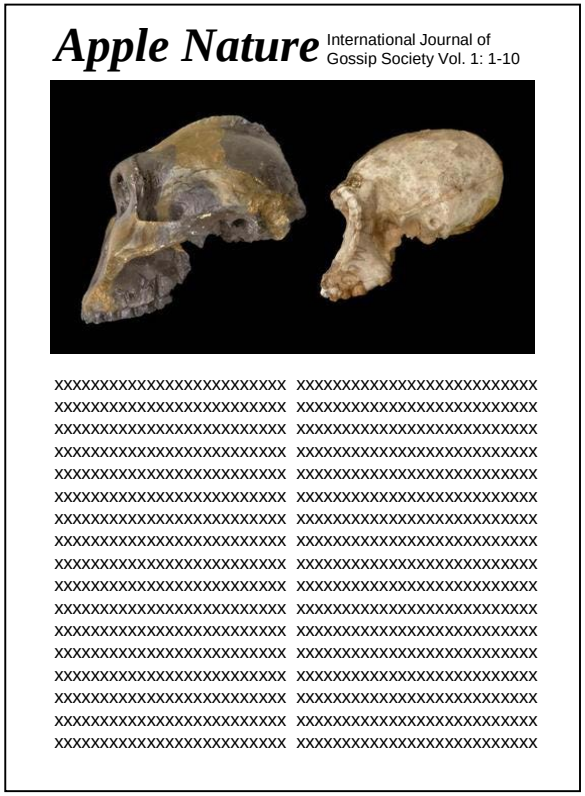
- 讀者/聽眾的背景為何? 年齡? 教育? 專業?
- 有些讀者/聽眾將需要更多的背景知識與解釋性圖片, 對多數人來說, 簡圖與示意圖比文字與表更容易被理解

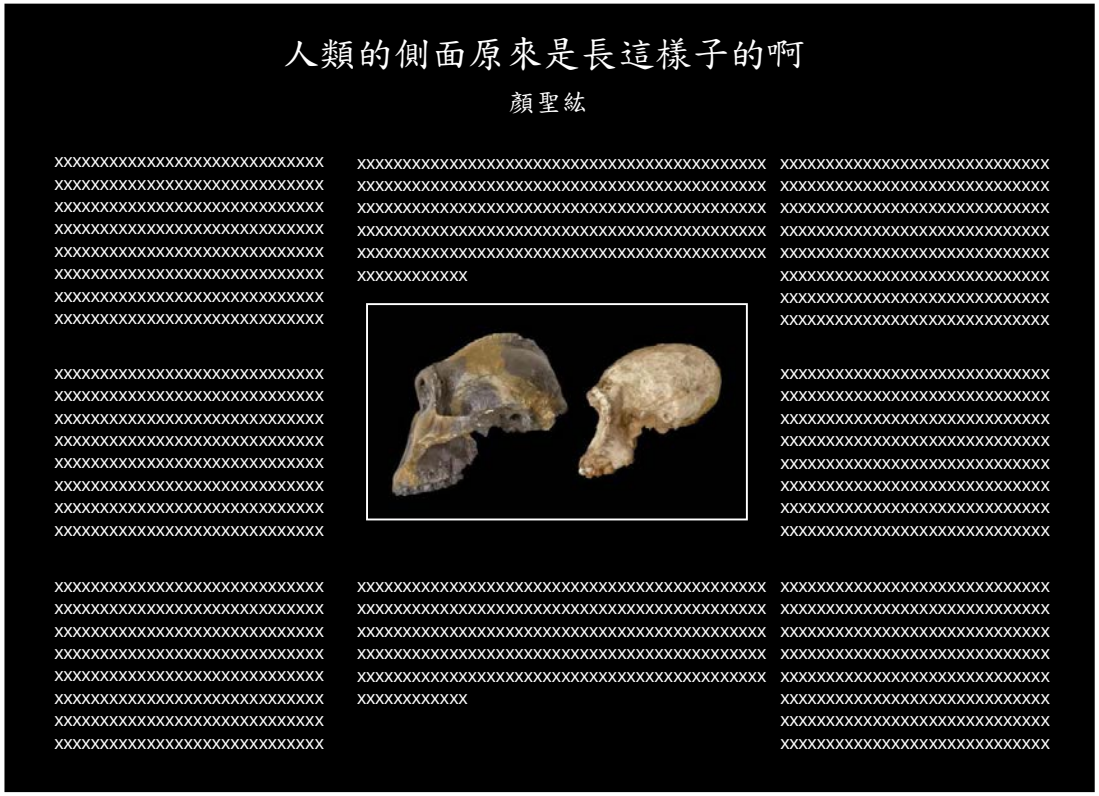




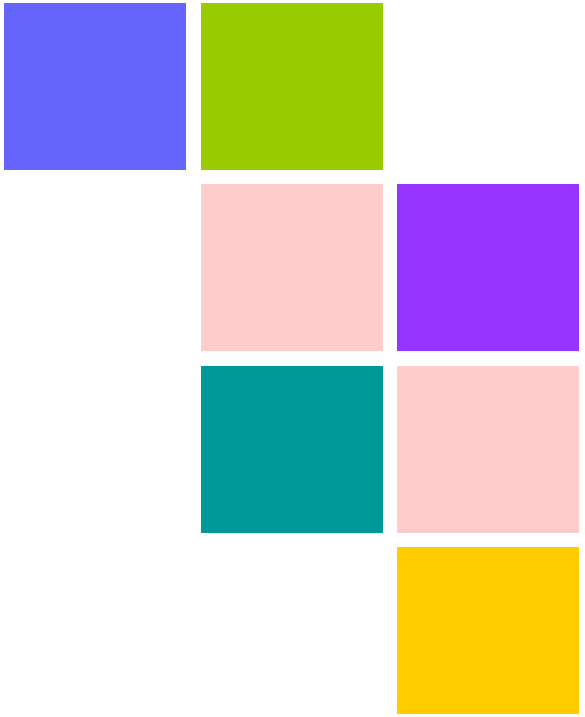
應該使用何種媒介?

- 若使用於期刊投稿....
- 若使用於課堂或公開演說....
- 若使用於海報....



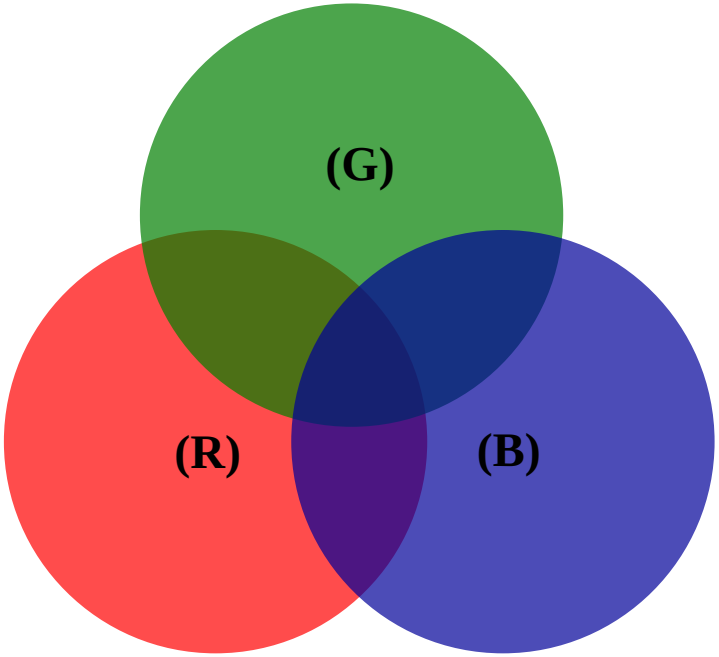


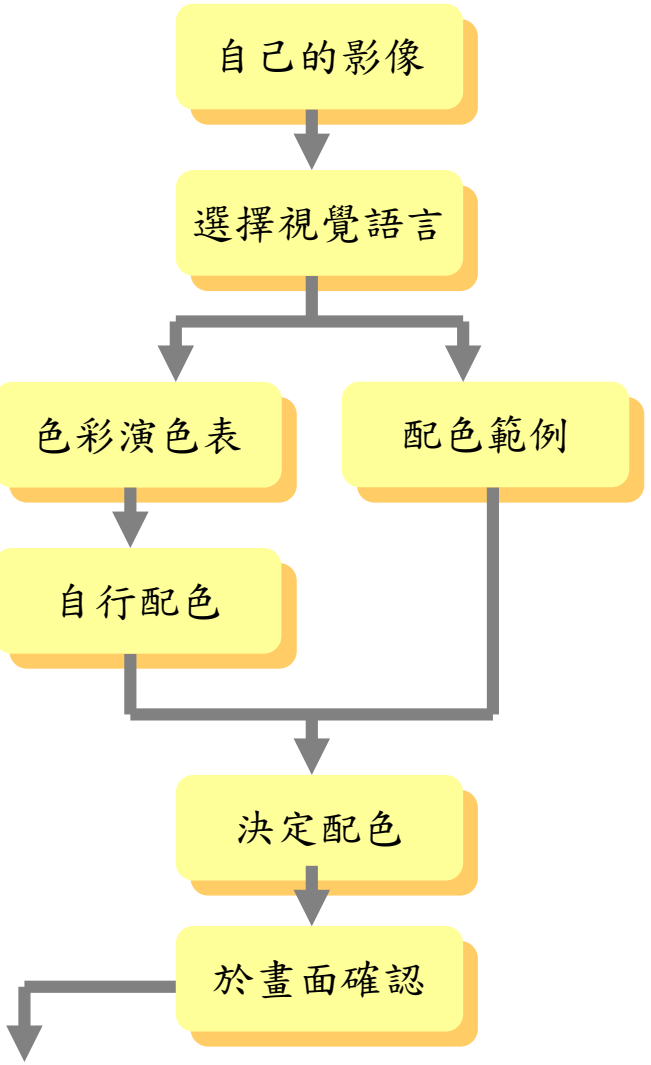
沒有色感怎麼辦?



RGB與安全色

●RGB配色特徵





- 是否易於觀看?
- 色彩對比是否恰當?
- 效果
- 是否美觀?
- 訊息是否明確?

易於觀看的基本概念

- 易於觀看

A B C D E F G H I J K L M N

A B C D E F G H I J K L M N

A B C D E F G H I J K L M N

- 加上對比

BIOLOGY

BIOLOGY

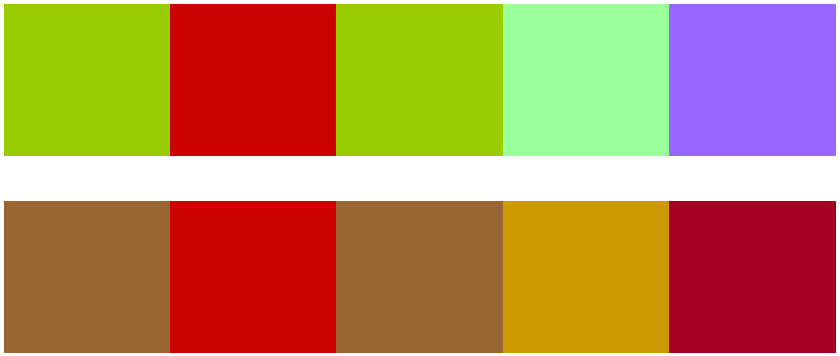
- 選擇色相

BIOLOGY

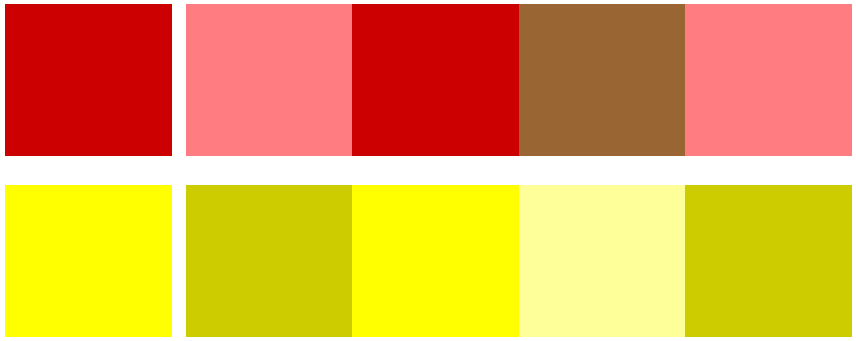
BIOLOGY

創造美感

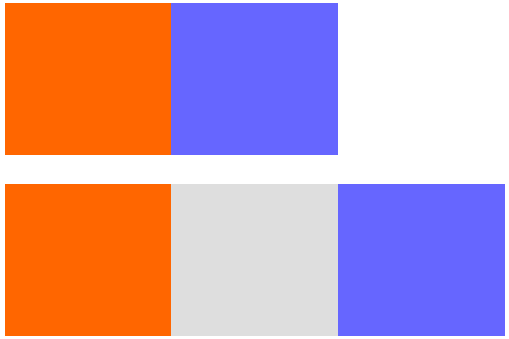
●調和



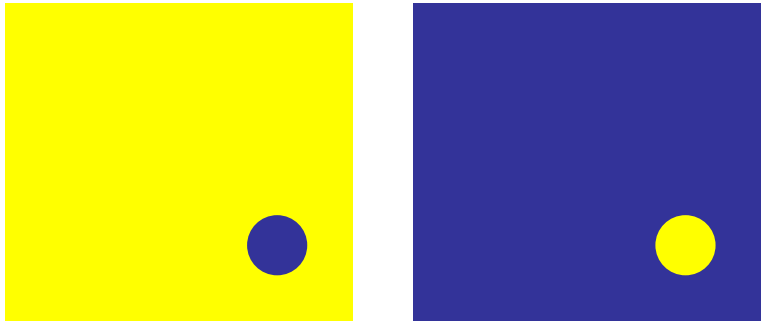
●美感與統一感



●利用無彩色

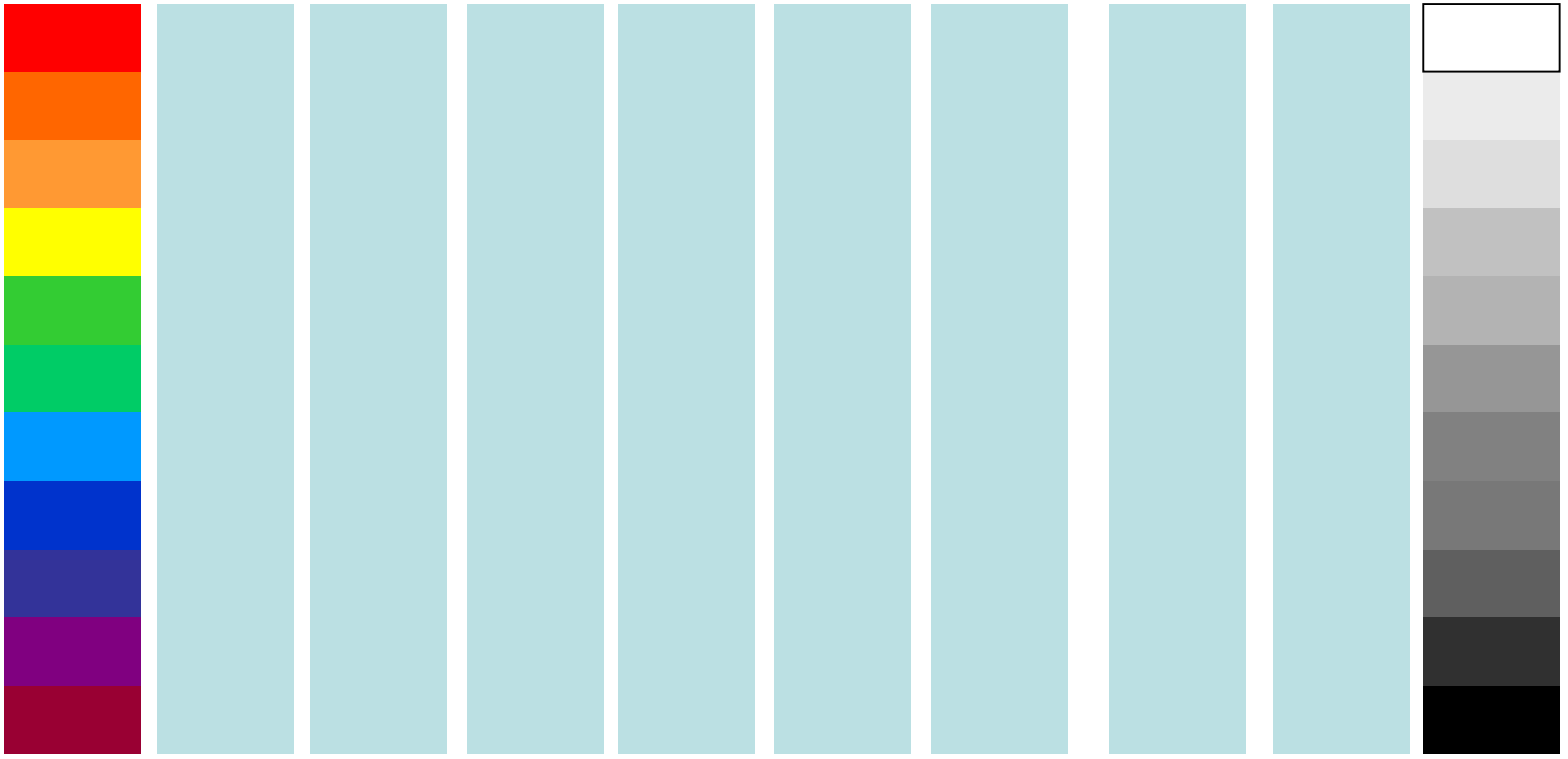


●平衡感



色彩影像演色表

P 純潔的 C 清新的 M 溫順的 Y 年輕的 S 嚴肅的 H 沉重的 HD剛硬的 PN質樸的 E 年長的 N 中性的

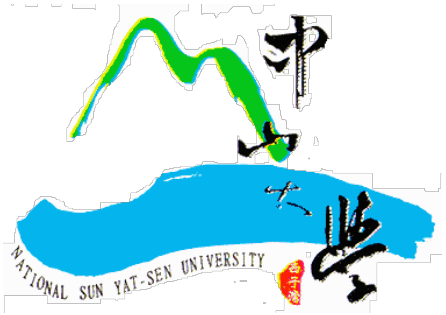


色彩, 字體與圖片的組合

國立中山大學生物科學研究所
博士論文

為什麼我還不能畢業
Why haven't I got graduated

學生: 喔喔喔
指導教授: 芝麻博士



中華民國 98年 7 月

國立中山大學生物科學研究所
博士論文

我畢業了你們慢慢玩吧
I've got it and you guys may keep on

學生: 爽爽爽
指導教授: 芝麻博士

中華民國 98 年 7 月

選形與構圖

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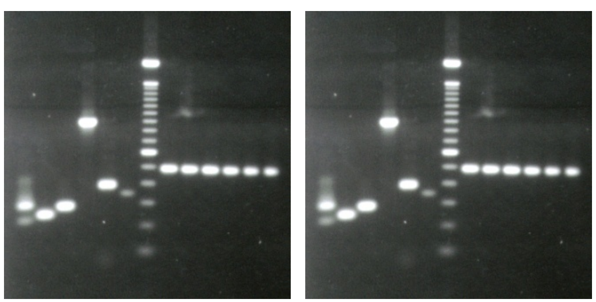


Fig. 1.XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

標題, 圖片與正文字塊的組合

Evolutionary ecology of stupidization in Taiwan politicians

Abstract xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx xxxxxxxxx. Mei-hua Report Vol. 1 (1): 100-101.

XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXX

Fig. 1.Mama and bian-bian

XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXX

18 *Shen-Horn Yen et al.*

complex, including three specimens of the edocla form of *E. aedea aedea* because this form has a wide variation in the metallic blue sheen in zone c of the hindwing. Under visible lighting conditions, each of these species appeared slightly different in the development of the metallic blue sheen, although every species had prominent white patches on the forewings and reduced white patches on the hindwings (compared with the yellow–orange mimetic type). The UV reflectance of the forewing white patches of *E. aedea aedea* and *E. sublutea sublutea* (*fasciata* form) was much stronger than in the two agaristine species and *Tosena fasciata*. The metallic blue sheen did not appear very differently in these lighting conditions. The UV-induced fluorescent forewing white patches of *Eterusia* and *Tosena fasciata* were stronger than those of the Agaristinae moths, whereas specimens with a metallic blue sheen had very similar appearance under this lighting. Including *Tosena* in this mimicry complex (Owada & Ta, 2002) is questionable because this species does not fly actively in the day time, unlike *Eterusia* species (Yen, pers. obs.). Furthermore, its reflectance of eyes, thoracic band and abdomen under the UV-derived fluorescence is not seen from either *Eterusia* or *Scobigera* moths.

Blue–white type (Fig. 3). Under the visible light, the main differences between *E. taiwana* and *E. aedea formosana* were the congregation of the white patches in zone c of the forewing and the development of submarginal spots in the hindwing. UV reflectance and UV-induced fluorescence showed no marked differences in the hindwing ground colour between *E. taiwana* and the two colour forms of *E. aedea formosana*. Because the presence of the yellow hindwings of *E. aedea formosana* is not sex limited, we do not expect that this unusual colour pattern is correlated with sexual selection within the subspecies. In Taiwan, *E. taiwana* and *E. aedea formosana* are sympatric, but the adults of the latter are generally more common (Yen, pers. obs.). Owada (2001) indicated that *E. aedea formosana* is nocturnal, whereas the first author's observations contradict this because only the male of this subspecies can be attracted by light traps, but both sexes are very active in the forest canopy during the day.

Phylogenetic relationships of Eterusia

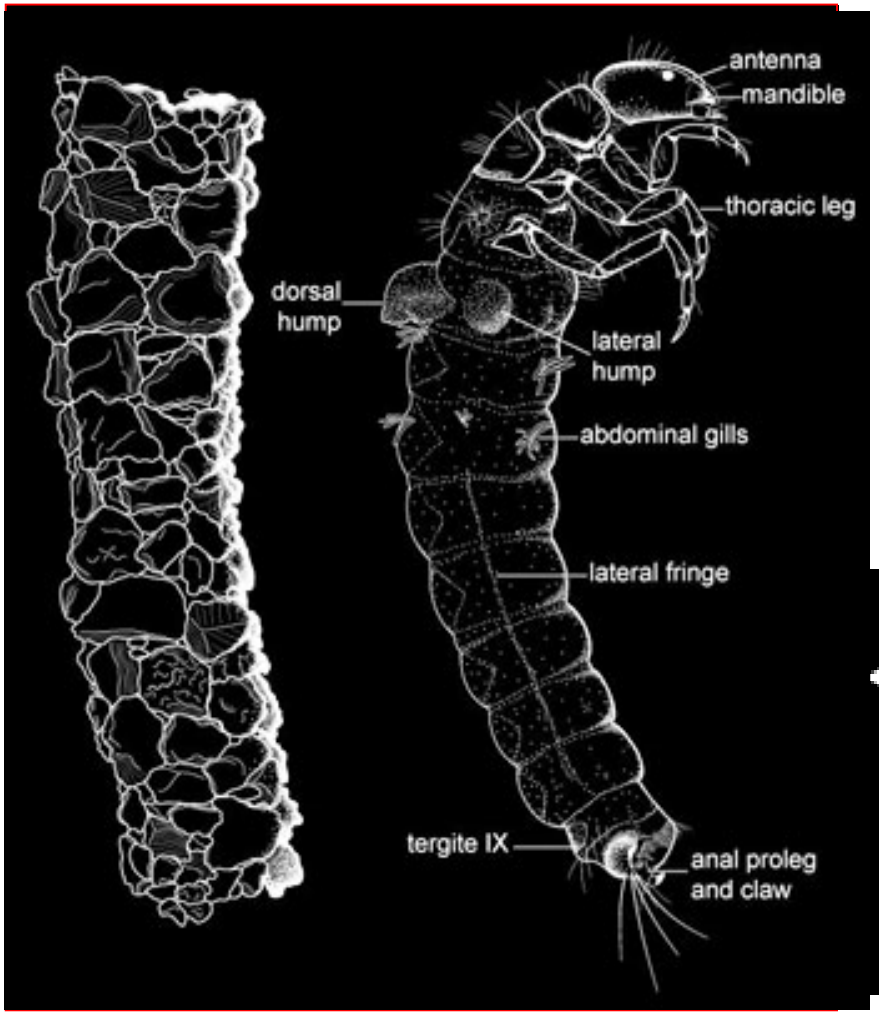
Relationships of Eterusia species based on the full dataset. The initial analysis of the dataset (Appendix 2) generated 907 MPTs (tree length = 356, CI = 0.752, RI = 0.858). The strict consensus cladogram of these (Fig. 11A) recovered *Eterusia* sensu Yen (2004a) as a monophyletic group, supported by thirty-one synapomorphies, of which thirteen are unique to *Eterusia*. The clade (*E. risa* + *E. angustipennis*) is supported by sixteen synapomorphies and the clade (*E. lineata* + *E. guerriana*) by seventeen synapomorphies. These two clades are sister groups and are referred to here collectively as the risa species group, which is supported by eighteen synapomorphic characters, including six unique ones.

The *E. tricolor* species group sensu Owada was recovered as a monophyletic group supported by twenty-four synapomorphies, but except for the sister-group relationship of *E. tricolor* and *E. taiwana* (supported by six

Fig.3. A potential mimicry complex participated by *Eterusia taiwana* (top) and *E. aedea formosana* (yellow form, middle; white form, bottom). A, Visible light patterns; B, ultraviolet reflectance patterns shown against an ultraviolet reflecting background; C, fluorescence patterns

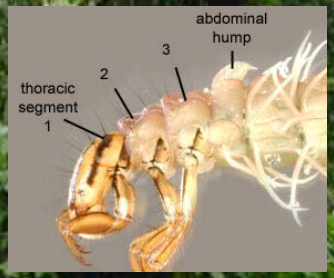
TRICHOPTERA 毛翅目

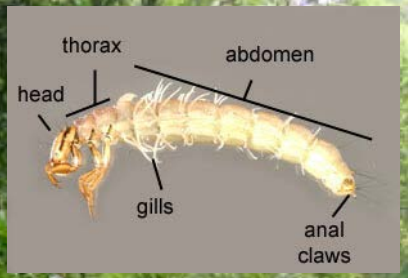
Caddisflies



- About 2400 highly specialised speciesLarvae aquatic, apneustic (no open spiracles), respiration epidermal, often by filamentous abdominal gills
- Larval tentorium reduced, delicate
- Larval antennae greatly reduced
- Larval abdominal segments I-IX without prolegs
- Larval abdominal segment IX with dorsal tergite
- Adult mandibles reduced, with loss of mandibular articulation
- Adult prelabium joined with hypopharynx to form a unique "haustellum" which serves as a lapping/sponging organ

平衡與協調-網格的使用





- About 2400 highly specialised speciesLarvae aquatic, apneustic (no open spiracles), respiration epidermal, often by filamentous abdominal gills
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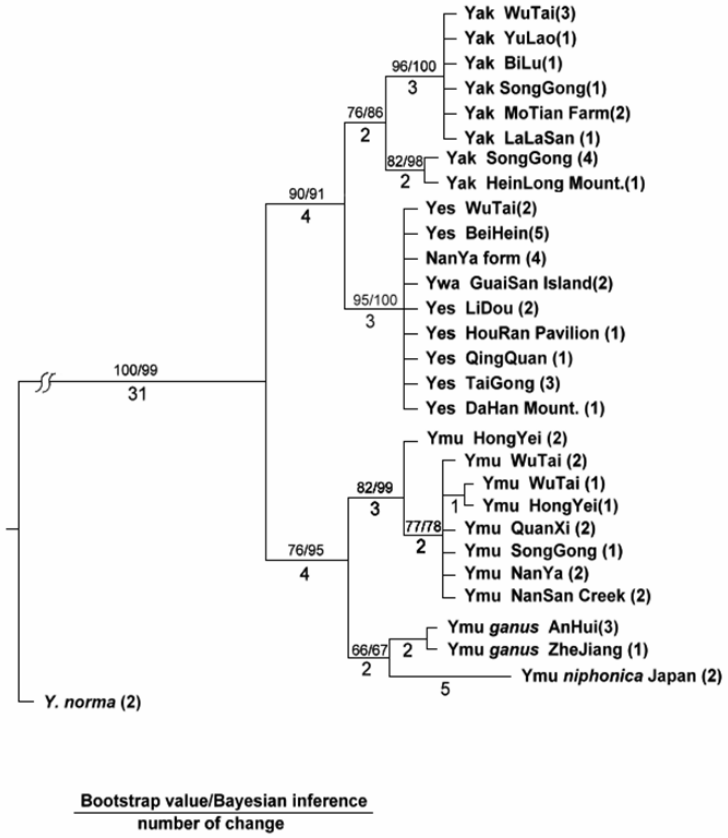
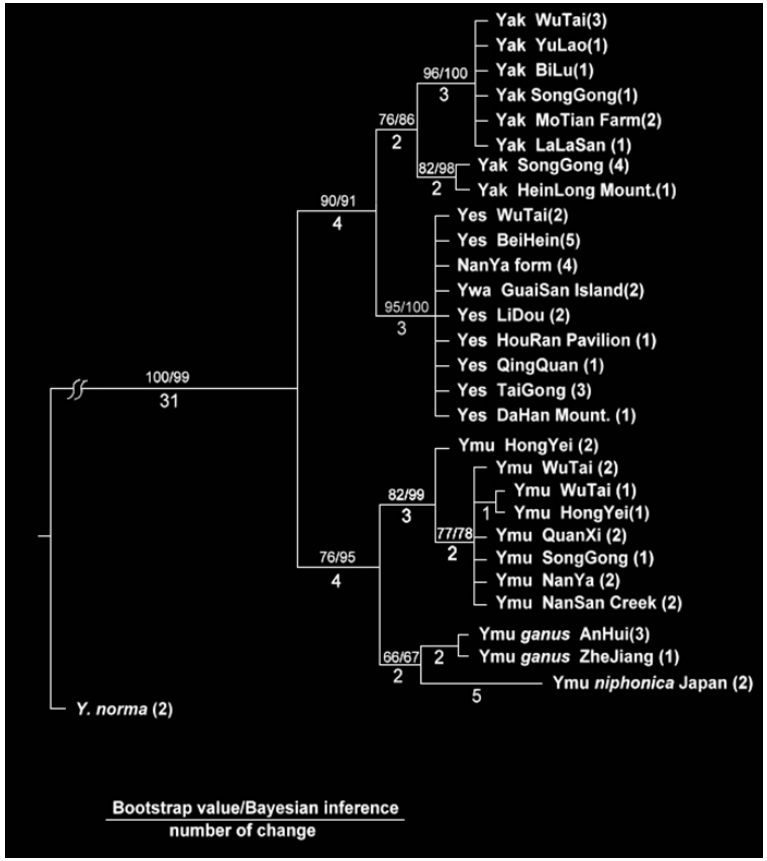
版面設置－黑白反轉


Yak WuTai(3)
Yak YuLao(1)
Yak BiLu(1)
Yak SongGong(1)
Yak MoTian Farm(2)
Yak LaLaSan (1)
Yak SongGong (4)
Yak HeinLong Mount.(1)
Yes WuTai(2)
Yes BeiHein(5)
NanYa form (4)
Ywa GuaiSan Island(2)
Yes LiDou (2)
Yes HouRan Pavilion (1)
Yes QingQuan (1)
Yes TaiGong (3)
Yes DaHan Mount. (1)
Ymu HongYei (2)
Ymu WuTai (2)
Ymu WuTai (1)
Ymu HongYei(1)
Ymu QuanXi (2)
Ymu SongGong (1)
Ymu NanYa (2)
Ymu NanSan Creek (2)
Ymu ganus AnHui(3)
Ymu ganus ZheJiang (1)
Ymu niphonica Japan (2)
Y. norma (2)
96/100
3
76/86
2
82/98
2
90/91
4
95/100
3
100/99
31
82/99
3
1
77/78
2
76/95
4
66/67
2
2
5
Bootstrap value/Bayesian inference
number of change


Yak WuTai(3)
Yak YuLao(1)
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Ymu HongYei(1)
Ymu QuanXi (2)
Ymu SongGong (1)
Ymu NanYa (2)
Ymu NanSan Creek (2)
Ymu ganus AnHui(3)
Ymu ganus ZheJiang (1)
Ymu niphonica Japan (2)
Y. norma (2)
96/100
3
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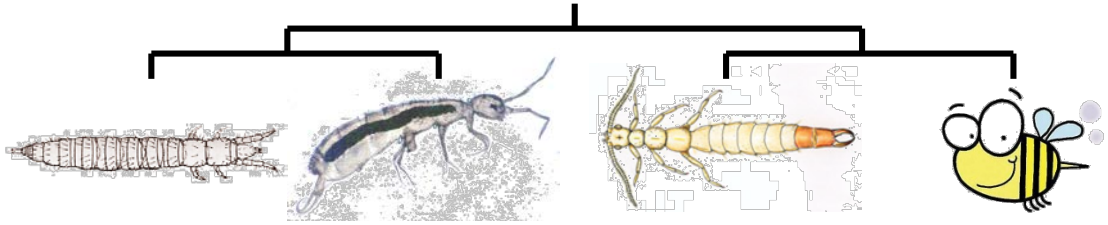
5
Bootstrap value/Bayesian inference
number of change

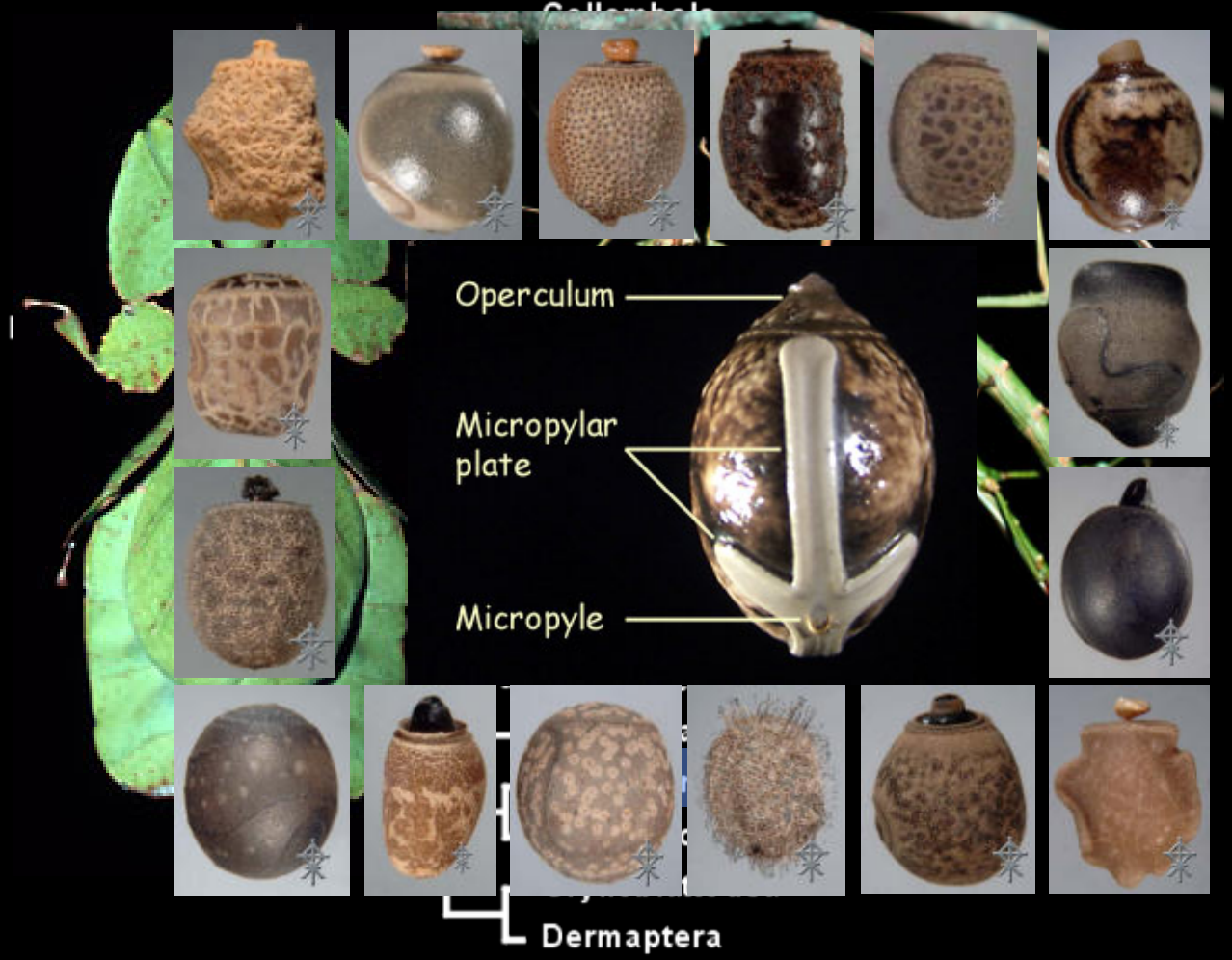
Diagnostic characters of INSECTA:



	PROTURA	COLLEMBOLA	DIPLURA	INSECTA
Mouthpart	entognathous	entognathous	entognathous	ectognathous
Eyes	absent	ocelli	ocelli	ocelli, oculli
Antennae	absent	present	present	present
Thorax	undeveloped	developed	developed	developed
Legs	5 segments	4 segments	5 segments	> 5 segments
Abdomen	12 segments	6 segments	10 segments	11 segment
Genital pore	btw A11-12	A5	btw A8-9	A9(m) A8(f)
Anal opening	posterior	A6	posterior	A10
Gas exchange	epidermal	epidermal	tracheal	tracheal
Larval development	anamorphic	epimorphic	epimorphic	epimorphic
Cerci	absent	absent	present	present

ORTHOPTEROIDS 直翅群 PHASMATODEA 虫修目

Orthopteroids



- About 2500 species in 3 or more families
- All possess a pair of exocrine glands inside the prothorax (in a few species, these glands can discharge an irritating, tear gas-like spray used for defense).
- The intestine has unique filament bearing glands.
- The dorso-ventral muscles of the abdomen are numerous, short, and arranged in parallel.
- Males of many species possess a unique sclerite termed the vomer. This structure is located above the genitalia and permits the male to clasp the female

字體, 行距與字距

小鼠有將近3500個位於特定染色體位置的基因被提出，很多這類基因自發性突變的發生而被首次認知。吾人對人類遺傳性免疫疾病機制的了解，可經由實驗動物中，因某一單一基因突變，干擾免疫系統之研究而獲益不少。二種影響淋巴器官發育的免疫突變：裸毛(nude, nu)，導致胸腺發育不全：顯性半肢畸型(hemimelia, Dh)導致胰臟發育不全。某些突變如：裸毛(nu)及嚴重複合免疫不全症(severe combined immunodeficiency, scid)可用於人體或其他異種組織受體。然而某些突變如棕灰色(beige, bg)可視為人類特殊疾病之同性質模式。免疫突變的主要價值在可深入了解哺乳動物免疫系的一良好工具。

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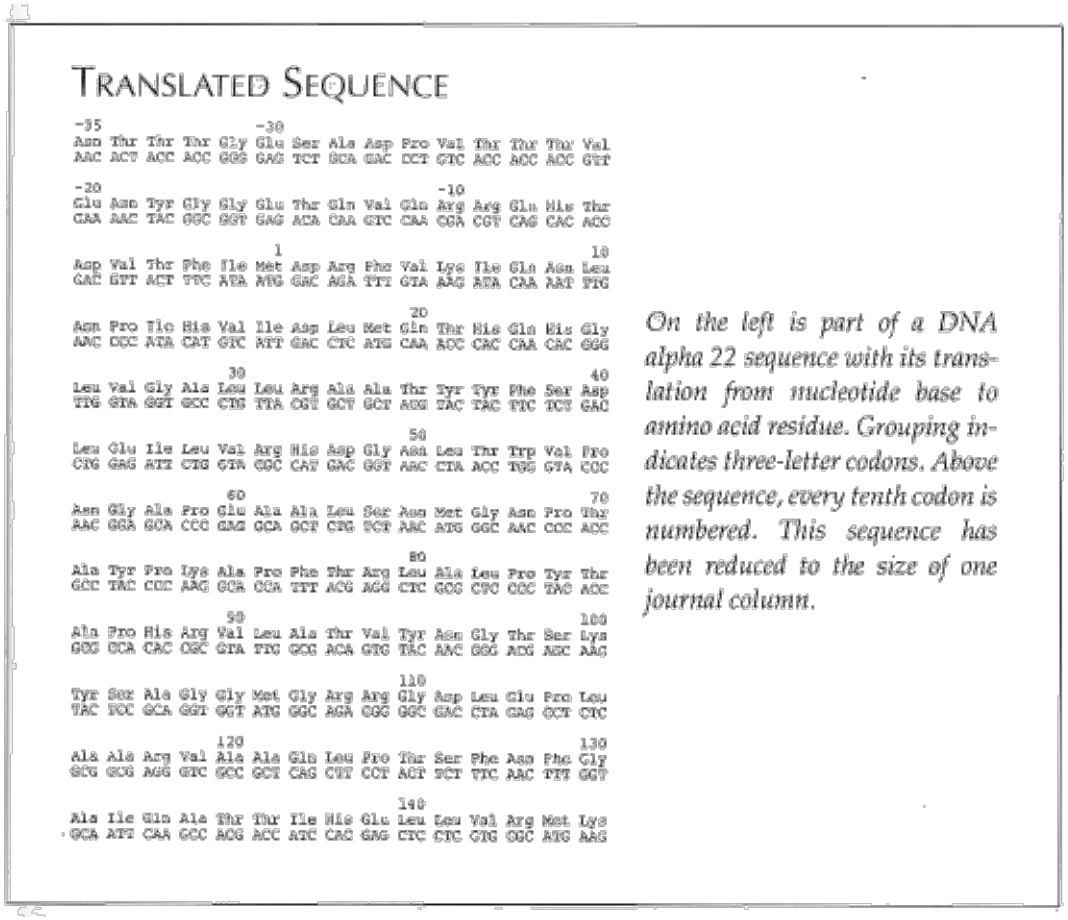
Molecular graphics

Genetic Sequences



TRANSLATED SEQUENCE

```
-35                 -30
Asn Thr Thr Thr Gly Glu Ser Ala Asp Pro Val Thr Thr Thr Val
AAC ACT ACC ACC GGG GAG TCT GCA GAC CCT GTC ACC ACC ACC GTT

-20                                 -10
Glu Asn Tyr Gly Gly Glu Thr Gln Val Gln Arg Arg Gln His Thr
GAA AAC TAC GGC GGT GAG ACA CAA GTC CAA CGA CGT CAG CAC ACC

                    1                                   10
Asp Val Thr Phe Ile Met Asp Arg Phe Val Lys Ile Gln Asn Leu
GAC GTT ACT TTC ATA ATG GAC AGA TTT GTA AAG ATA CAA AAT TTG

                                   20
Asn Pro Ile His Val Ile Asp Leu Met Gln Thr His Gln His Gly
AAC CCC ATA CAT GTC ATT GAC CTC ATG CAA ACC CAC CAA CAC GGG

                   30                                  40
Leu Val Gly Ala Leu Leu Arg Ala Ala Thr Tyr Tyr Phe Ser Asp
TTG GTA GGT GCC CTG TTA CGT GCT GCG ACG TAC TAC TTC TCT GAC

                                   50
Leu Glu Ile Leu Val Arg His Asp Gly Asn Leu Thr Trp Val Pro
CTG GAG ATT CTG GTA CGC CAT GAC GGT AAC CTA ACC TGG GTA CCC

                   60                                  70
Asn Gly Ala Pro Glu Ala Ala Leu Ser Asn Met Gly Asn Pro Thr
AAC GGA GCA CCC GAG GCA GCT CTG TCT AAC ATG GGC AAC CCC ACC

                                   80
Ala Tyr Pro Lys Ala Pro Phe Thr Arg Leu Ala Leu Pro Tyr Thr
GCC TAC CCC AAG GCA CCA TTT ACG AGG CTC GCG CTC CCC TAC ACC

                   90                                  100
Ala Pro His Arg Val Leu Ala Thr Val Tyr Asn Gly Thr Ser Lys
GCG CCA CAC CGC GTA TTG GCG ACA GTG TAC AAC GGG ACG AGC AAG

                                  110
Tyr Ser Ala Gly Gly Met Gly Arg Arg Gly Asp Leu Glu Pro Leu
TAC TCC GCA GGT GGT ATG GGC AGA CGG GGC GAC CTA GAG CCT CTC

                  120                                 130
Ala Ala Arg Val Ala Ala Gln Leu Pro Thr Ser Phe Asn Phe Gly
GCG GCG AGG GTC GCC GCT CAG CTT CCT ACT TCT TTC AAC TTT GGT

                                  140
Ala Ile Gln Ala Thr Thr Ile His Glu Leu Leu Val Arg Met Lys
GCA ATT CAA GCC ACG ACC ATC CAC GAG CTC CTC GTG CGC ATG AAG
```

On the left is part of a DNA alpha 22 sequence with its translation from nucleotide base to amino acid residue. Grouping indicates three-letter codons. Above the sequence, every tenth codon is numbered. This sequence has been reduced to the size of one journal column.

Molecular graphics

Genetic Sequences

Vertical Spacing

```
          10                  20
12345 67890 12345 67890 12345
CTTGT CCTCC TGGTA TTGGG ATTTG    25
AGGTC CAGGG GACCC AACAG CCCCA    50
GCAAG ATGAG ATGCC TAGCC CGACC    75
TTCCT CACCC AGGTG AAGGA ATCTC   100
TCTCC AGTTA CTGGG AGTCA GCAAA   125
GACAG CCGCC CAGAA CCTGT ACGAG   150
AAGAC ATACC TGCCC GCTGT AGATG   175
AGAAA CTCAG GGACT TGTAC AGCAA   200
AAGCA CAGCA                     210
```

The figure on the left is narrow because there are 25 bases in each line. This fits well into a two-column journal. For a one-column journal or for a slide, there would be wasted space to the right and left of the figure.

Both sequences on this page are ApoC2 cDNA and were generated in the GeneWorks® program.

Horizontal Spacing

```
          10                  20                  30                  40                  50
1234567890 1234567890 1234567890 1234567890 1234567890
CTTGTCCTCC TGGTATTGGG ATTTGAGGTC CAGGGGACCC AACAGCCCCA    50
GCAAGATGAG ATGCCTAGCC CGACCTTCCT CACCCAGGTG AAGGAATCTC   100
TCTCCAGTTA CTGGGAGTCA GCAAAGACAG CCGCCCAGAA CCTGTACGAG   150
AAGACATACC TGCCCGCTGT AGATGAGAAA CTCAGGGACT TGTACAGCAA   200
AAGCACAGCA                                               210
```

Fitting 50 paired bases in each line results in a wide figure. The wide or more rectangular shape is appropriate for a one-column journal in which one column fills the page or for a slide that fits the screen best in a wide format.

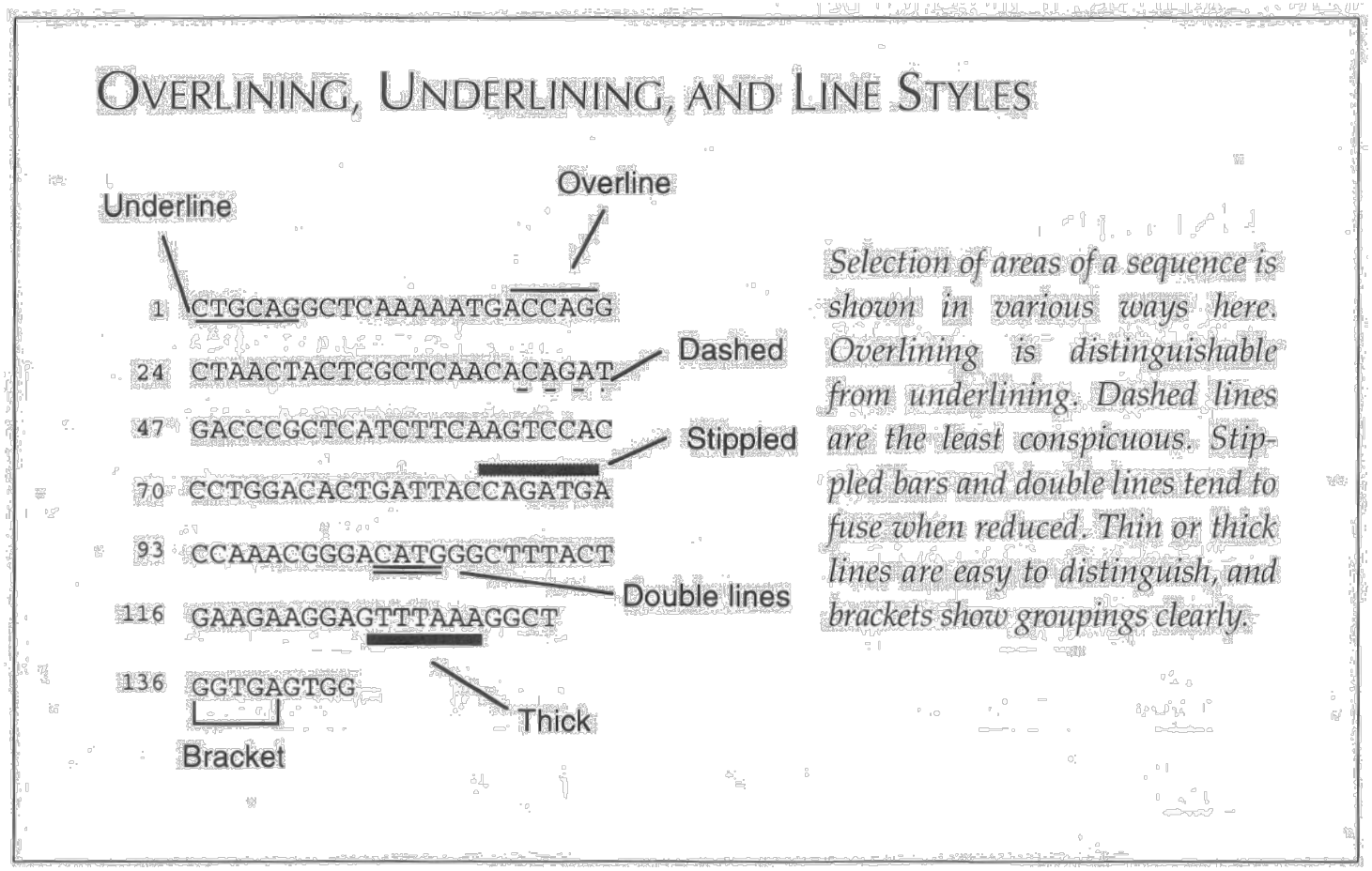
Molecular graphics

Genetic Sequences

Repeats of nucleotides, regions of sequences, and sites of enzyme cleavage are some aspects of sequence analysis. Above, enzyme cleavage sites are indicated in different ways. Underlining is the simplest and clearest. Boxing groups of letters is effective, but because the letters are so close together, the boxes may distort or obscure the letters themselves.

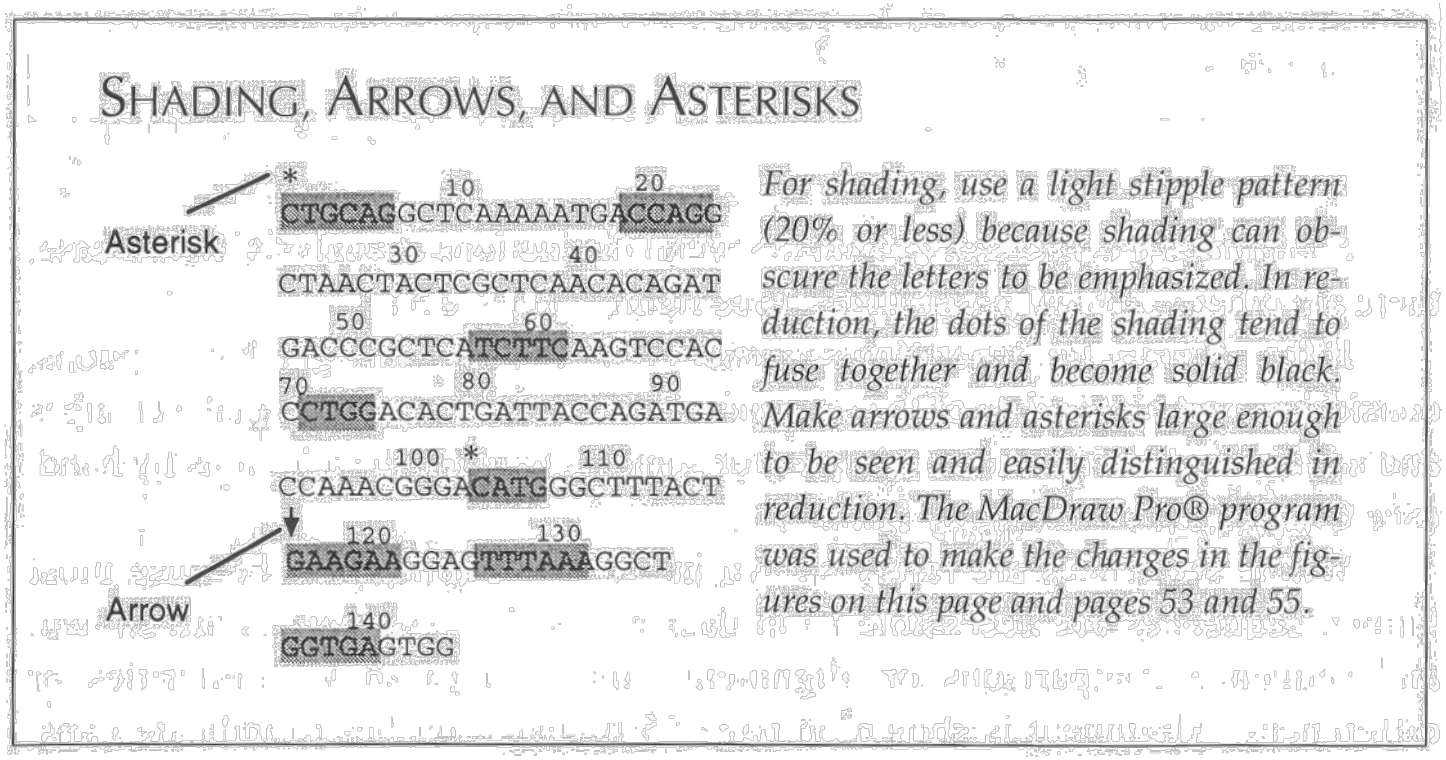
Molecular graphics

Genetic Sequences



Molecular graphics

Genetic Sequences



Molecular graphics

Genetic Sequences

SEQUENCE ALIGNMENT

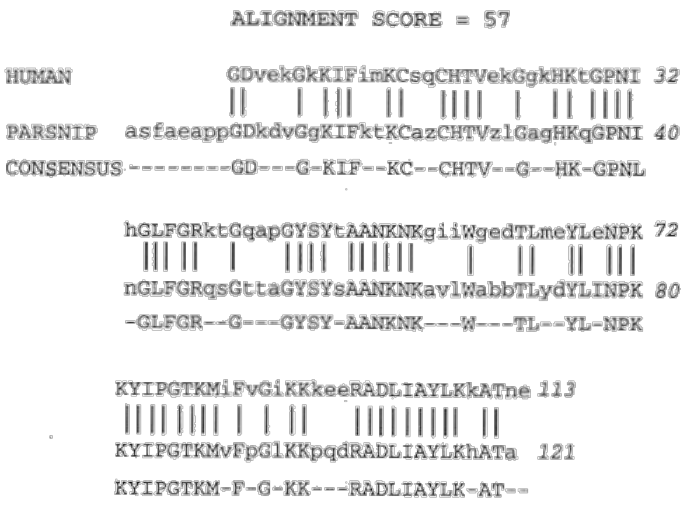
```
 1          GDvekGkKIFimKCsqCHTVekGgkHKtGPNLhGLFGRktGqapGYSYtAANKNKgiiWgedTL
            ||    | |||  ||  ||||  |  ||  ||||  ||||||  |   ||||  |||||||   |   ||
 1 asfaeappGDkdvGgKIFktKCazCHTVzlGagHKqGPNLnGLFGRqsGttaGYSYsAANKNKavlWabbTL

   --------GD---G-KIF--KC--CHTV--G--HK-GPNL-GLFGR--G---GYSY-AANKNK---W---TL


65 meYLeNPKKYIPGTKMiFvGiKKkeeRADLIAYLKkATne
     ||  ||||||||||||  |  |  ||    ||||||||||  ||
73 ydYLlNPKKYIPGTKMvFpGlKKpqdRADLIAYLKhATa

   --YL-NPKKYIPGTKM-F-G-KK---RADLIAYLK-AT--
```

Shown above is a sequence alignment of human and parsnip cytochrome amino acids. Here amino acids are represented by single letters rather than a three-letter abbreviation. Although this is more compact, quick identification is hampered. The alignment is shown as it appears on the computer screen. Capital letters joined by vertical dashes denote exact alignment. The horizontal dashes in the bottom line denote gaps in alignment.

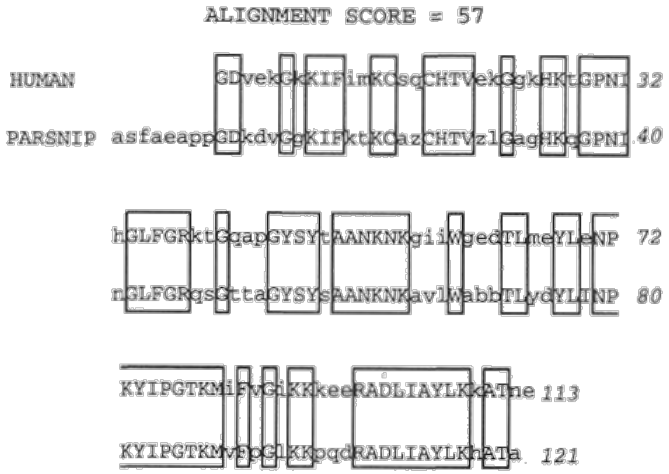
Molecular graphics

Genetic Sequences

Labeled Alignment



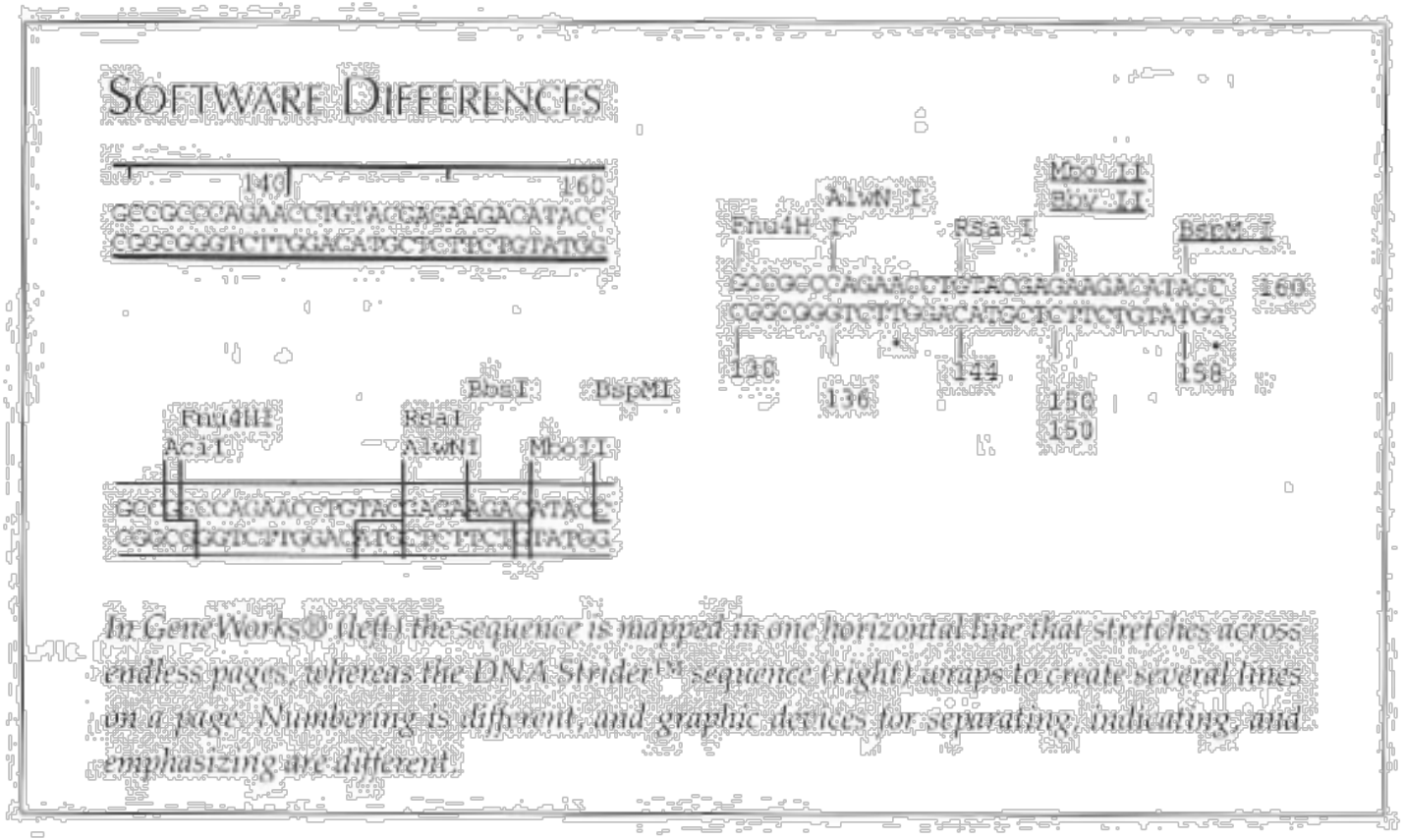
Boxed Alignment



Both new arrangements will fit into one column of a journal or are a suitable format for a slide. In the figure on the left, the three rows are labeled and the consensus score is given in the title. On the right, alignment is indicated by boxing. This eliminates the need for a consensus line and also makes the areas of homology visually clearer. These changes can be made by hand or in a drawing program.

Molecular graphics

Genetic Sequences

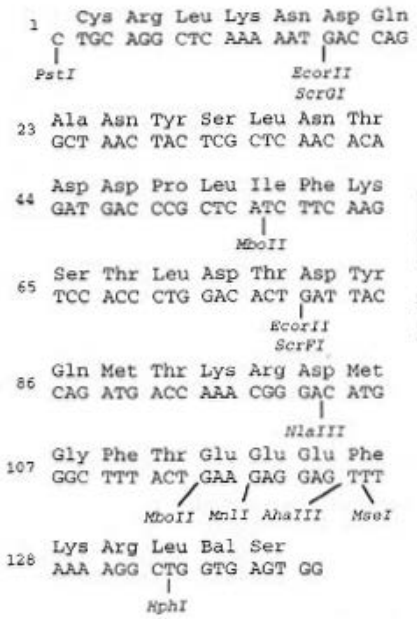


In GeneWorks® (left) the sequence is mapped in one horizontal line that stretches across endless pages, whereas the DNA Strider™ sequence (right) wraps to create several lines on a page. Numbering is different, and graphic devices for separating, indicating, and emphasizing are different.

Molecular graphics

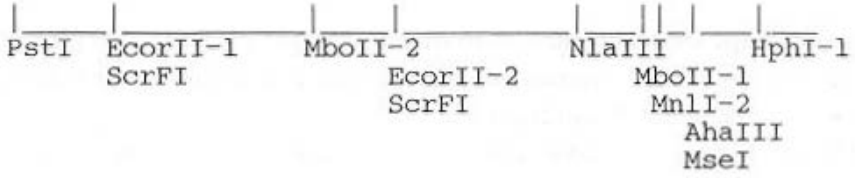
Restriction Maps

Sequence Showing Restriction Sites



The sites of enzymatic cleavage and enzyme names are added to this DNA strand. This works well for a small sequence. For longer sequences and for a more diagrammatic approach, a scaled map works better.

Map Showing Restriction Sites

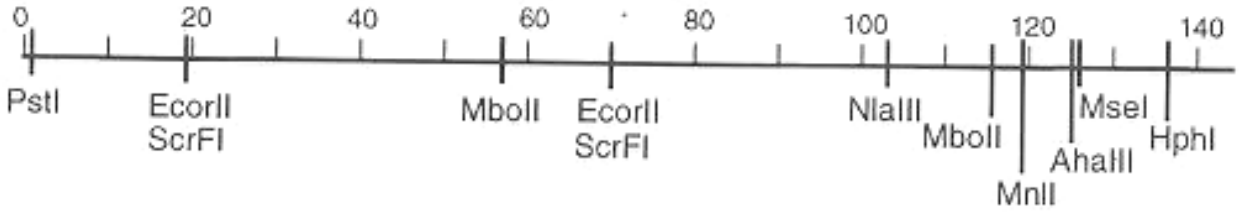


This figure shows the restriction map as it comes from the computer. The sequence is represented by the horizontal line. The enzymes are labeled and the cleavage sites are indicated by the vertical lines.

Molecular graphics

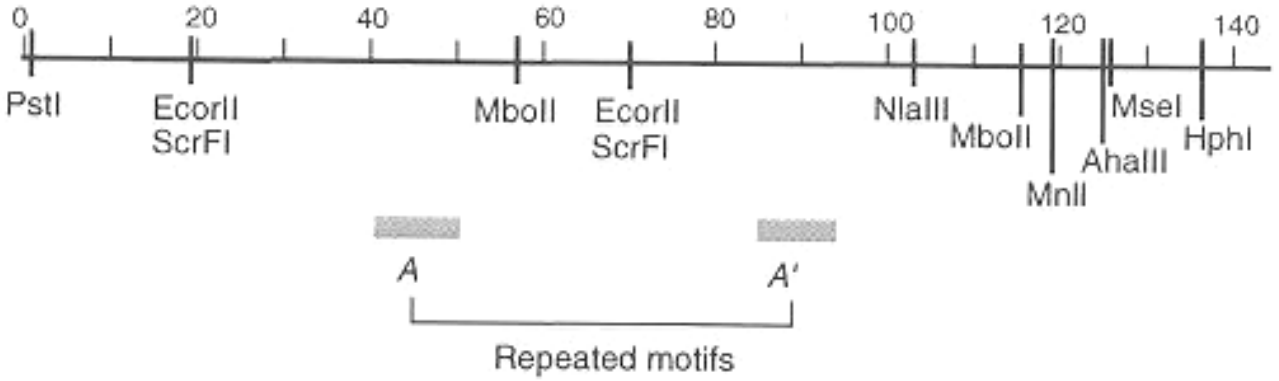
Restriction Maps

Redrawn Map



The previous map is redrawn in the MacDraw Pro® program. This diagram shows the overlapping sites more clearly and has a numbered scale to relate the total length to the restriction sites.

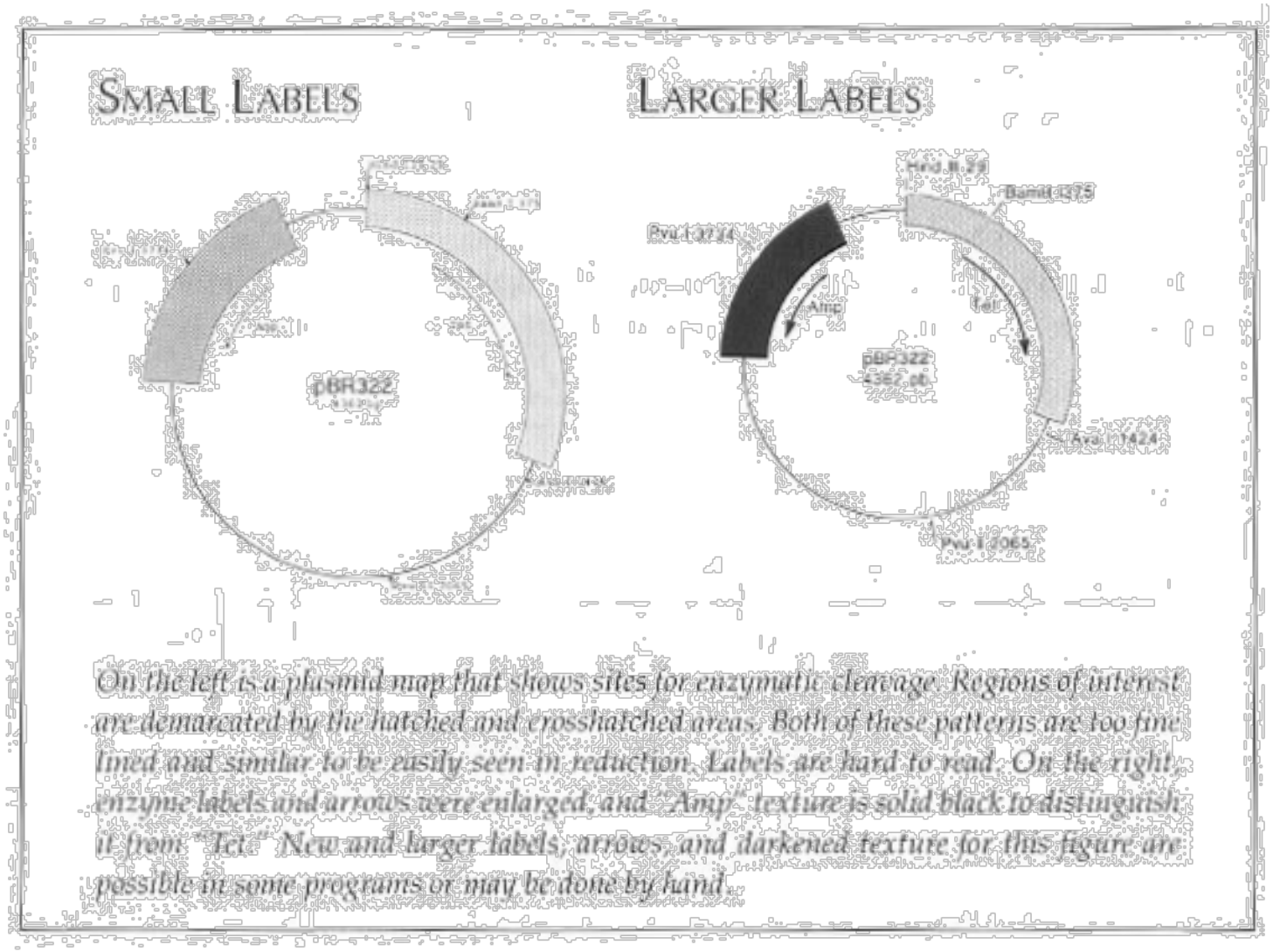
Added Motifs



A′ is a repeat of the motif A. Both are positioned under the area in the sequence line in which they appear. Because the repeat is of secondary importance in this figure, the motif areas are indicated by stippled bars, which are less obtrusive than solid lines and also symbolize areas. Labels for the motifs are the same size as the enzyme labels, but italicized to make them different.

Molecular graphics

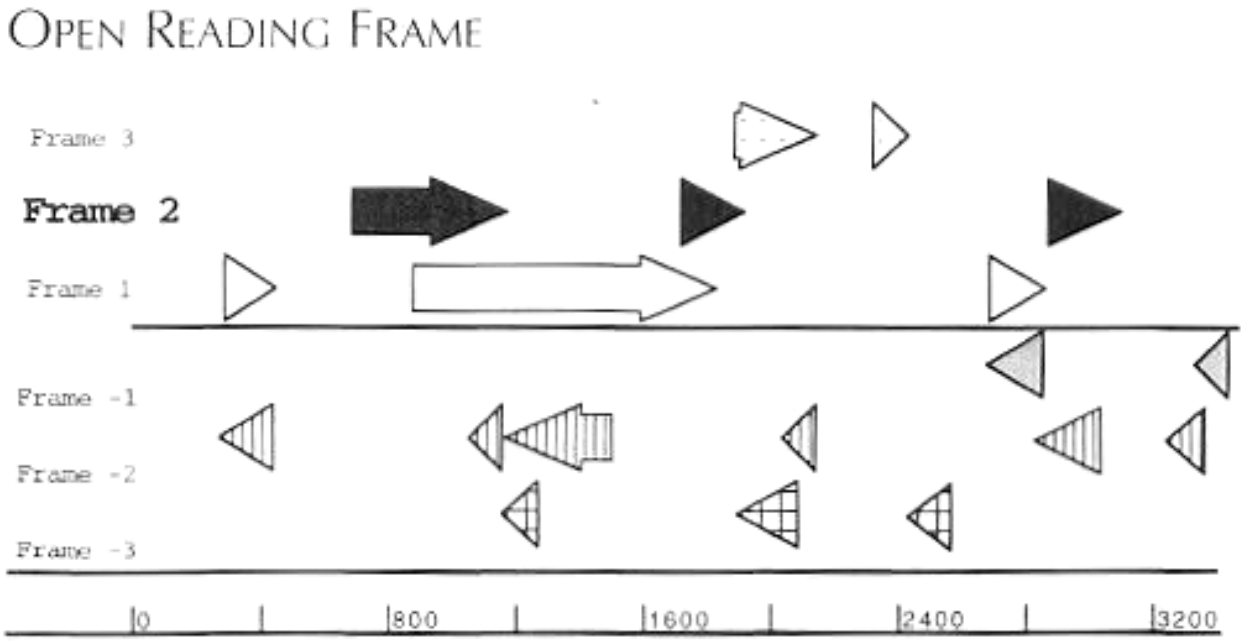
Restriction Maps



On the left is a plasmid map that shows sites for enzymatic cleavage. Regions of interest are demarcated by the hatched and crosshatched areas. Both of these patterns are too fine lined and similar to be easily seen in reduction. Labels are hard to read. On the right, enzyme labels and arrows were enlarged, and "Amp" texture is solid black to distinguish it from "Tet." New and larger labels, arrows, and darkened texture for this figure are possible in some programs or may be done by hand.

Molecular graphics

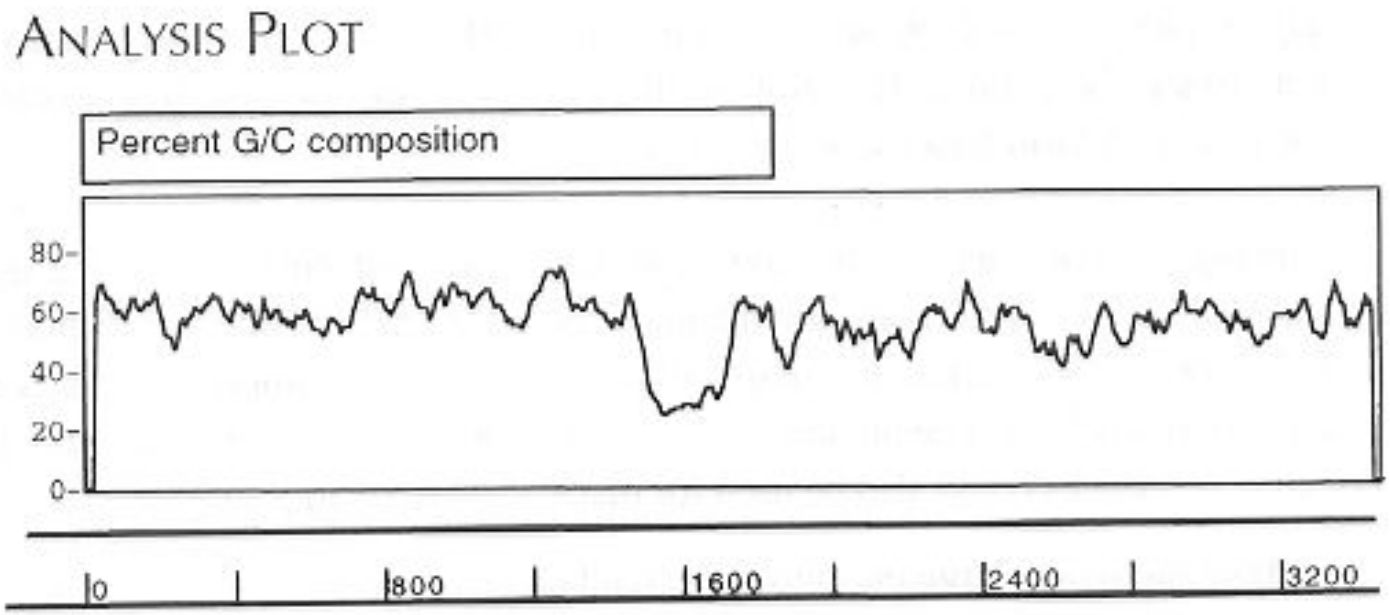
Restriction Maps



Labeling and arrow texture were changed in the program to emphasize important information.

Restriction Maps

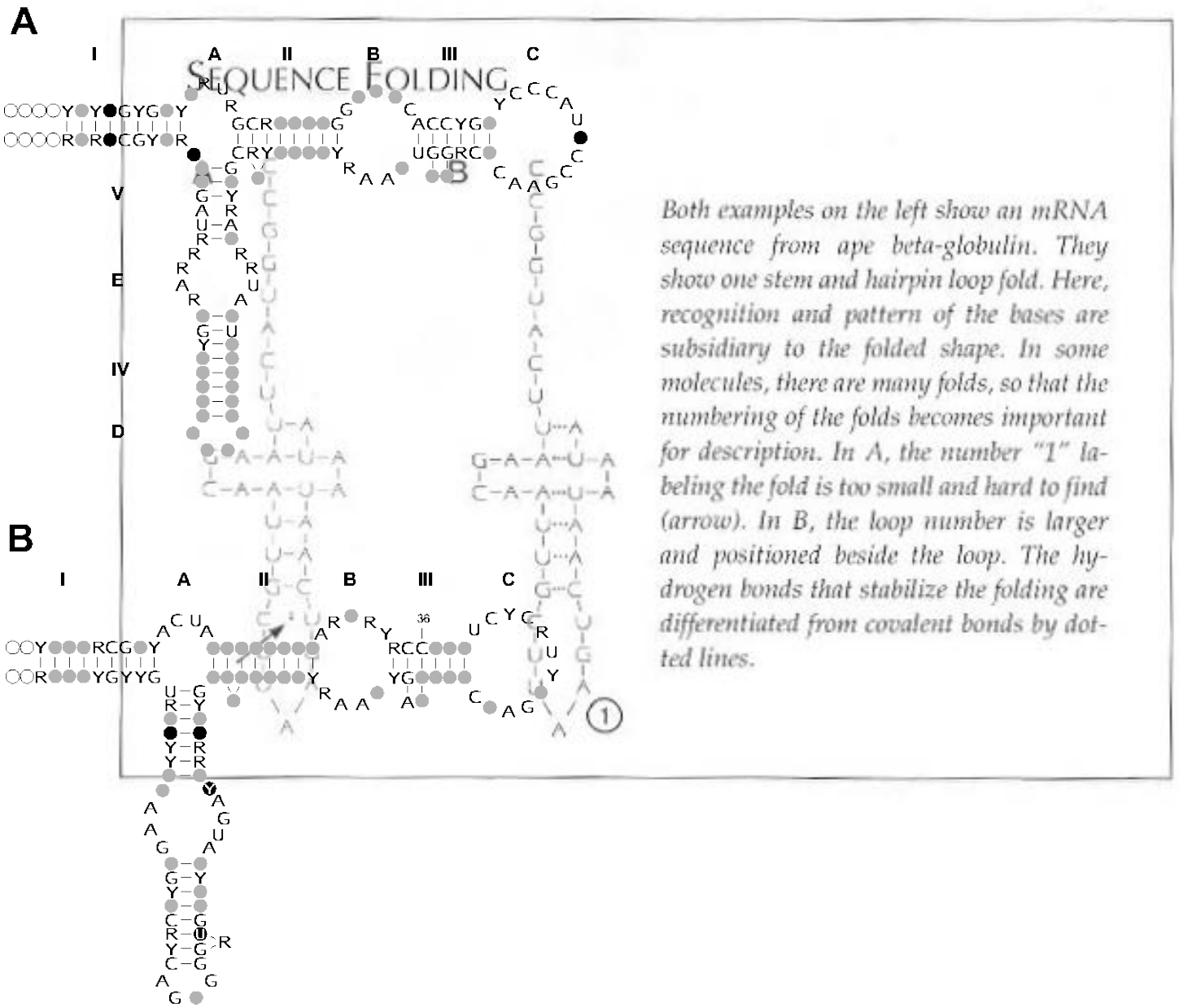
Molecular graphics



This graph shows a kind of DNA footprinting of the ApoC3 gene. The lows in this plot show A-T-rich bases. Both figures on this page were produced by the GeneWorks® program.

Molecular graphics

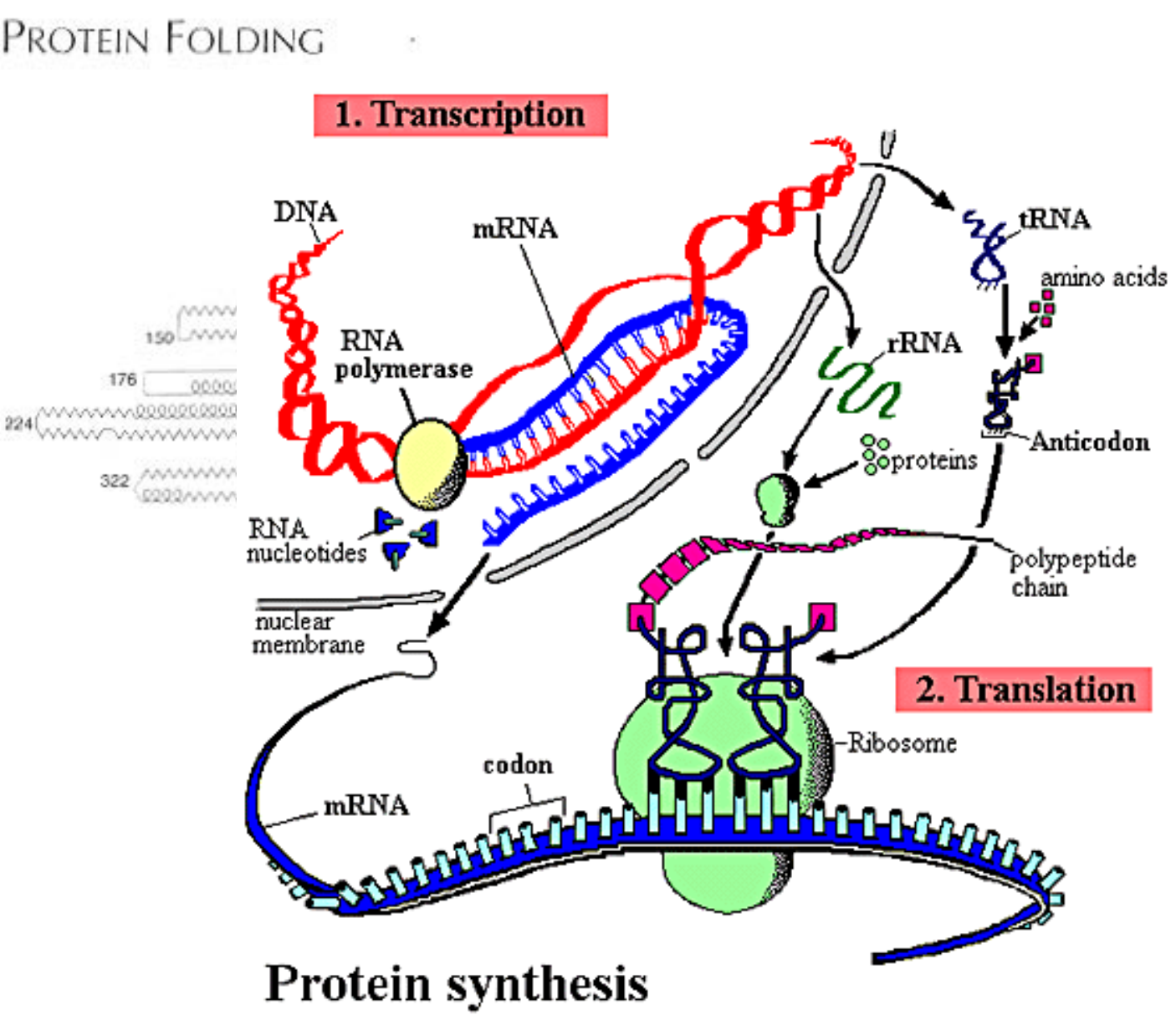
Molecular models



Both examples on the left show an mRNA sequence from ape beta-globulin. They show one stem and hairpin loop fold. Here, recognition and pattern of the bases are subsidiary to the folded shape. In some molecules, there are many folds, so that the numbering of the folds becomes important for description. In A, the number "1" labeling the fold is too small and hard to find (arrow). In B, the loop number is larger and positioned beside the loop. The hydrogen bonds that stabilize the folding are differentiated from covalent bonds by dotted lines.

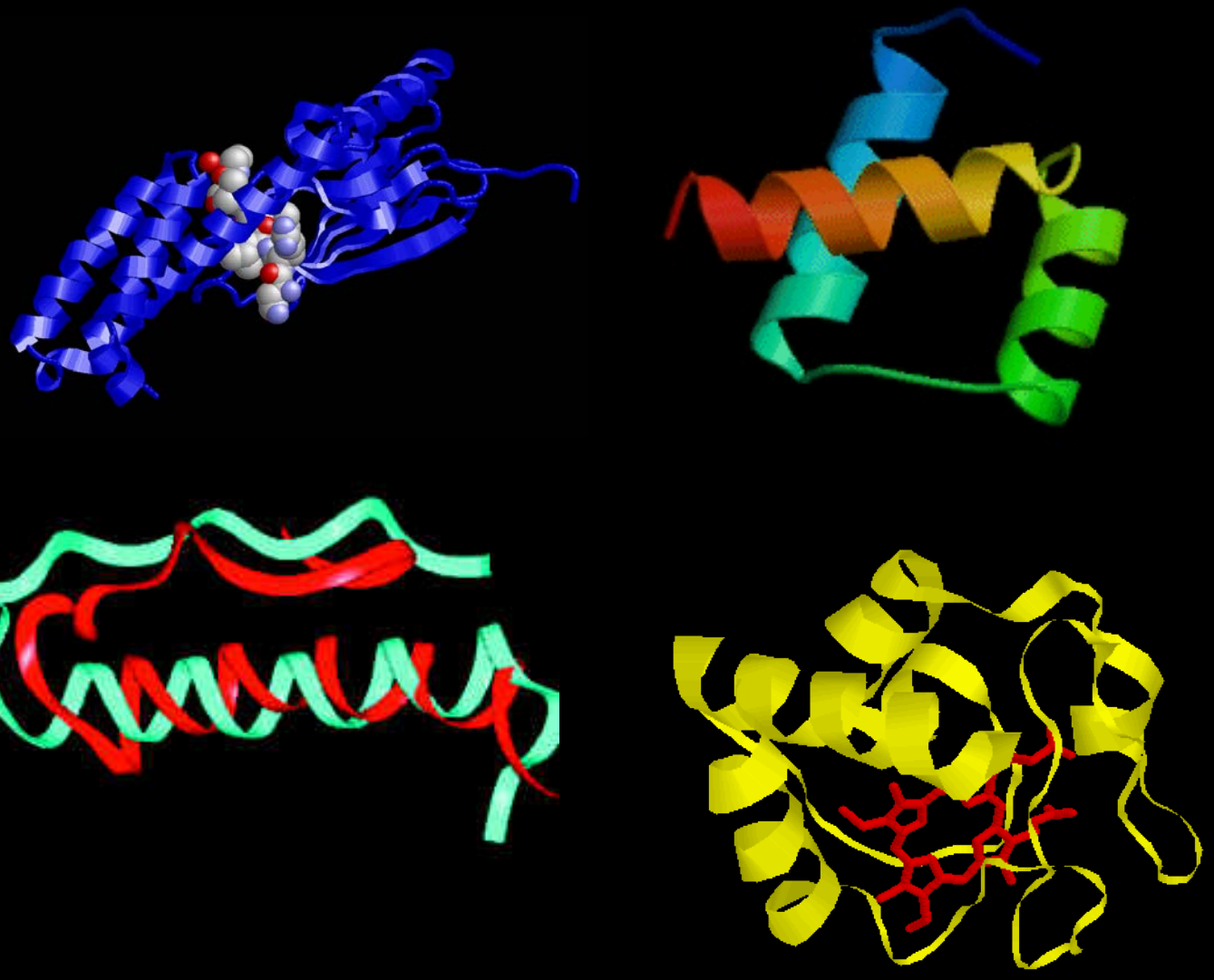
Molecular graphics

Molecular models



Molecular graphics

Molecular models



Software Comparison

Molecular graphics

http://www.ccl.net/cca/documents/chamotlabs/Software.shtml

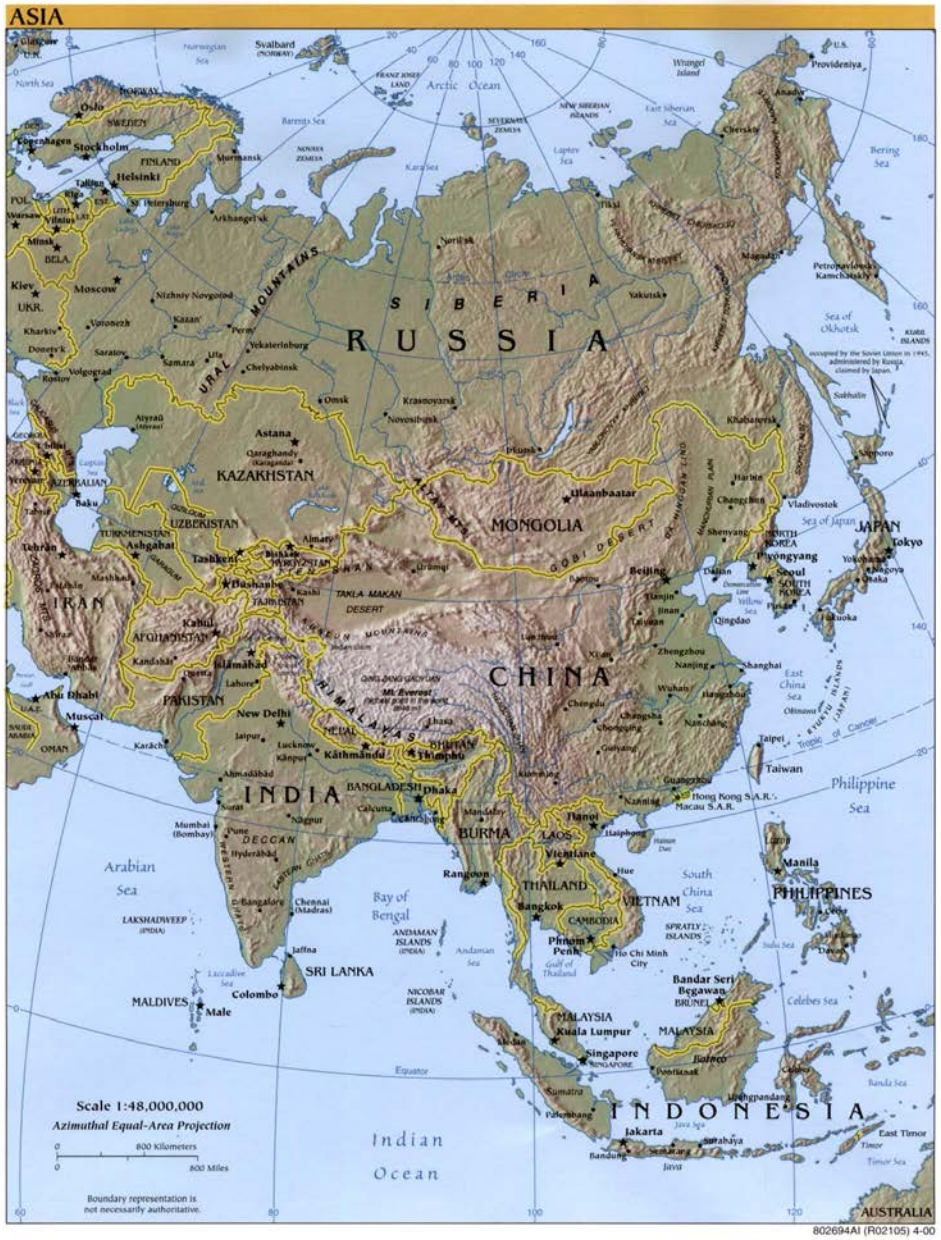
http://www.cellbiol.com/soft.htm

http://www.oligo.net/dnasis.htm

http://www.dnastar.com/

How to deal with maps

Physical map with political boundaries



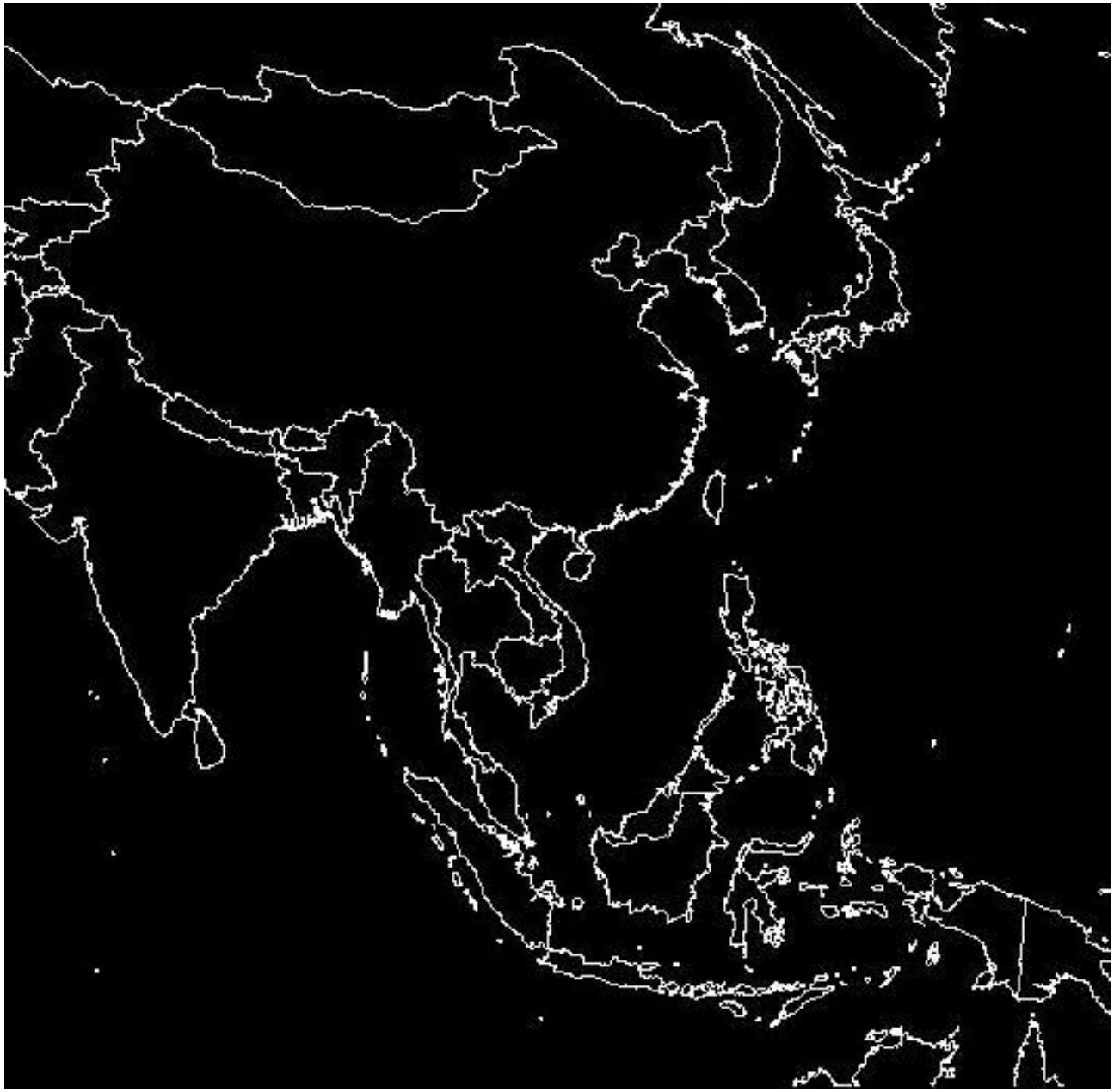
How to deal with maps

Physical map with political boundaries

How to deal with maps

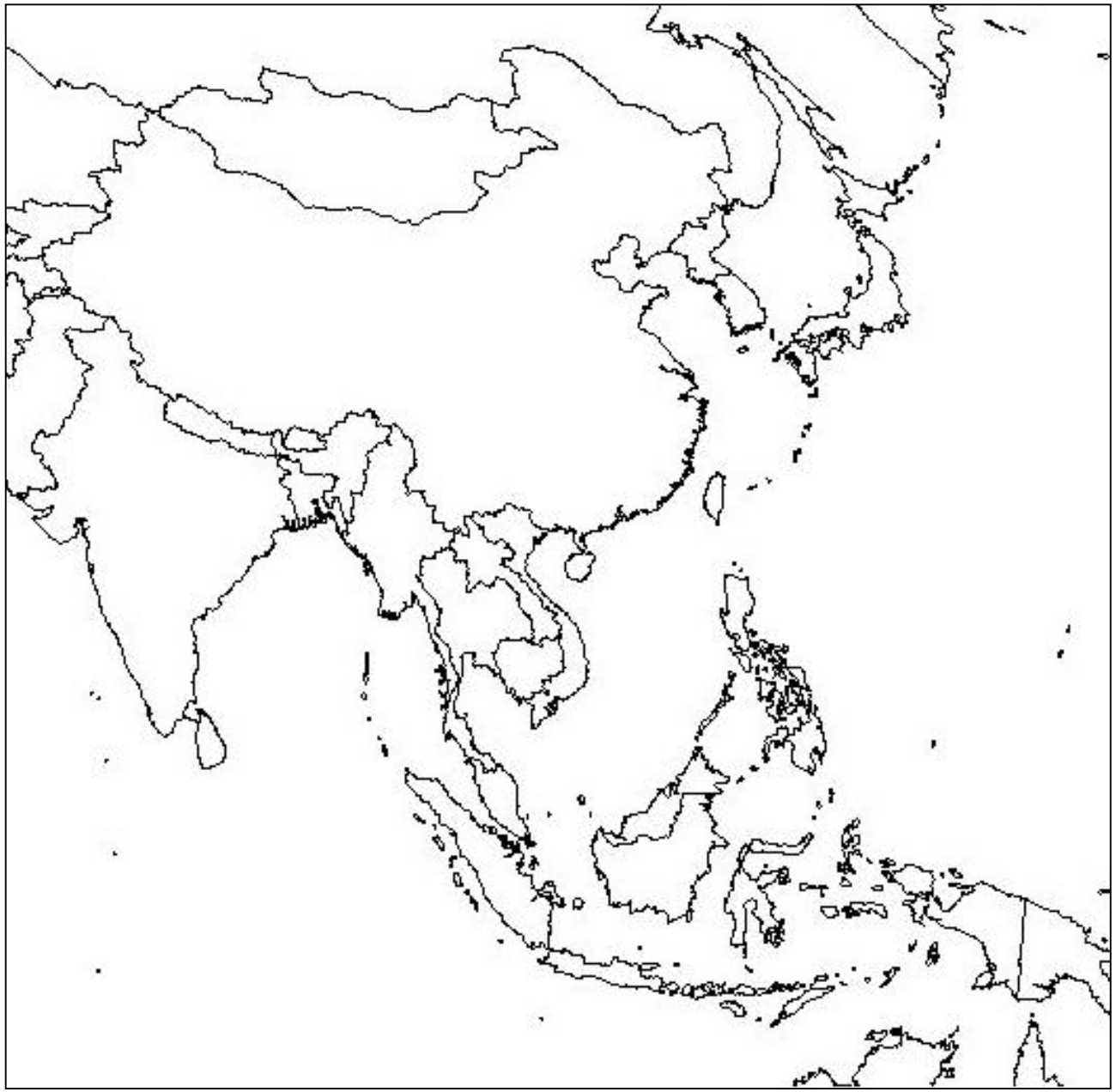
Physical map with political boundaries

Outlined map



How to deal with maps

Outlined map

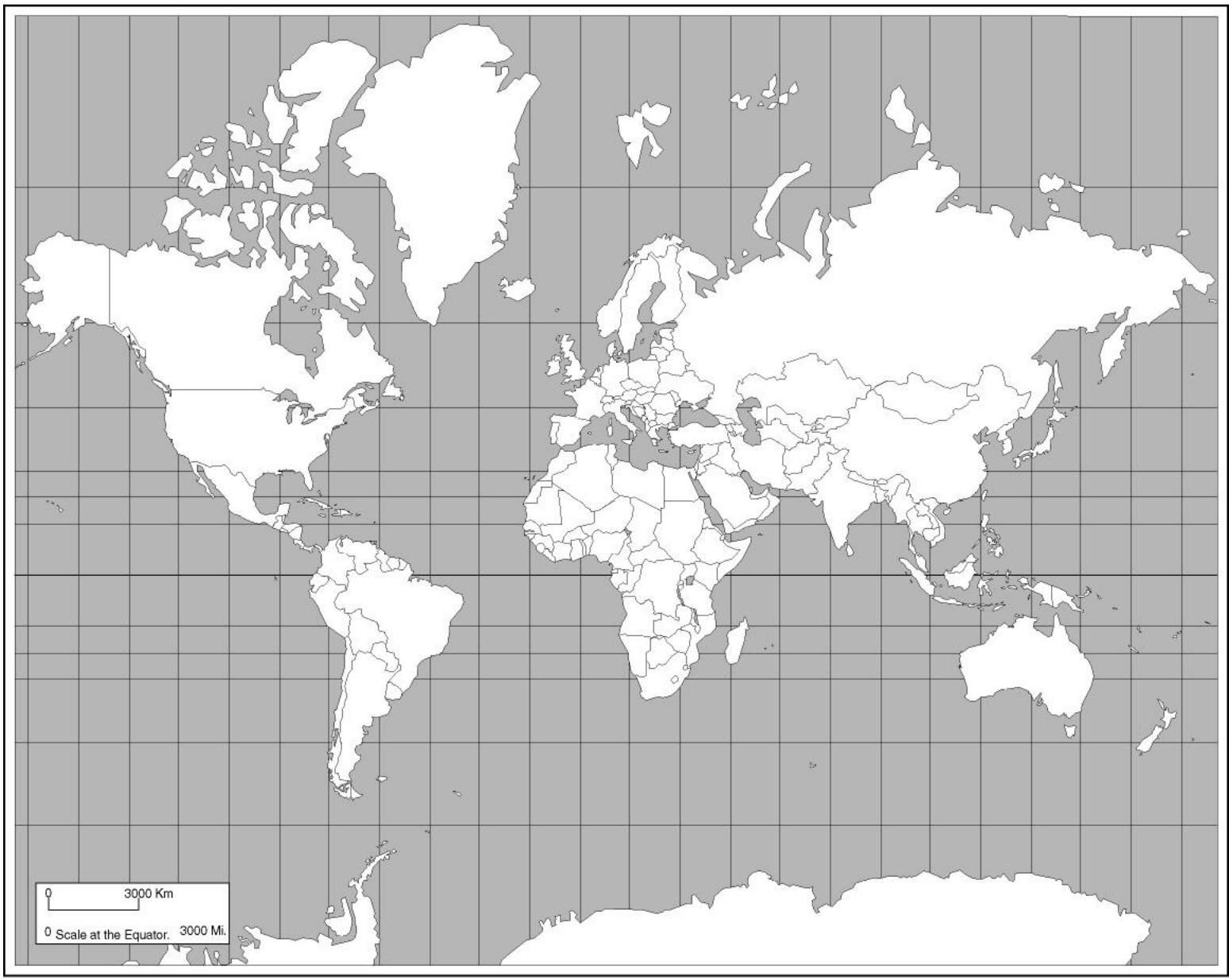


How to deal with maps

Outlined map

How to deal with maps

Outlined map



How to deal with maps

Physical map showing geological features

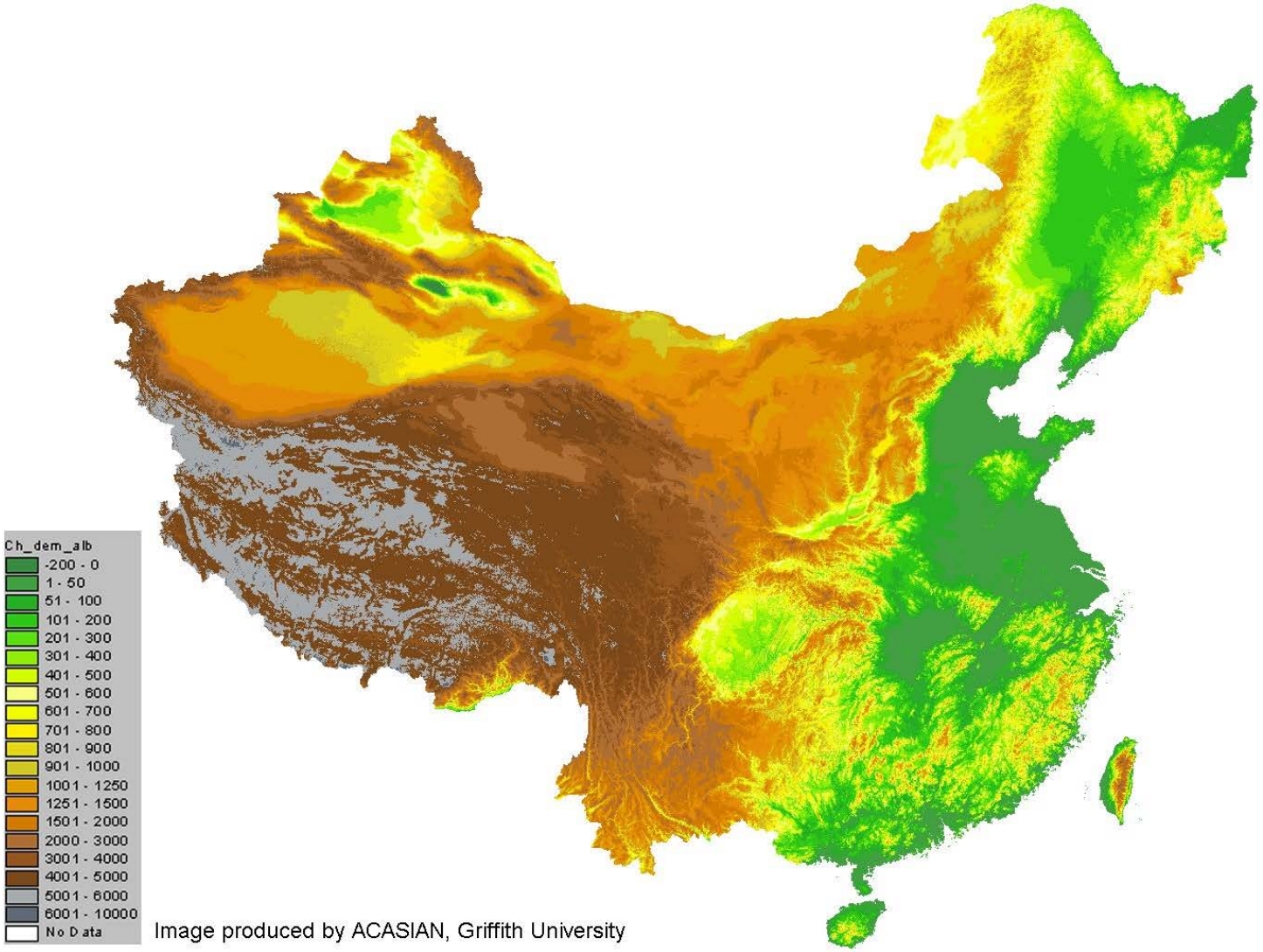
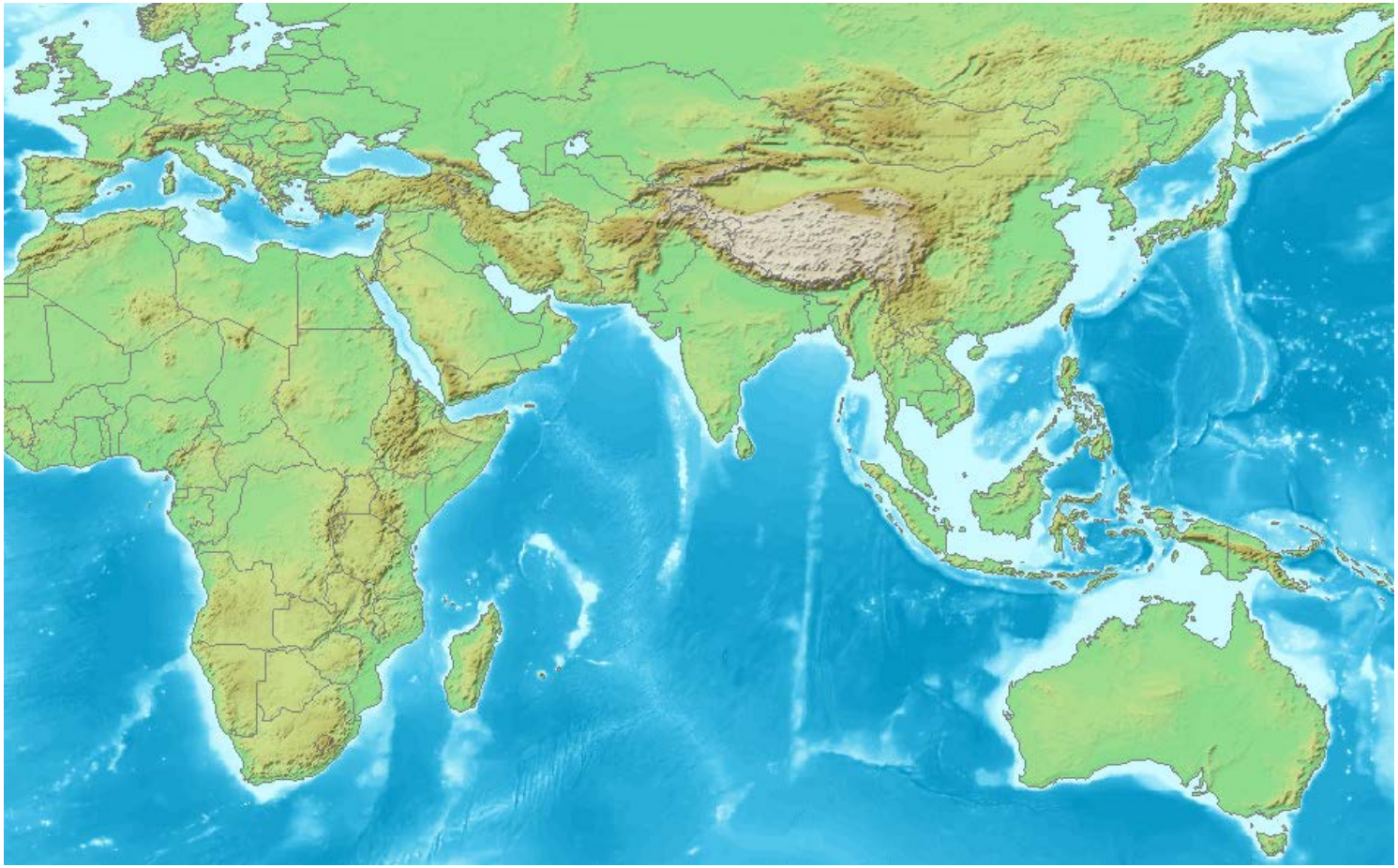


Image produced by ACASIAN, Griffith University

How to deal with maps

Physical map showing geological features



How to deal with maps

Physical map showing geological features

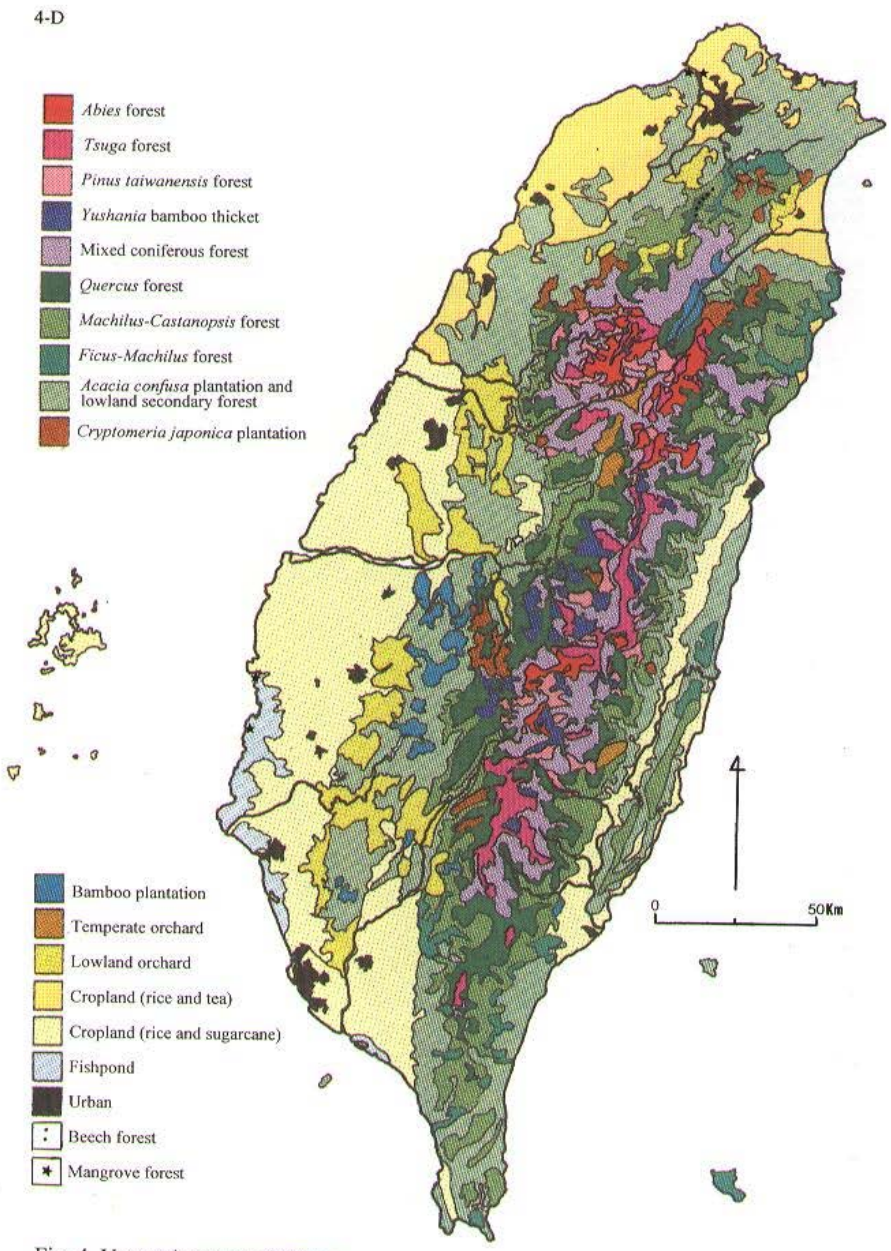
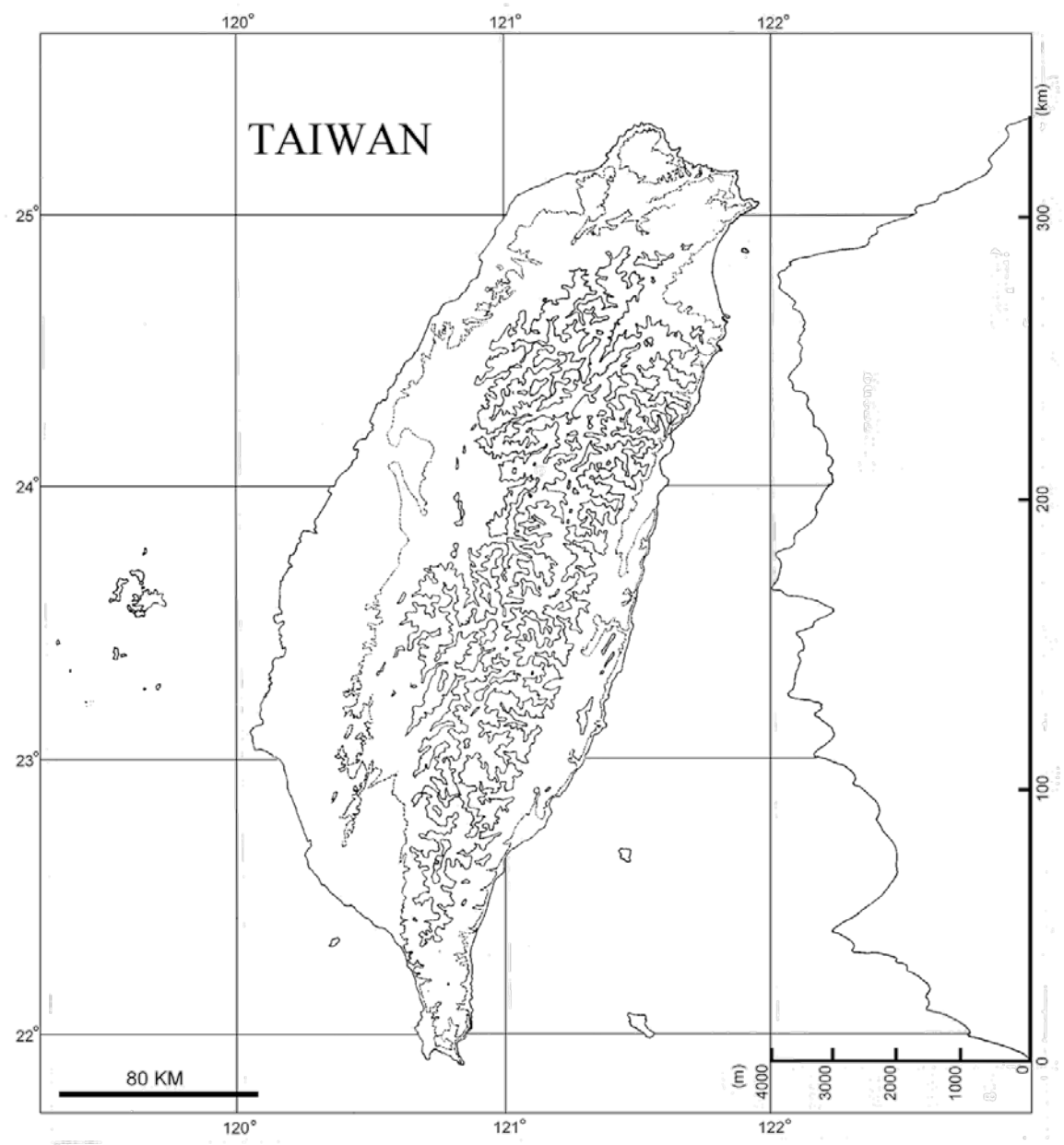


Fig. 4. Vegetation map of Taiwan.

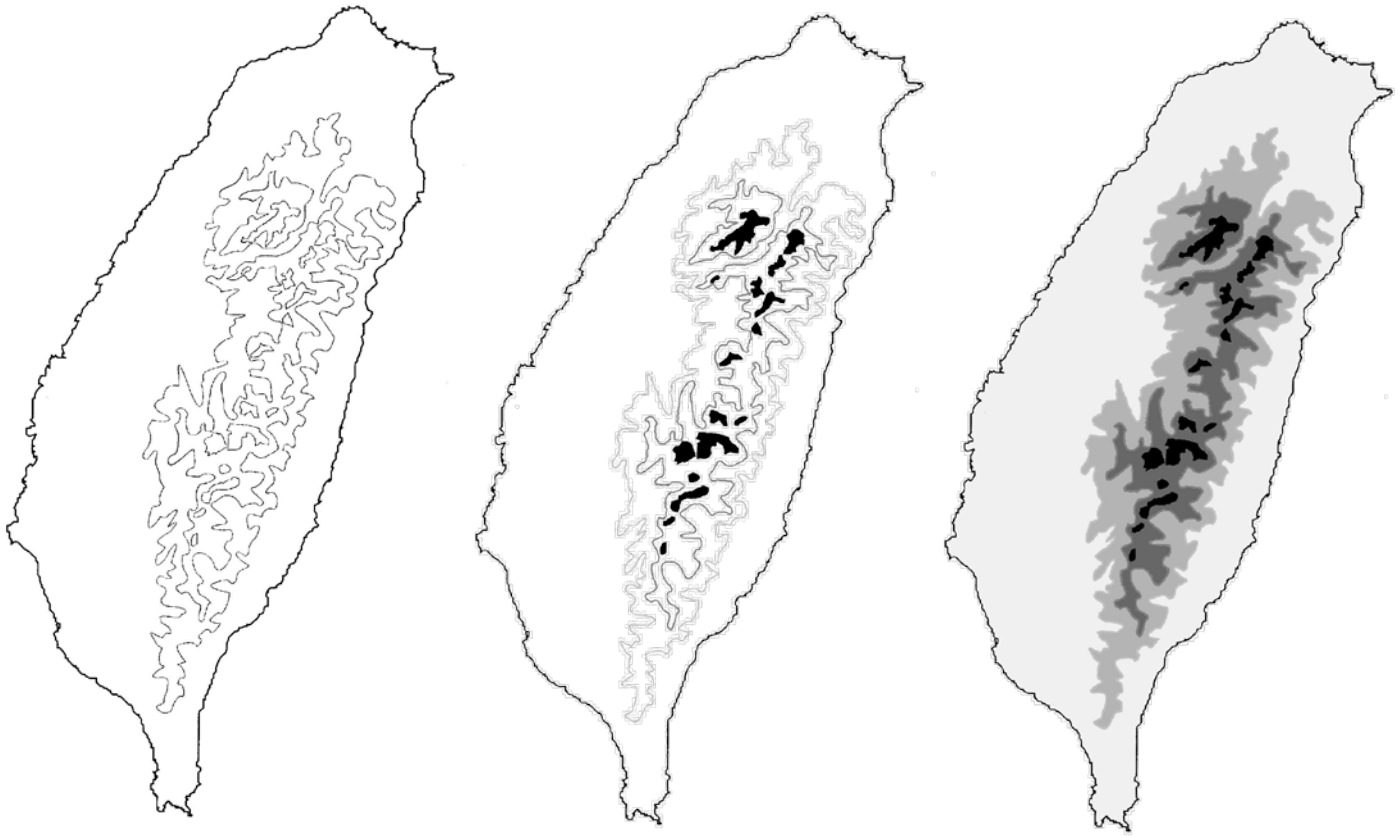
How to deal with maps

Physical map showing geological features



How to deal with maps

Physical map showing geological features



How to deal with maps

Map photos

Free maps resources

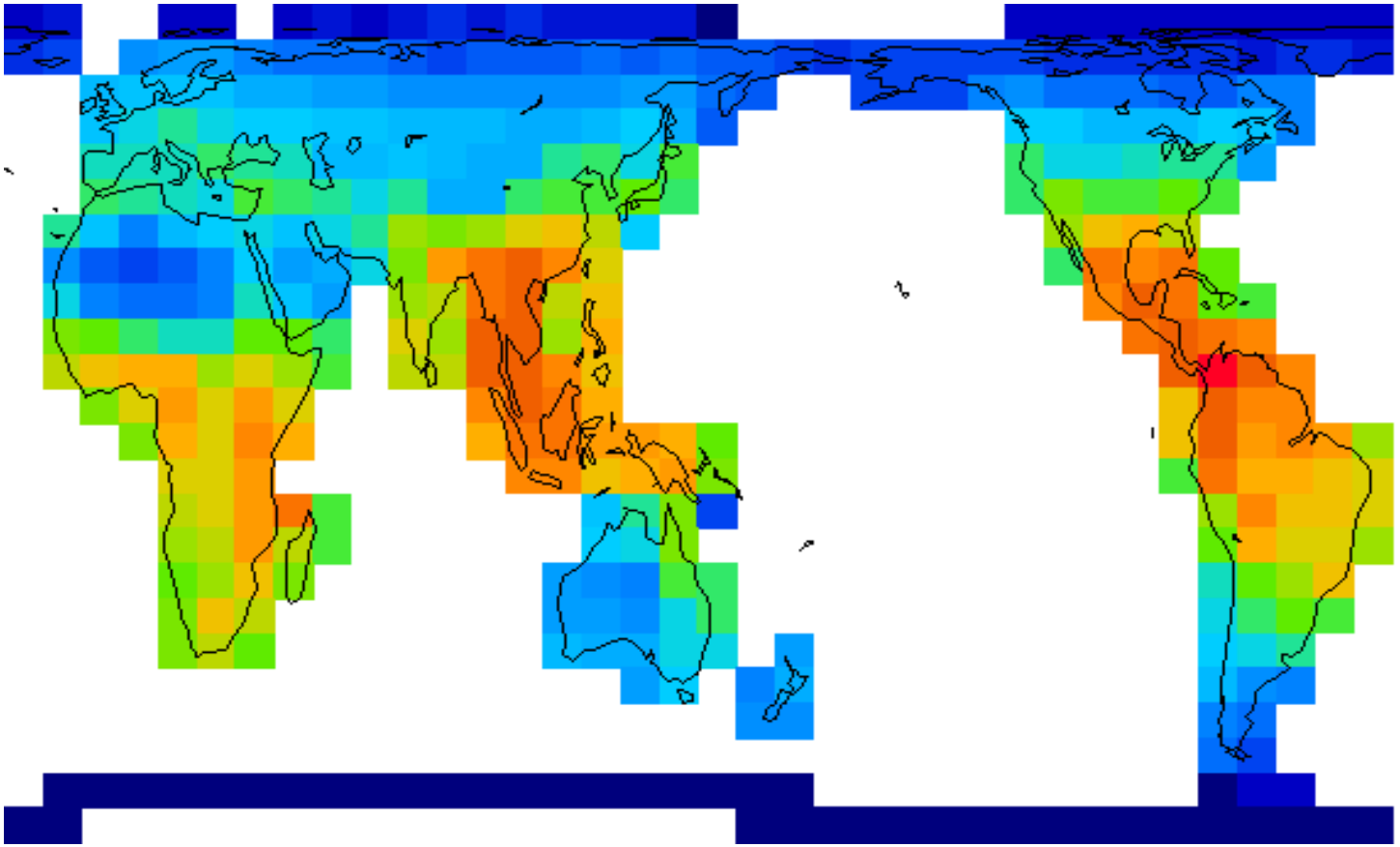
How to deal with photos

http://www.demis.nl/home/default.htm

http://www.alexandria.ucsb.edu/other-sites/Universe.html

http://www.nhm.ac.uk/science/projects/worldmap/index.html

http://www.google.com



How to deal with photos

Resolution, focus, & background

如何製作一個好的簡報?

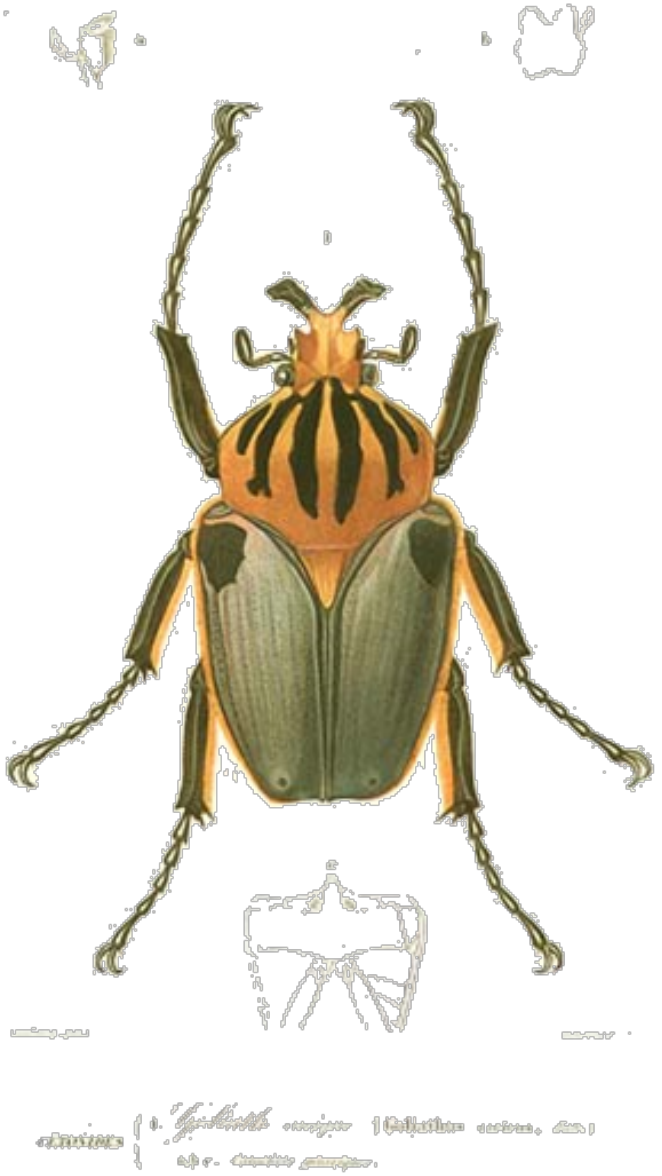
- 演說內容與架構
- 圖文選擇與排序
- 排版與設計
- 調整與定稿

如何製作一個好的簡報?

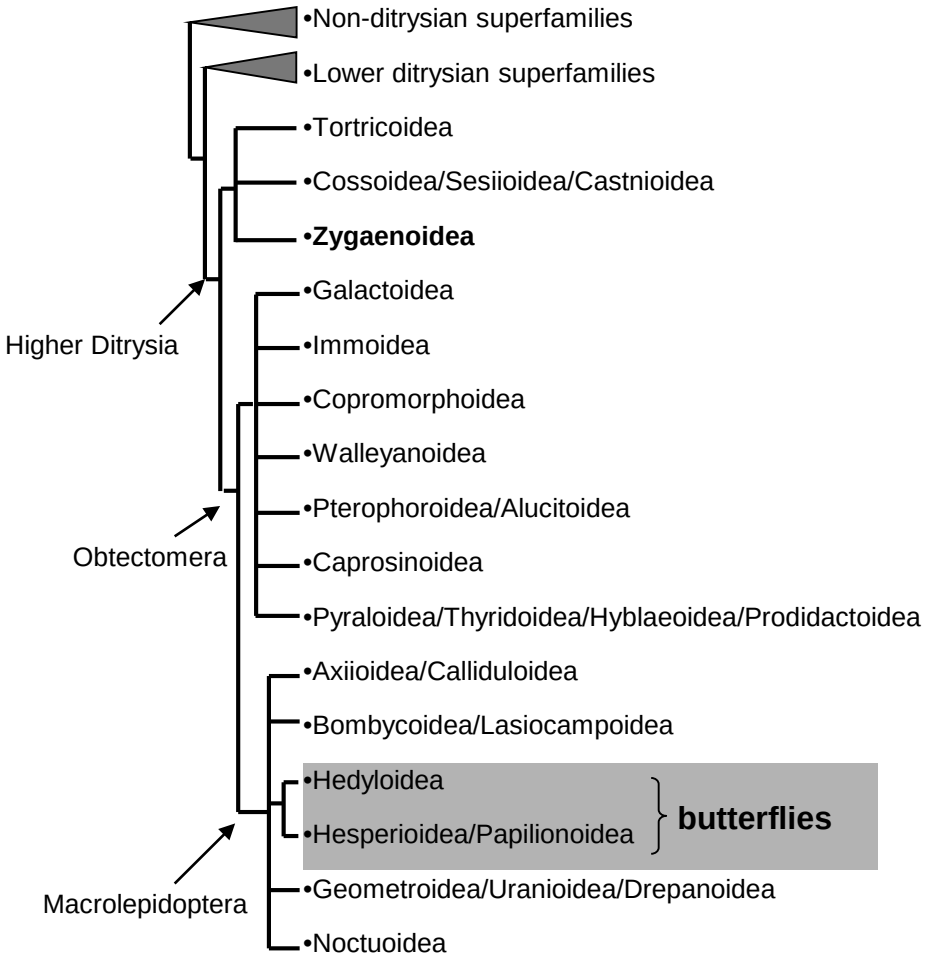
- 演說內容與架構
  - 誰是你的聽眾?
  - 你瞭解自己的演說內容嗎?
  - 前言, 動機, 研究方法, 結果討論的比重為何?
  - 不同性質的演說具有不同的內容架構
  - 你的演說內容符合一個完整的科學研究步驟嗎?

如何製作一個好的簡報?

- 圖文選擇與排序
  - 各投影片間的敘事邏輯是否連貫?

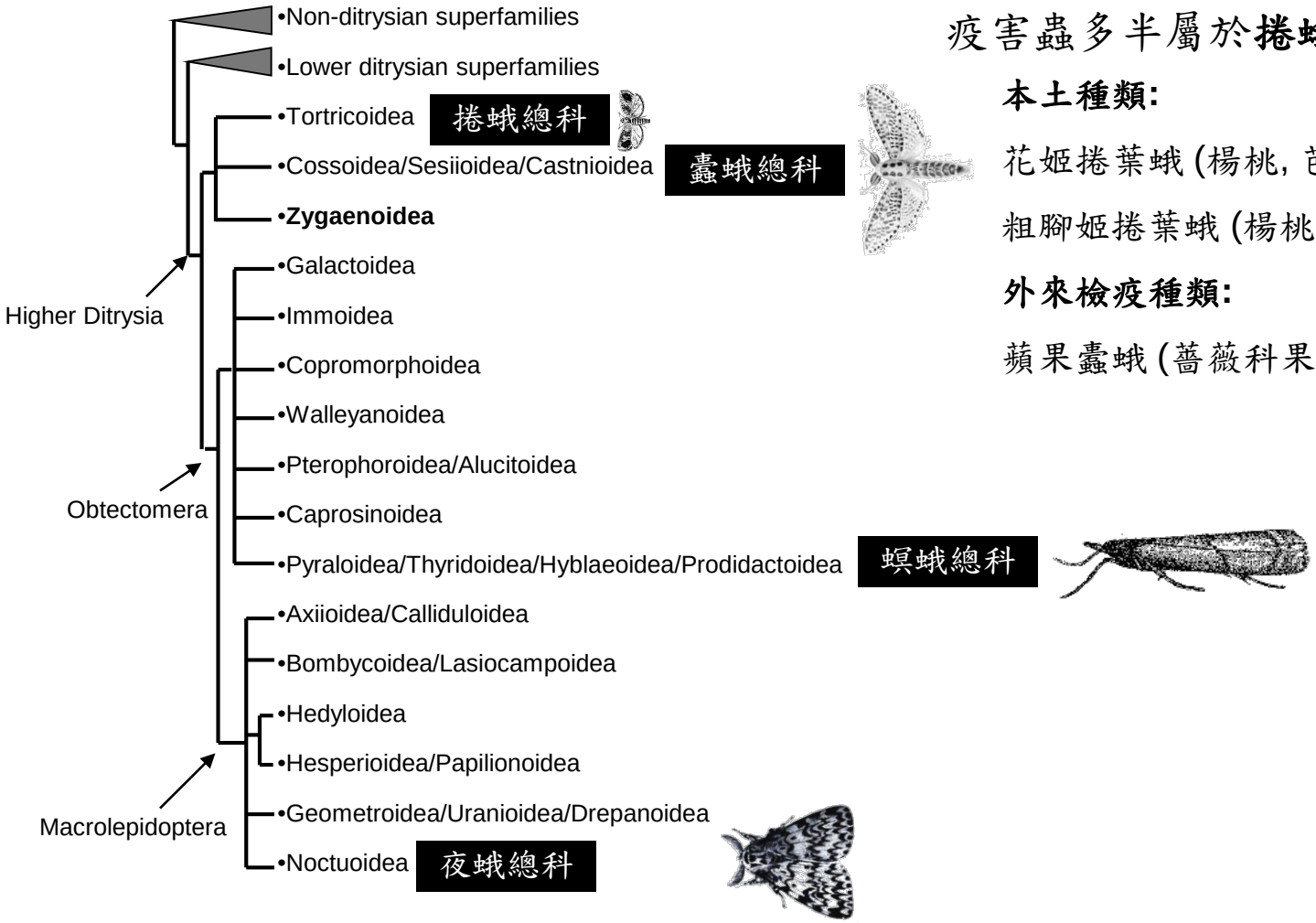


什麼是蛾類?



- 非真蝶類鱗翅類昆蟲的泛稱
- 與蝶類並非兩個對立的單源群
- 佔有鱗翅目昆蟲85%以上的種類, 也就是說-全球約有17萬種
- 分屬約100個科
- 台灣約有4500種 (扣除蝶類)

有多少是"果樹害蟲"？



■台灣的鱗翅目果樹害蟲以捲蛾、蠹蛾、螟蛾以及夜蛾總科種類為主

■近年來的本土與國際鮮果檢疫害蟲多半屬於**捲蛾科**

本土種類:

花姬捲葉蛾 (楊桃, 芭樂, 龍眼...)

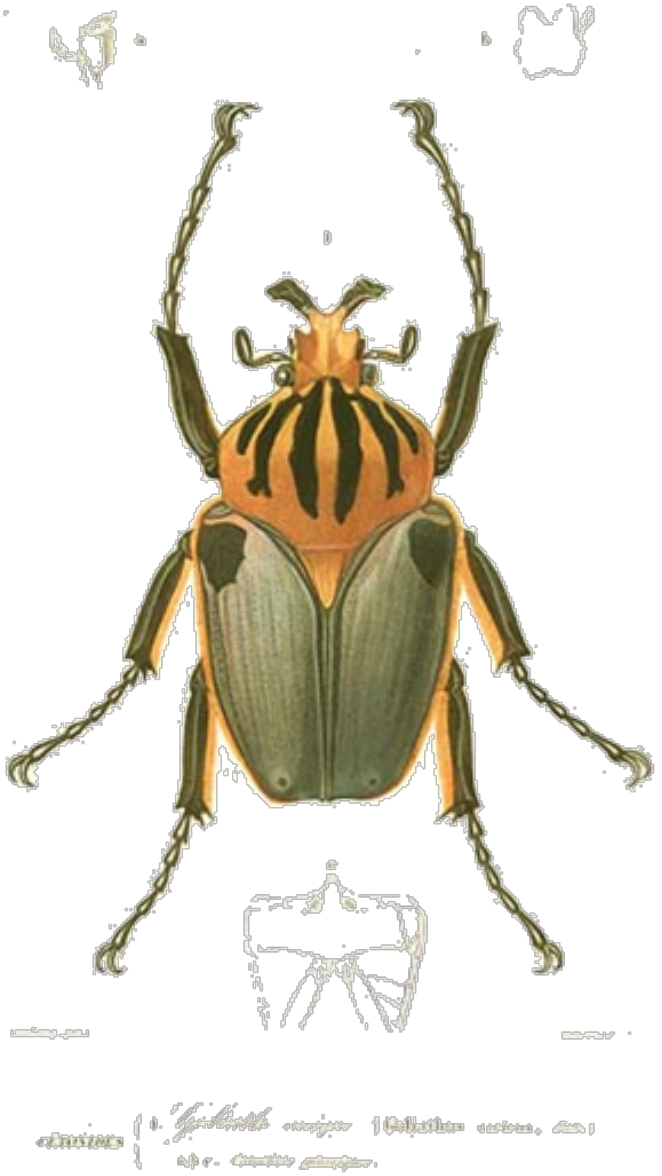
粗腳姬捲葉蛾 (楊桃, 龍眼, 釋迦..)

外來檢疫種類:

蘋果蠹蛾 (薔薇科果樹)

如何製作一個好的簡報?

- 圖文選擇與排序
  - 各投影片間的敘事邏輯是否連貫?
  - 一開始就要顯示演說的架構



Outlines of the talk

- Significance of the Lepidoptera
- The evolution of the Lepidoptera
- Their ecology under the framework of evolution
- What I have been doing
- What we can do – the perspectives

如何製作一個好的簡報?

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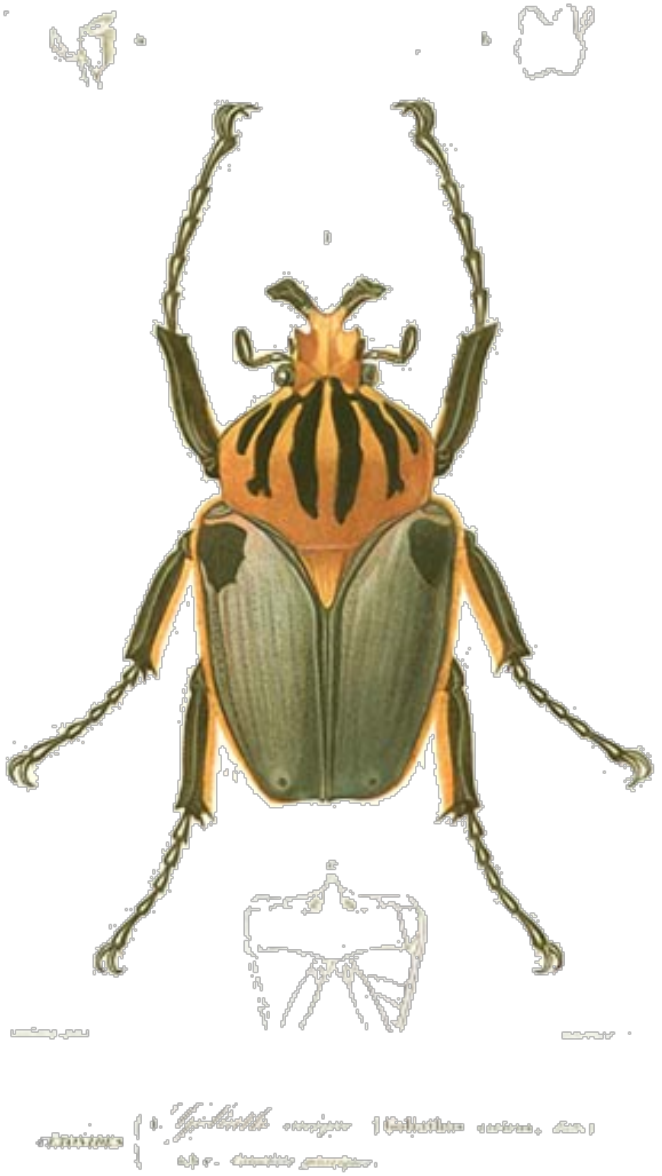

Gregariousness

- Why caterpillars get gregarious
- Any pre-social behaviour recognized?
- Origin of gregariousness

如何製作一個好的簡報?

- 圖文選擇與排序
  - 各投影片間的敘事邏輯是否連貫?
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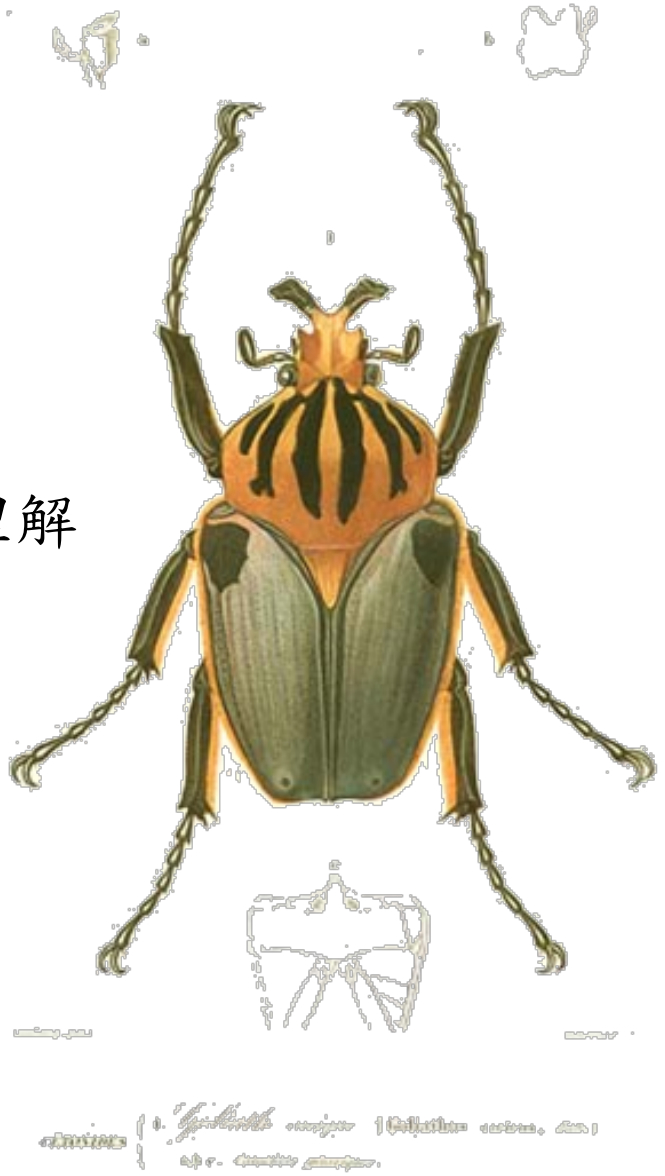
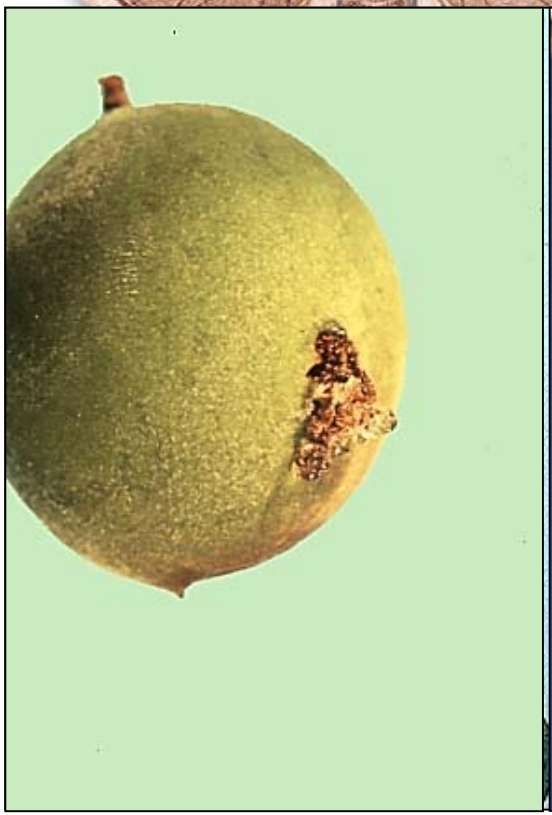
  - 選擇與製作合適的圖協助文字的理解

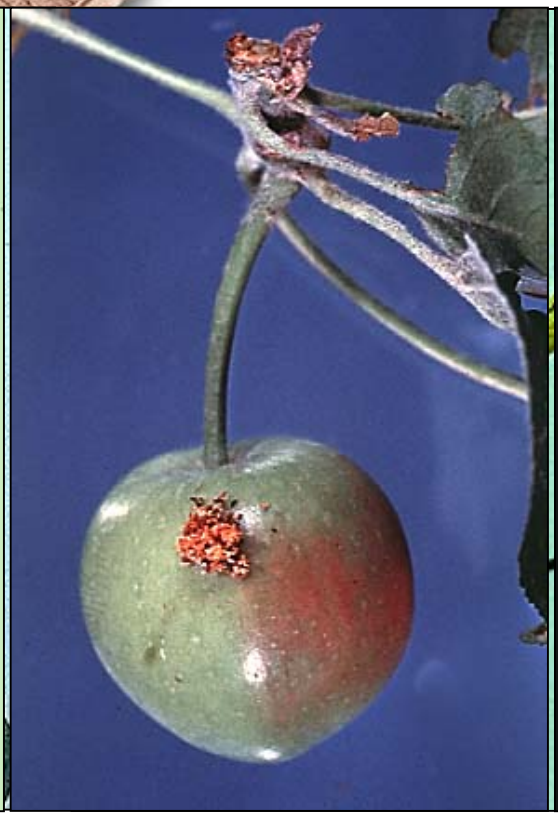


為什麼針對東方果實蛾(OFM)進行研究?

■東方果實蛾(*Grapholita molesta* (Busck, 1916), Oriental fruit moth, 簡稱OFM)，又稱桃小食心蛾、桃折心蟲、梨姬食心蟲、桃折梢蛾或桃樹蛀蟲；屬鱗翅目(Lepidoptera)捲蛾科(Tortricidae)。

■此種蛾類因為害薔薇科果樹之嫩芽與果實，且於感染初期不易檢測，已成為植物檢疫上極為重要之物種，並對農產品進出口影響甚鉅。





如何製作一個好的簡報?

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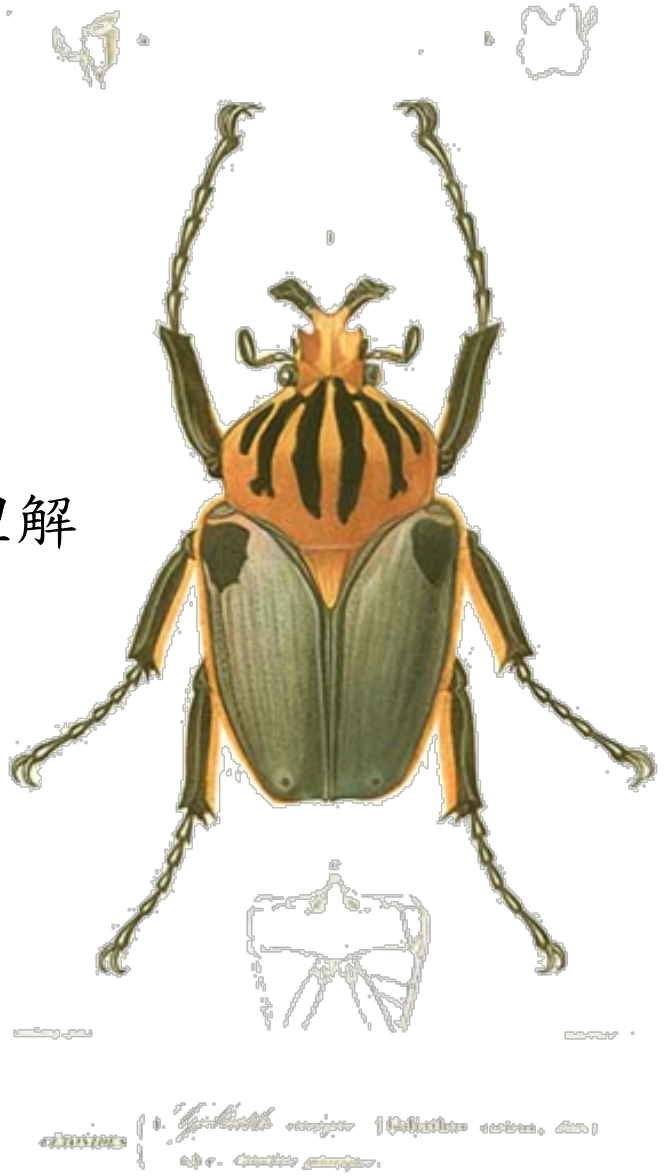
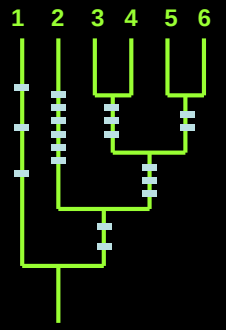
  - 選擇與製作合適的圖協助文字的理解
  - 沒有圖怎麼辦?



The idea of a species - Summary



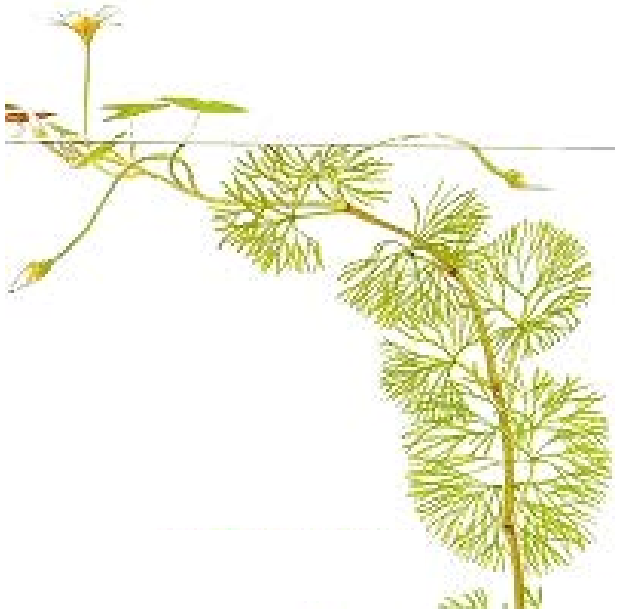
• The **phenetic species concept** defines a species as a set of organisms that are sufficiently phenetically similar to one another.

• The **biological species concept** defines a species as a set of interbreeding forms. Interbreeding between species is prevented by isolating mechanisms.

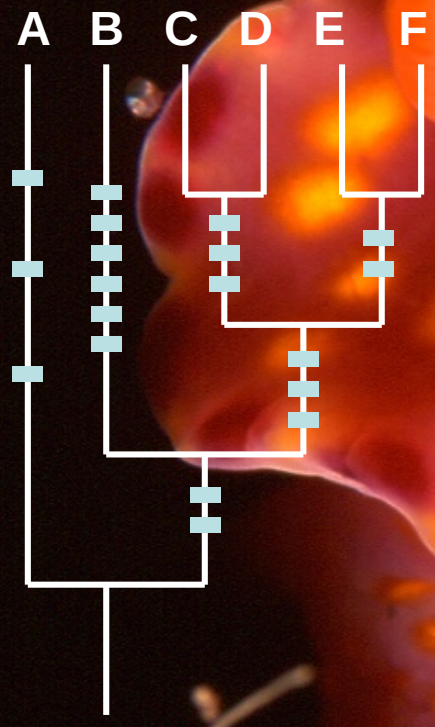
• The **recognition species concept** defines a species as a set of organisms with a shared specific mate recognition system: different members of the species recognize one another as potential mates.

如何製作一個好的簡報?

- 排版與設計
  - 第一張投影片要如何處理?保守些或加點創意?



Principles of SYSTEMATIC BIOLOGY



Lecturer: Dr. Shen-Horn Yen

Week 5 2004-10-14

如何製作一個好的簡報?

- 排版與設計
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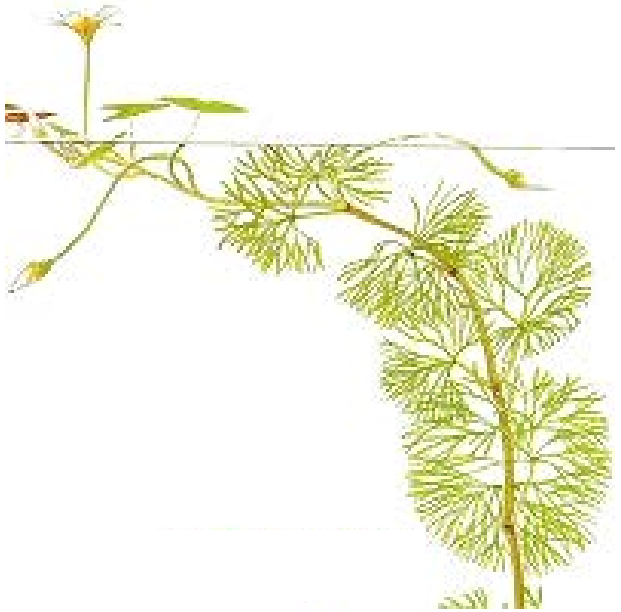
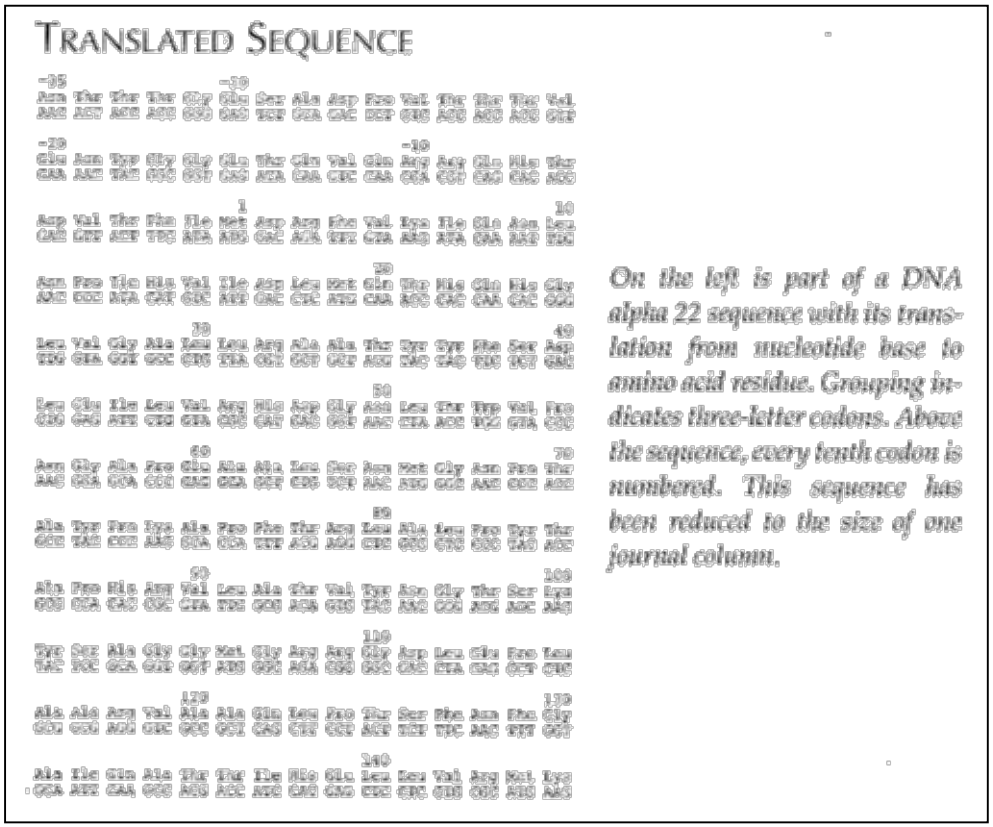


Molecular graphics

Genetic Sequences



How to deal with photos

Resolution, focus, & background

如何製作一個好的簡報?

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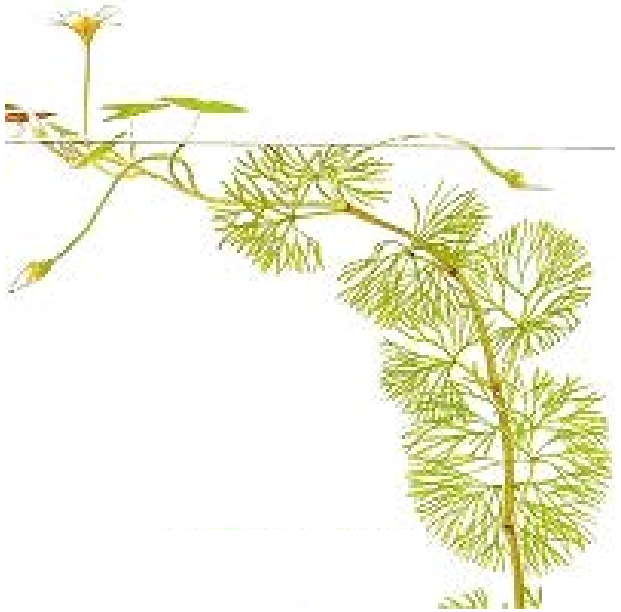

我們將如何進行?

確認東方果實蛾是否分布於台灣

■追溯1992年台灣鱗翅目昆蟲誌之東方果實蛾記錄真偽與引證標本存放地點(與大阪芸術大学芸術学部環境デザイン学科駒井古実博士合作)

■調查台灣各主要薔薇科水果產地(尤其是台中新社與苗栗卓蘭之桃子園)是否存在東方果實蛾之族群: 由臨時工與研究生於2005年1月起以每個月2次之頻率於選定之試驗地點進行成蟲之燈光誘集, 費洛蒙誘引, 以及幼蟲與蛹之採集. 若採到疑似東方果實蛾個體, 將進行飼養, 並測試其寄主偏好

■確認台灣在過去是否已有東方果實蛾之標本記錄: 將地毯氏檢查以下學術機構中之捲蛾科標本以確認東方果實蛾是否在19世紀末即在台灣被採獲. 國內部份: 台灣大學昆蟲系(NTU), 中興大學昆蟲系(NCHU), 國立自然科學博物館(NMNS), 屏東科技大學植物保護技術系(NPPI), 農業試驗所應用動物系(TARI), 林業試驗所森林生物系(TFRI). 國外部份: 美國華盛頓史密松機構國家自然史博物館Kawaba與Issiki收藏(NMNH), 大英自然史博物館昆蟲系A.E. Wileman收藏(BMNH), 德國洪堡大學自然史博物館Staudinger收藏(MNHB), 德意志昆蟲研究所Hans Sauter收藏(DEI), 慕尼黑動物學博物館(ZSM)以及北海道大學農學部昆蟲學講座松村松年收藏(HUFA).

如何製作一個好的簡報?

- 排版與設計
  - 第一張投影片要如何處理? 保守些或加點創意?
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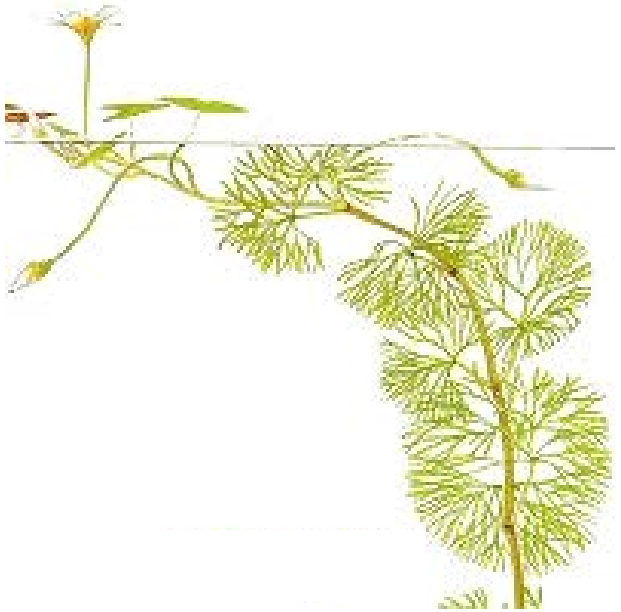
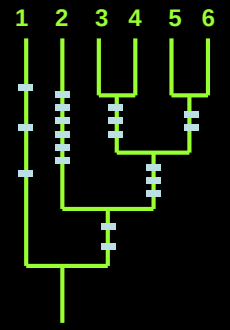
  - 標題與內文之字體大小與字數是否適中?
  - 圖片排版的基本建議



The idea of a species - What are the reproductive species concepts?



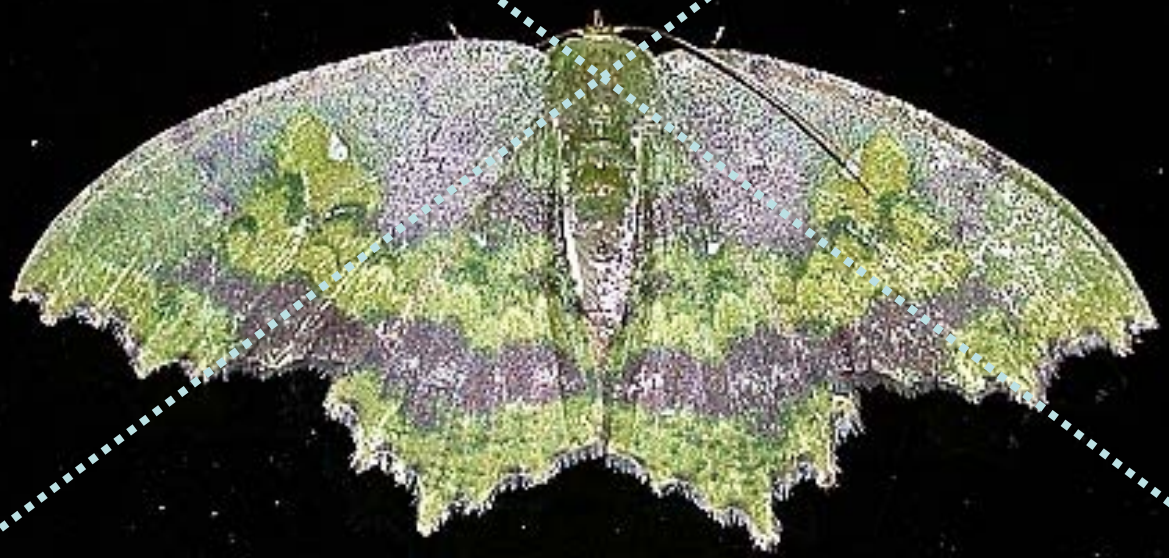
Isolating mechanisms

An isolating mechanism is any property of two species that stops them from interbreeding. Biologists distinguish between prezygotic and postzygotic mechanisms: mechanisms that prevent the formation of hybrid zygotes and those that reduce the viability or fertility of hybrid zygotes.

The table gives Dobzhansky's classification of the main types of isolating mechanisms. In particular cases, isolation is not likely to be due completely to only one factor from Dobzhansky's list. It may be caused by a mix of several prezygotic and postzygotic factors.

色系平衡與協調

Context in the Lepidoptera Evolutionary Ecology



畫面平衡

REPRODUCTION

Physiological control of reproduction

- Neurosecretory cells in the brain produce neuropeptides and also control the synthesis of **ecdysteroids** and **juvenile hormones (JH)**

- JH triggering the **functioning of ovary, accessory glands, and fat body**

- Ecdysteroids influence **morphogenesis as well as gonad functions**

- Neuropeptides play various roles at different stages of reproduction, as they regulate endocrine function and also directly influence reproductive events, especially **ovulation, oviposition and larviposition**

畫面平衡

REPRODUCTION

Bring the sexes together

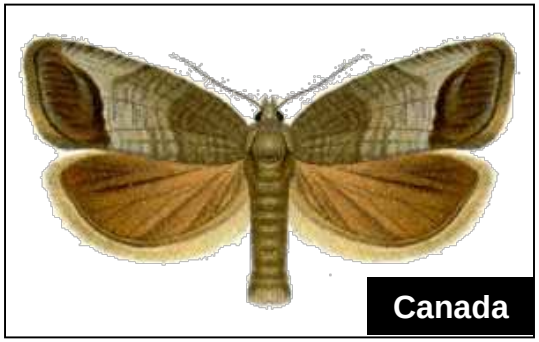
- Biolumination
- Swarming
- Lek mating system

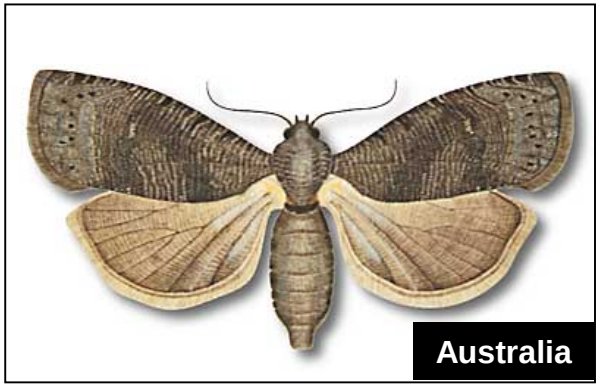
我們的研究將回答以下問題:

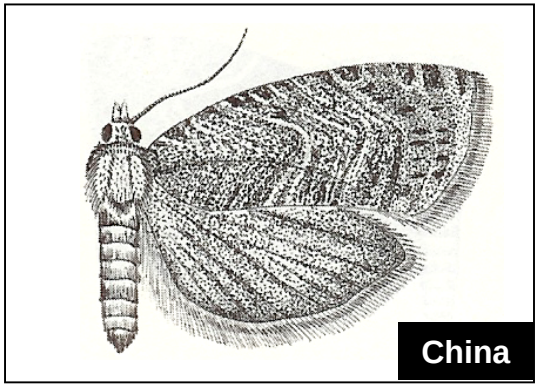
圖片的均質化

■確認東方果實蛾是否分布於台灣

■確認真正的東方果實蛾倒底是什麼?→因各國的農業昆蟲文獻與檢疫害蟲手冊上的東方果實蛾形態並不一致



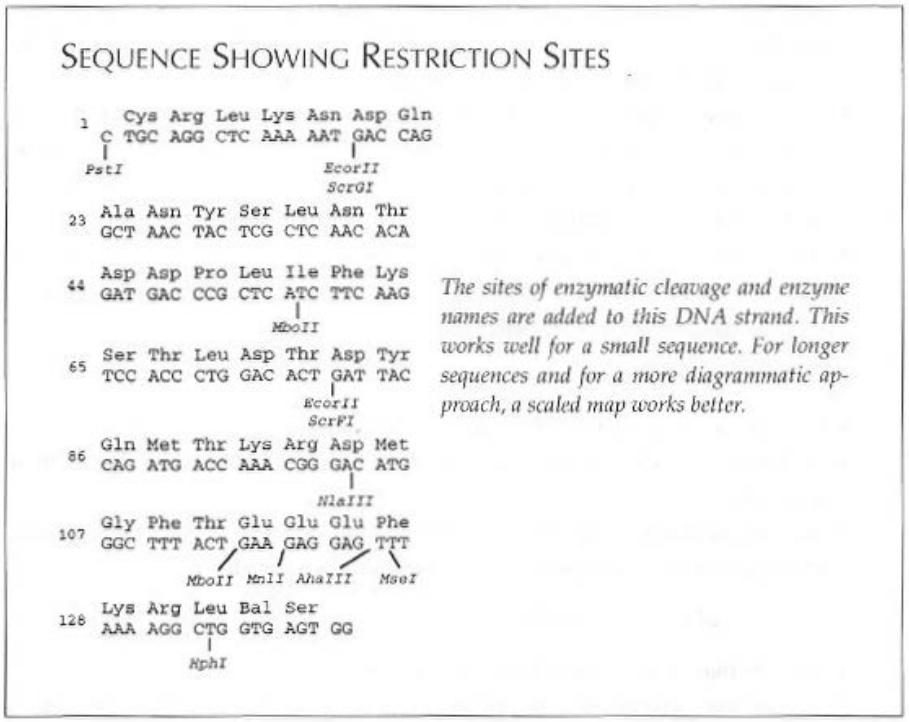


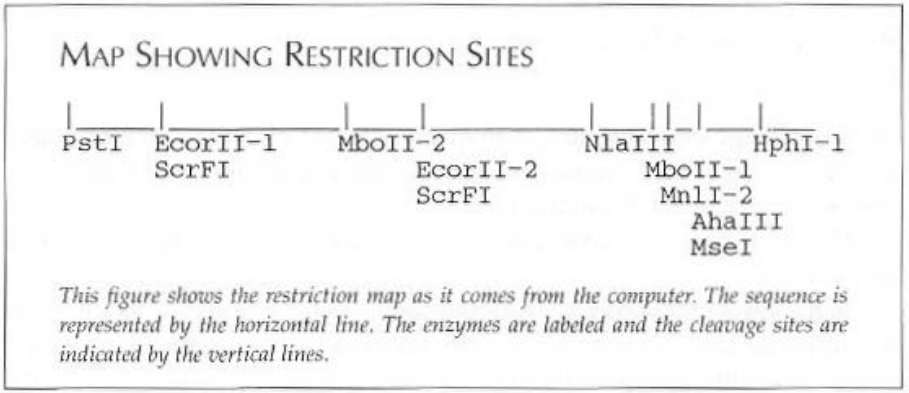


Molecular graphics

Restriction Maps

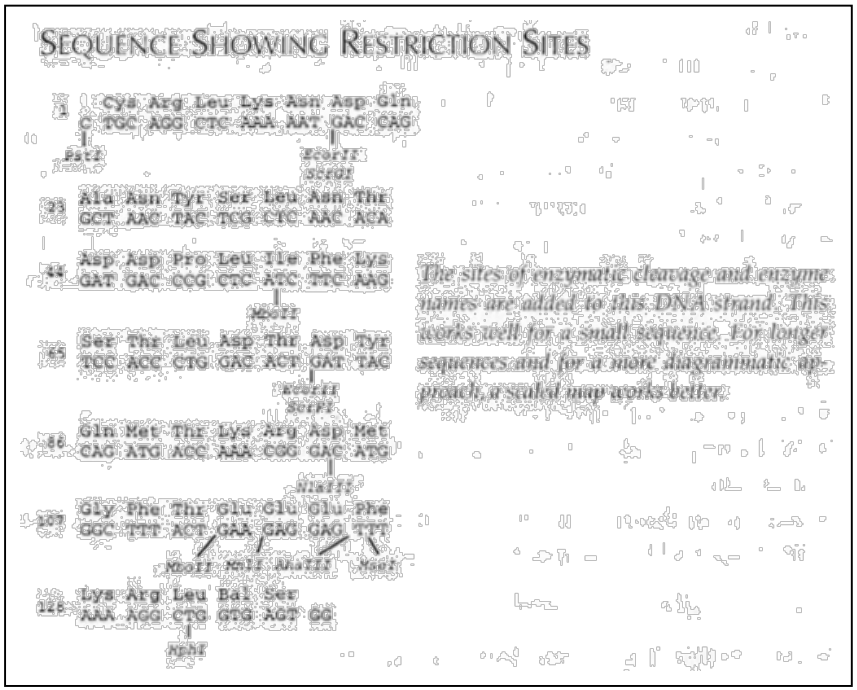
黑白稿的銳化

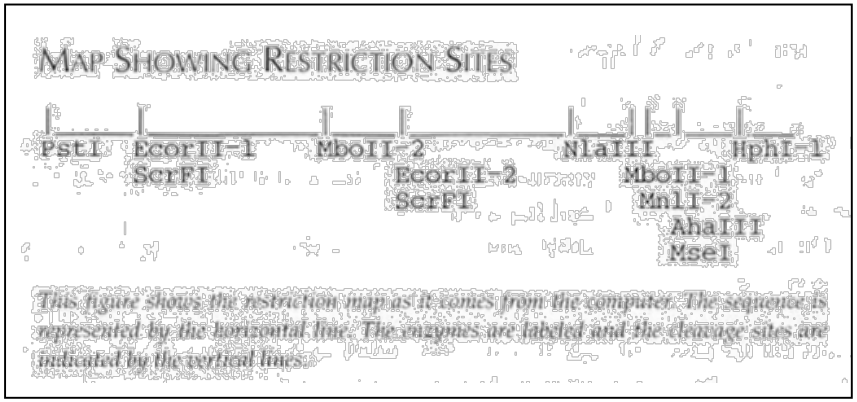




Molecular graphics

Restriction Maps





黑白稿的銳化

Defence mechanisms

依圖片特性排版

- How many chemical substrates are utilized?
- Which ones are more effective on their predators?
- Any phylogenetic correlations with their diets?

如何製作一個好的簡報?

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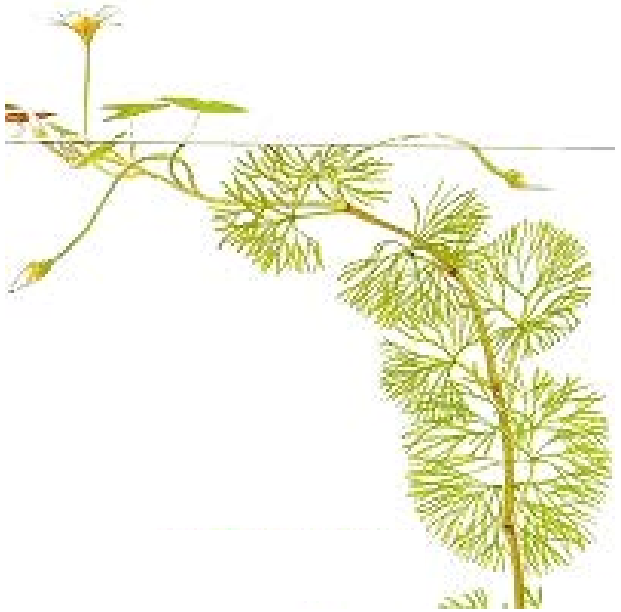
  - 圖片排版的基本建議
  - 顏色與字型



昆蟲學養蟲報告

超艱辛版

苦主:XX友 9052014

水螳螂等待獵物

大亂鬥之後~~

水棲昆蟲都互相吃光

然後放的蝦籠被偷走

只能說很衰

如何製作一個好的簡報?

- 排版與設計
  - 第一張投影片要如何處理? 保守些或加點創意?
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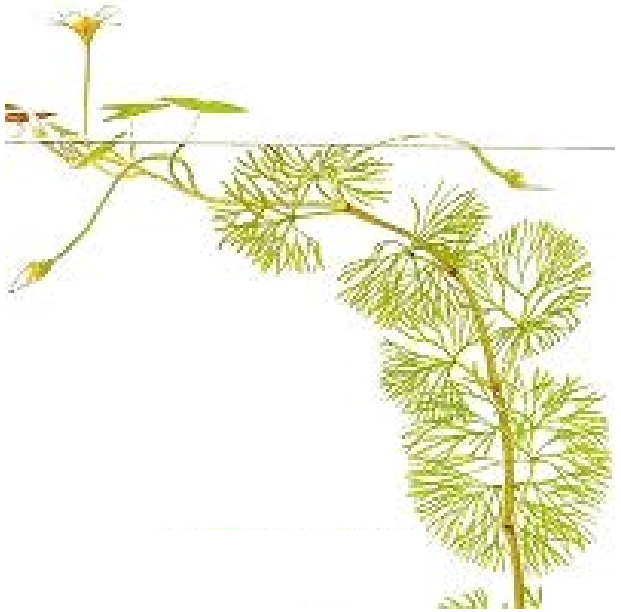
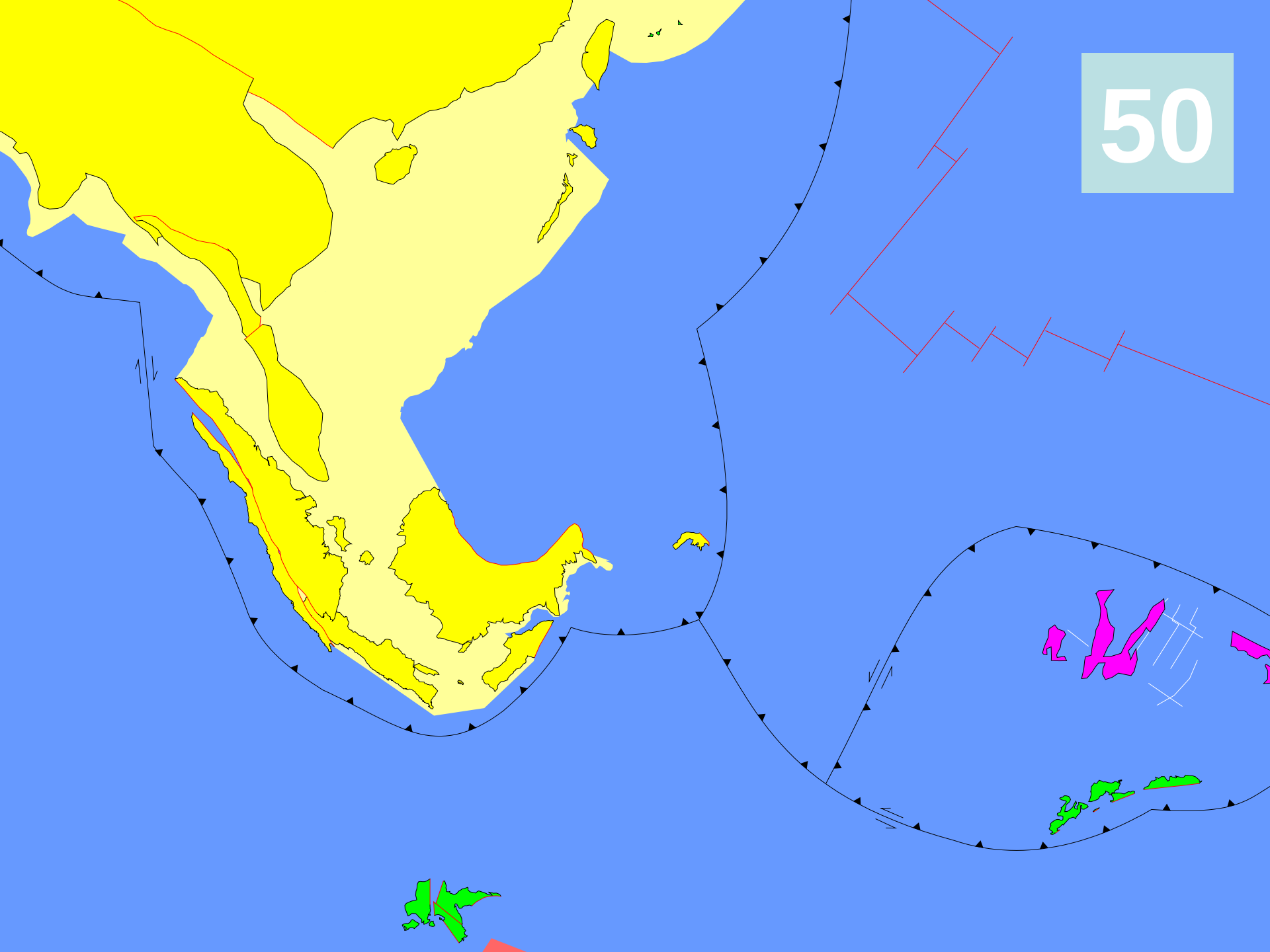
  - 圖片排版的基本建議
  - 顏色與字型
  - 動畫的輔助

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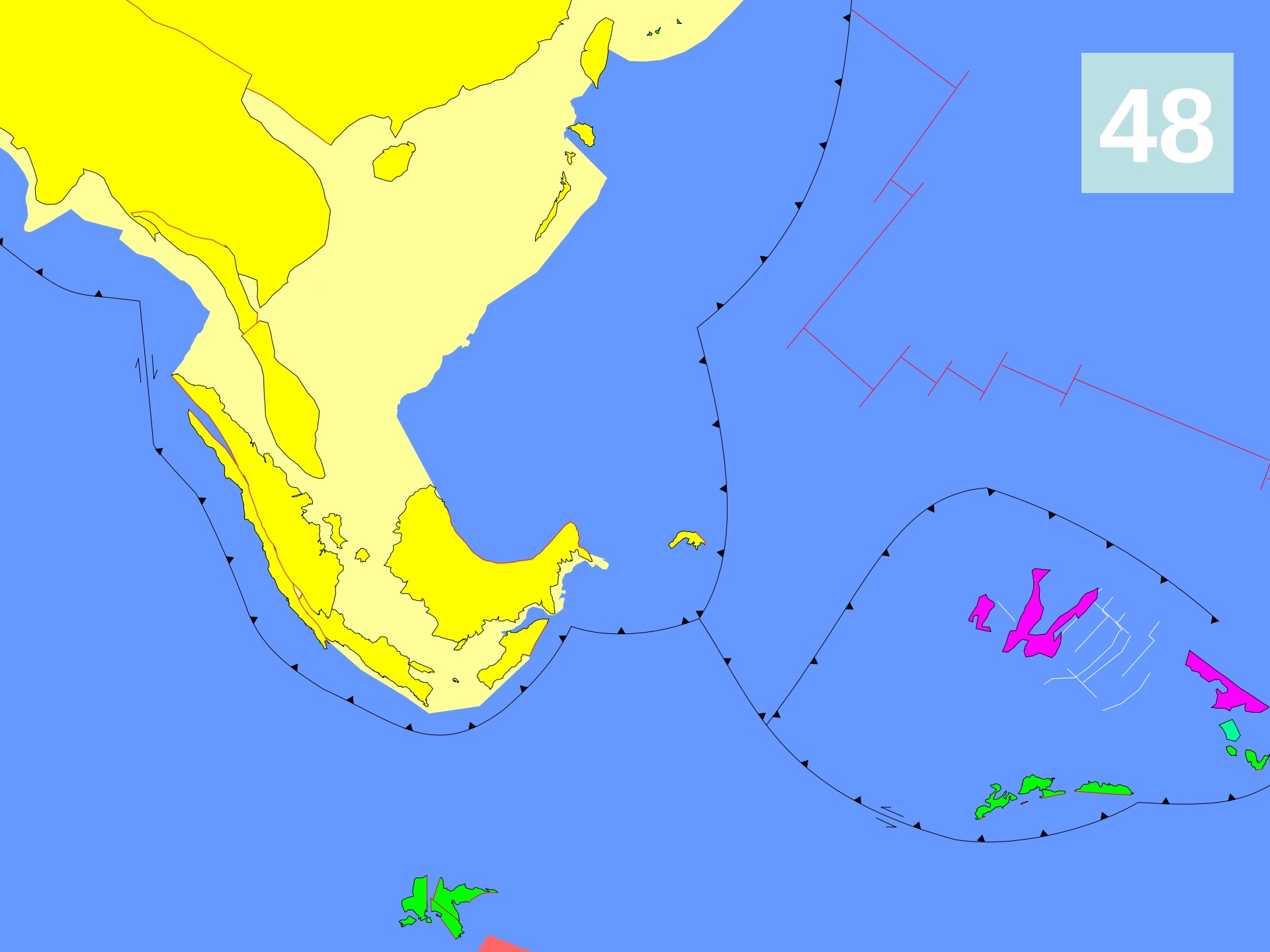
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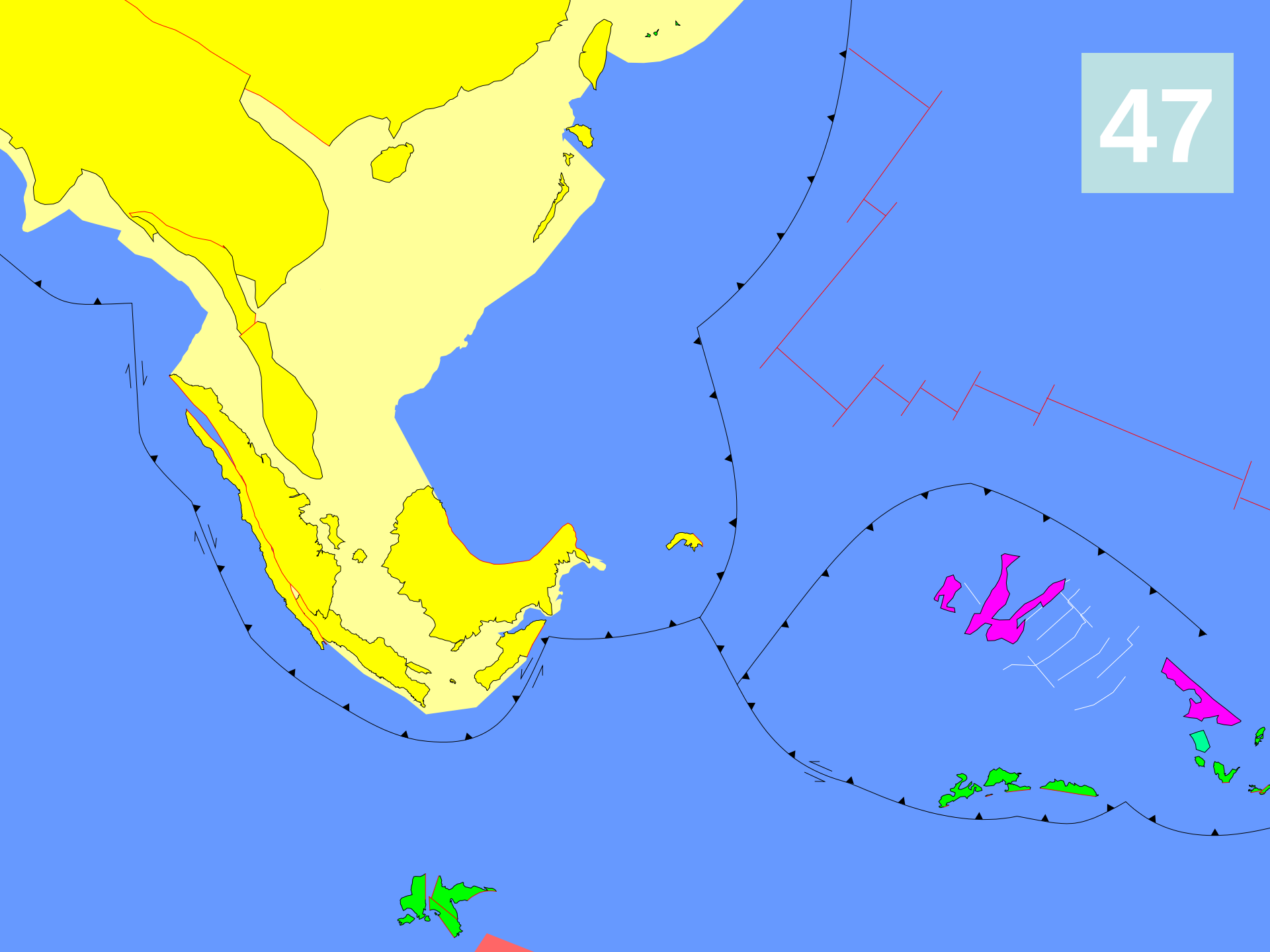
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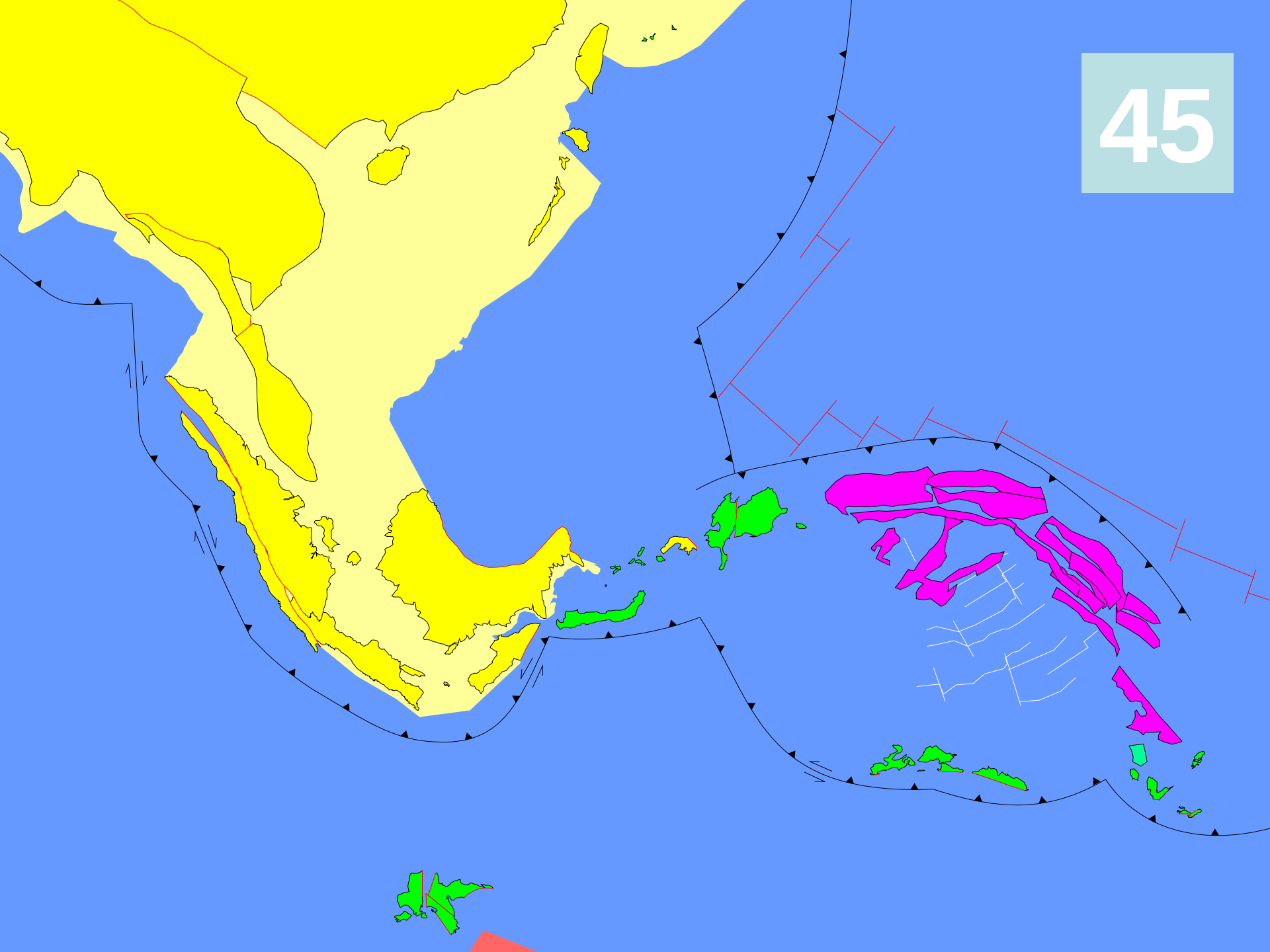
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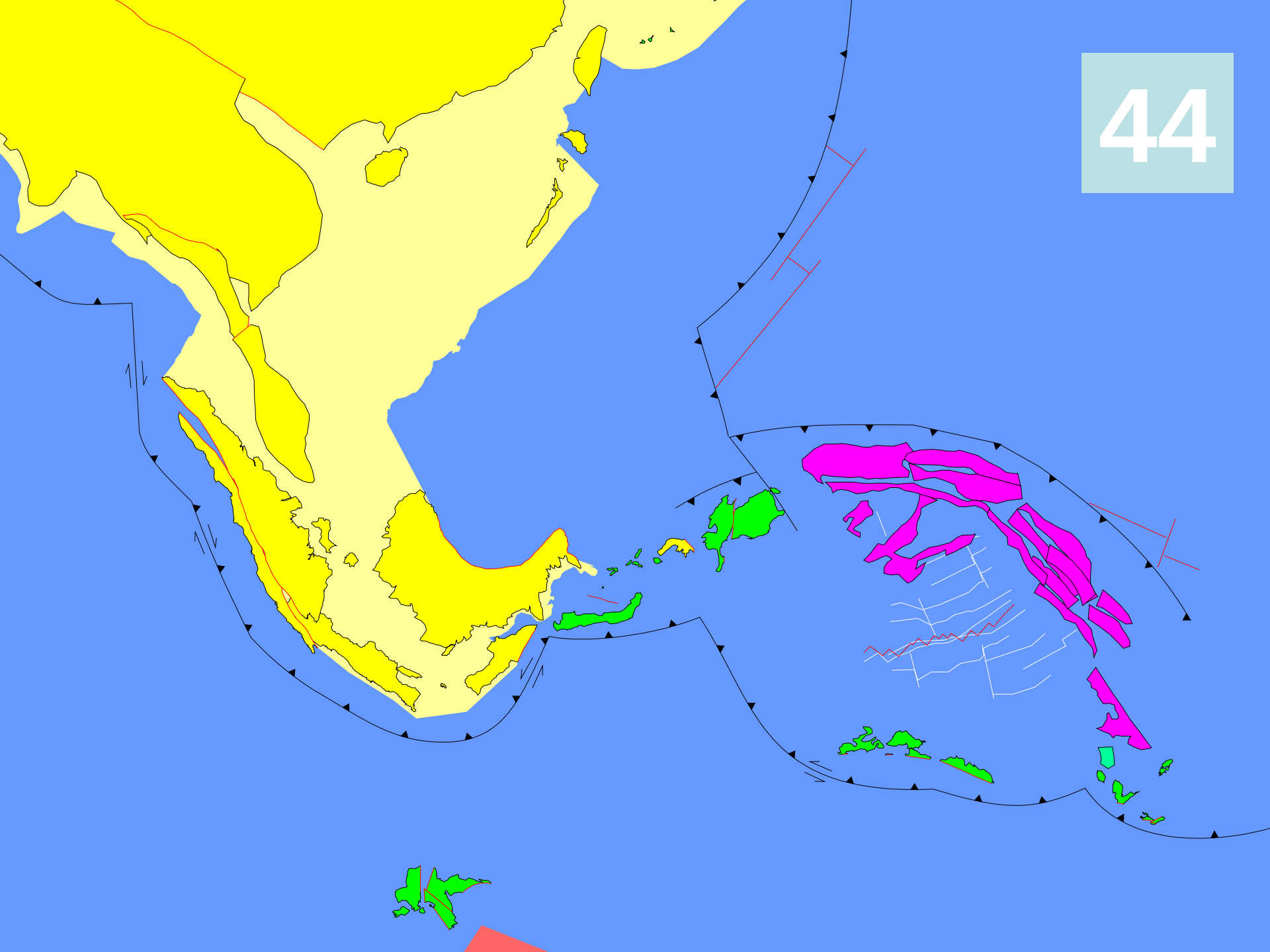
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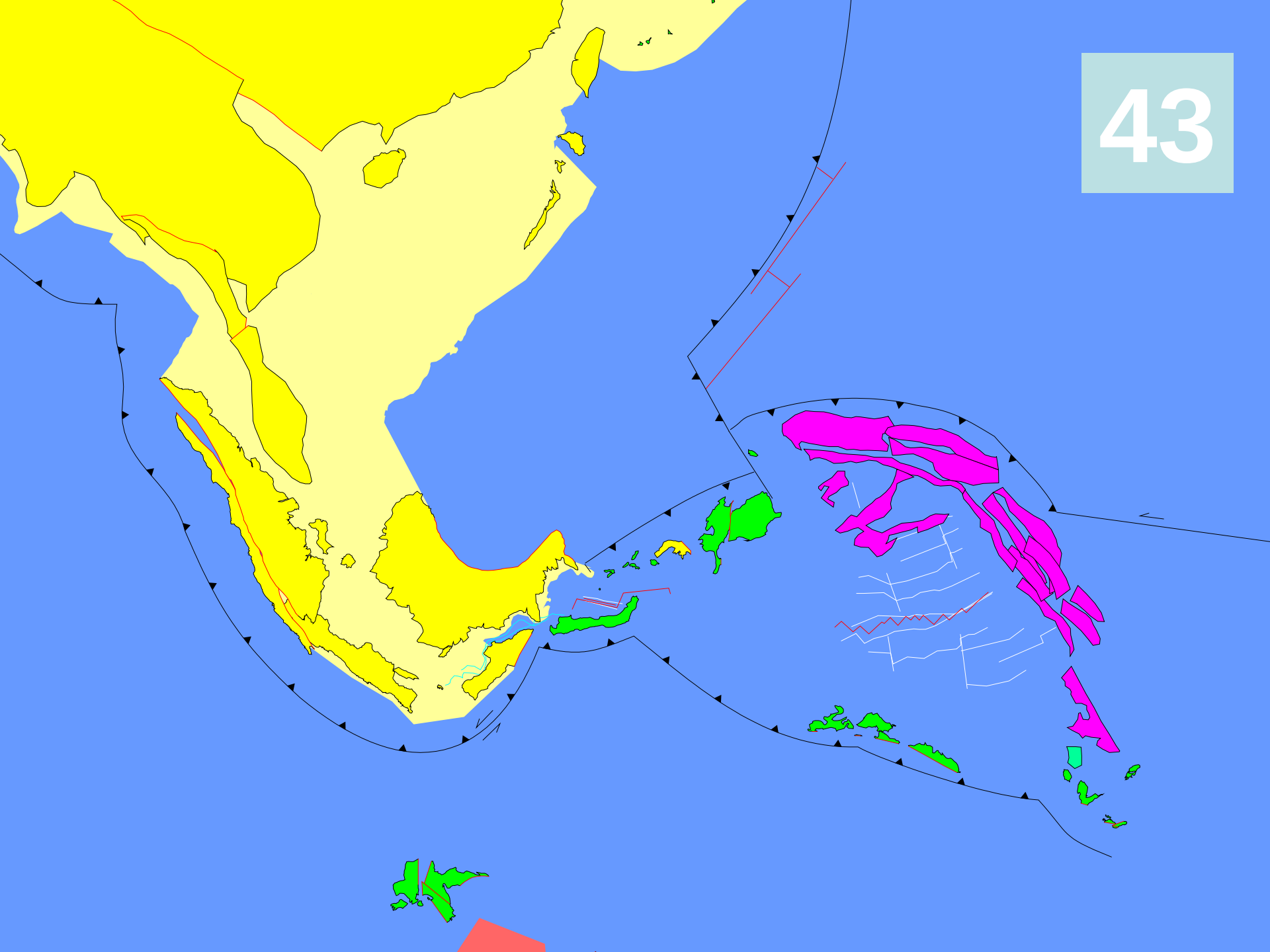
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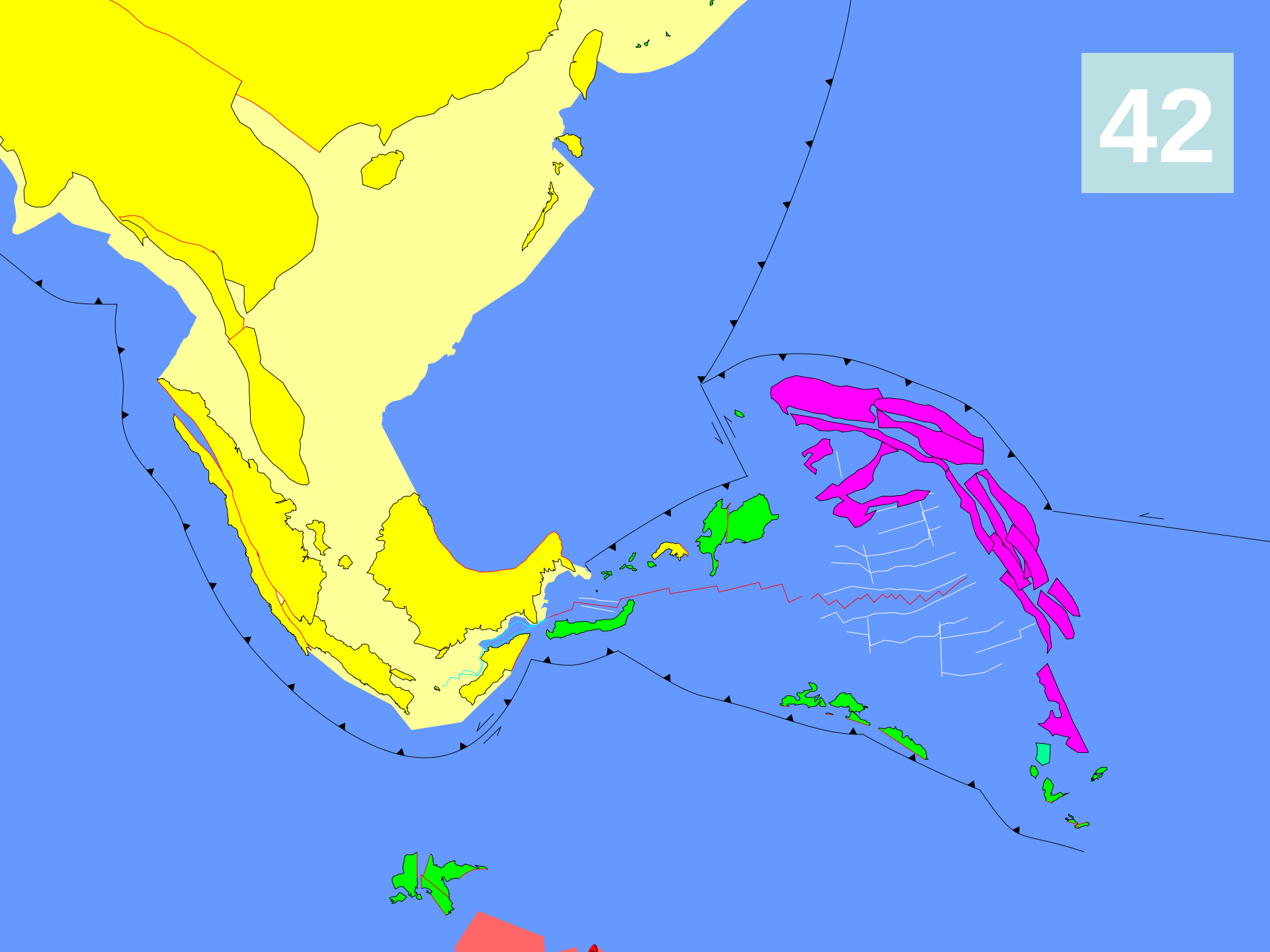
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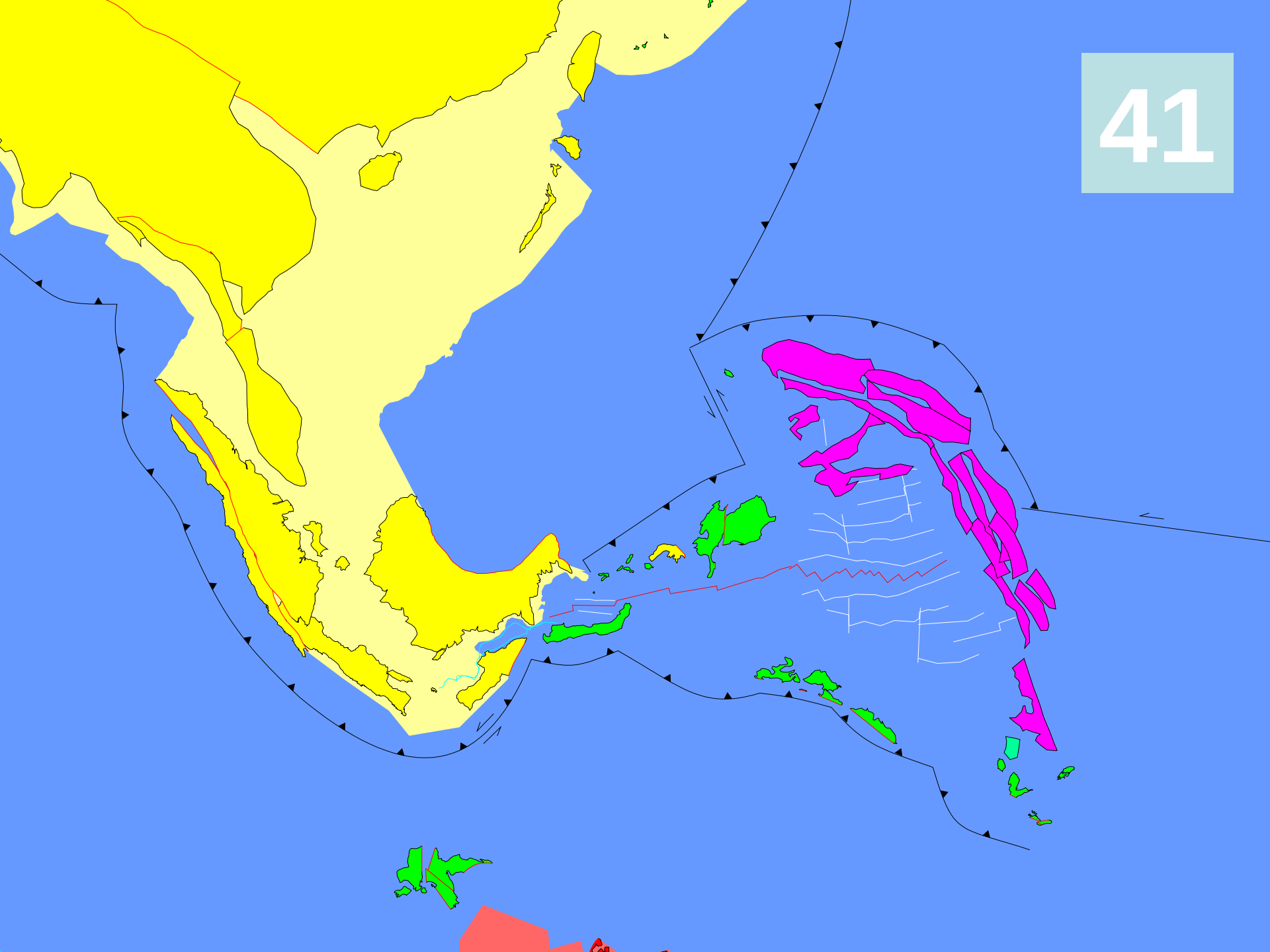
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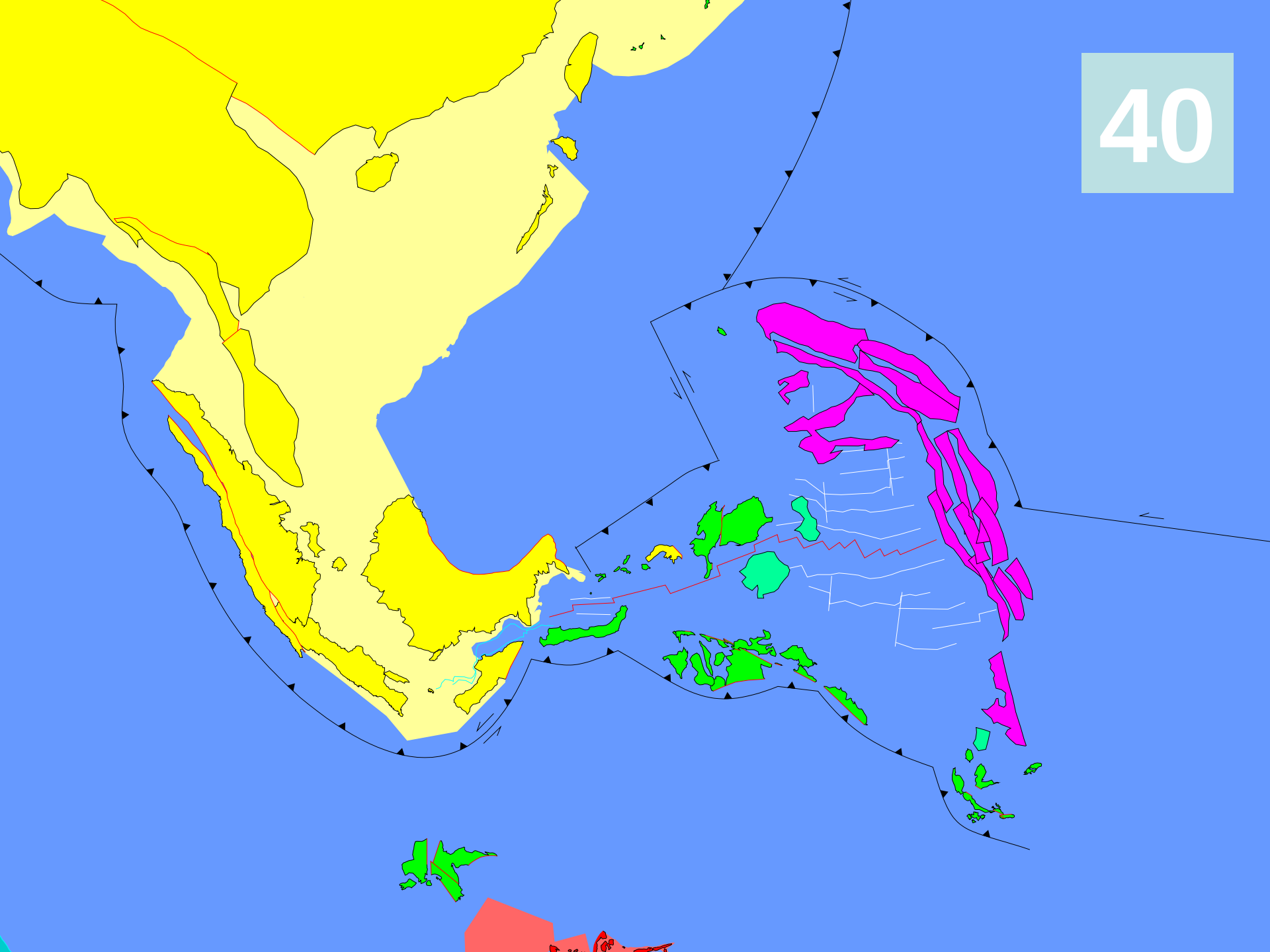
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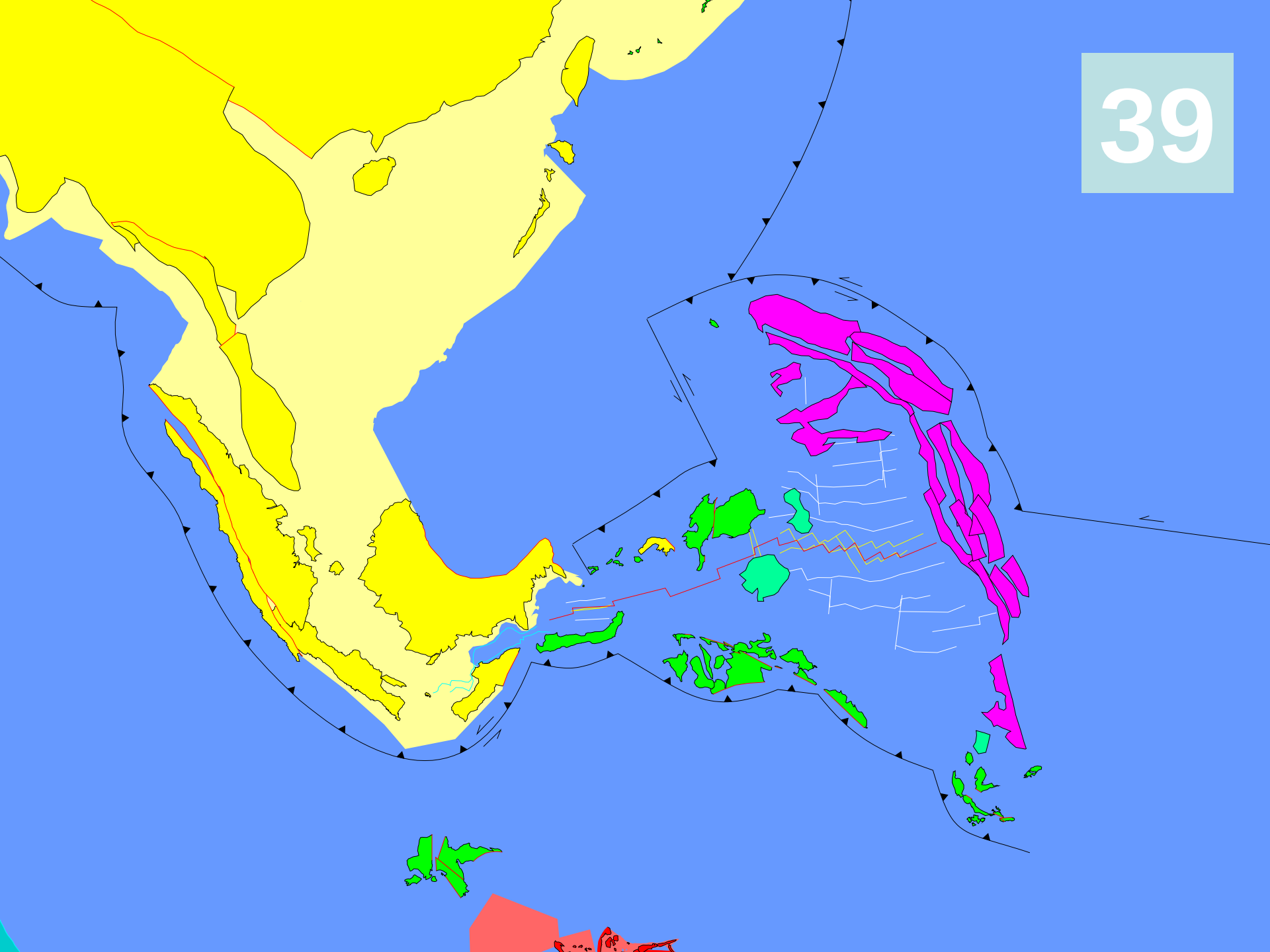
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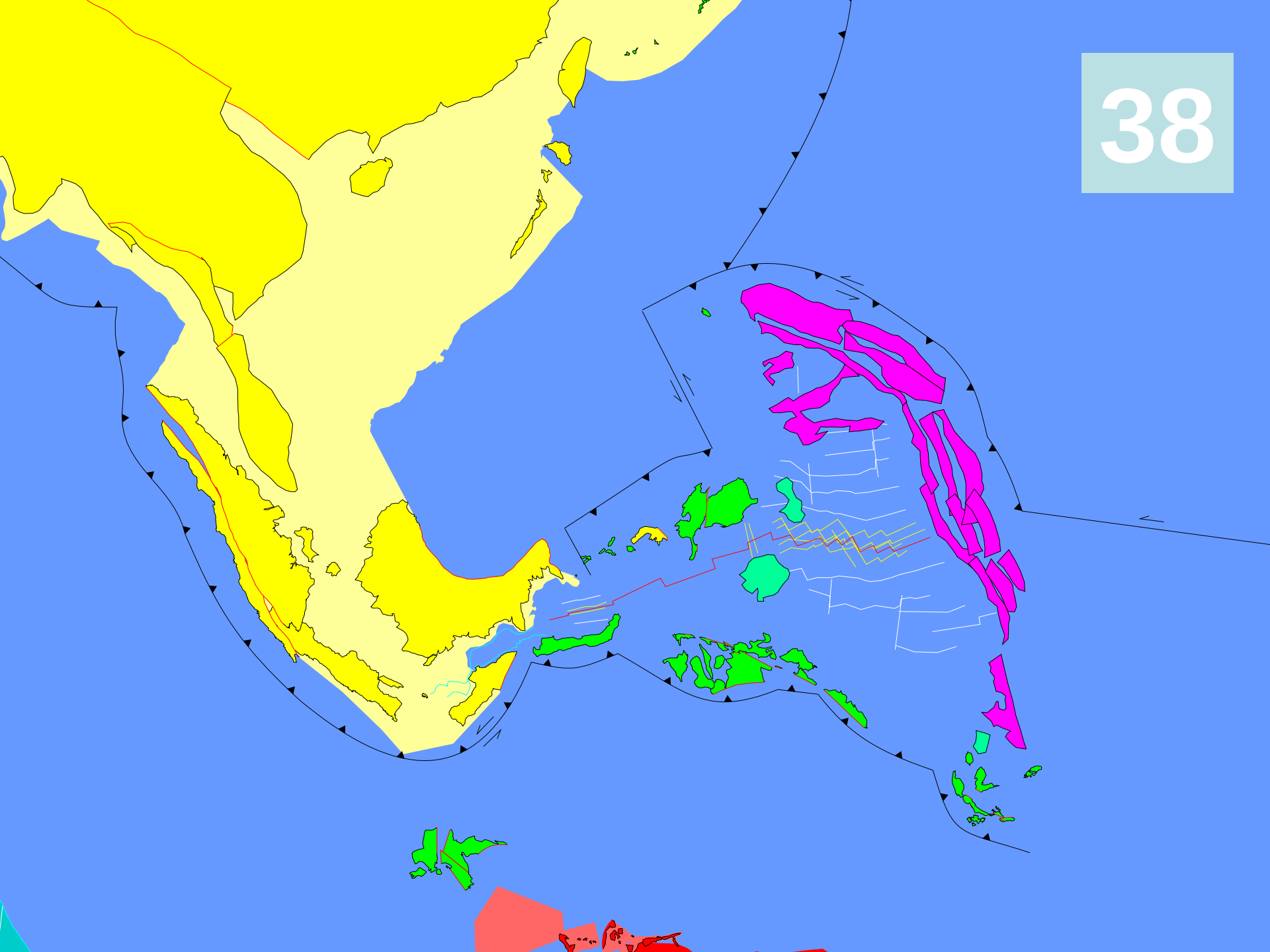
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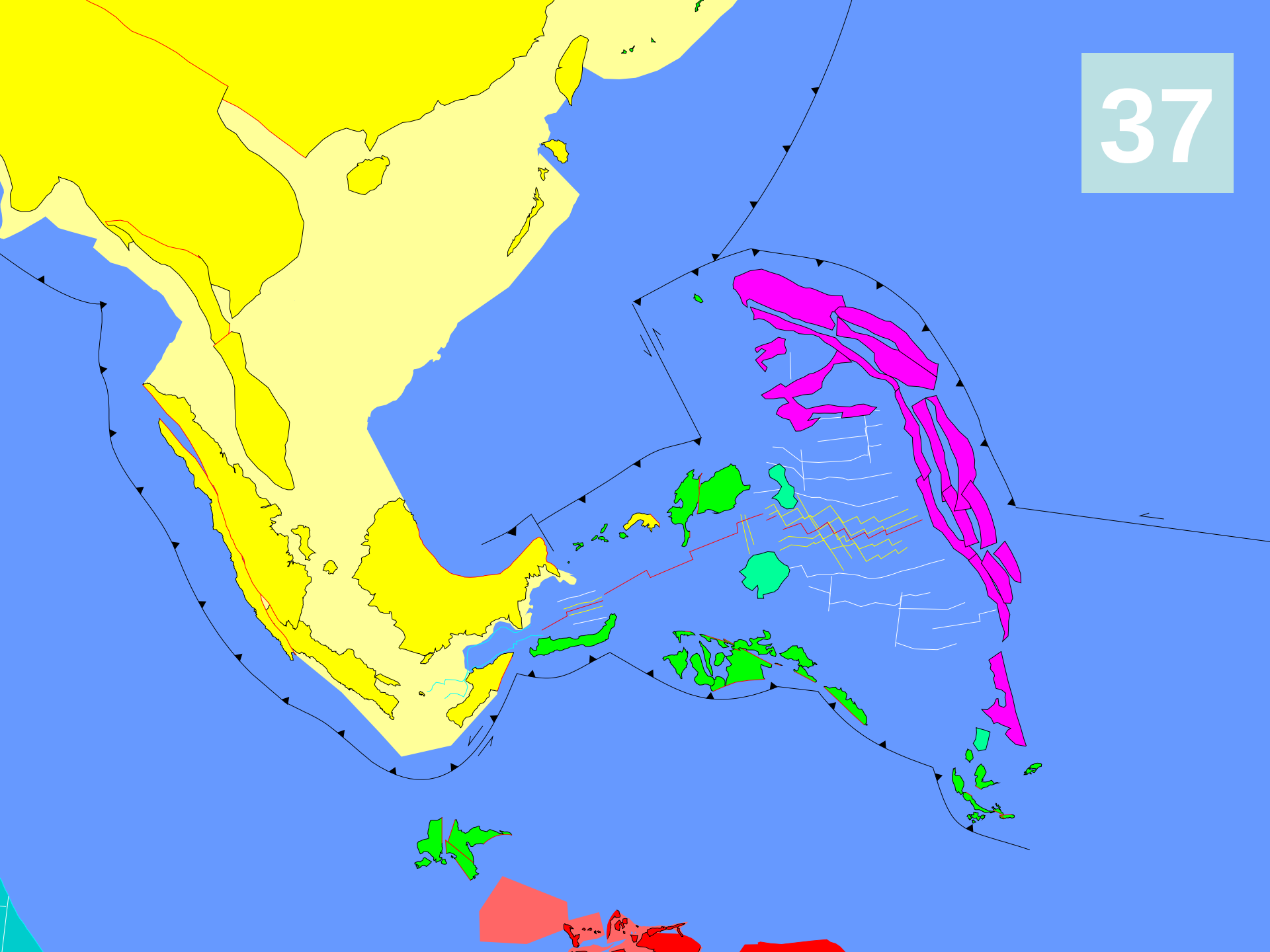
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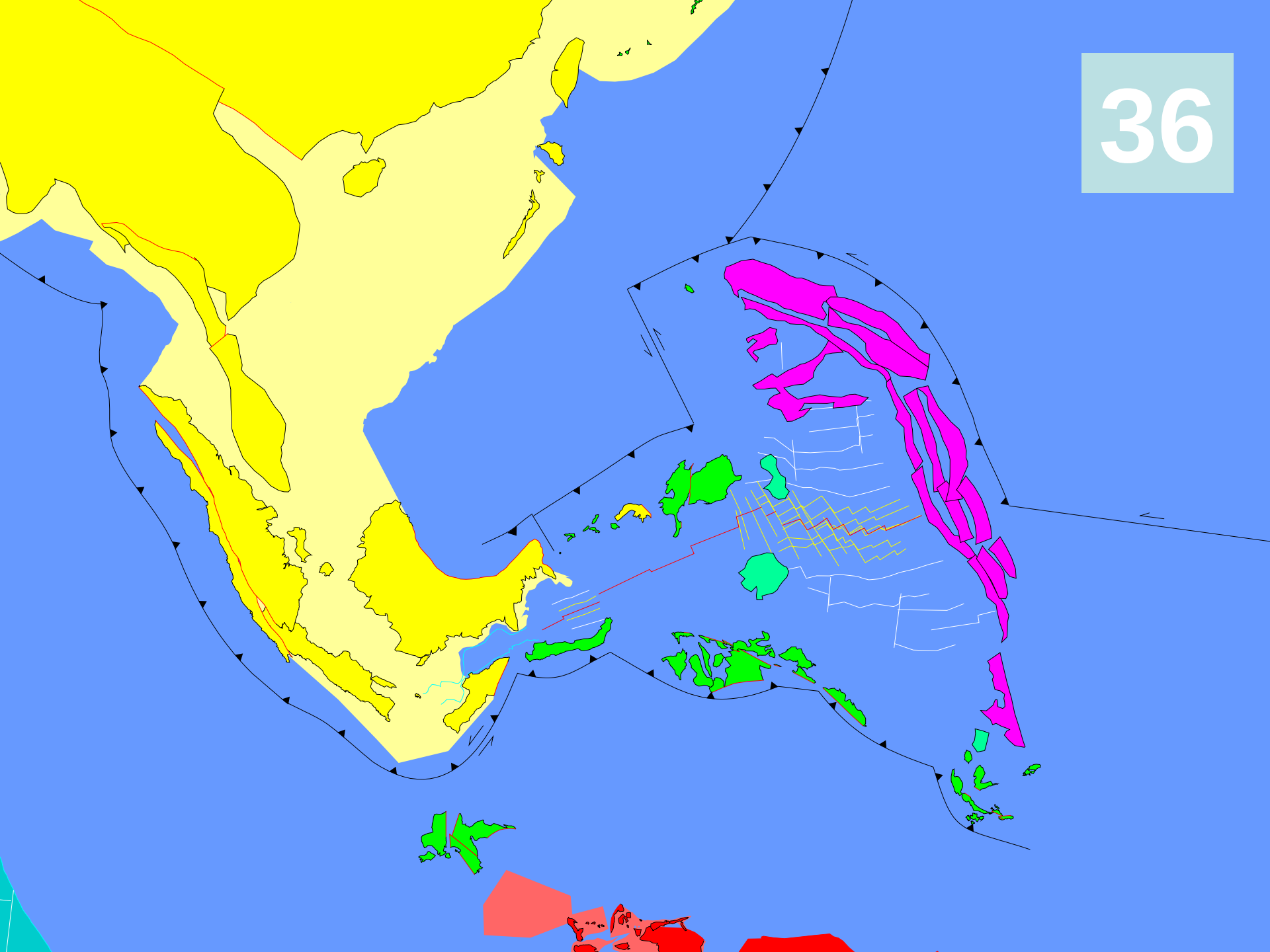
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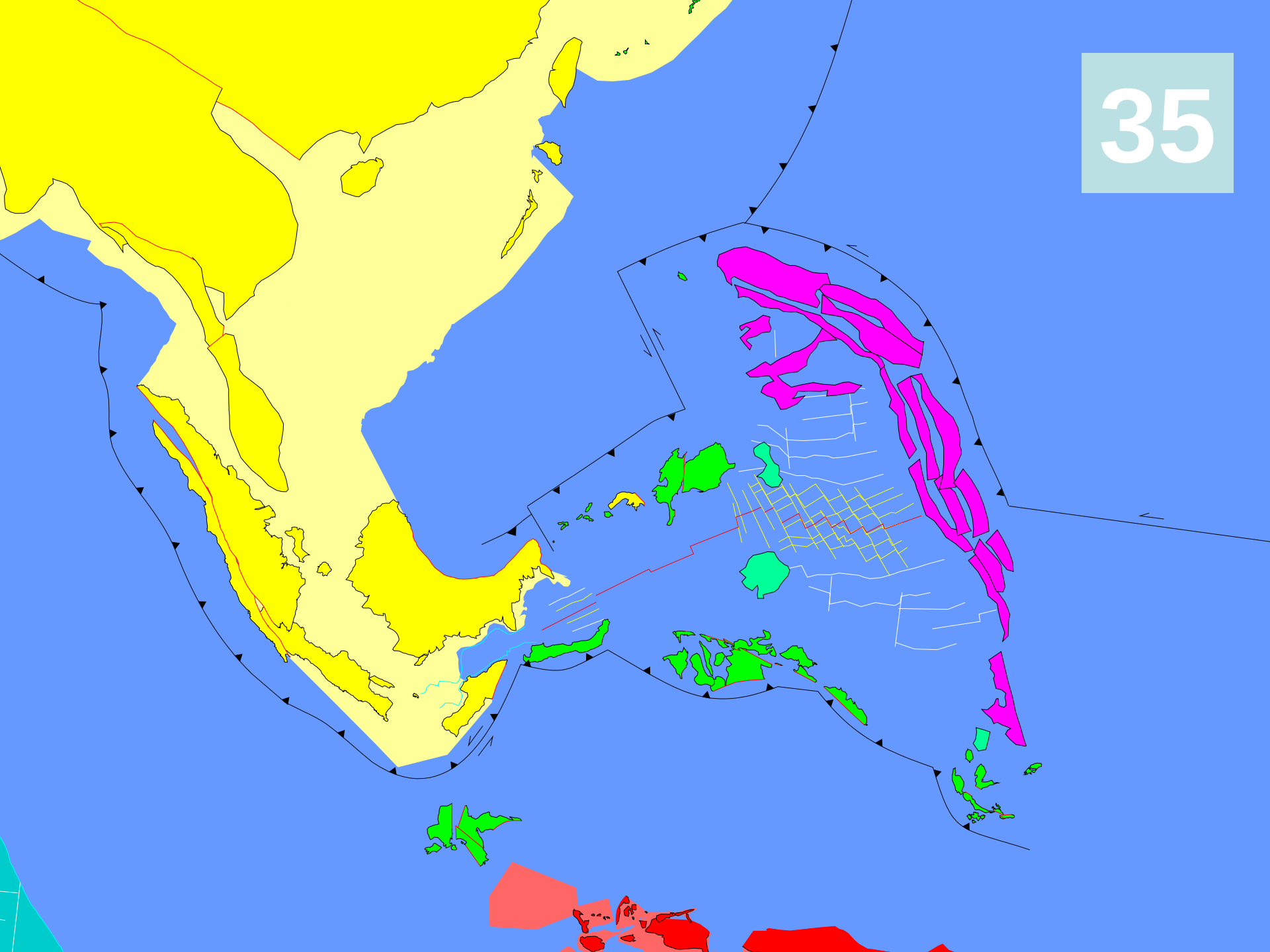
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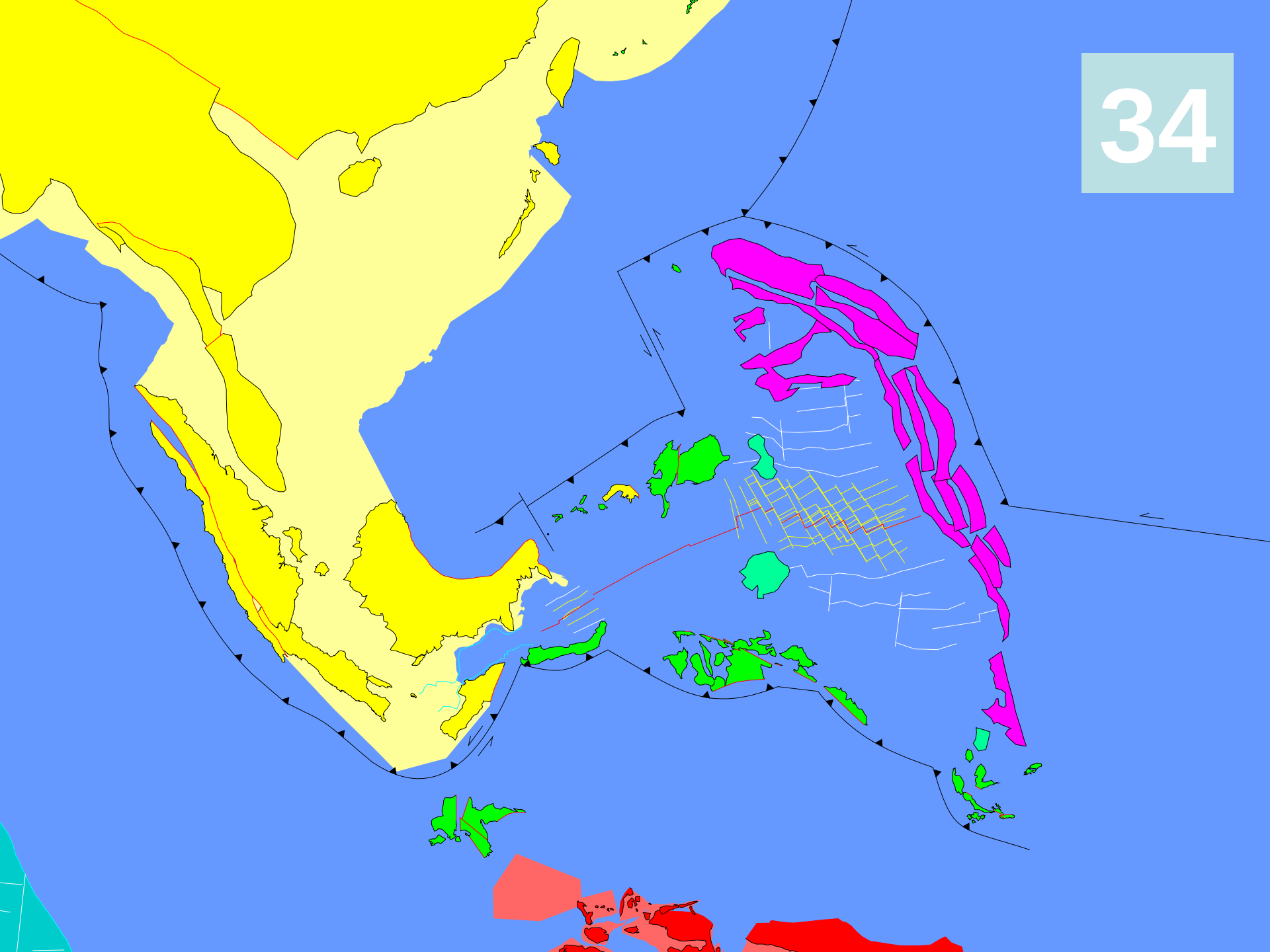
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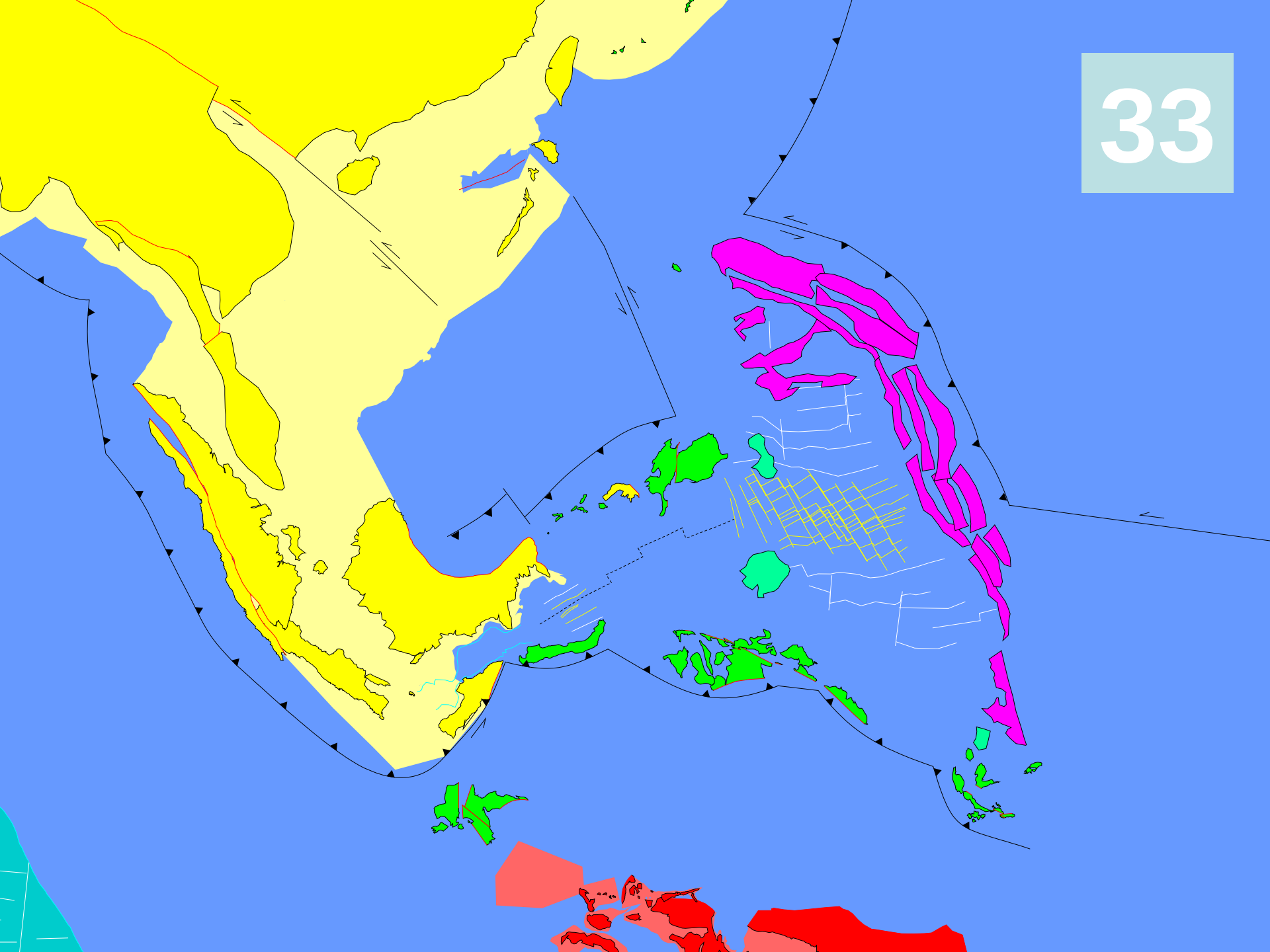
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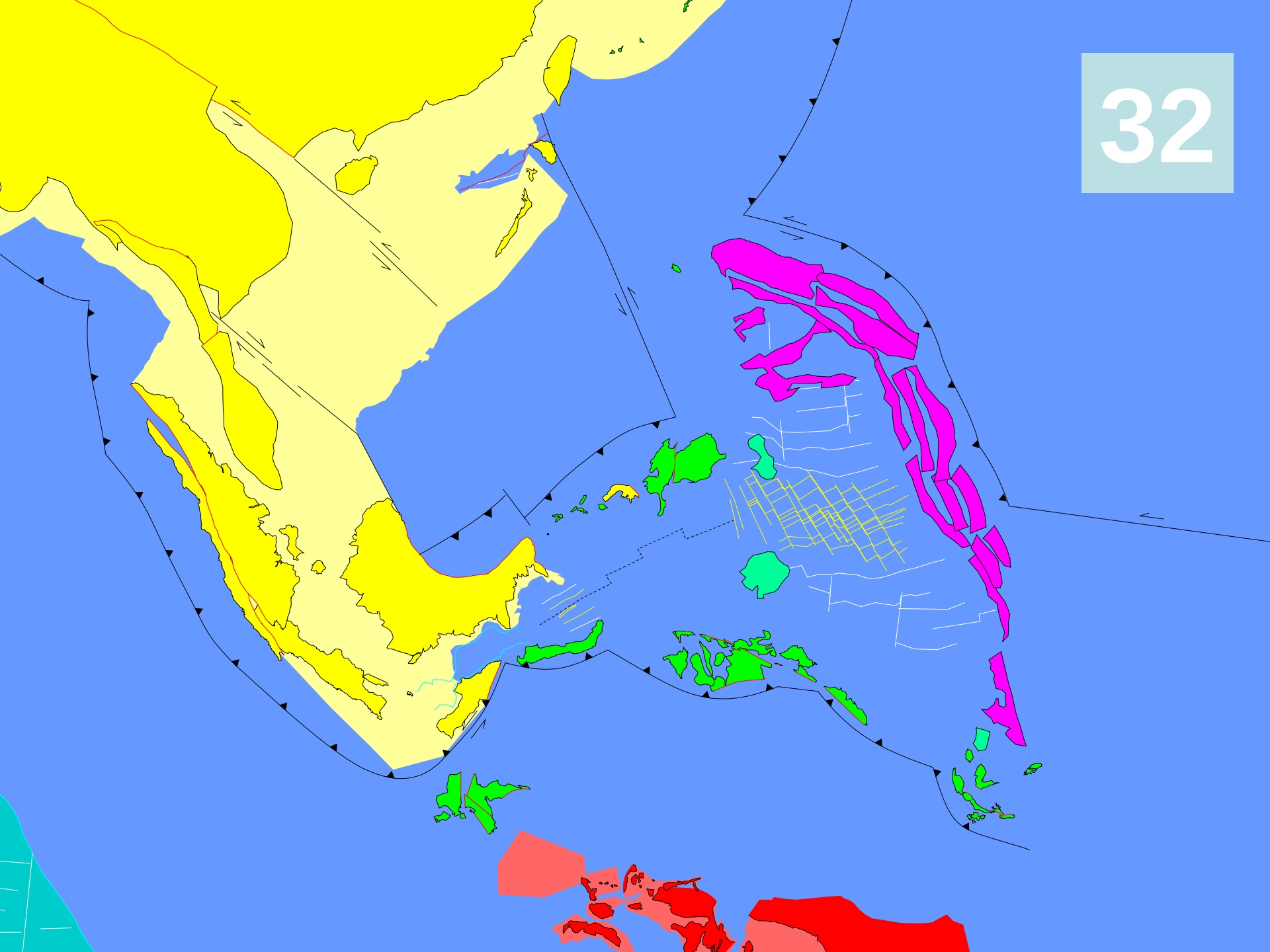
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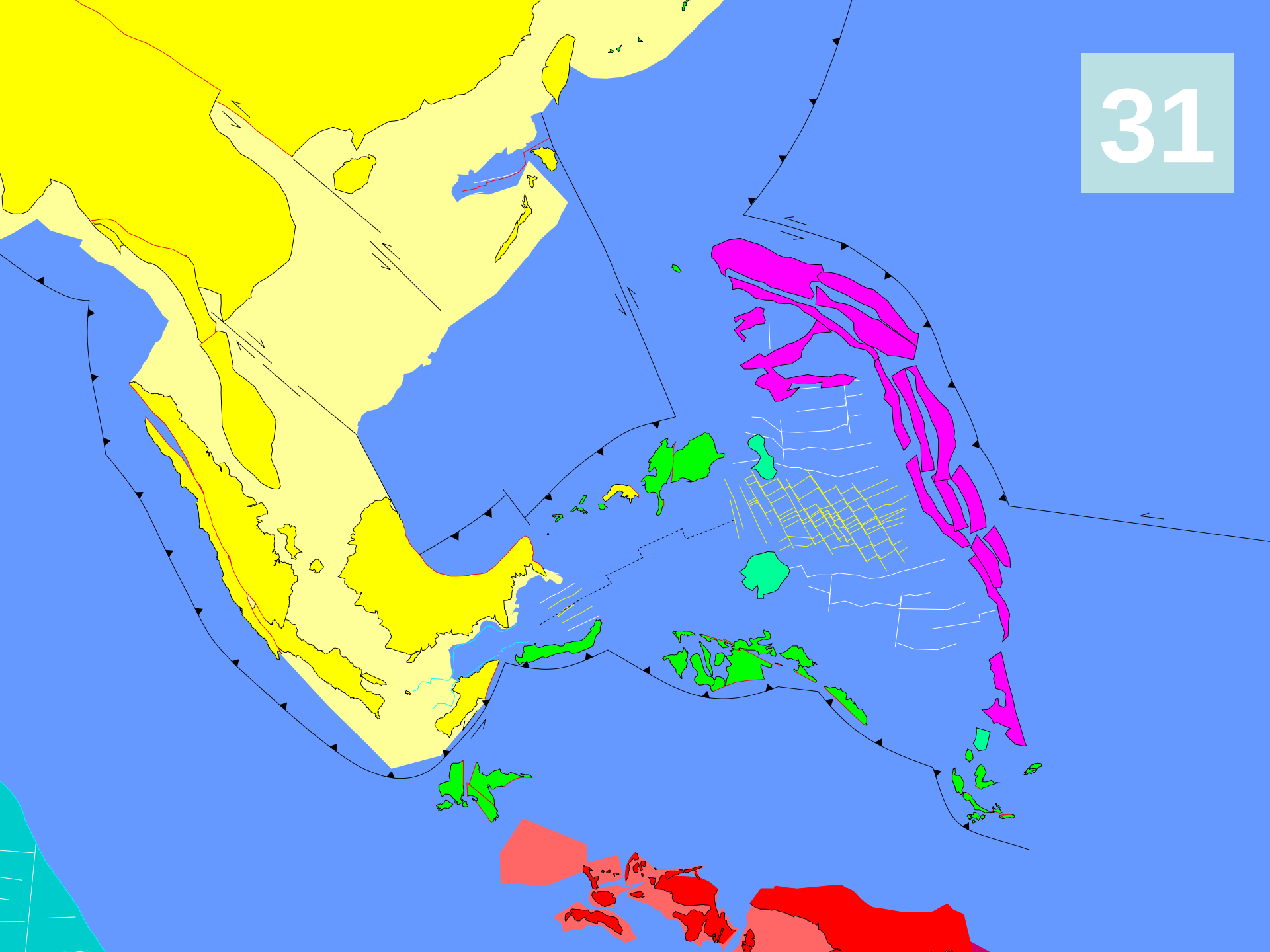
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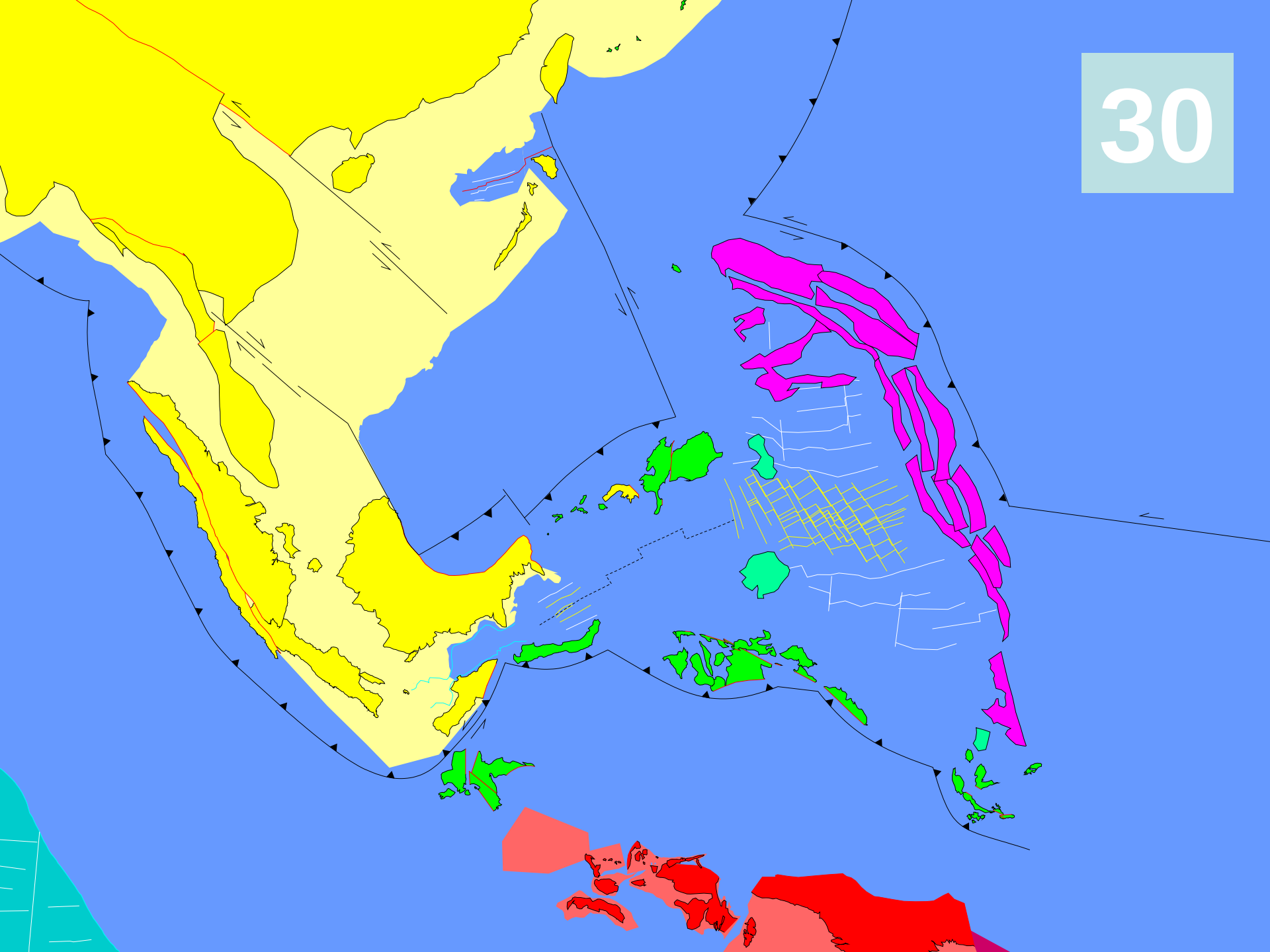
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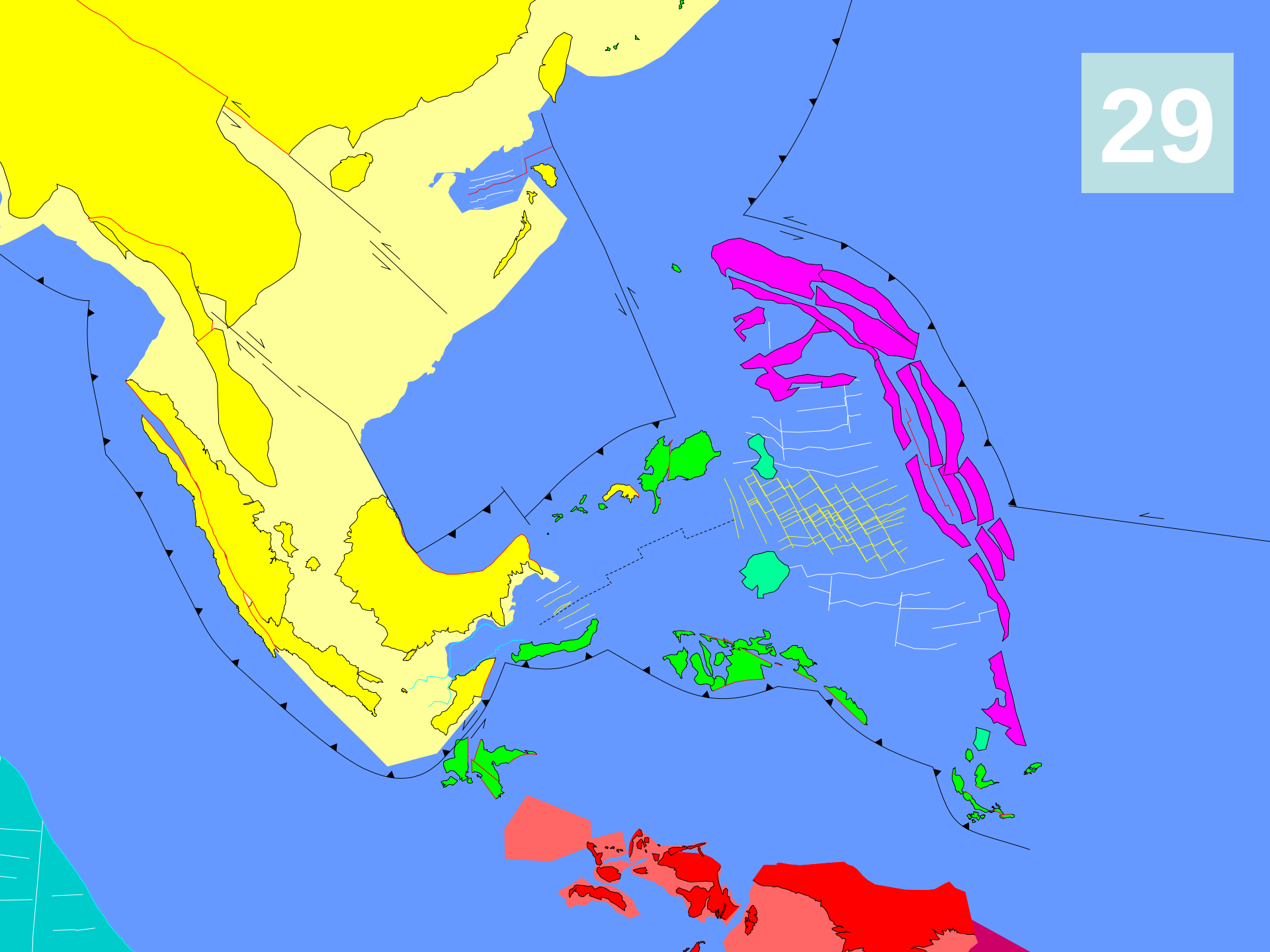
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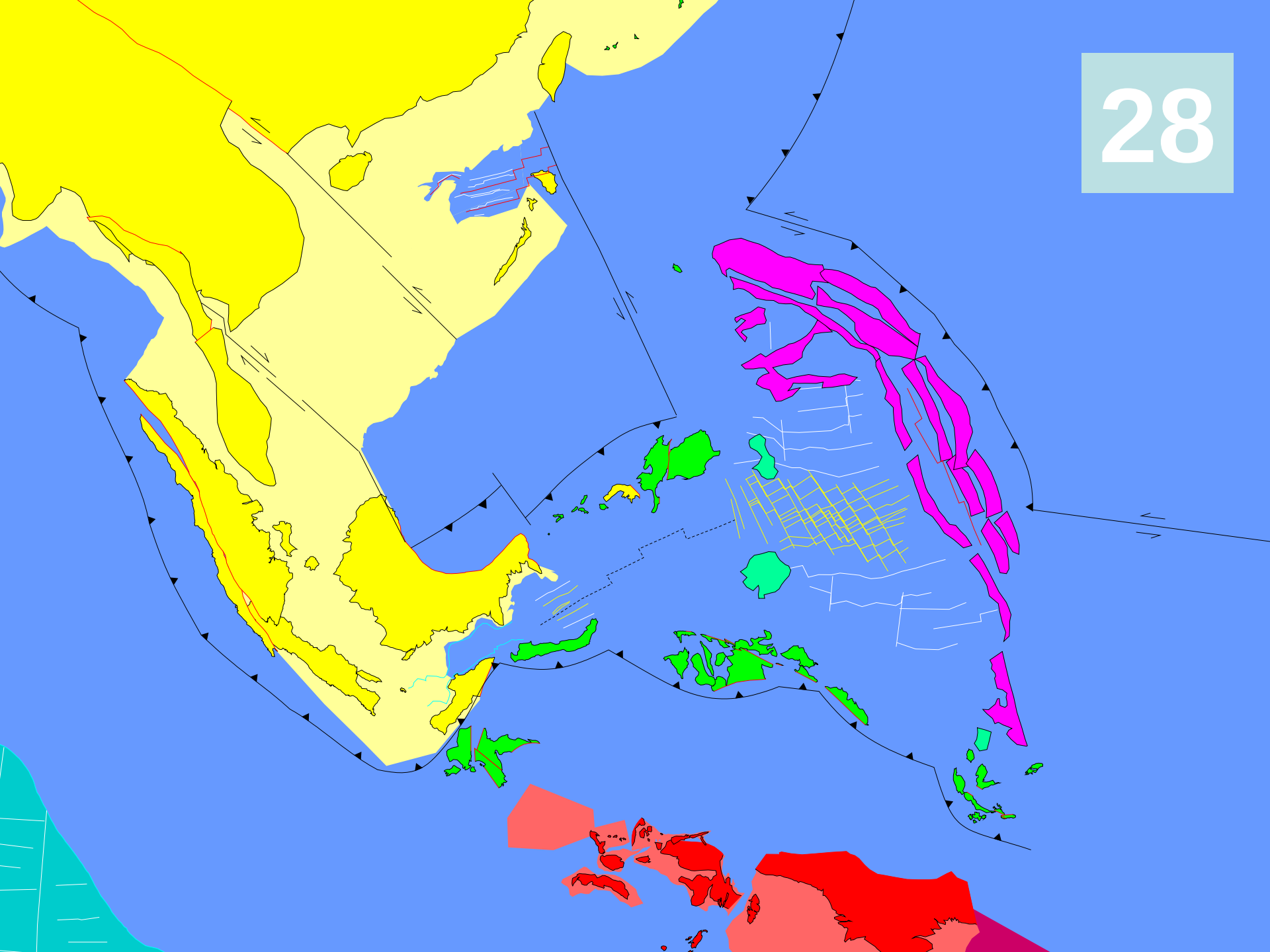
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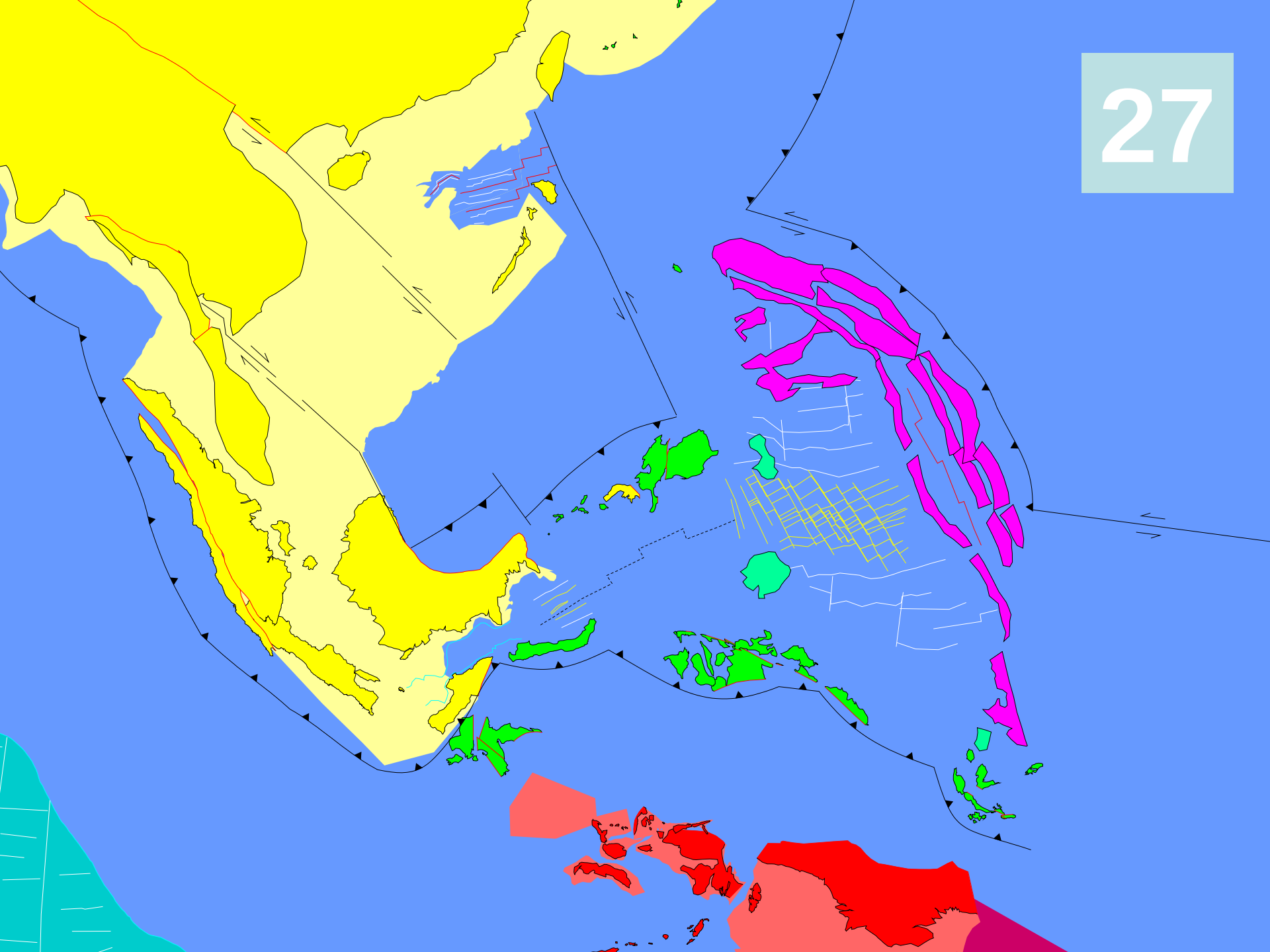
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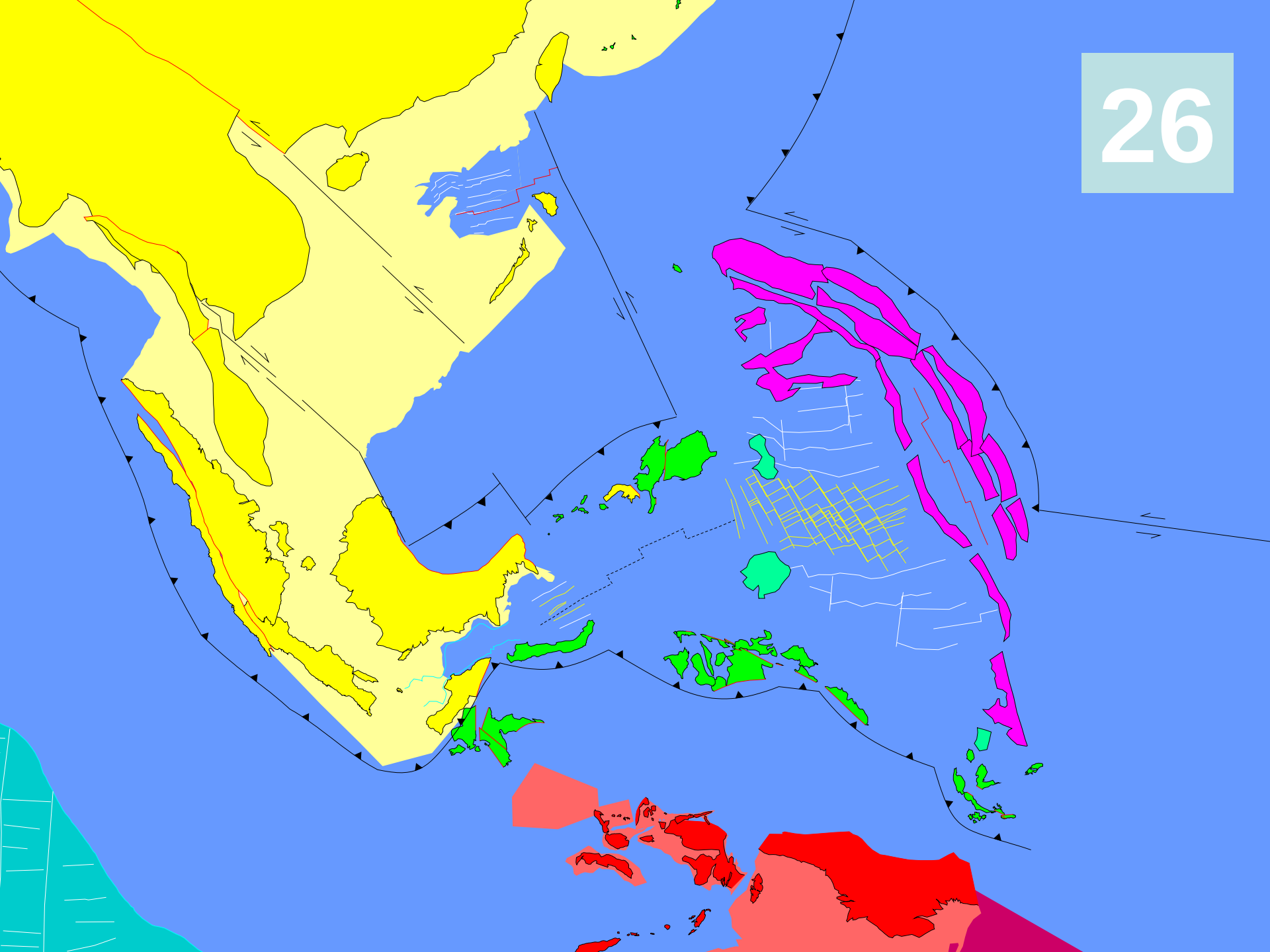
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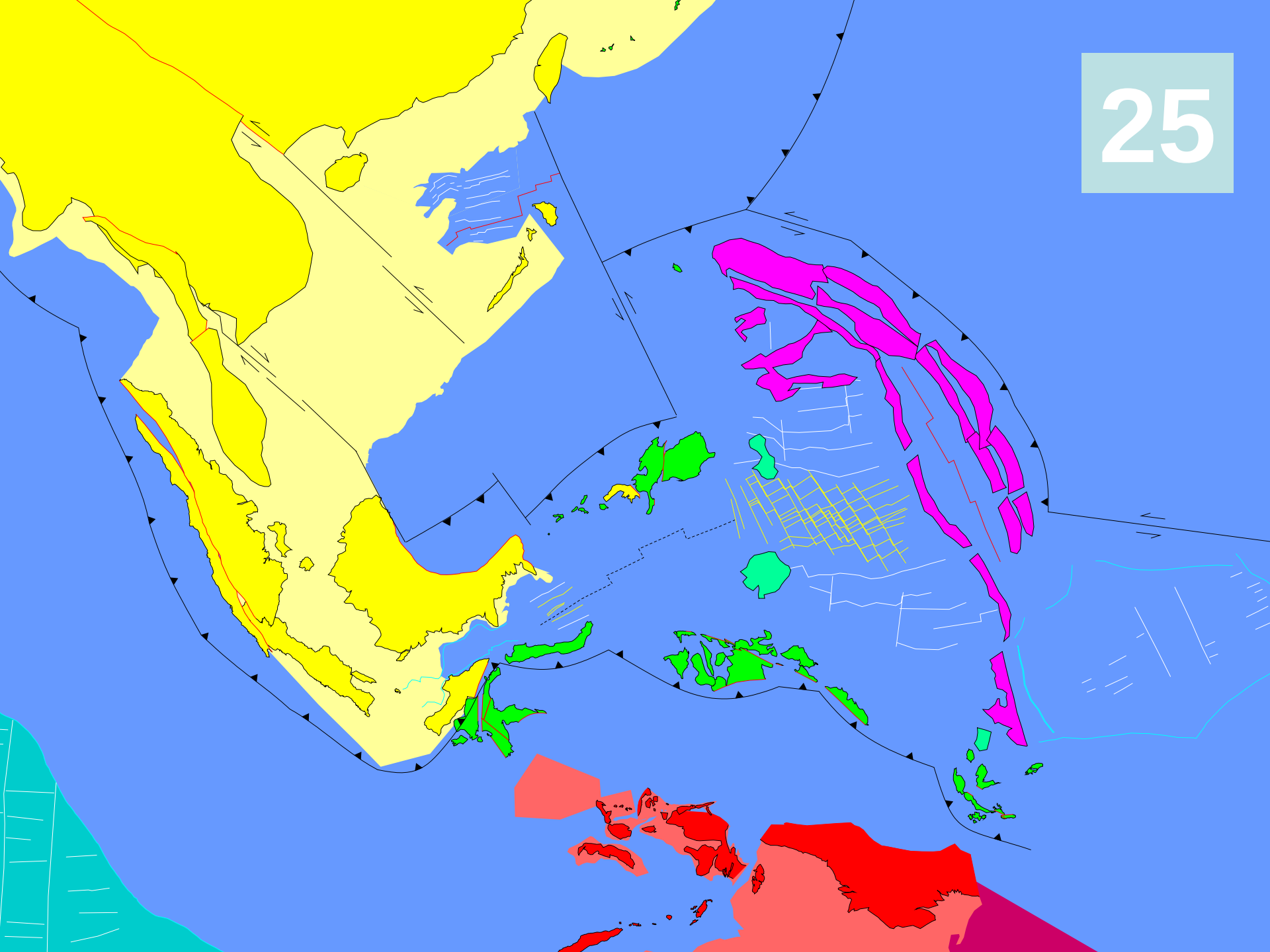
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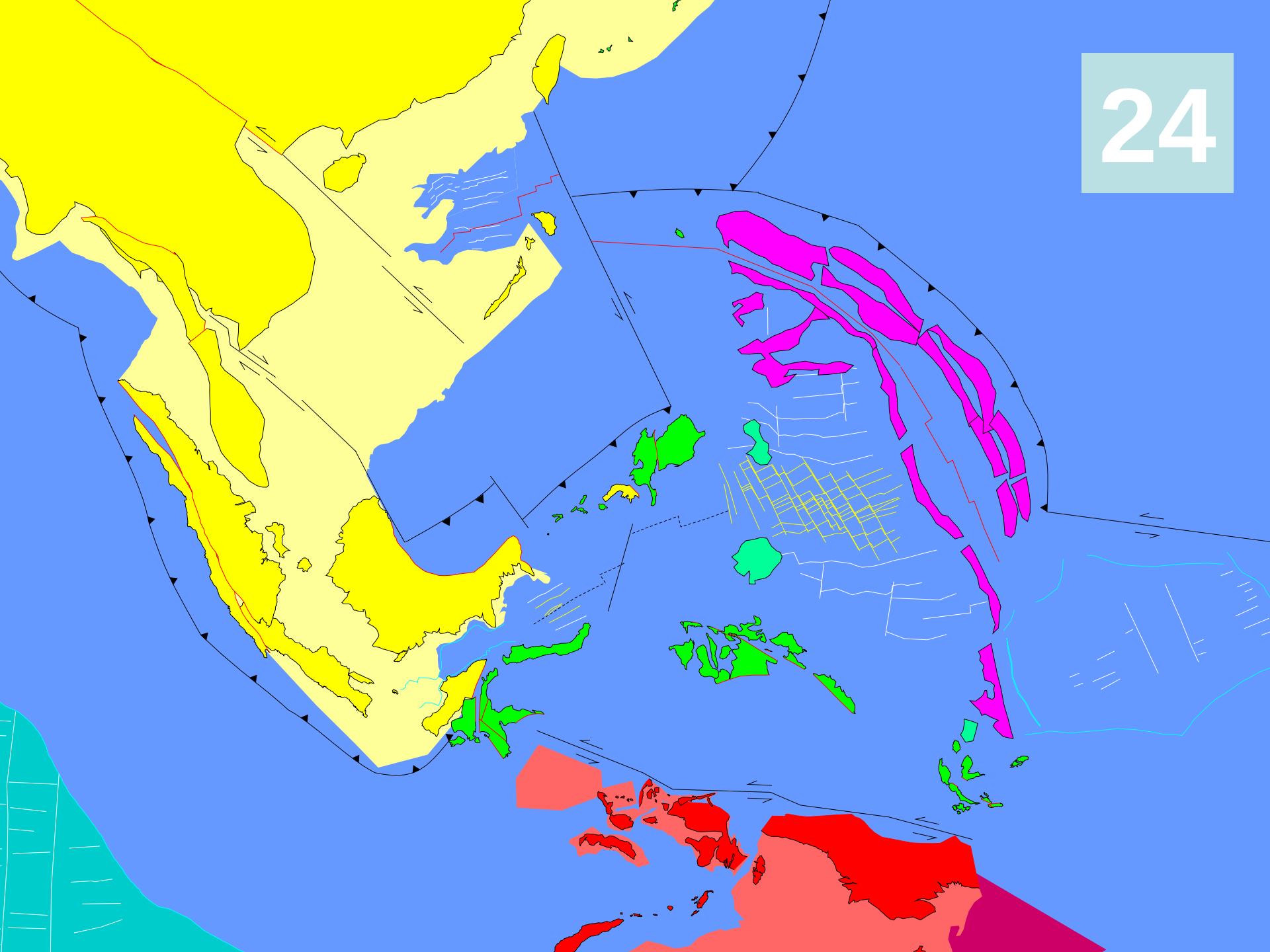
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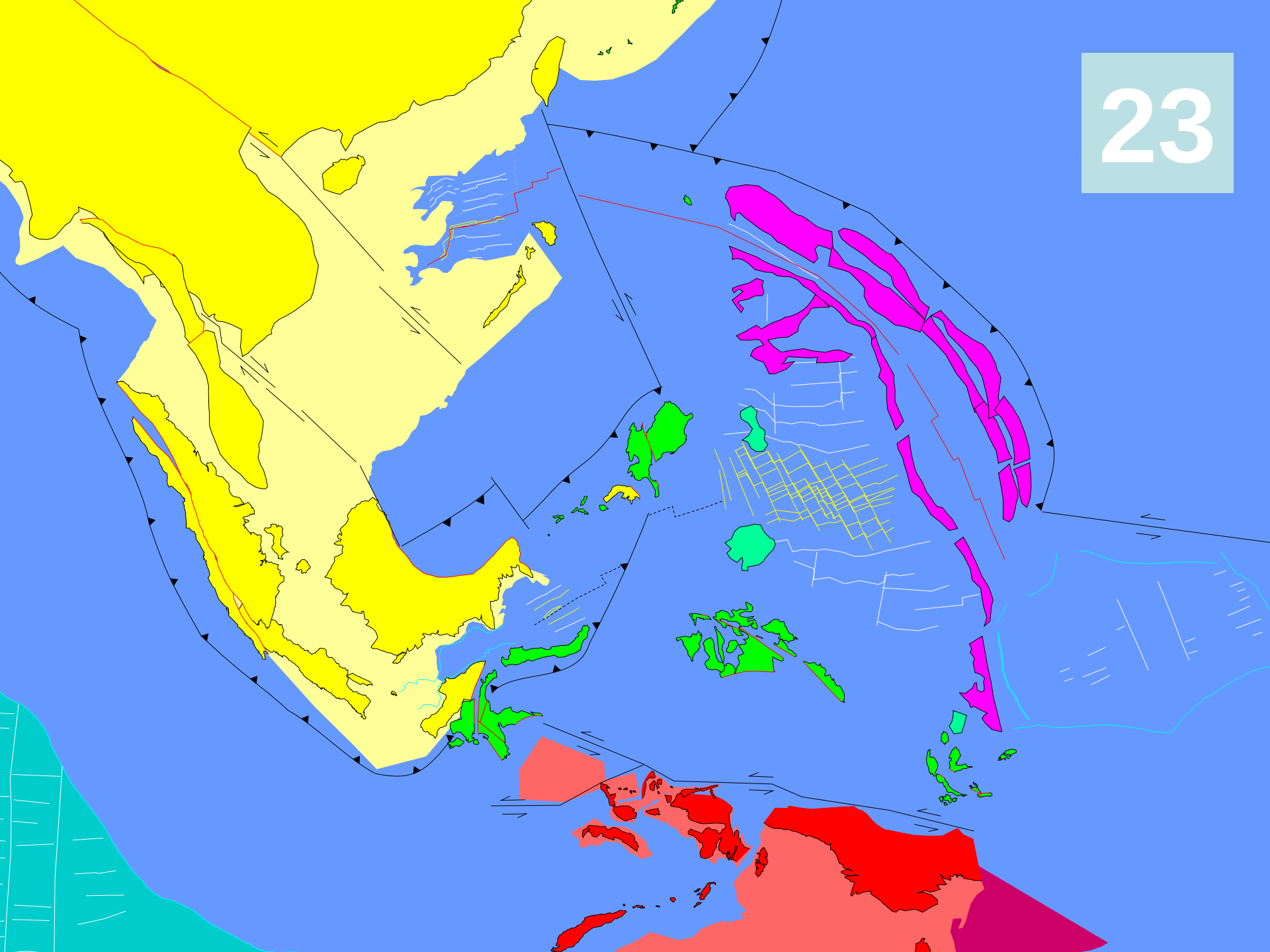
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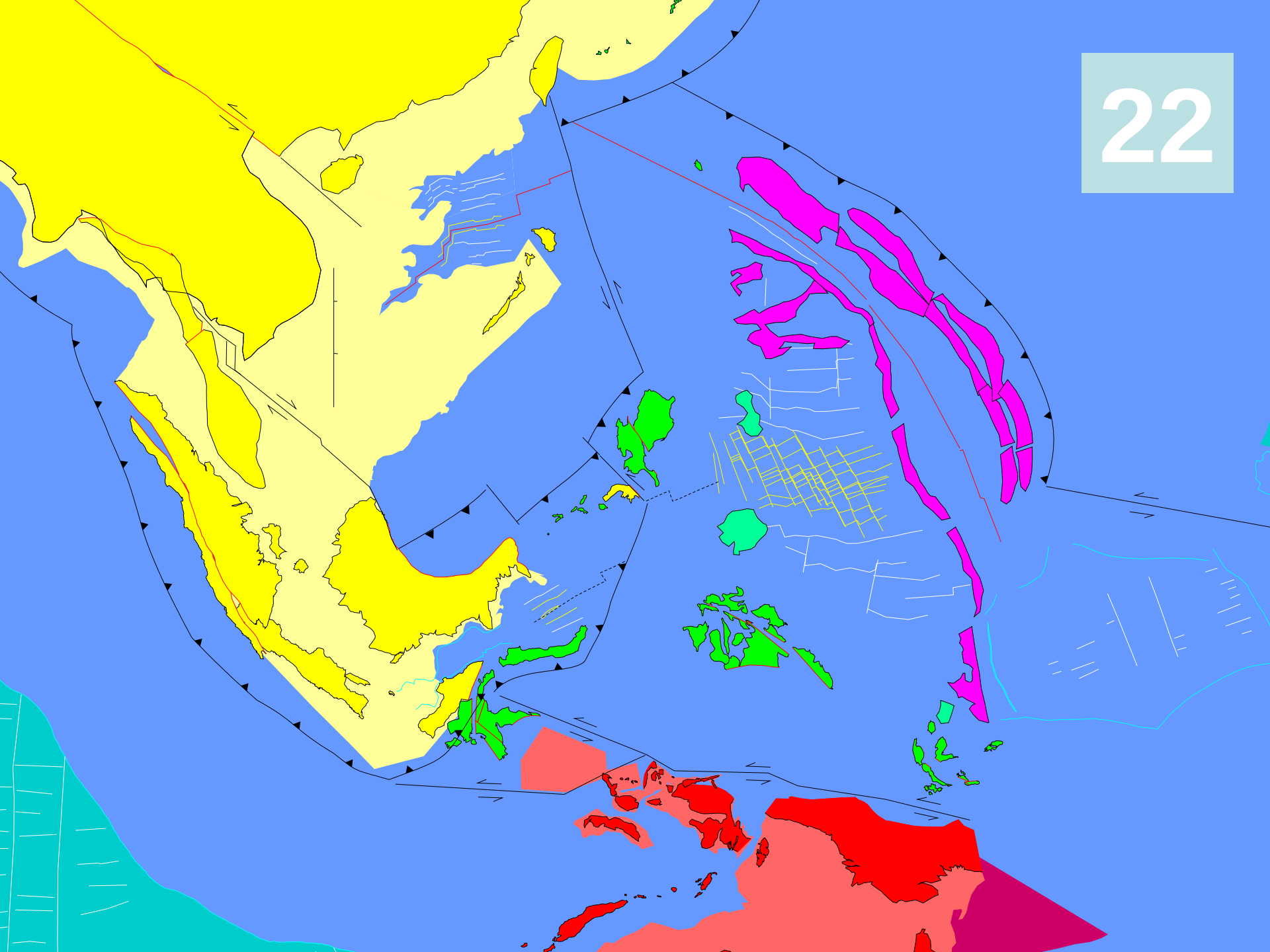
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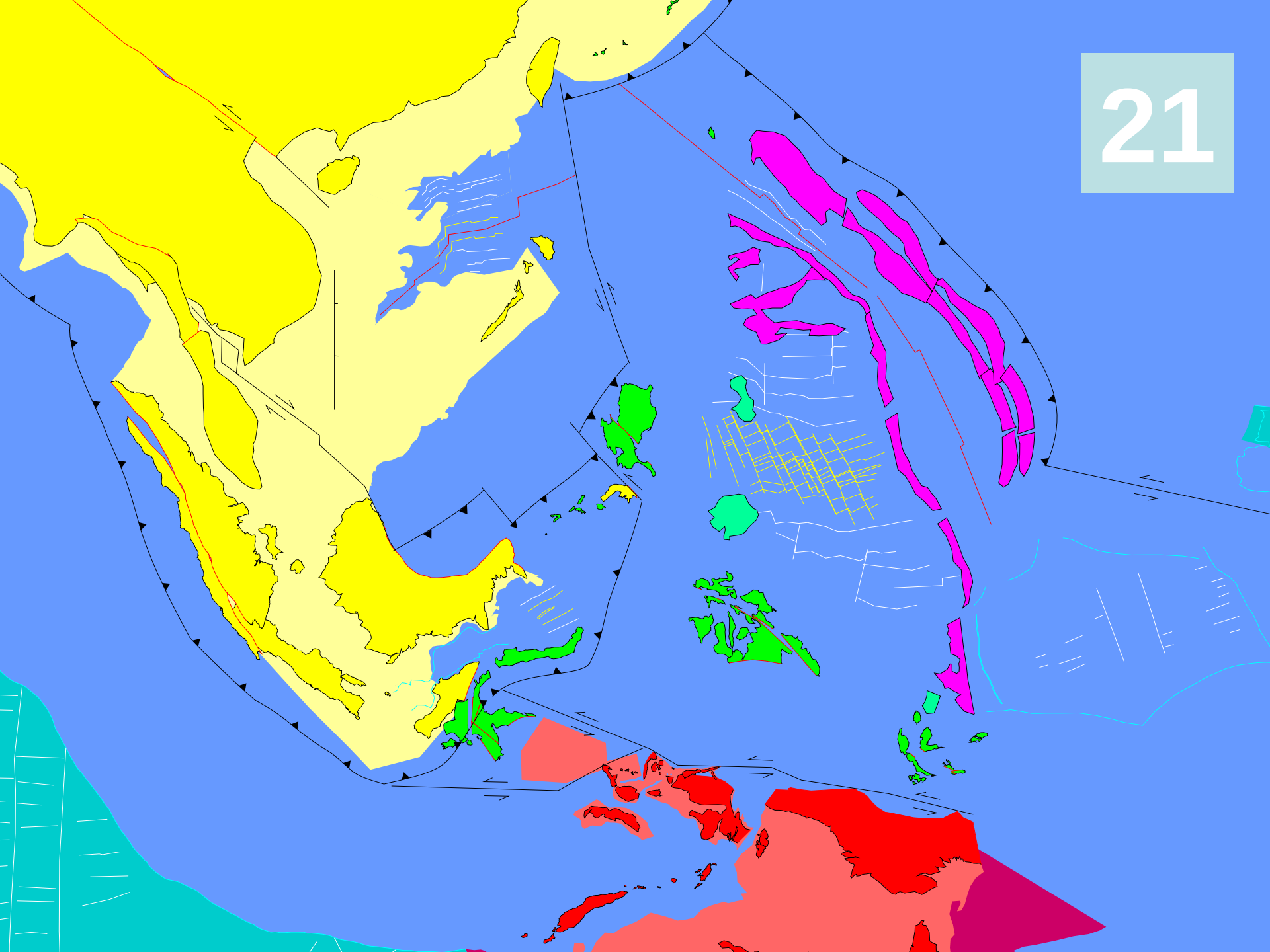
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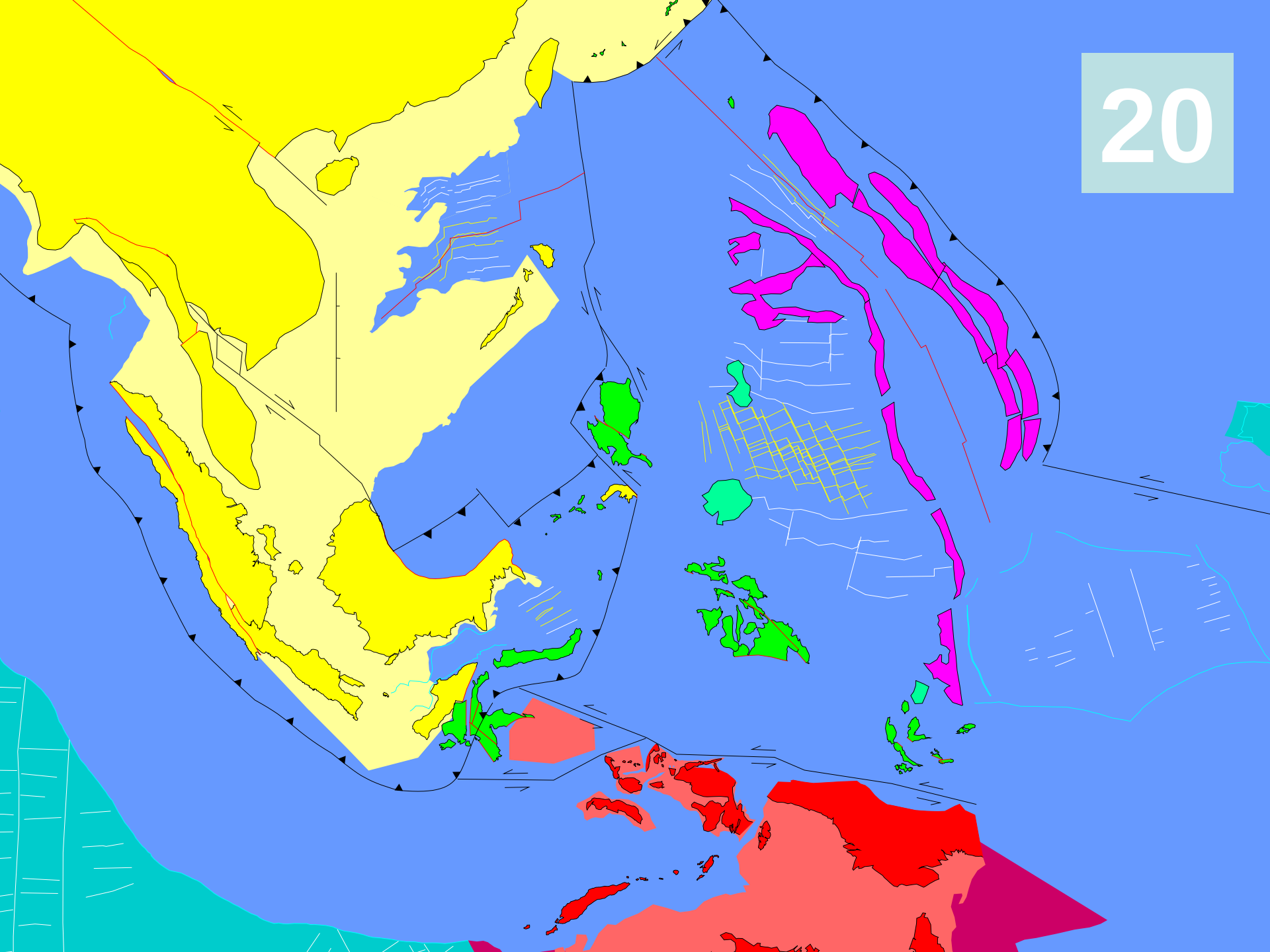
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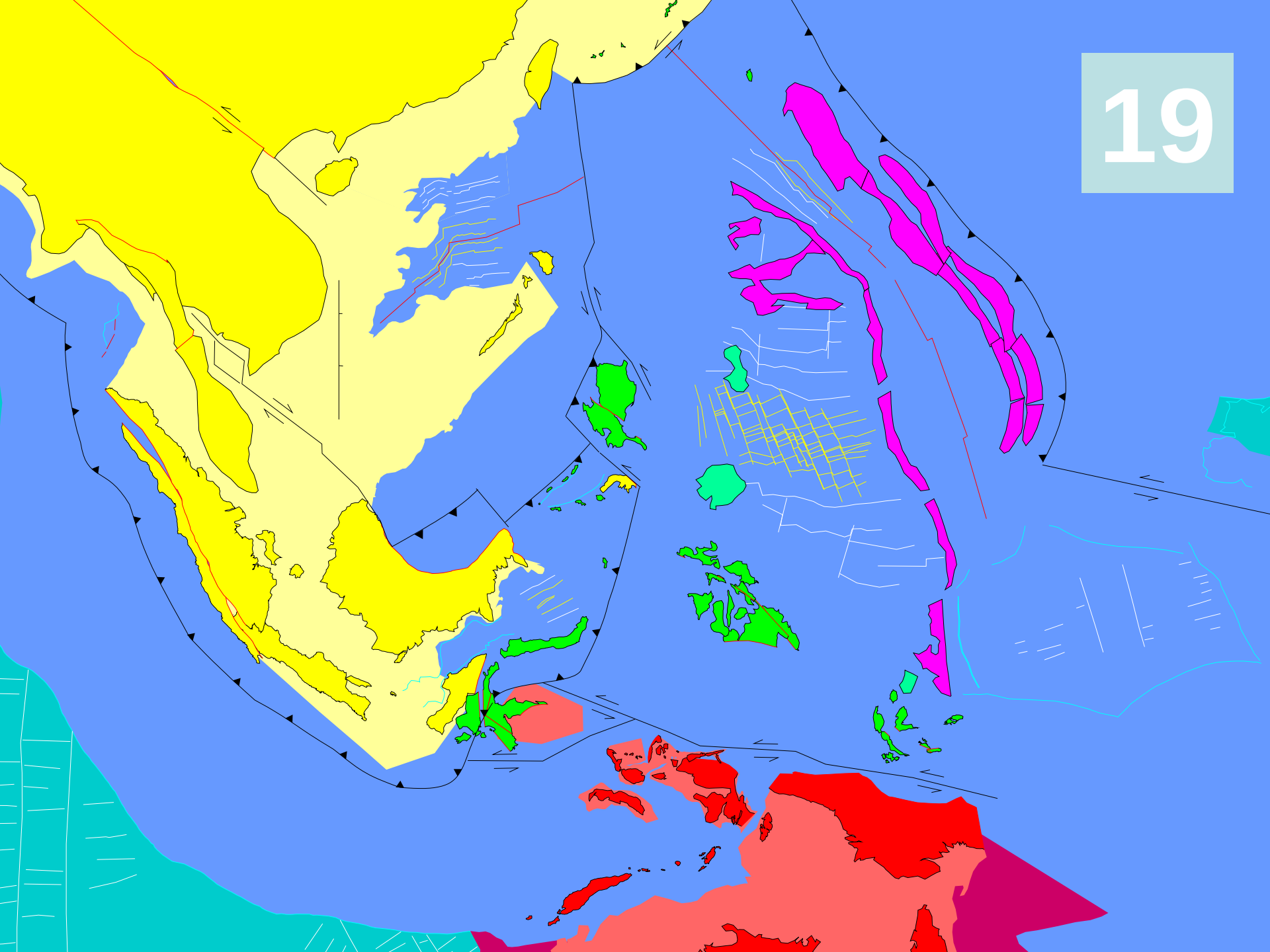
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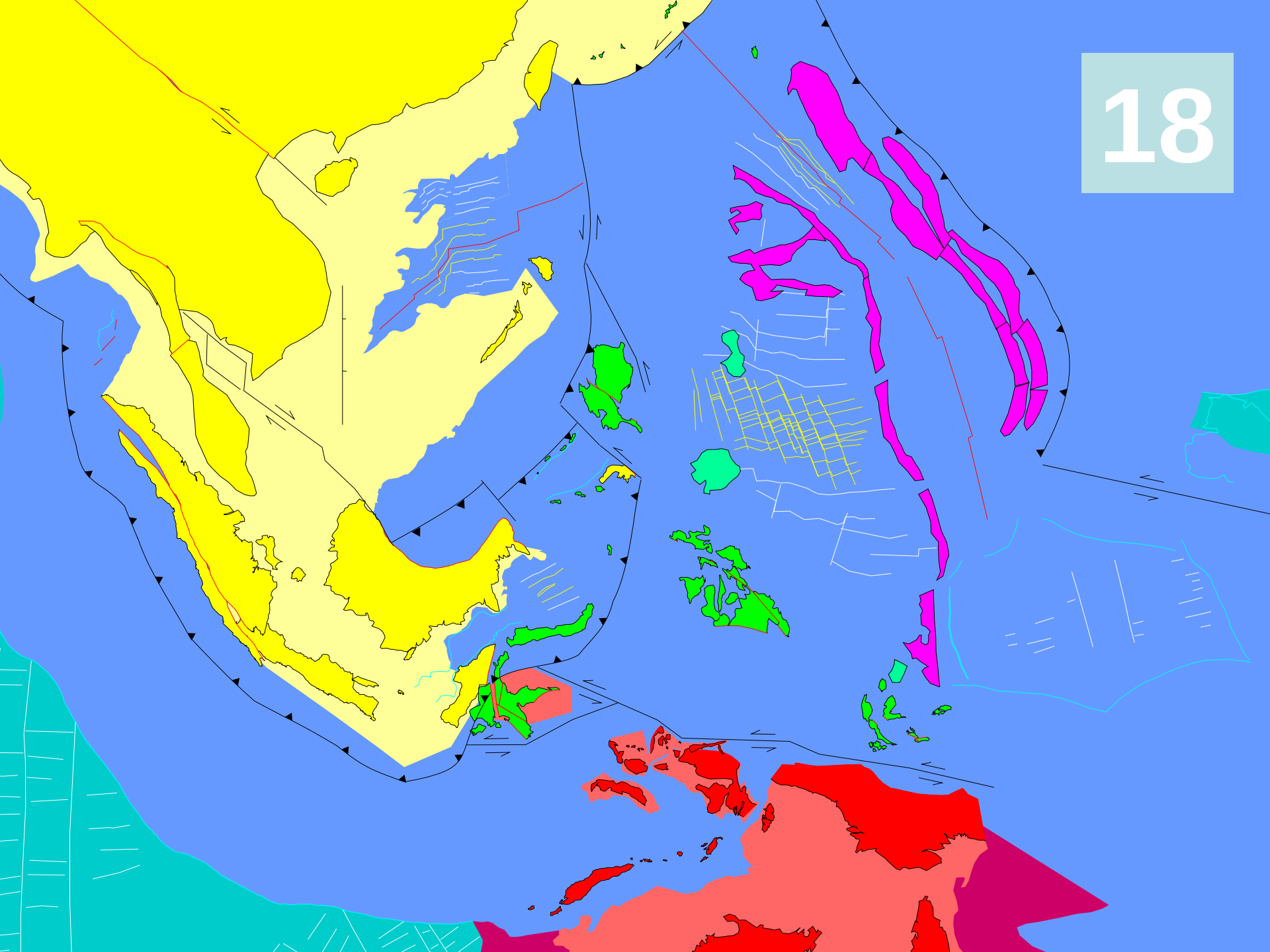
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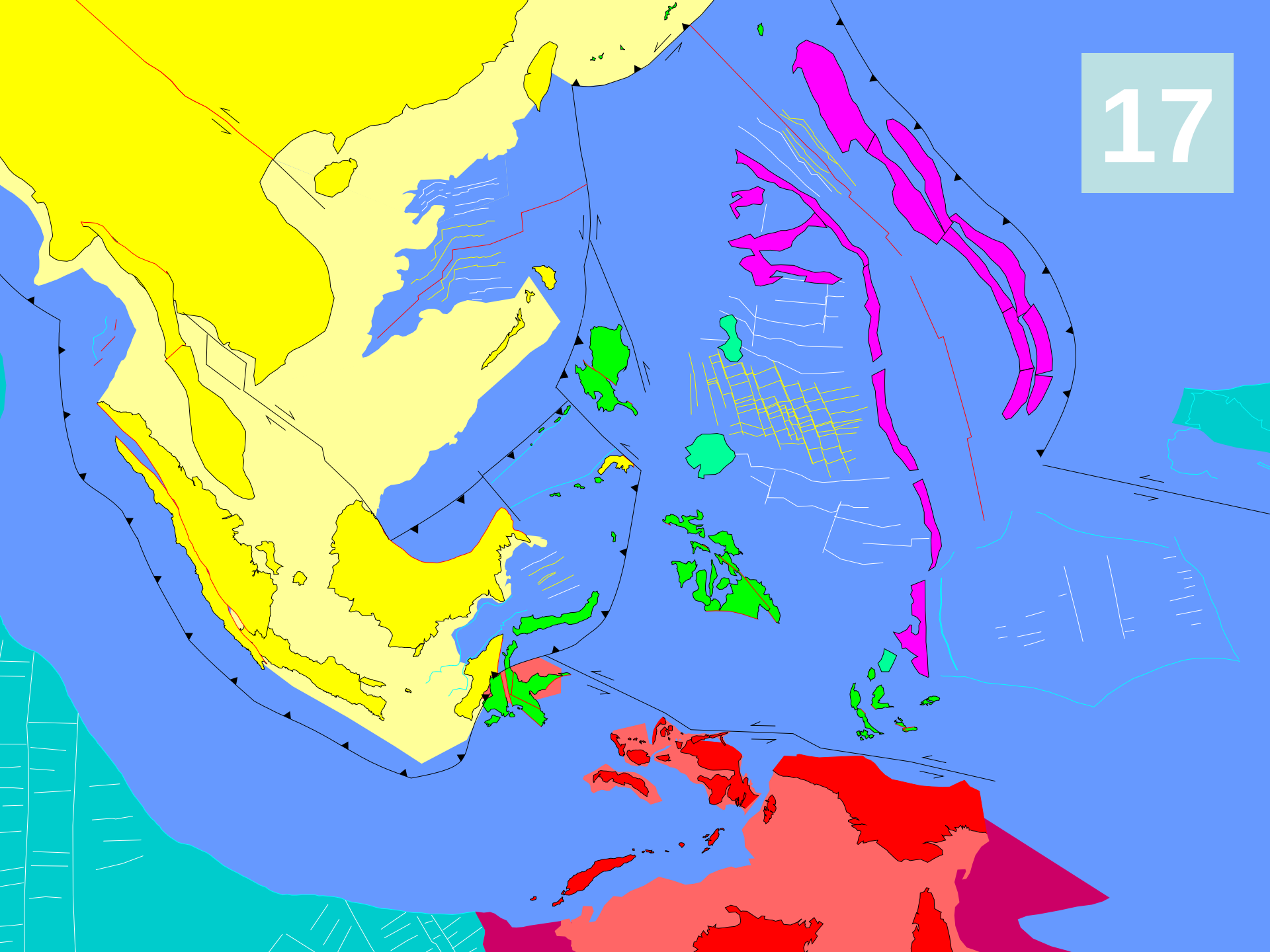
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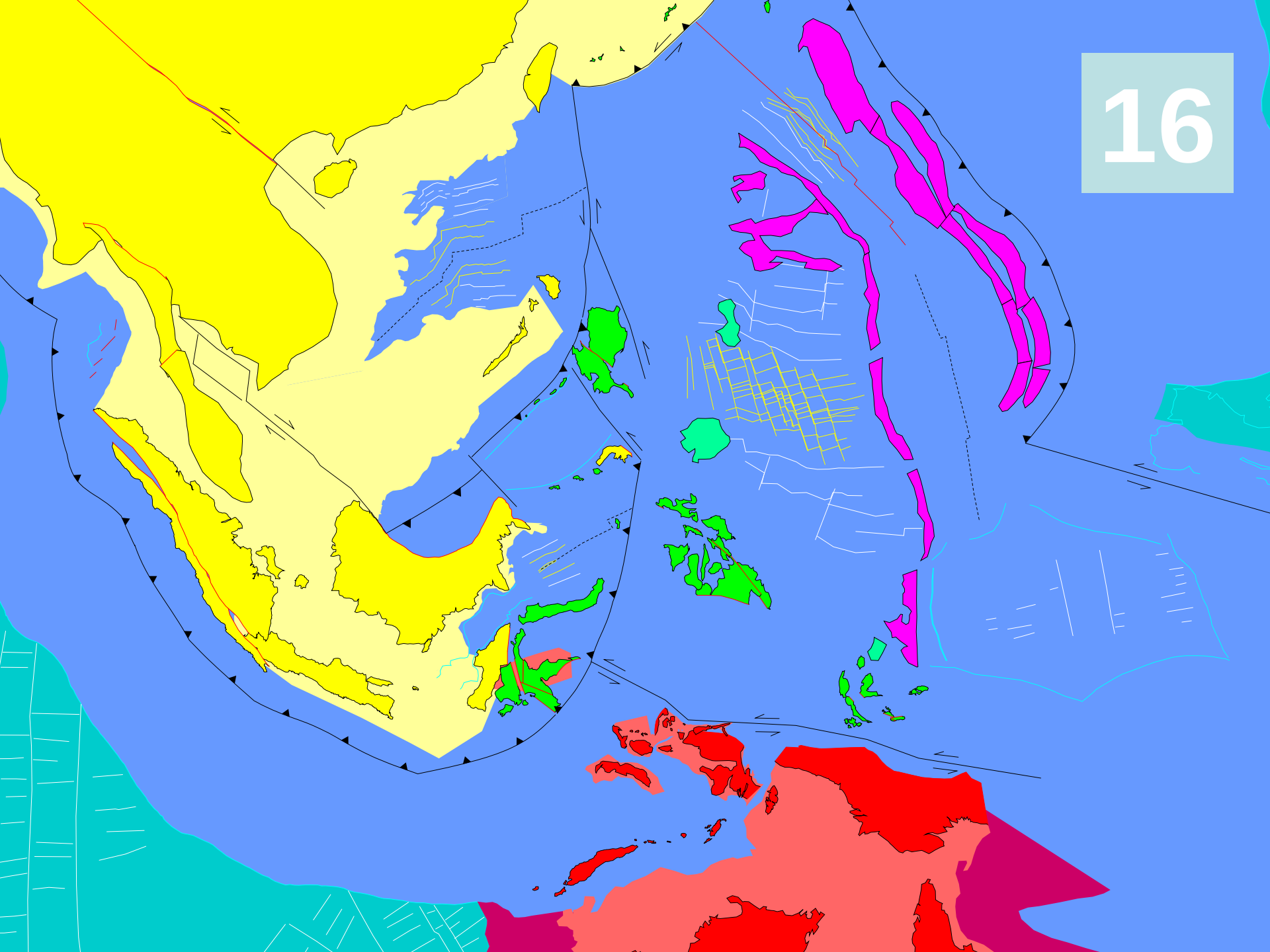
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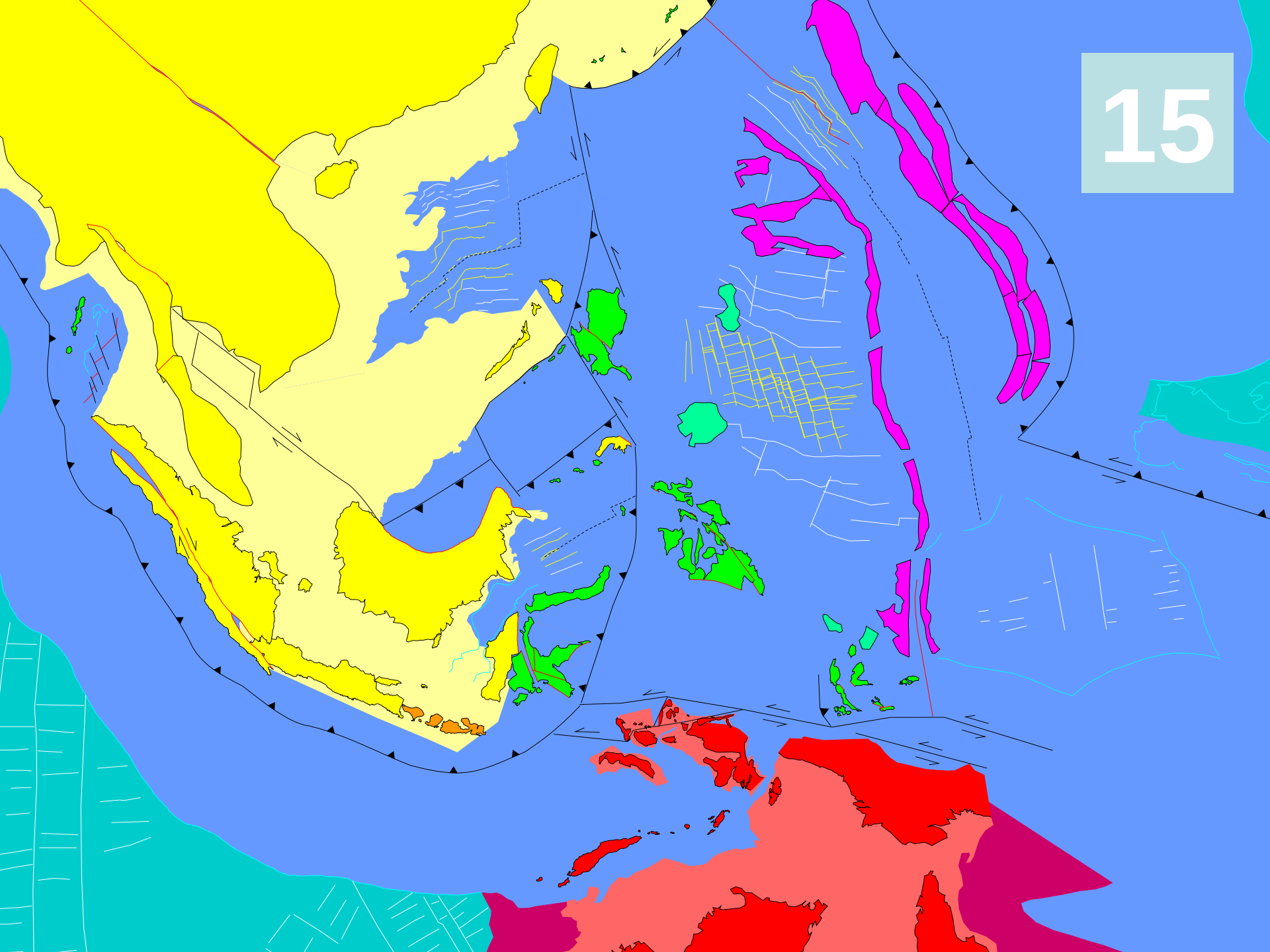
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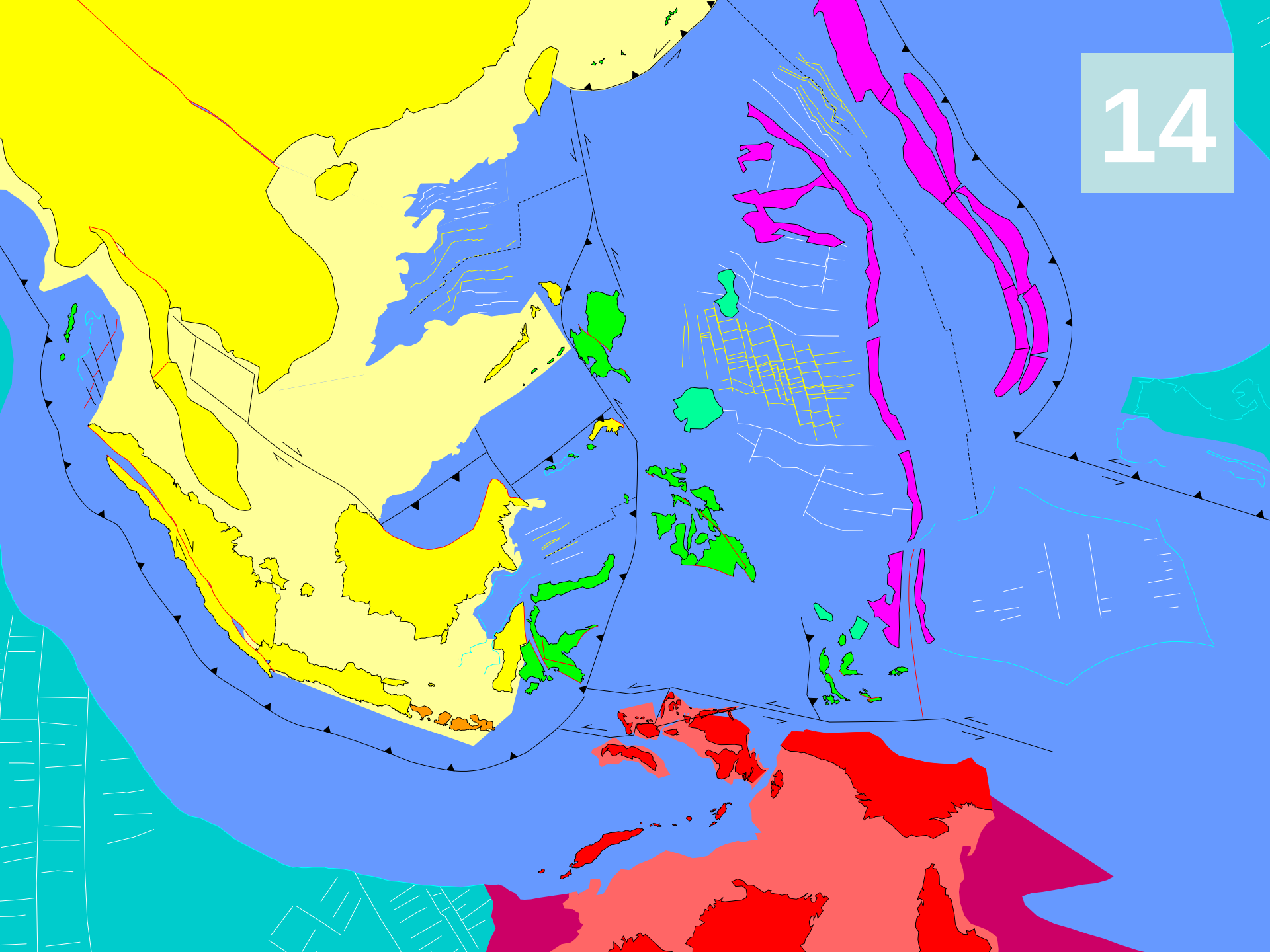
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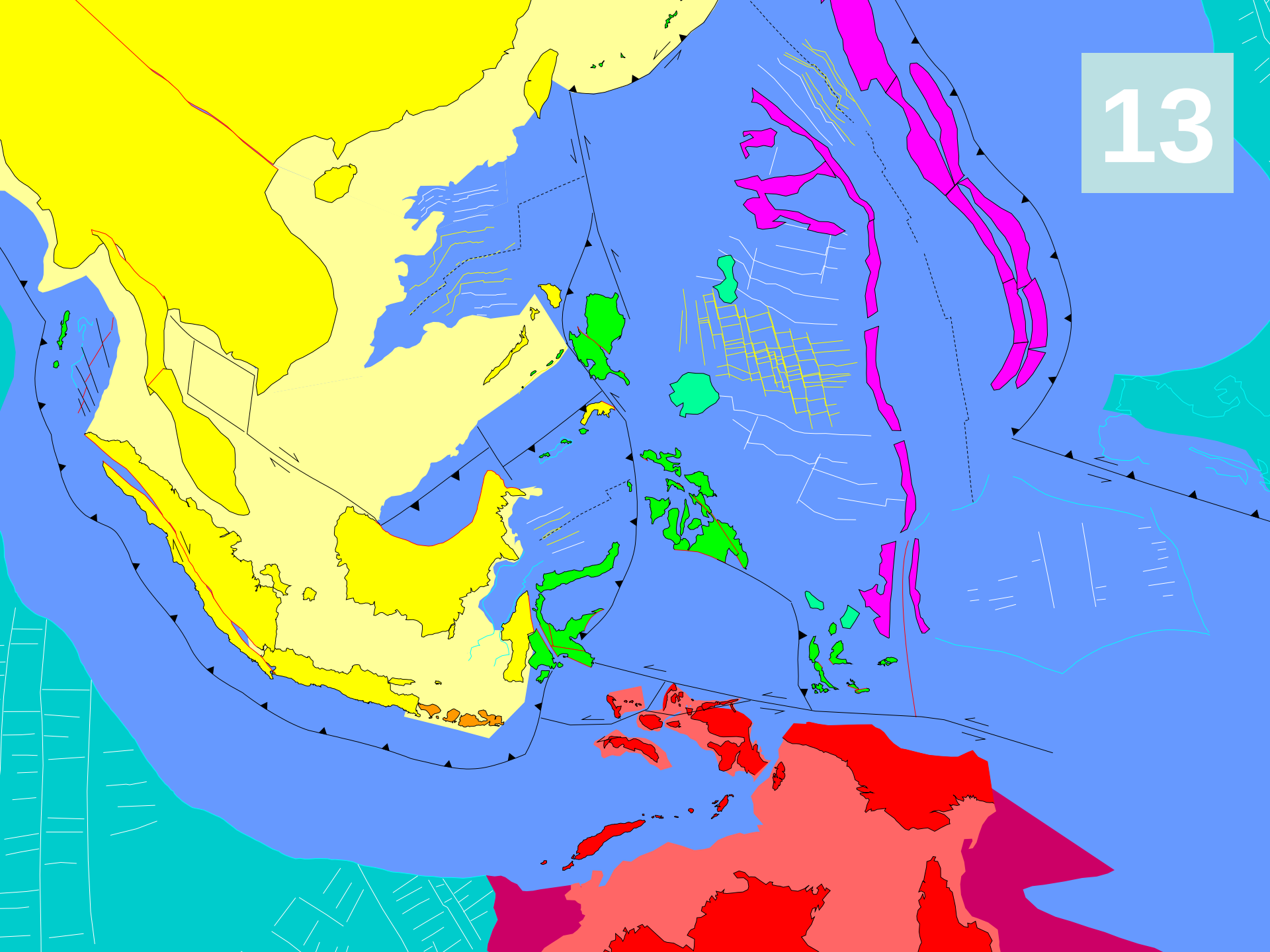
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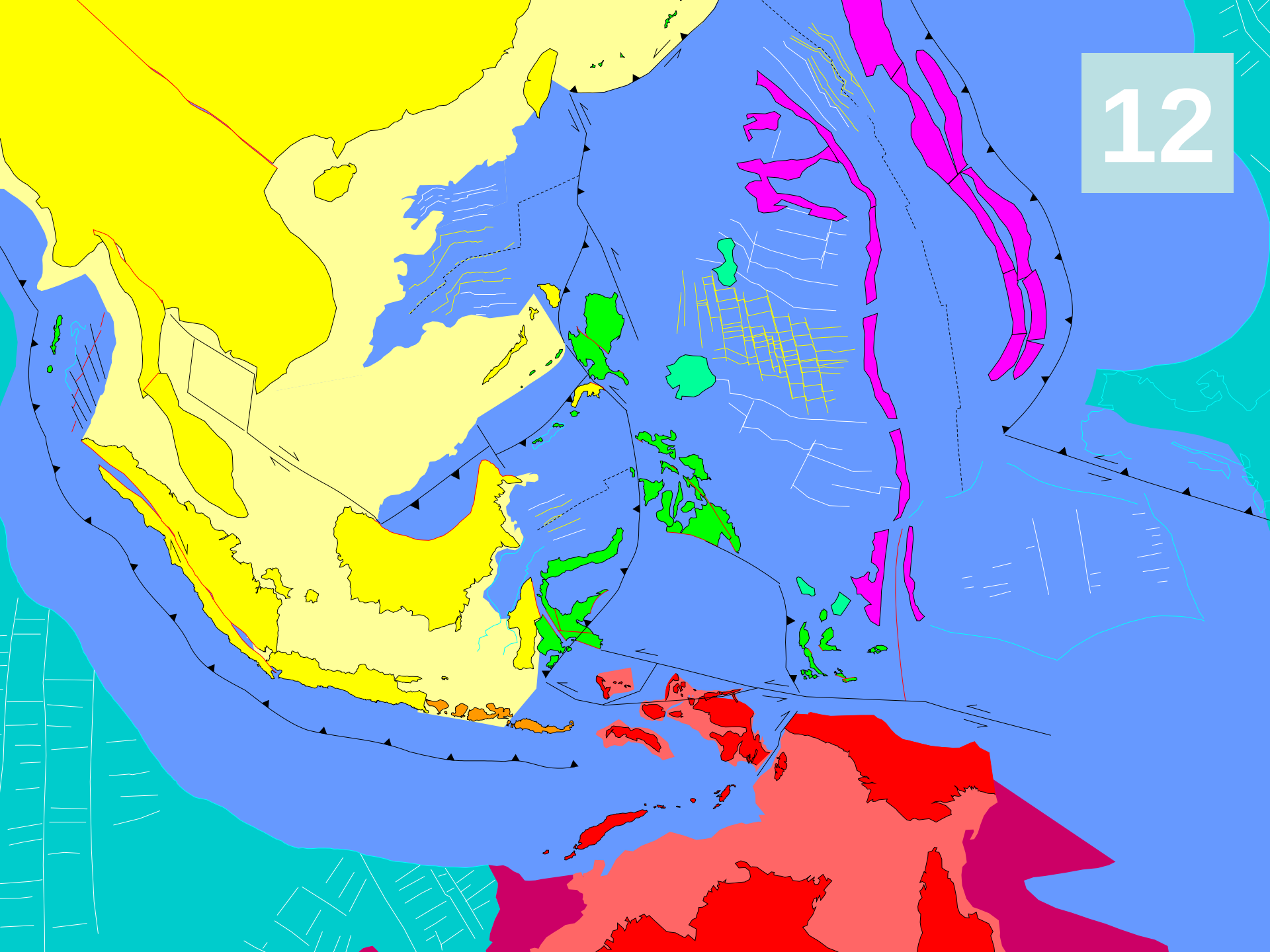
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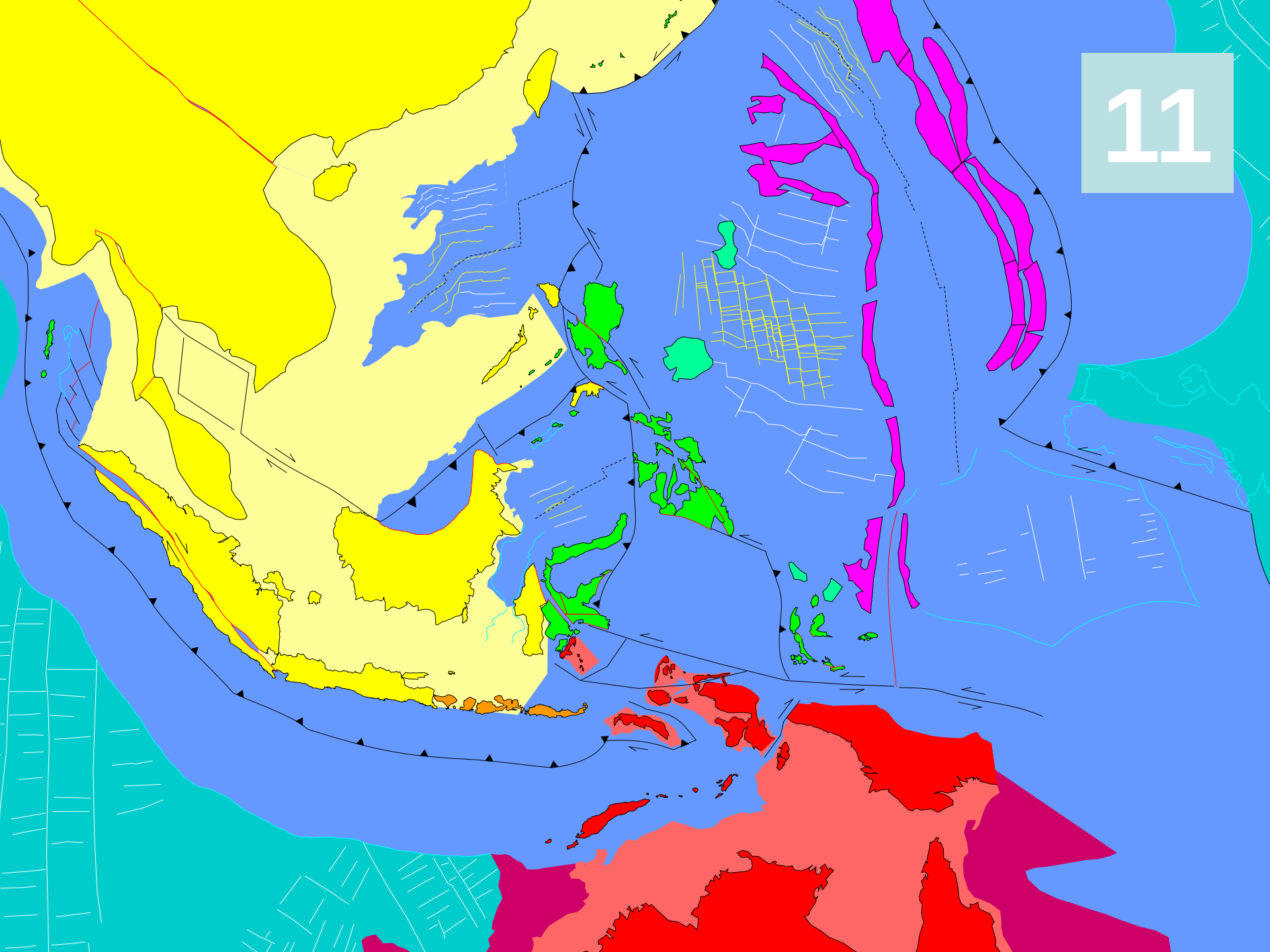
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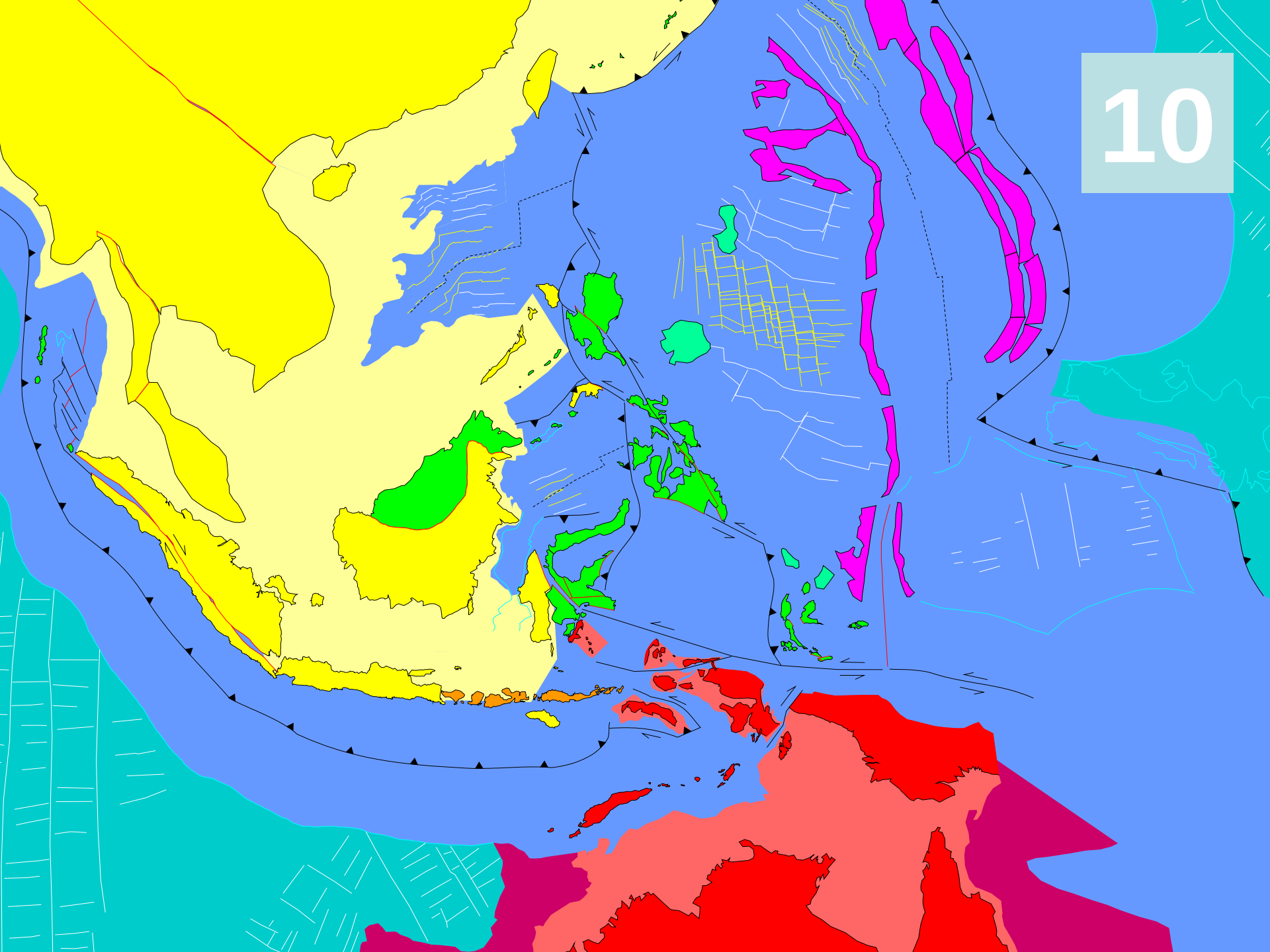
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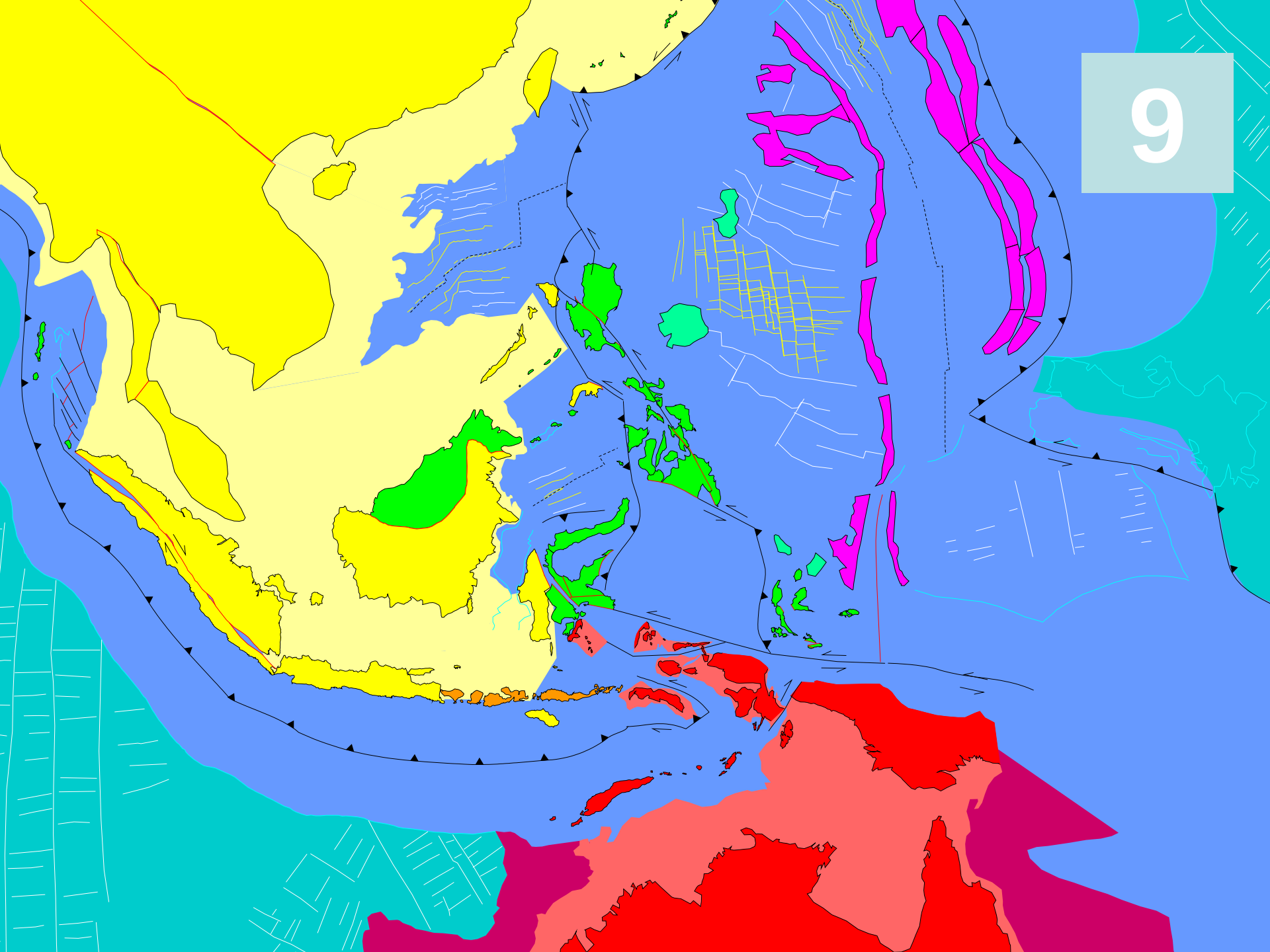
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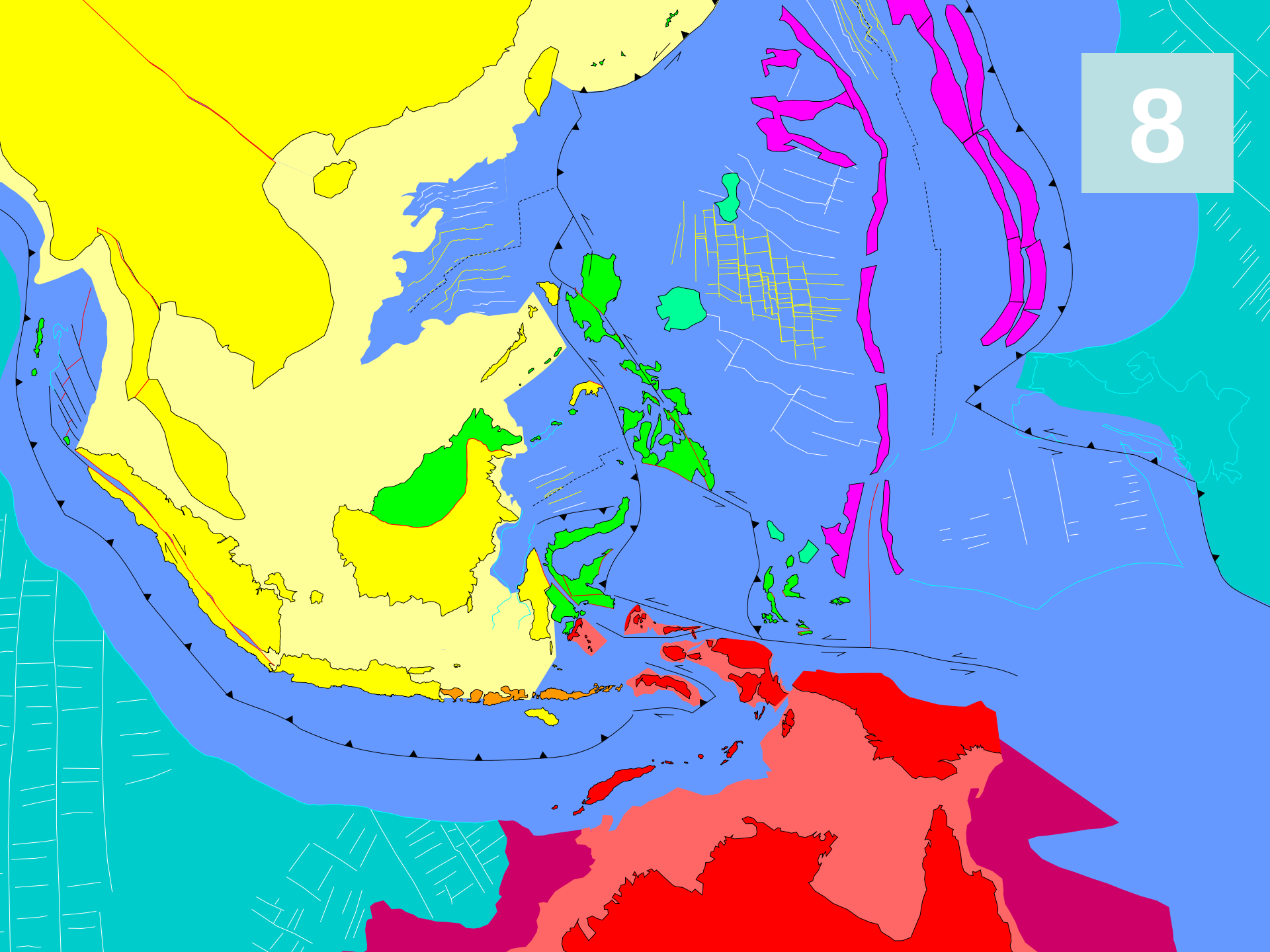
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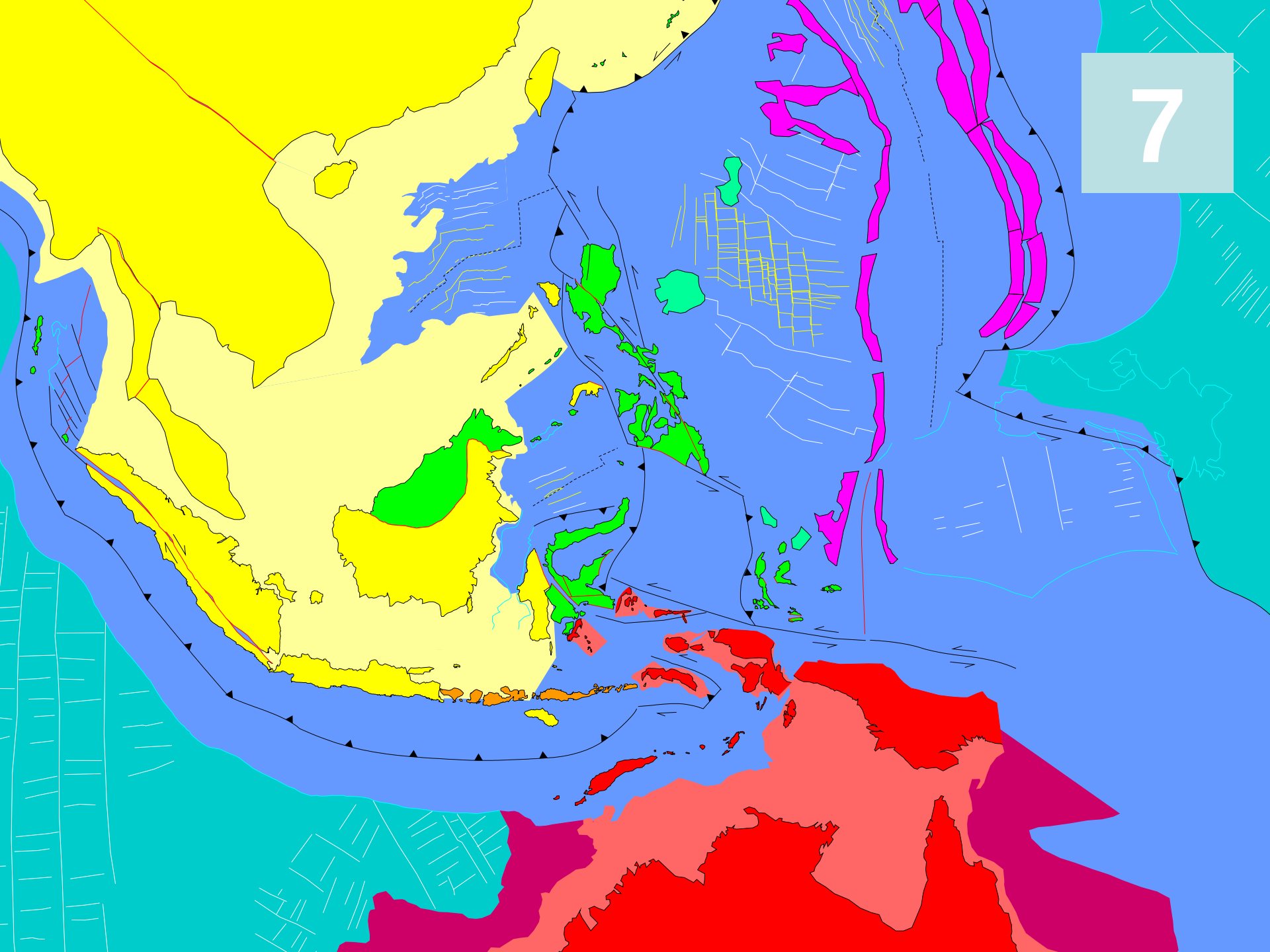
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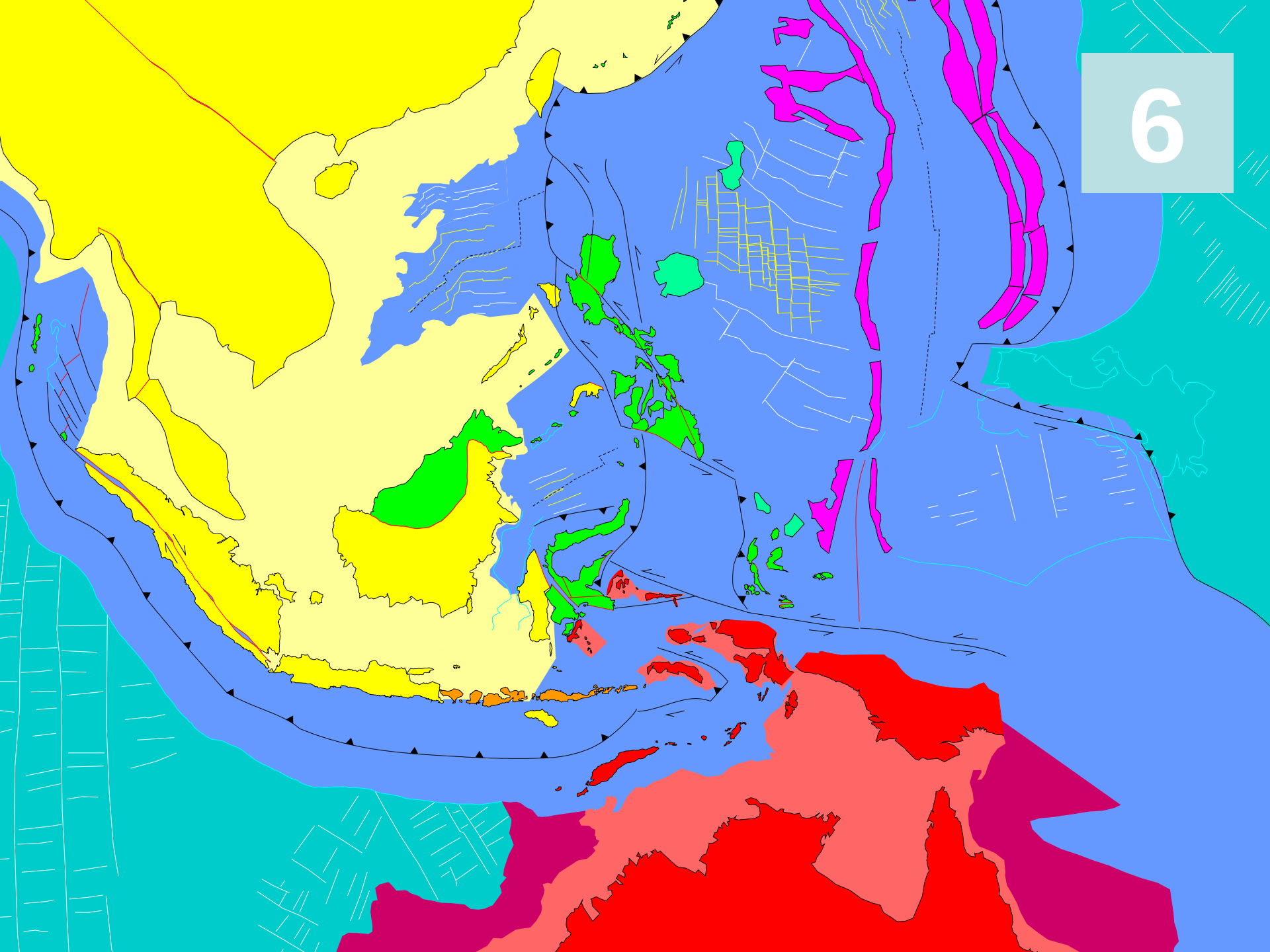
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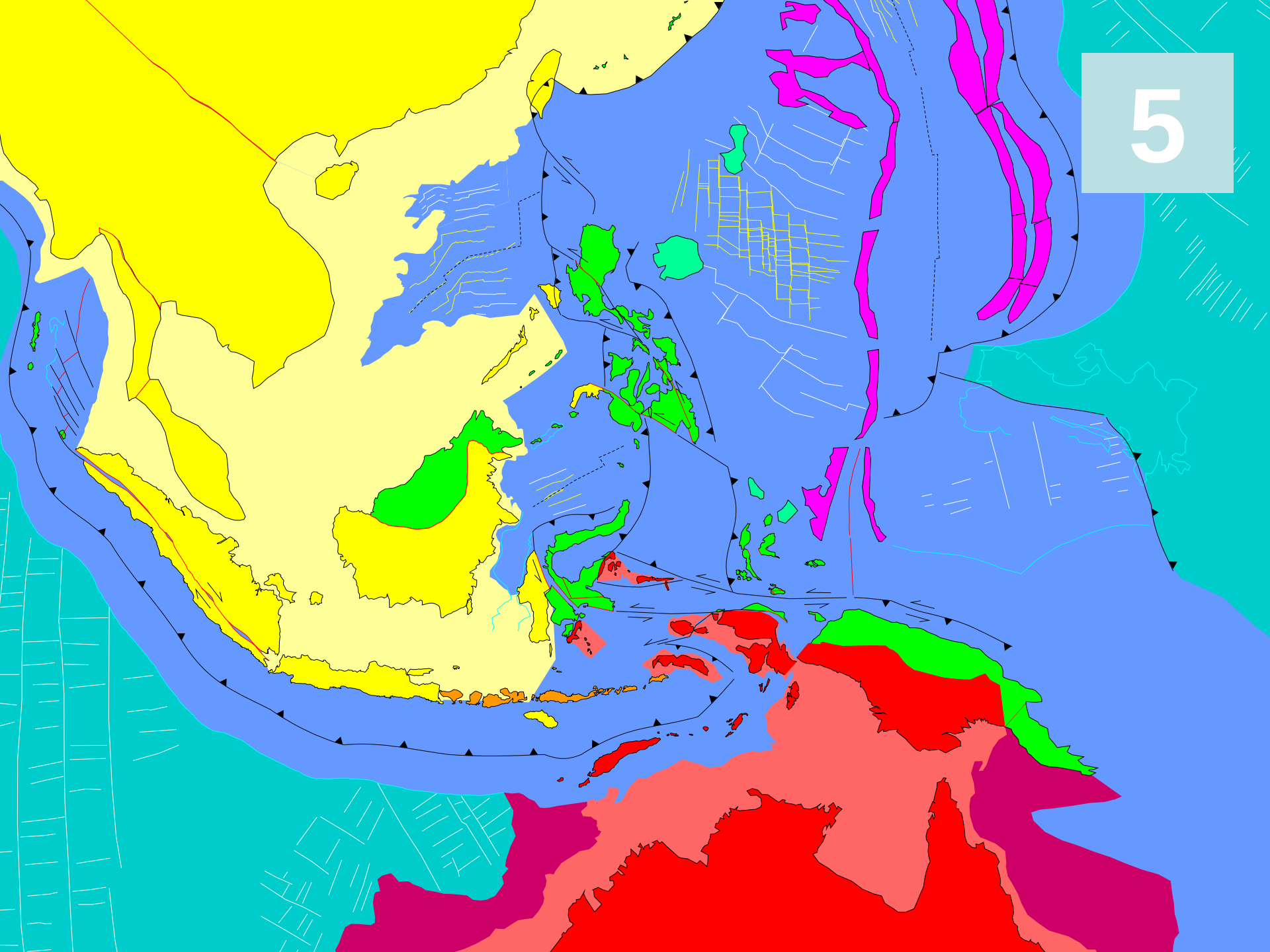
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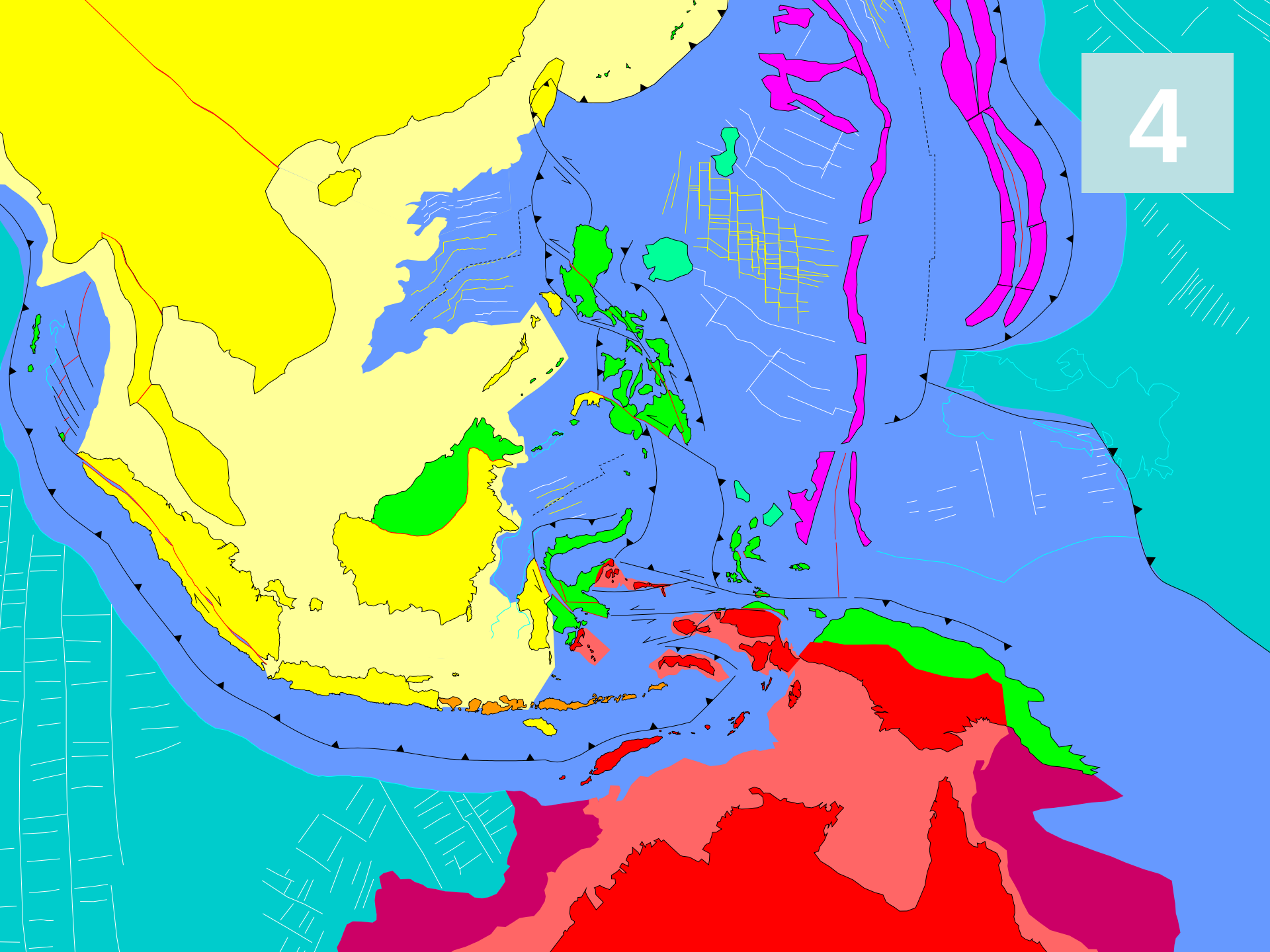
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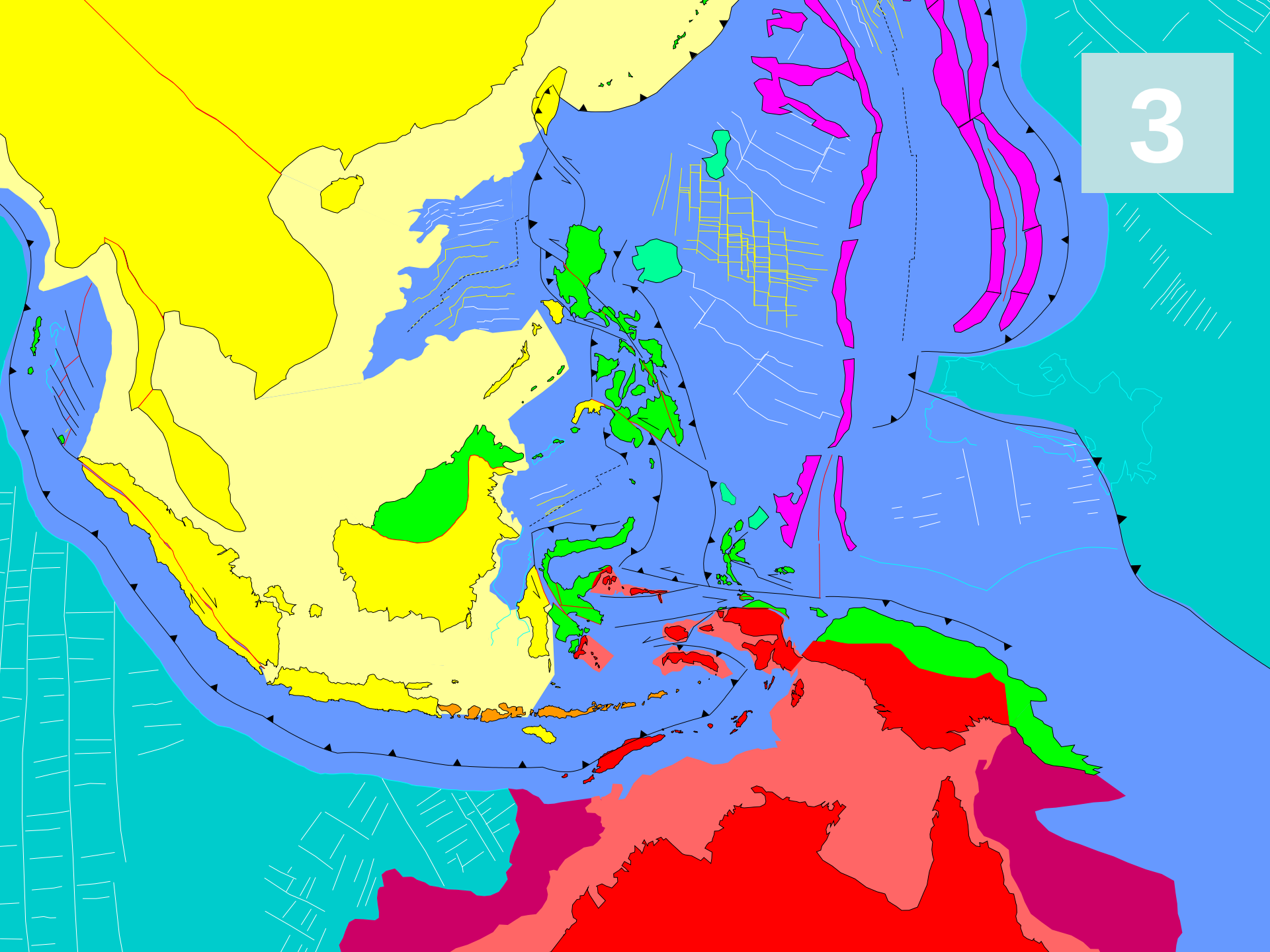
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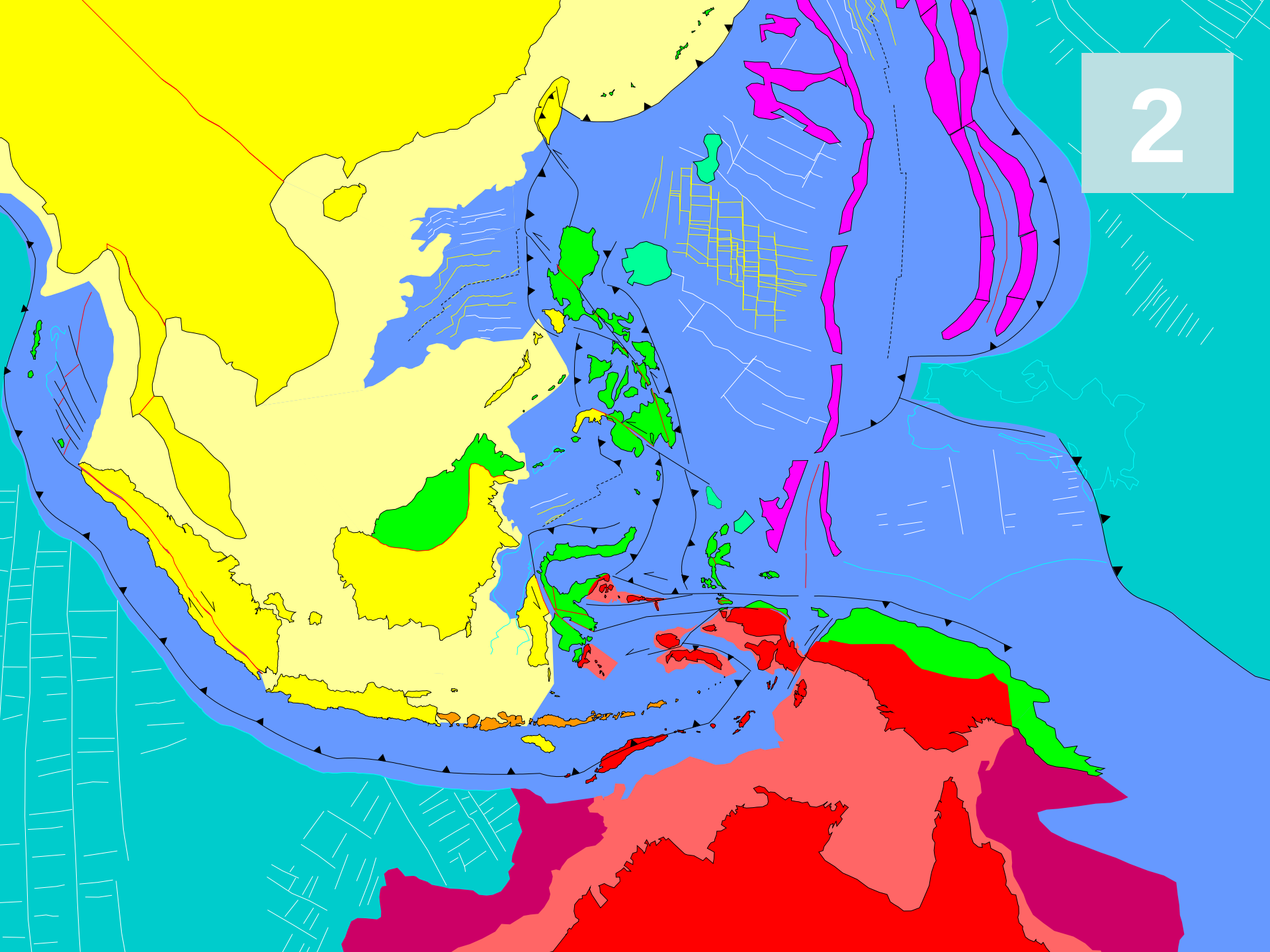
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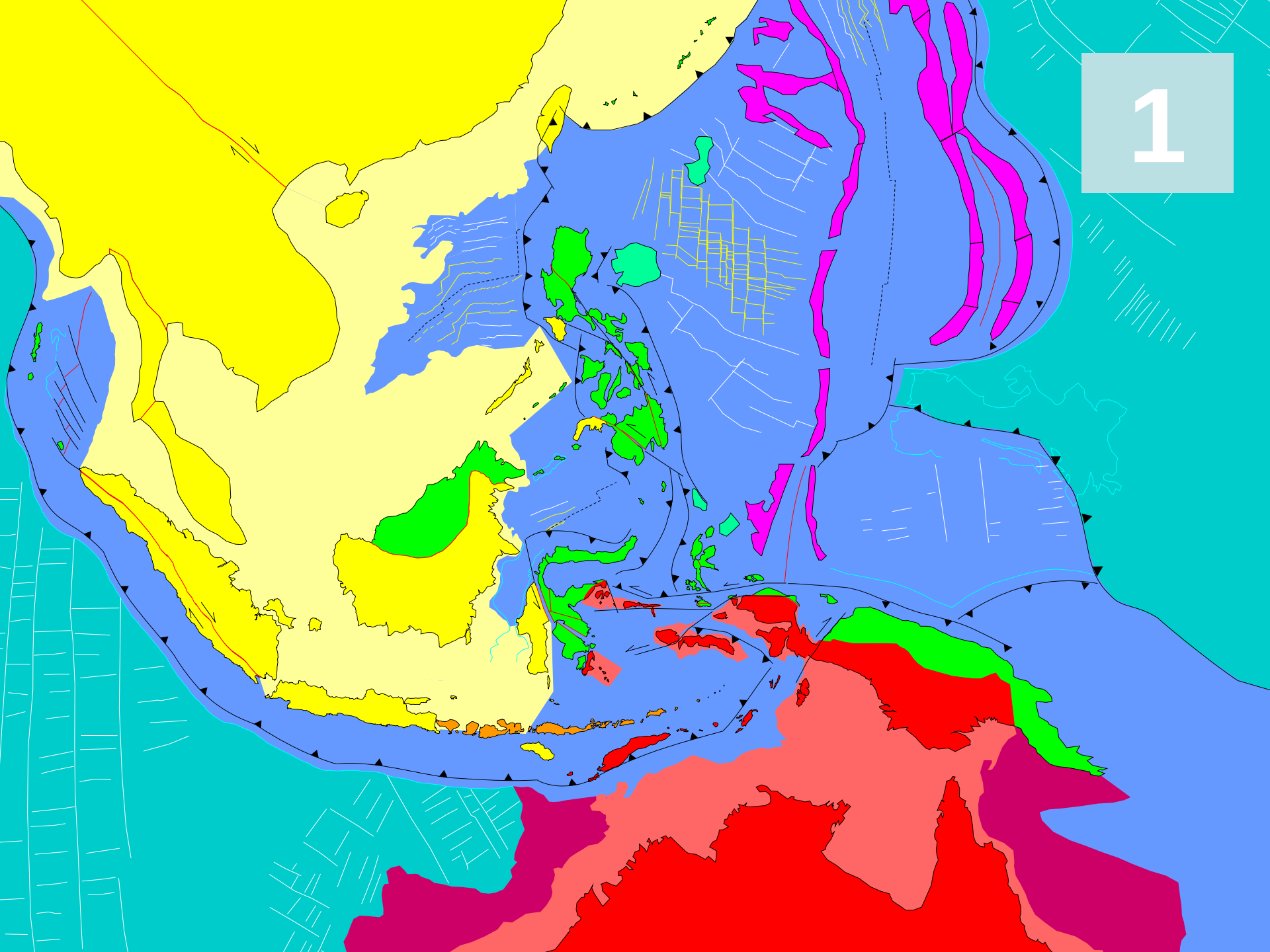
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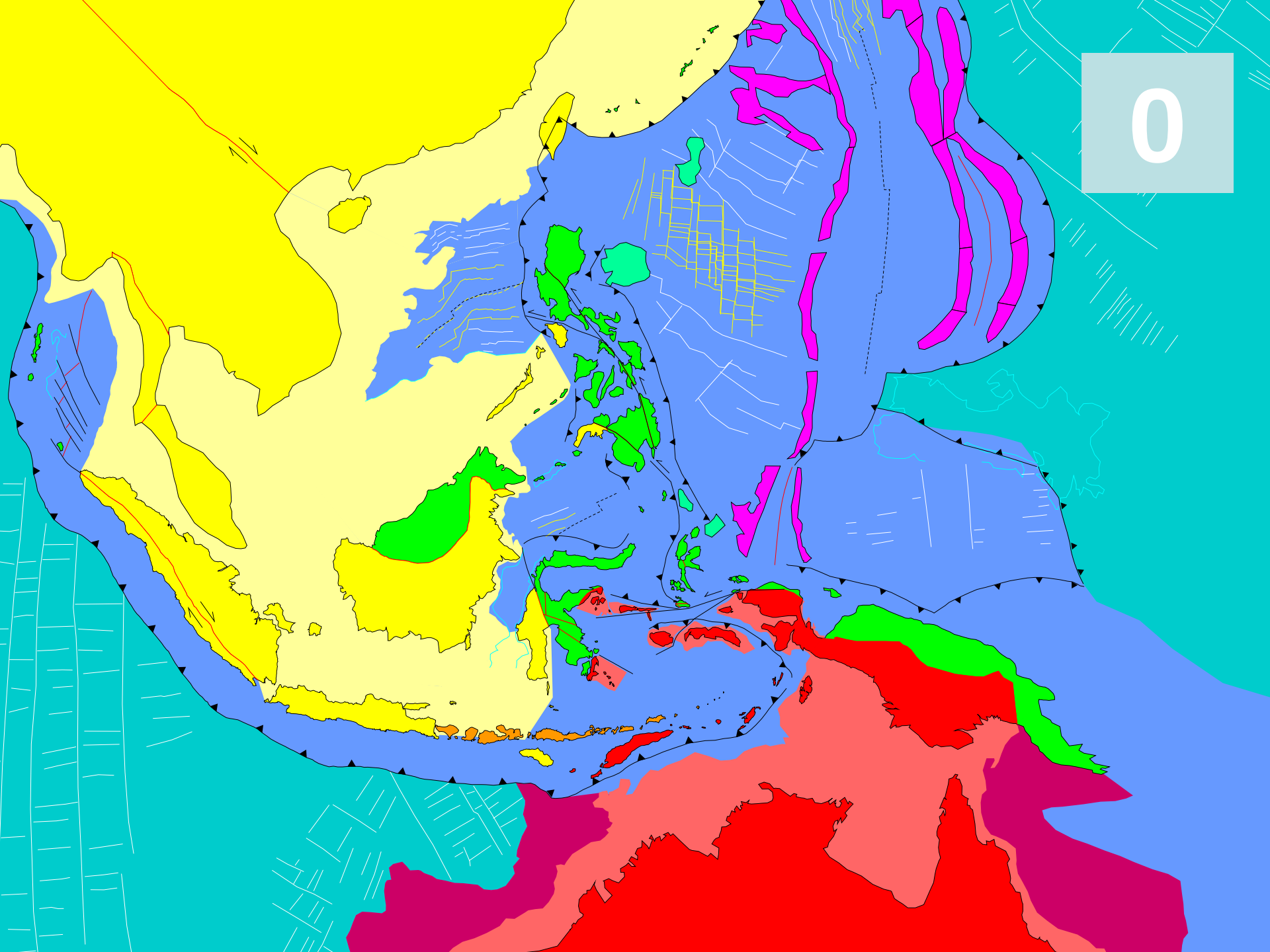
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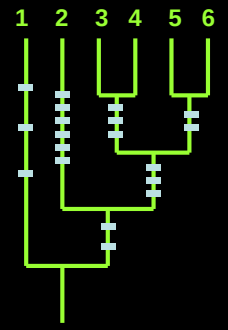
How is molecular evidence used?

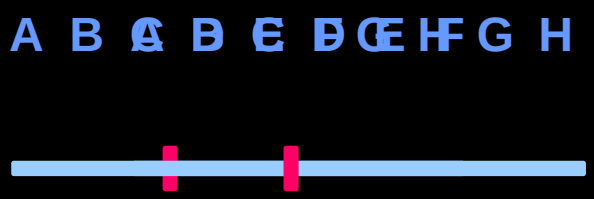


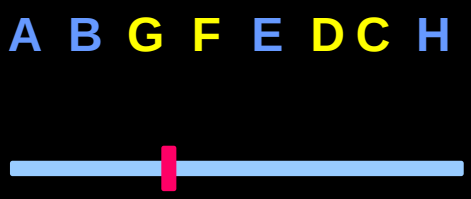
Unrooted trees can be inferred by chromosomal inversions.

The phylogeny of one subgroup of the Hawaiian fruitflies is better known than that of any other equivalently large group of living creatures. It was worked out, by Carson and his colleagues, from chromosomal banding patterns which are clearly visible in fruitflies such as Drosophila melancia , opposite.

The banding patterns differ between species, and it soon becomes obvious that regions of the chromosomes have been inverted during evolution: a segment of genes within a chromosome has been inverted as a whole.

Using knowledge of chromosomal inversions, the unrooted tree of the fruitflies could be inferred. The following animation makes clear how this is possible.

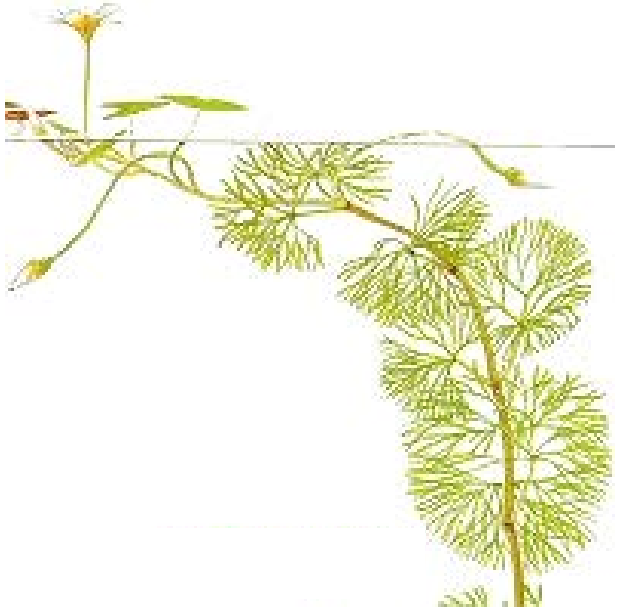




如何製作一個好的簡報?

- 排版與設計
  - 第一張投影片要如何處理? 保守些或加點創意?
  - 各主要內容之分節是否在設計上有區隔?
  - 標題與內文之字體大小與字數是否適中?
  - 圖片排版的基本建議
  - 顏色與字型
  - 動畫的輔助
  - 需要其它的創意嗎? (例如裝可愛)



如何製作一個好的簡報?

- 調整與定稿
  - 檢查錯字, 文法, 拼字

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  - 檢查錯字, 文法, 拼字
  - 調整字級, 字體, 縮排, 間距, 顏色之一致性與區隔度

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  - 調整圖片之位置, 大小, 解析度, 以及說明性

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  - 調整圖片之位置, 大小, 解析度, 以及說明性
  - 調整邊界

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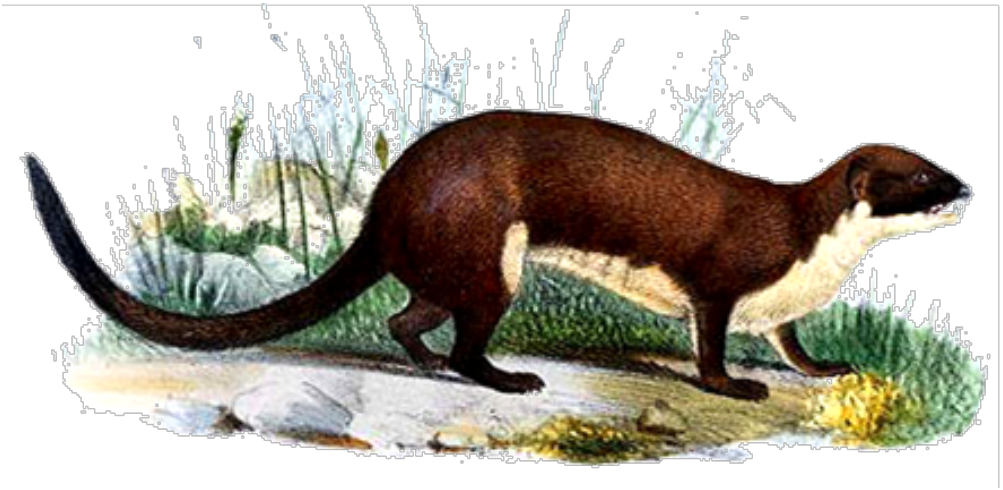
  - 調整圖片之位置, 大小, 解析度, 以及說明性
  - 調整邊界
  - 依演說時間調整投影片數量與投影片內文之份量

如何製作一個好的簡報?

- 調整與定稿
  - 檢查錯字, 文法, 拼字
  - 調整字級, 字體, 縮排, 間距, 顏色之一致性與區隔度
  - 調整圖片之位置, 大小, 解析度, 以及說明性
  - 調整邊界
  - 依演說時間調整投影片數量與投影片內文之份量
  - 必要時調整插入圖片之解析度以降低檔案大小

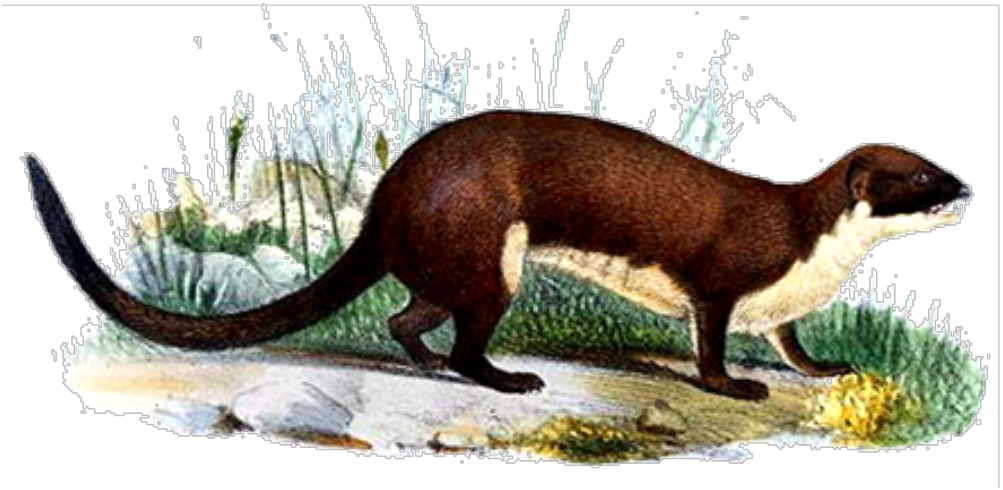
Some of the advantages of posters are:

- They can be studied at leisure or quickly scanned
- They offer personal contact with interested viewers
- They can be seen as a whole entity
- They can be more informative than a talk
- It is a visual medium and excellent for illustrations



Some of the limitations of posters are:

- The audience is not captive but must be attracted to the presentation
- The viewers is not comfortably seated
- Space if limited, so the poster must be selective
- Text and figures must be large enough to be seen from a distance of 3-4 feet
- Posters take more time to prepare and cost more money than slides



Plan the poster

Journal paper presented as a poster

[14.01] NICMOS OBSERVATIONS OF THE PRE-MAIN-SEQUENCE PLANETARY DEBRIS SYSTEM HD 98800

Dean C. Hines, Frank J. Low & Glenn Schneider (NICMOS Project, Steward Observatory, The University of Arizona)

ABSTRACT

Spectral energy distributions (SEDs) from 0.4 to 4.7 μm are presented for the two principal stellar components of HD 98800 (Aa+Ab and Ba+Bb). The third major component, an extensive planetary debris system (PDS), emits > 20% of the luminosity of star B in a blackbody SED at 160 ± 5 K extending from mid-IR to sub-wavelengths. The absence of detectable reflected circumstellar starlight in our HST/NICMOS observations suggests an upper limit of < 0.3 for the 0.4-μm albedo of the PDS material. Values are presented for the temperature, luminosity, equivalent radius and mass of each major system component. Remarkable similarities are found between the PDS and the interplanetary debris system around the Sun as it could have appeared a few million years after its formation.

We report these results as part of a comprehensive program by the NICMOS Instrument Definition Team to investigate the Environments of Nearby Stars. This work is supported by NASA grant NAG 5-6062. This paper is based on observations with the NASA/ESA Hubble Space Telescope, obtained at the Space Telescope Science Institute, which is operated by the Association of Universities for Research in Astronomy, Inc. under NASA contract NAS5-26555.

INTRODUCTION

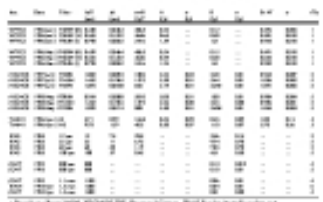
HD98800 (SAO 179815, IRAS F11195-2438) was found by *IRAS* to contain the brightest planetary debris system (PDS) in the sky (Zuckerman & Becklin 1993). Recently identified as one of 11 known members of the nearby TW Hydrae Association (Kastner et al. 1997; Webb et al. 1999), this HD 98800 (TWA 4) system is comprised of two similar K dwarfs that have not yet reached the main sequence. Both stars are spectroscopic binaries with periods of 262 (Aa+Ab) and 315 days (Ba+Bb; Torres et al. 1995). At a distance of 46.7±4pc, the two brightest components of HD 98800 separated by ≈0.8″ are well resolved by the NICMOS 0.4-to-2.5-μm Camera 2 (NIC2; Low, Hines & Schneider 1999). From the ground at 4.7 and 9.8 μm, Gehrz et al. (1999) showed that neither component B is actually at the center of the PDS with only a small amount of dust possible around A. Separations of Ab from Aa and of Bb from Ba are of order 1 AU (0.02″), and the luminosity of Ab is thought to be greater than that of Aa.

Using the sub-arcsecond resolution and dynamic range in excess of one million afforded by the Near Infrared Camera and Multi-Object Spectrometer (NICMOS) onboard *HST*, we have resolved the two primary components in five bands from 0.95 to 1.9 μm, separating the peak of their spectral energy distributions. Our objective was to obtain precise relative and absolute photometry of the two stellar components and to search for a halo of scattered or reflected light from the PDS realizing that all other resolved planetary debris systems scatter and emit about equally.

OBSERVATIONS

Spanning 30h days, the two *HST* orbits were aimed at obtaining high fidelity 'sub-stepped' images using four narrow band filters and one centrally located medium band filter. Four images were planned at each epoch and at each wavelength using a spiral dither pattern to allow for bad pixel replacement and to improve the spatial sampling from ≈ 2 AU to ≈ 1 AU. Unfortunately, in the first orbit only half of the images were obtained due to a pointing error. Care was taken to correct for effects of non-linear response in the detectors including persistence for cosmic ray events, and for flat fielding of the images. In-flight flat-field images and the HD 98800 raw images were reduced with in-flight dark frames. Table 2 summarizes flux densities and their ratios derived from the complete set of 38 NICMOS images. These are supplemented at other wavelengths from the literature.

TABLE 1: PHOTOMETRY OF HD 98800



THE PRIMARY STARS (A & B)

Figure (1) shows the spectral energy distributions of components A and B based on WFPC2 and NICMOS data and the results from Gehrz et al. (1999). For the PDS we include color-corrected Faint Source Catalog flux densities from *IRAS* and measurements at sub-mm wavelengths. The corresponding blackbody temperatures for the two primary stars and for the PDS are included in Table 1, along with errors estimated from the fitting process and from the flux density errors. For comparison, we list effective temperatures for the stars based on the B-V colors from Stahler&Shen, et al. (1998) using the Bessell (1979) color-temperature relation, but treating both A and B as single stars. Also, we have attempted to fit these data using model SEDs based on ground-based photometry of K dwarfs of the same spectral types. Unexpectedly, these unpublished models of main sequence K-stars (M. Meyer 1999) do not represent the measured flux densities of A and B short of 2 μm as well as do the simple blackbody models. However, beyond 2 μm the SEDs of these stars appear to drop below the simple blackbody model. The luminosities listed in Table 1, derived by integration of the blackbody models, may be high by as much as 5% due to this effect. Because the B-V colors are close to normal for stars with spectral types K6 and K7, we do not include an interstellar reddening correction. Neglecting the uncertainty of the distance, we believe the errors of the luminosity determinations are of order ± 5%. Taking our measured luminosities and treating our blackbody temperatures as good approximations to the true effective temperatures, current PMS models give plausible values for mass, but are in conflict with other age indicators.

Using the luminosity and temperature of components A and B their radii were calculated. In neglecting their duplicity we note that this oversimplification is more significant for B than for A (see Stahler&Shen et al. 1996). The values in Table 2 show that the cooler star, B, is slightly larger than star A, a result well within the precision of the relative measurements involved. The main-sequence stars may well have this property. However, when both components of star B are considered, they each can have radii smaller than that of star Aa (Ab is almost negligible), and as previously noted, some portion of the power emitted by Ba and Bb will be reflected by the PDS adding to the star's apparent luminosity. Figure 1 shows that there are slight differences between the two primary components in detail relative to their respective blackbodies. Also, star A varies at all wavelengths by as much as a few percent and significant coronal activity has been reported (e.g. Pakull & Beuermann 1988; Henry & Hall 1994).

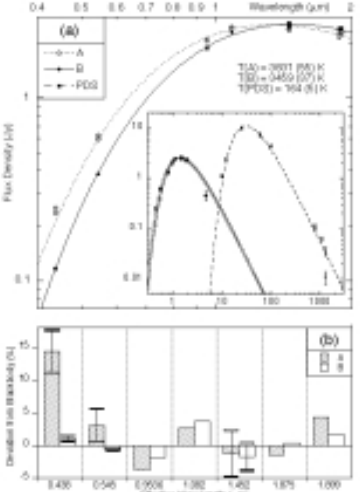


Figure 1. (a) SEDs of primary components with blackbody fits. Expanded view shows the measurements used for the fits to *IRAS*. (b) Spectral and temporal distribution of mean flux densities from blackbody fits. First epoch indicated by black bar (see Table 1).

THE PLANETARY DEBRIS SYSTEM

At 0.95 μm, where our resolution is highest, we have been unable to detect starlight reflected by the PDS. This implies < 6% for the reflected light relative to the direct emission from Ba+Bb. The power emitted in our direction by the PDS divided by the total power emitted by Ba+Bb (systemic components A and B) is 0.14. Therefore, at 0.95μm we have placed an upper limit on the albedo of the reflecting material of 0.3. Note steroids have albedos that are generally lower than 0.2 (e.g. IRAS, Tedesco et al. 1989). In our fifteen we see no indication of coloration of the stellar emission from components B as might be caused by reflection from the PDS. This suggests that the albedo is low at all bands from 0.4 to 2 μm.

We must explain how a circumstellar envelope can form and be maintained over millions of years with geometry, opacity, and stability sufficient to produce the system that we observe. Consider the case of a failed terrestrial planet of an Earth mass to form dense "dust bands" which overlap and fill in a belt subtending 30% of the celestial sphere around the stars in B. The required range of orbital inclinations is -12° to +12°. In the solar system, the dust bands lie 10° above and below the ecliptical plane, and are constantly replenished by collisional erosion of asteroids in those same orbits. The much larger quantity of dust in the HD 98800B planetary debris system follows from its recent formation.

Just as we calculated the radii of the stars, we have also calculated an "equivalent" radius of 2 AU for the material orbiting around star B, even though its projection the IR excess, clearly, is not circular in shape. This result is consistent with our proposed geometry of the PDS and constrains that portion of the belt that is visible directly. The actual radii of the inner debris orbits calculated from radiative equilibrium is about 4.5 AU.

In the solar system, where the corresponding temperatures are 280 to 250 K, the dust is optically thin, of order 10%, and its emission follows a blackbody at least out to 100 μm. In HD 98800B the dust opacity remains high from 1 to at least 1000 μm, but we find no indication of attenuation of light from star B. This implies that the orbital plane of the dust system is inclined to our line-of-sight by more than 12°. The most likely value is near 45° since the emitting area must equal that of the equivalent disk, ≈ 10 sq. AU. Because most of the 165 K emitting surface is obscured by colder particles in larger orbits, the actual ratio of IR to optical luminosity is probably higher than the observed ratio of 0.19 reported here. Clearly, the IR emission is not isotropic. Using the predicted 4.5 AU inner radius of the belt, an equivalent thickness of 1 mm, and terrestrial density, a rough estimate of minimum mass is 0.4 earth's masses.

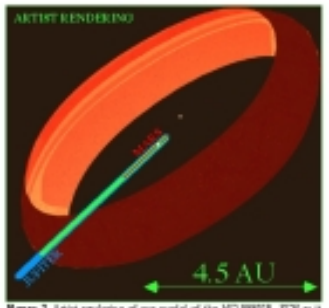


Figure 2. Artist rendering of our model of the HD 98800B PDS as it might appear in the near-to-mid infrared. The belt represents the range orbital inclinations about a midplane inferred from the debris covering factor (20%) at the radiative equilibrium radius (implied by the debris temperature of 164K). The orbital radii of Mars and Jupiter are included for comparison.

TABLE 2: DERIVED PROPERTIES OF THE COMPONENTS IN HD 98800

SUMMARY

- Our high fidelity NICMOS data enable us to determine precisely the SEDs of the two primary stars, and thus accurately determine their individual temperatures and luminosities, which are dominated by the near infrared.
- The two stars differ slightly in temperature, but have nearly equal flux densities beyond one micron. The nearly equal luminosities imply that B is slightly larger than A.
- The PDS is a nearly perfect 165 K blackbody implying large opacity to at least from 7μm to > 1100μm.
- The accurate determination of the luminosity of Star B allows us to calculate the ratio of luminosity of B reradiated with the luminosity radiated by the PDS (which presumably is heated by star B). The ratio = 0.19.
- We also derive an inner radius of 4.5 AU for the PDS.
- After careful pull reduction and modeling, we place an upper limit of < 6% to the scattered light from the PDS complied with the dilute light from B. The albedo of the debris is < 0.3.
- We are lead to a plausible model for the PDS (Figure 2), in which about 0.4 earth masses of material orbits stars (Ba+Bb) in a configuration similar to that of the zodiacal dust bands which are sustained by the asteroid belt flues in our solar system (Low et al. 1984).

CONCLUSIONS

In conclusion, we now have enough information about the stars in HD 98800 to test, and perhaps improve, models of PMS dwarfs. We can also construct plausible models of recently formed planetary debris systems with interesting similarities to our own planetary system. We note that as yet no other analogues of very young systems of this type have been found, indicating that the lifetime of this optically thick phase is probably rather short. Photometric observations using adaptive optics on the largest telescopes and space missions such as NGST should resolve both the thermal and reflected components of the PDS around HD 98800B. Infrared surveys are in progress and in the planning stage with SIRTF should provide new and better means of locating planetary debris systems, thus providing an answer to the question of how often terrestrial planets are formed.

Acknowledgments: Valuable assistance from our colleagues, M. Meyer, M. Rieke, D. McCarthy and B. Becklin is much appreciated, and we thank A. Storrs, D. Golombek, P. Stumpf, and I. Dobinsky for their help on PDC.

Flux ratios in each band were determined by matching component B, using B, from a flux-scaled replica of the original image (left panel).

The rolling process was applied iteratively to remove the uncontracted wings of the PSF of template star (right panel). f = flux(A1)/flux(B).

Figure 3.

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Contact: dhines@as.arizona.edu

Dean C. Hines
NICMOS Project
Steward Observatory - 290
933 North Cherry Avenue
University of Arizona
Tucson, Arizona 85721 USA

phone: 520-621-3445
fax: 520-621-1995

This display paper is available at: http://nicmosis.as.arizona.edu:8000/AAS98_2/HD98800_POSTER.gif, see http://xxx.lnal.gov/abs/astro-ph/9905366 for a preprint of our Astrophysical Journal Letter for more details and upon which this presentation is based.

Plan the poster

Poster Instructions

- Provided by meeting organizers
- Size, location, length of time for viewing, information to be included, layout suggestions
- Orientation

Plan the poster

Poster Title

- Lengthy poster titles discourage viewer
- Brief, informative, and interesting

MECHANISM OF AIRWAY CONSTRICTION AND SECRETION EVOKED BY LARYNGEAL ADMINSTATION OF SO_2 IN DOGS

EVIDENCE THAT REFLEX OF SO_2 ARE MEDIATED BY AFFERENT ENDING IN THE UPPER AIRWAY

ARE REFLEC EFFECTS OF SO_2 MEDIATED BY AFFERENT ENDING IN THE UPPER AIRWAY?

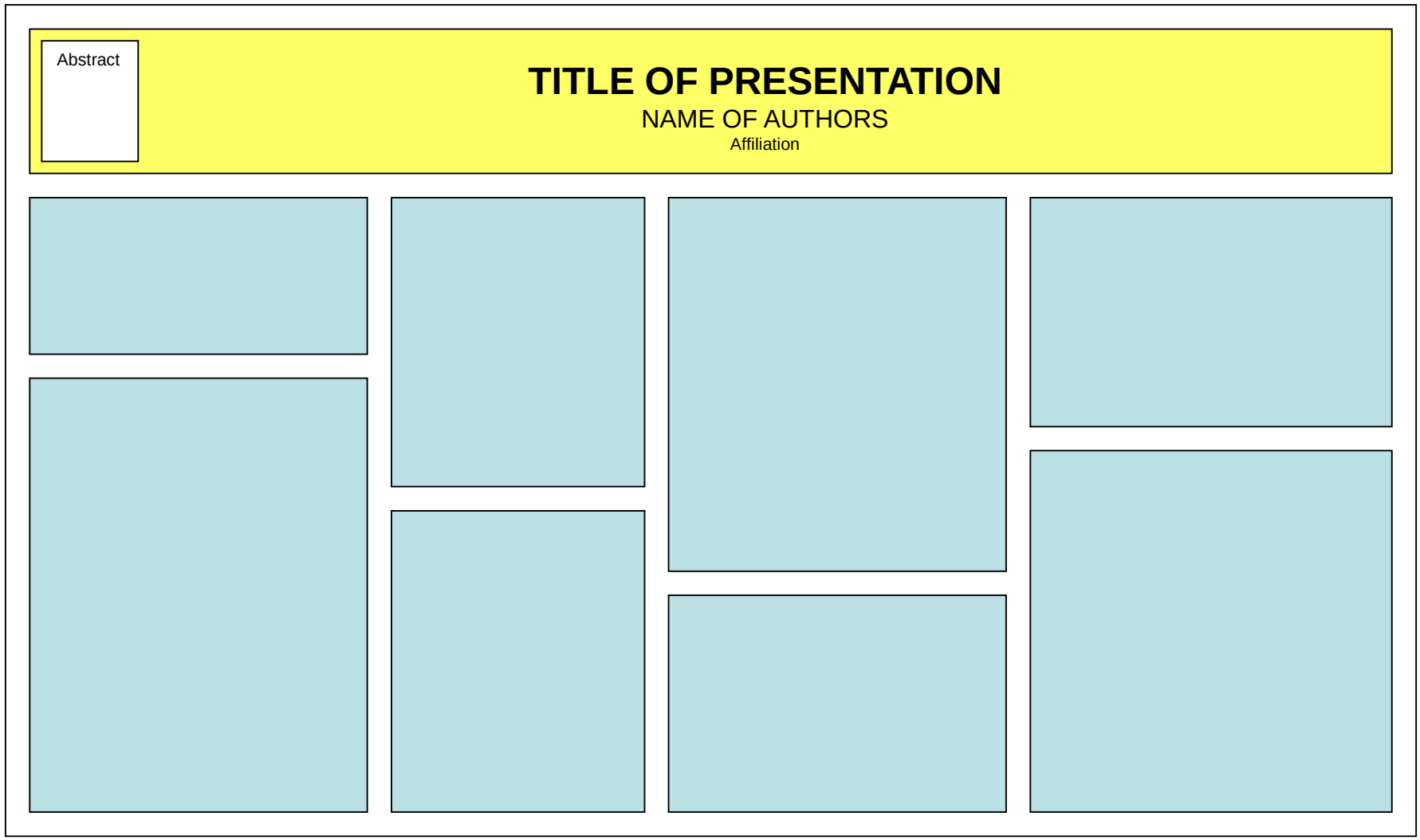
HOW DOES SO_2 AFFERENT THE UPPER AIRWAY?

- 1-inch-high letter will stretch across 2 meters or less
- With the addition of names of authors and institution, the height of the title will be at least 6.66 cm

Plan the poster

Abstract

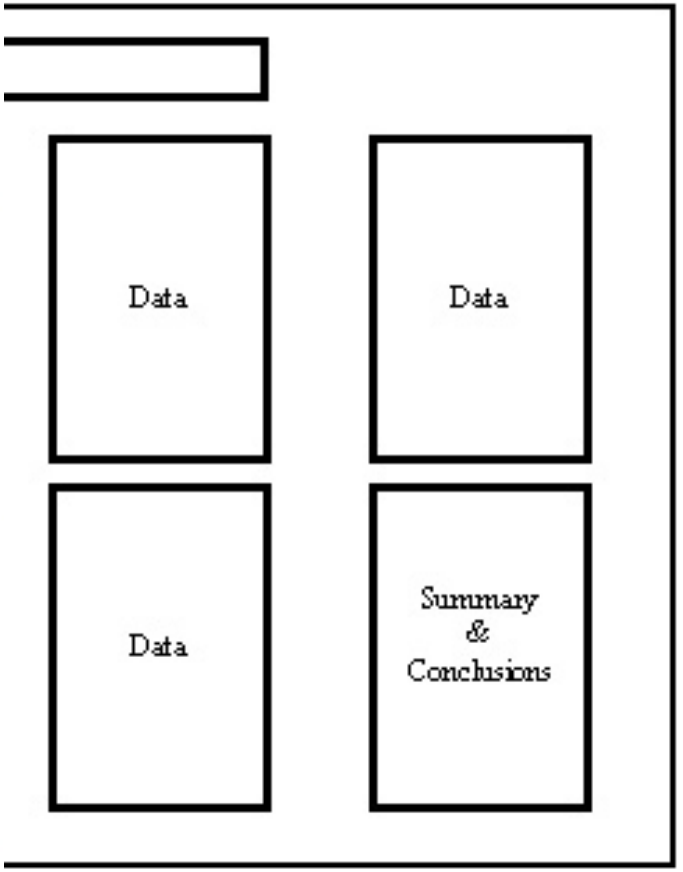
- An enlarged abstract will add nothing to the poster



Plan the poster

Rough Sketch

- To visualize size and position when planning the poster, sketch a rough plan



Plan the poster

Poster Text

- Plan the poster text in short, simple, separate statements. This allows the viewer to scan the text quickly and easily for the important points

PARAGRAPH

Low concentrations of SO_2 cause bronchoconstriction in asthmatic patients. Since low concentration of SO_2 may be totally absorbed in the upper airways and since the upper airways appear to be very sensitive to SO_2, we have explored the possibility that SO2 evokes reflex effects by engaging afferent nerves in the upper airways

SEPARATE STATEMENTS

- **Bronchoconstriction in asthematic patients if cause by SO_2 in low concentrations**
- **Upper airways are sensitive to and totally absorb low concentrations of SO_2**
- **We explored the possibility that SO_2 engages afferent nerves in the upper airways**

Plan the poster

Poster Text

- For quick identification, text should have a title. If each section of text is titled, the flow of information on the poster becomes more apparent. Here the first statement emphasizes low concentration of SO_2

TEXT TITLE

INTODUCTION

SO_2 in low concentrations causes cause bronchoconstriction in asthmatic patients.

Upper airways are sensitive to and totally absorb low concentrations of SO_2.

We explored the possibility that SO_2 engages afferent nerves in the upper airways.

TEXT SIZE

INTODUCTION

SO_2 in low concentrations causes cause bronchoconstriction in asthmatic patients.

Upper airways are sensitive to and totally absorb low concentrations of SO_2.

We explored the possibility that SO_2 engages afferent nerves in the upper airways.

FONT VARIATION (TIMES NEW ROMAN)

INTODUCTION

SO_2 in low concentrations causes cause bronchoconstriction in asthmatic patients.

Upper airways are sensitive to and totally absorb low concentrations of SO_2.

We explored the possibility that SO_2 engages afferent nerves in the upper airways.

FONT VARIATION (UNIVERS)

INTODUCTION

SO_2 in low concentrations causes cause bronchoconstriction in asthmatic patients.

Upper airways are sensitive to and totally absorb low concentrations of SO_2.

We explored the possibility that SO_2 engages afferent nerves in the upper airways.

FONT VARIATION (AVANT GARDE)

INTODUCTION

SO_2 in low concentrations causes cause bronchoconstriction in asthmatic patients.

Upper airways are sensitive to and totally absorb low concentrations of SO_2.

We explored the possibility that SO_2 engages afferent nerves in the upper airways.

FONT VARIATION (TAHOMA)

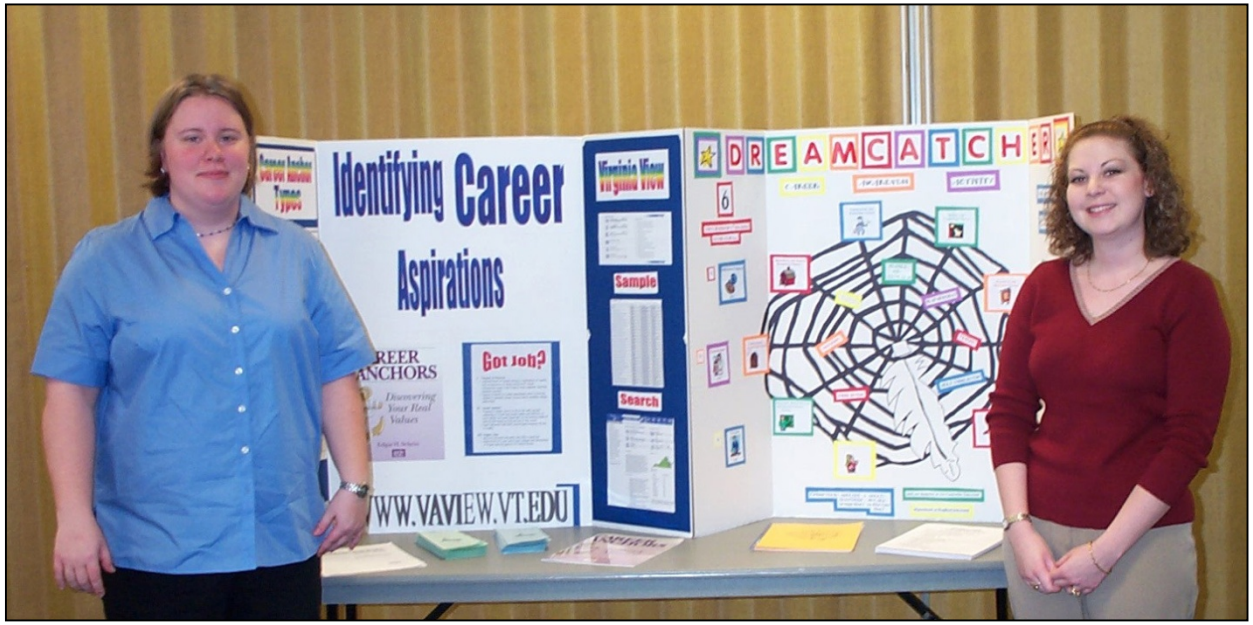
INTODUCTION

SO_2 in low concentrations causes cause bronchoconstriction in asthmatic patients.

Upper airways are sensitive to and totally absorb low concentrations of SO_2.

We explored the possibility that SO_2 engages afferent nerves in the upper airways.

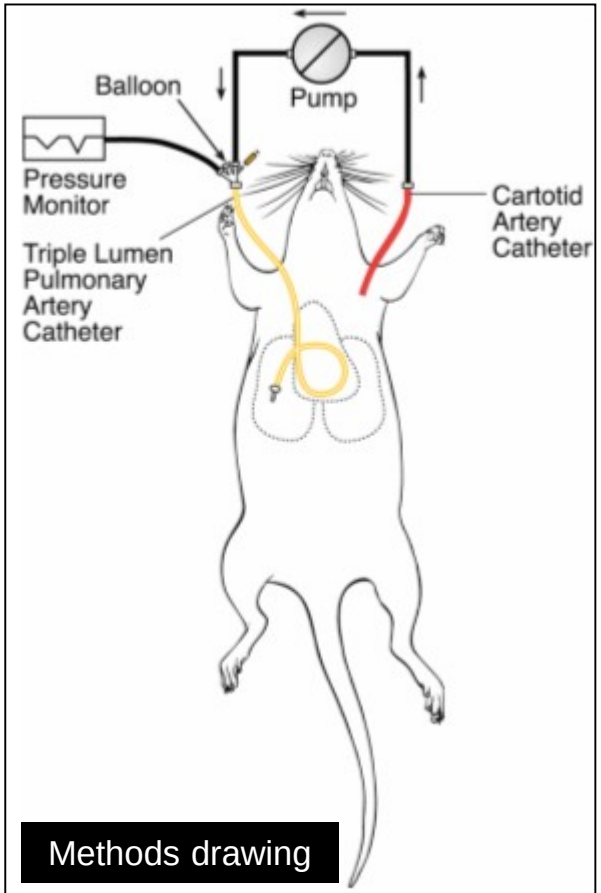
DOES THE POSTER DISCOURAGE THE VIEWER?



Plan the poster

FIGURES

- Figures are more impressive than text on a poster. The poster medium is made for pictures. Figures hold the viewer's attention and communicate vividly and memorably.



Methods drawing

Numbered figure with legend

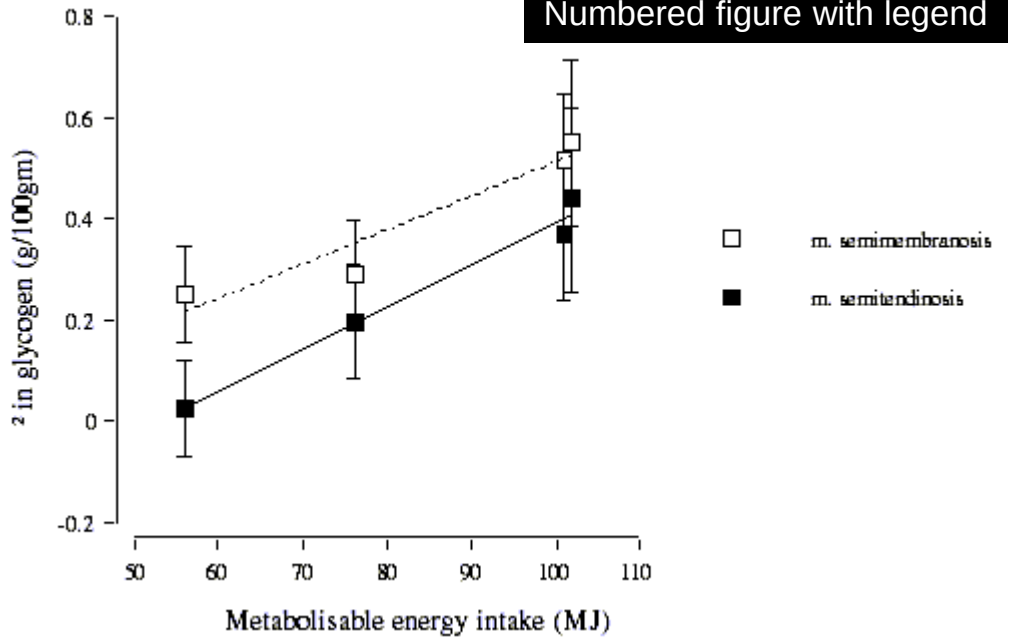
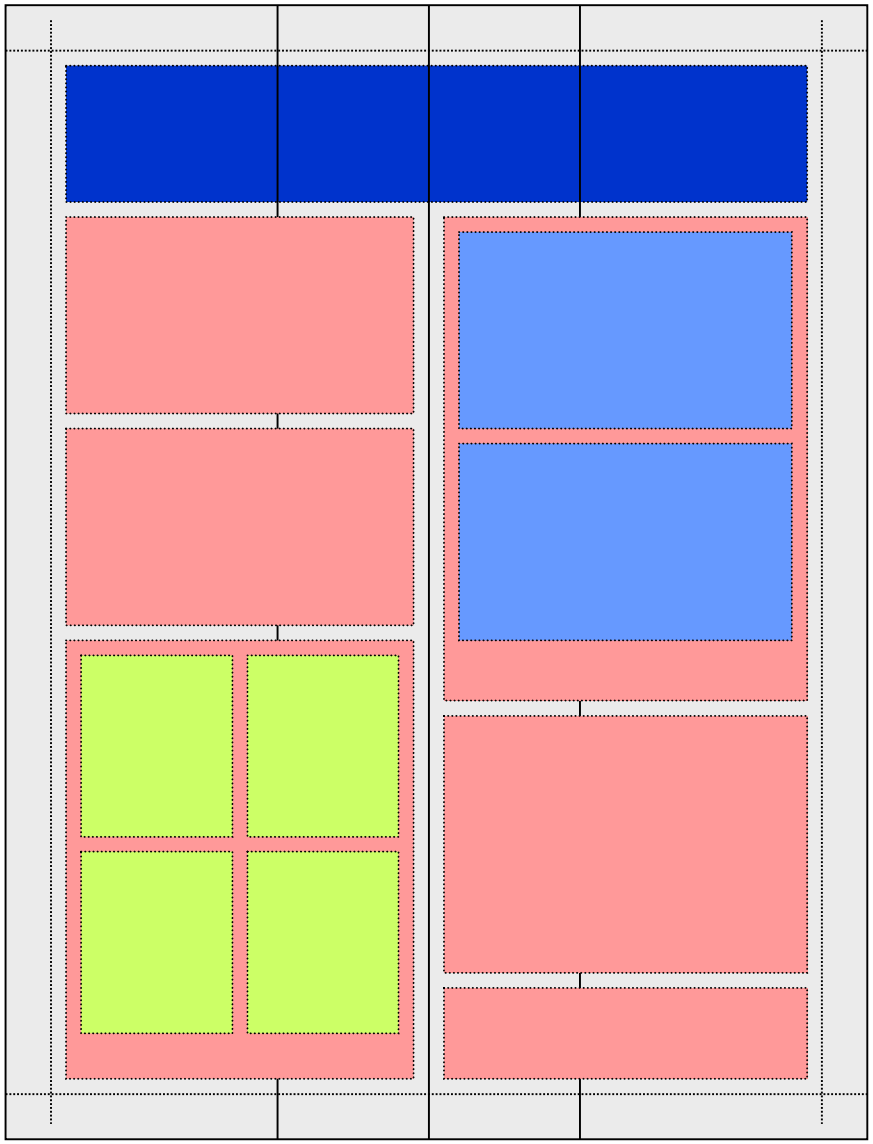


FIGURE 1 The figure number here will make the sequence of information clear. The text underneath clarifies or emphasizes the point and makes it a satisfying, integrated figure

Plan the poster

- Readable space
- Poster division
- Poster background
- Colour

Poster Layout



Examples

Alternative background colour

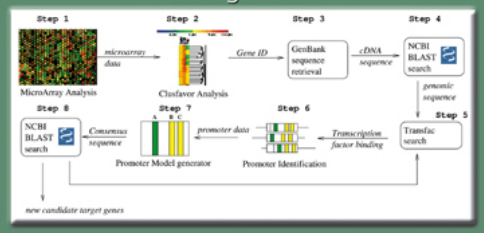
A Modeling and Execution Environment for Scientific Workflows

Office of Science U.S. Department of Energy

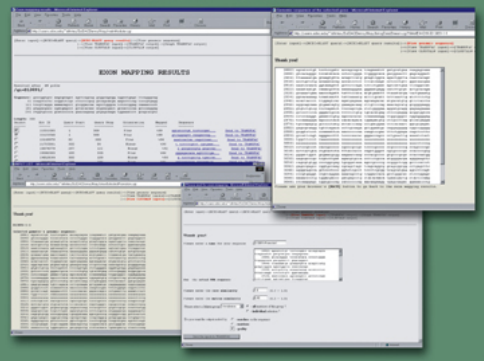
SDM CENTER

Scientific Workflow Example: Promoter Identification Workflow (simplified)

Gene workflow approach for understanding co-regulation



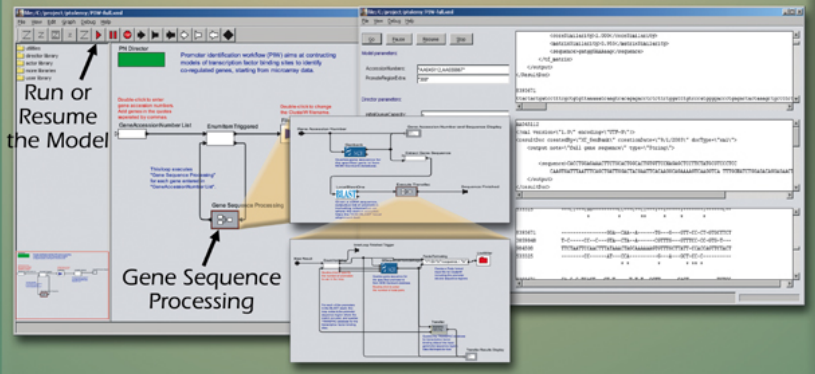
"OLD APPROACH" - Custom-built Software



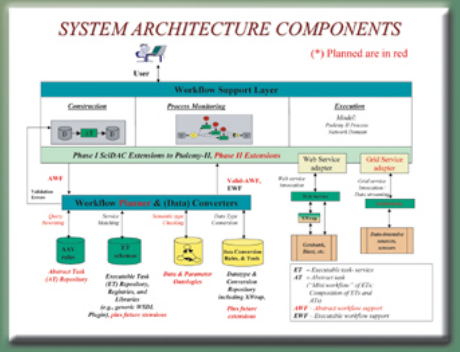
- E.g., Perl-based ad-hoc CGI application
- Difficult to reuse, change, optimize and maintain
- Dependent on third-party software

SDM Center's Scientific Workflow Environment

"NEW APPROACH"- Easy to Customize, Generic Approach to Scientific Process Automation



- Extends Ptolemy II for scientific workflows: library of bioinformatics modules (BLAST, ClustalW,...), generic WSDL module, user-driven workflow steering, local and web service-based execution modules, GUI for workflow design & execution, XML-based workflow exchange (MoML), Java-based open source software, easy packaging and installation on diverse platforms.
- Planned extensions: extended suite of data transformation modules, Grid service-based execution modules, data streaming support, XML Schema and OWL-extensions for workflow typing, data provenance.



http://sdm.lbl.gov/sdmcenter/

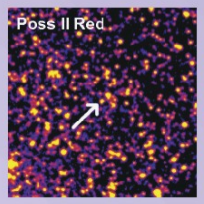
This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory, under Contract W-7405-Eng-48 and under Contract No. DE-FC02-01ER25486 for SciDAC/SDM.

Examples

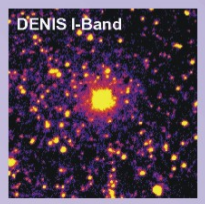
Make figure background transparent

Nova Cl Aquilae in Decline

B. Armsdorfer, S. Schmeja, S. Kimeswenger
Institut für Astrophysik, Leopold-Franzens-Universität Innsbruck, Austria
http://astro.uibk.ac.at



Cl Aql on POSS II Red (Aug. 1990)



Cl Aql, DENIS I-Band (May 11, 2000)

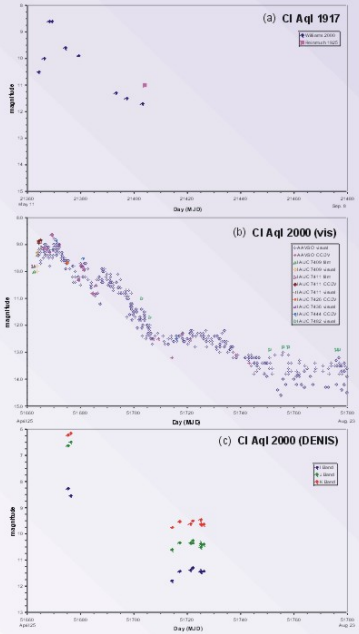


Fig. 1. The diagrams show the light curve of Cl Aql in (a) 1917 as measured from photographic plates, (b) in 2000 from visual data and (c) in 2000 from NIR data, all in the same scale. In each of the three cases the abscissa covers a range of 120 days. The light curve (b) contains mostly data contributed to the AAVSO database by amateur astronomers (Mattei 2000): The filled symbols are photometries obtained using CCDs, the open symbols are visual estimates and can therefore contain significant errors. Especially after the end of July (MJD 51750), when the magnitude of the nova falls below 13ᵐ, there is a pretty large straggling of the data.
The light curve shows a rather slow decline compared to other recurrent novae ($t_2 \approx 25$ days). The NIR decline is of about the same order as the visual decline. On June 27 (MJD 51722) we took three sets of images in intervals of about 20 minutes, and we could not find any short-term variation in this period.

The first known outburst of Cl Aquilae was discovered on Heidelberg plates recorded in June 1917 (Reinmuth 1925) and classified as a possible nova by Dürbeck (1987). The measured maximum of the outburst was about $m_{pg} \approx 11^m$ and thus rather low, but obviously the real maximum has been missed. Williams (2000) detected this nova on Harvard College Observatory patrol plates from 1917 and found a maximum of 8.6^m.
On April 28, 2000 Takamizawa et al. discovered a probable nova in Aquila with $m_{vis} \approx 10^m$ which seems to be identical with the 1917 nova. It reached its peak in the beginning of May at about 8.7^m, which is 7.5^m above the quiescent phase (Szkody 1994). Thus it is a recurrent nova with the longest known period.

The NIR photometry was obtained using the DENIS instrument (Epchtein et al. 1997) at the ESO 1m-telescope in La Silla in the period from May 10 (about 12 days after outburst) to July 1, 2000. The images were taken simultaneously in all three bands Gunn-I (0.82 µm), J (1.25 µm) and K (2.15 µm). The exposure time of each image was 9 seconds in I and 11 seconds in J and K. Each band was observed with five to seven images while moving the source around in the field of view. This was used to eliminate errors due to local flatfield effects, and to be able to obtain the sky background using the iso-airmass median sky filtering. Thus, the intrinsic noise within one set could be reduced to 0.01^m. The fluxes of the nova and two nearby comparison stars were measured using the SExtractor software (Bertin & Arnouts 1996). The magnitudes of the nova were calculated relatively to the two comparison stars, which were then calibrated using the DENIS online zero points.

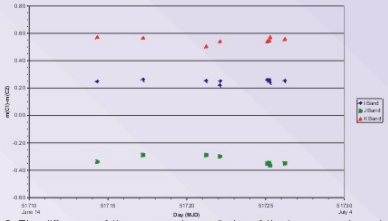


Fig. 2. The difference of the measured magnitudes of the two comparison stars indicates the overall quality of the measurements. The errors are 0.013ᵐ in I, 0.031ᵐ in J and 0.023ᵐ in K.

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- We thank the DENIS consortium (P.I.N. Epchtein, Observatoire de la Côte d'Azur) for being able to do these additional observations.
- We have used data from the AAVSO International Database, based on observations submitted to the AAVSO by variable star observers worldwide.

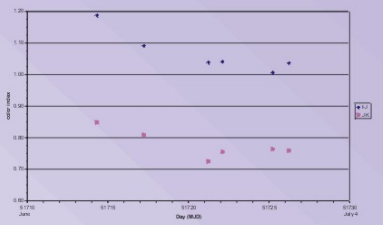


Fig. 3. While the nova gets more and more blue in (I-J), the reddening in (J-K) around June 25, 2000 (MJD 51720) may indicate the start of the dust formation episode. (J-K) was about 0.36ᵐ on May 11/12.
The decrease in (I-J) is consistent with a recovery from the 0.7^m dip in the visual (Fig. 1b) between MJD 51700 and 51720 caused by the formation of a dust shell. The increase of (J-K) may be a sign of the onset of the formation of very hot dust particles causing the next dip in the visual light curve starting at MJD 51730. Using typical dust formation radii of 10 m (Kimeswenger & Koller 2000), this gives an estimate for the velocity of the dust drift of a few hundreds of km/s.

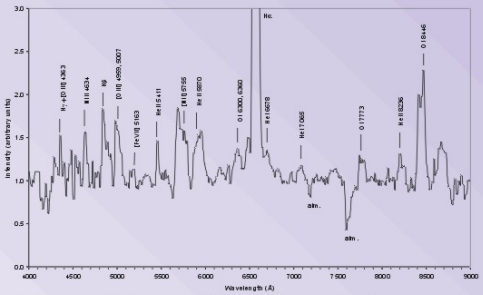
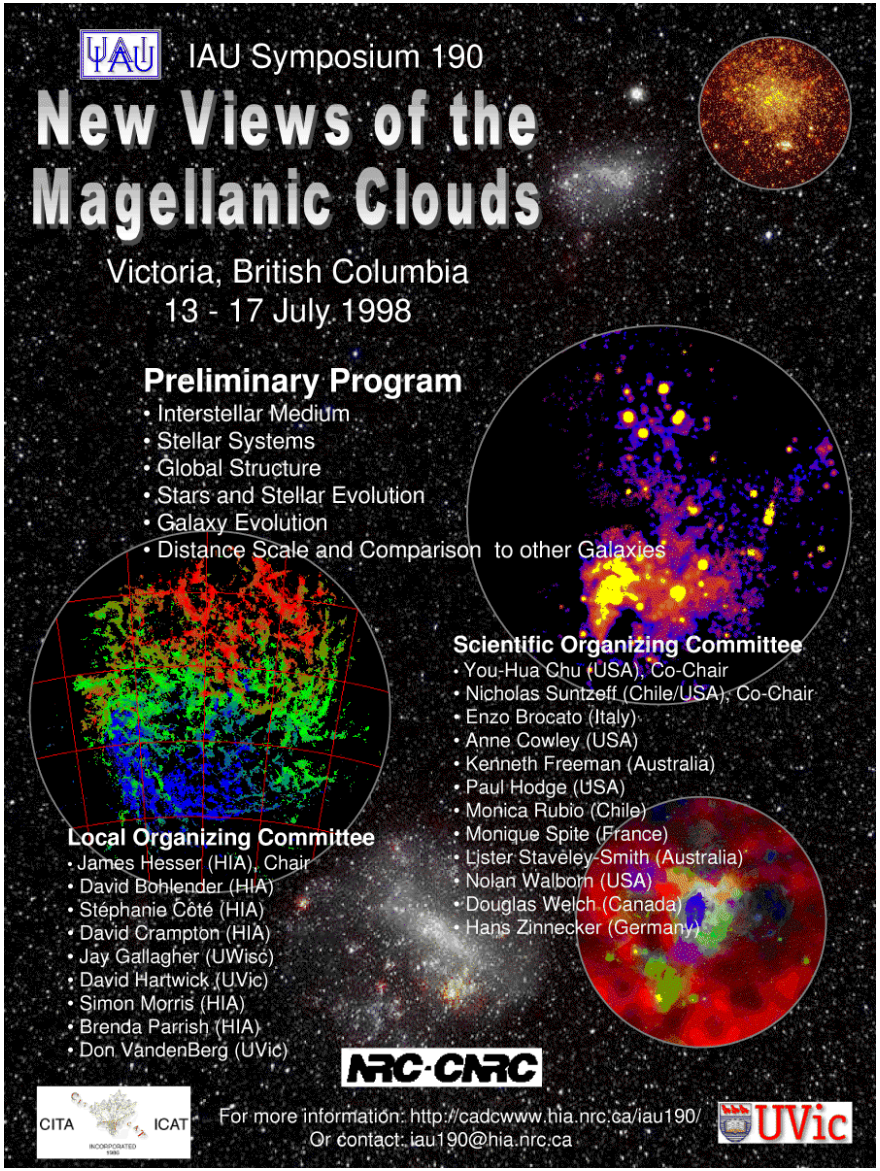


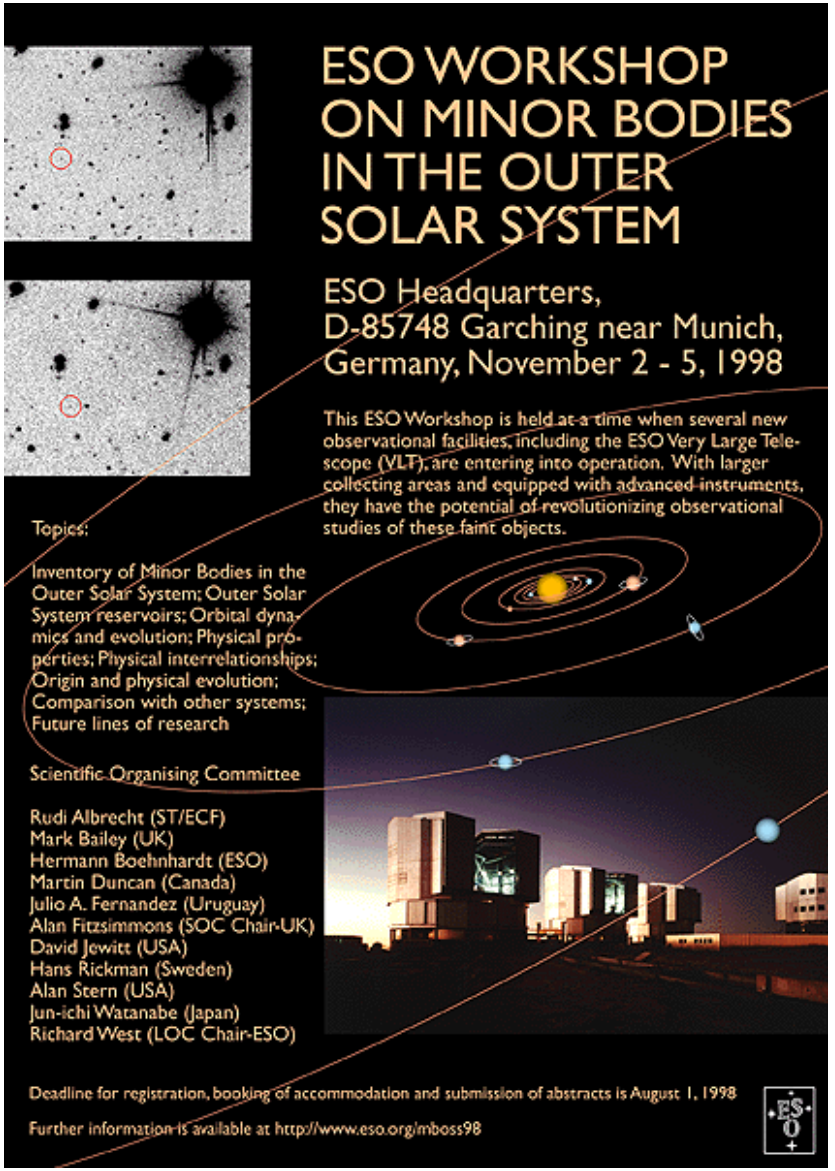
Fig. 4. This composite spectrum was obtained with the Innsbruck 60 cm-telescope on May 14, 2000 (MJD 51679), about two weeks after the outburst of the nova. We took 2 to 3 spectra of every region with an exposure time of 1800 seconds each. The spectrograph was used with a grating of 240 lines/mm, giving a resolution of about 2.4 Å/pixel on the CCD. Different spectra of the same region show no differences, which indicates that the error is smaller than 10% of the continuum. Therefore, the various features of the emission lines are real and not caused by noise. The spectrum shows a flat continuum from 4000 to 9000 Å and strong emission lines (1.5 to 9 times the continuum). The emission line profiles vary significantly between the different species. The velocities range from 3400 km/s FWHM (in case of H) up to 7400 km/s. The lines showing higher velocities are flat-topped.

AG-Tagung "Dynamic Stability and Instabilities in the Universe", Bremen, 18.-23. September 2000

Examples

Strong visual impact





Examples

Emphasize the titles

Put the Title of the Scientific Poster Here

M. Russi, E. Masson, J. Mangual, F. Schertz
Name of Institution can be placed here

Abstract

Insert your text here. You can place your organizational logo on either side of the title of the poster. In hac habitasse platea dictumst. Nullam tellus. Fusce eget tellus accent pellentesque tempor. Morbi scelerisque enim. In non neque. Etiam ac enim. Nullam aliquet lorem ullamcorper interdum. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque blandit. Cras metus. Proin ultrices sit amet sapien adipiscing malesuada. Maecenas ac mattis. In hac habitasse platea dictumst. Maecenas non nunc nunc pretium. Proin nec nisl id pede imperdiet tempor. Proin lacinia. Nullam ultrices nulla eget velit vestibulum porttitor. Praesent vitae lorem. Utquis metus sed velit placerat bibendum. Nam porttitor orci vel augue.

Objectives

Insert your text here. Remember to size your text to fit your information into the space. The larger your text, the easier it will be for others to read your poster.

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Methods

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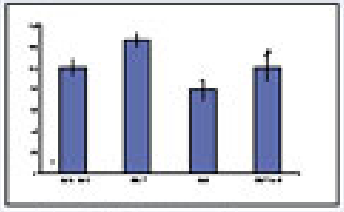

Figure 1. Maecenas mattis

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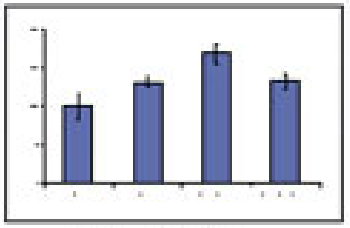


Figure 2. Nullam vitae

Insert your text here. Remember, you can change template colors to fit your own taste or institution colors. The graphic can be replaced with several smaller graphics.

Results

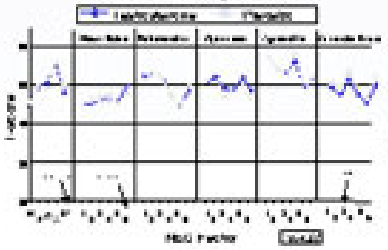
Characteristic	
Age (years)	60.5 (9.2)
Race*	9
Menopausal	1 (1) (8%)
Hormone therapy	9 (52.9)
Previous positive cervix	7 (41.2)
Genitalia symptoms	9 (52.9)
Vulvar symptoms	10 (58.8)
[illegible] stage of gestation not pertinent	2
Pap Age on [illegible]	11.8
Concurrent vulvar/vaginal precancerous	9 (52.9)
Therapies not defined	9 (29.4)

Data are presented as mean (standard deviation or n(%)
*Did not answer all questions

Put your information here. Remember to size your text accordingly.

Graph/image title

Title of the chart goes here



Conclusion

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Examples

Simplify use of colour

Put The Title of the Scientific Poster Here

M. Russi, E. Masson, J. Mangual, F. Schertz
Name of Institution can be placed here

Introduction

Insert your text here. You can place your organizations logos on either side of the title of the poster. In hac habitasse platea dictumst. Nullam tellus. Fusce eget risus nec est pellentesque tempor. Morbi scelerisque nulla. In non neque. Etiam ac nulla. Nulla vitae sem non lorem ullamcorper interdum. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Pellentesque blandit. Cras metus. Proin ut lacus sit amet sapien adipiscing malesuada. Maecenas mattis. In hac habitasse platea dictumst. Maecenas nonummy posuere eros. Proin nec urna id pede imperdiet vulputate. Proin lacinia. Nullam vitae nulla eget velit vestibulum porttitor. Praesent vel orci. Ut quis metus vel elit placerat bibendum. Nam porttitor orci vel augue.

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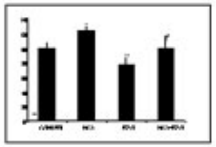
Results



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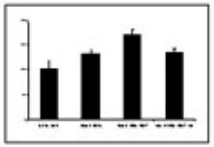

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Insert your text here. Remember, you can change template colors to suit your own taste or institution colors. The graphic can be replaced with several smaller graphics.

Conclusion

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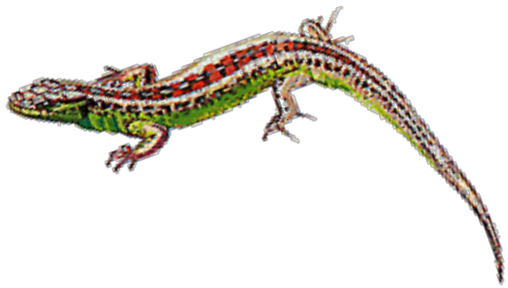
- How to digitise your figures?
- Should I make up a figure plate?
- Should I tell the editor where to insert the tables and figures?
- Colour adjustment, figure rotation, and legend preparation



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TIFF and EPS for Macintosh or PC are the only acceptable formats for figures that will appear in the print journal. (See *Supporting Information* below for acceptable formats for online-only supplementary material.) All color images must be in CMYK (cyan, magenta, yellow, black) mode. Include the font files for any text. PC or Macintosh versions of Adobe PostScript fonts must be used (no system "bitmap" fonts). Images must be final size, preferably 1 column (8.7 cm) width. Figures wider than 1 column should be between 10.5 and 18.0 cm wide. Numbers, letters, and symbols should be at least 2 mm in size after reduction and must be consistent. Composite figures must be preassembled. Details and the Digital Art Submission Checklist are at http://cjs.cadmus.com/da/index.asp. Direct questions to caham@cadmus.com .

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Number tables (Arabic numerals) in the order in which they are cited in the text. Each table should have a brief title, be on a separate page, and be double-spaced.

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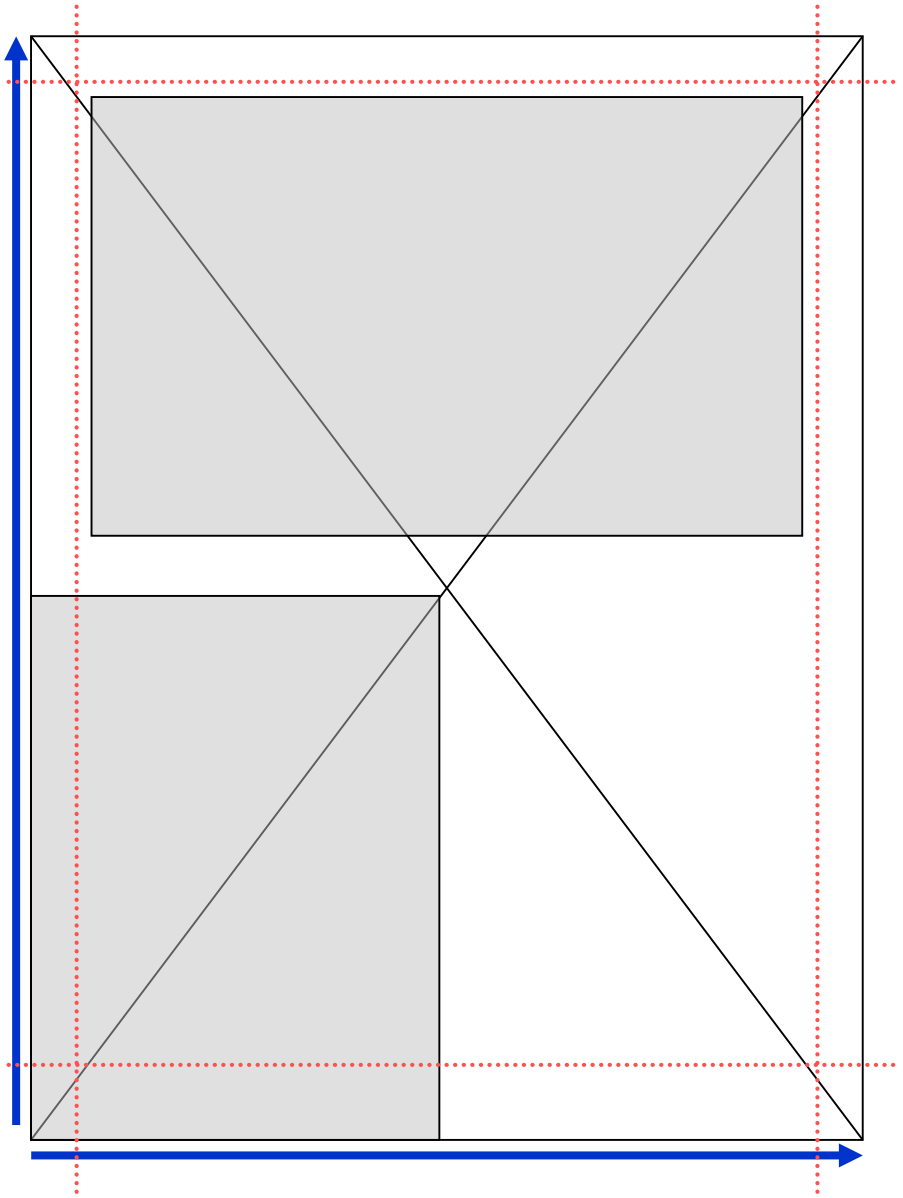

Reduction

Apple Daily Vol. 1 Number 1 2005 May 18

「加料」麵包 吃到最後一口發現蟑螂斷腳

基隆市1名市民發現買來的麵包中有一截蟑螂的斷腳，昨天送到衛生局請求主持公道。
記者邱瑞杰／攝影

【記者邱瑞杰／基隆報導】

基隆市1名市民吃麵包時，咬到一截蟑螂的斷腳，覺得噁心，隨即把麵包送到衛生局。衛生局昨天通知麵包業者說明，業者說，不知道問題出在那裡，將向消費者道歉，尋求諒解。

衛生局食品衛生課長王翠雯說，這名市民一共買了4個麵包，他在吃第1個麵包到最後一口時，發現咬到異物，拿出來一看竟然是蟑螂的腳，隨即把「那一口」已咬過的麵包和另3個麵包送到衛生局處理。

王翠雯說，被指含有蟑螂腳的麵包並不完整，檢視當事人送來的另3個麵包，沒有發現蟑螂腳等異物，因此不能據以處分業者，但仍要求業者要加強注意廚房的環境衛生。

基隆市日前另有1名市民在吃從超商買來的豆乾時，發現豆乾竟然發霉了，隨即依照標示在包裝上的製造廠商電話，打電話去向業者申訴，但電話無人接聽，她依語音指示留下她的聯絡電話要求處理。

這名市民說，留話當晚就接到廠商客服人員的電話，對方一直道歉，讓她的氣消了一半，對方並贈送「大包」的豆乾及其他商品做為補償，她感受得到廠商的誠意，不再追究。

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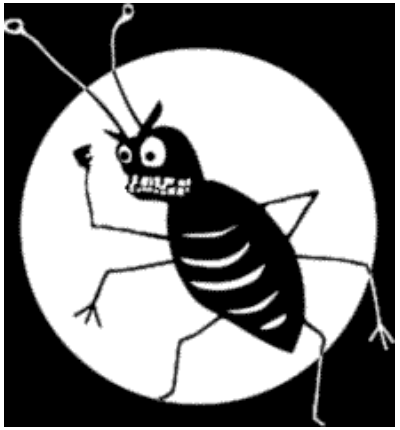

圖一 基隆市1名市民發現買來的麵包中有一截蟑螂的斷腳，昨天送到衛生局請求主持公道。

小蛇棲身玄天上帝神像腳下

【記者謝恩得／梅山報導】

嘉義縣梅山鄉過山村魁聖宮信徒最近發現有條長約1公尺的蛇，棲身在傳說收伏蛇妖的玄天上帝神像腳下。魁聖宮負責人朱瑞豐說，這條蛇可能在農曆3月3日玄天上帝生日時就來這裡。

魁聖宮位於嘉義縣梅山鄉過山村山區，四周都是山林，最近有信眾擦試神桌時，驚見有條長約1公尺的蛇纏繞在神像下方，讓信眾稱奇的是，桌上有5尊神像，小蛇卻選擇玄天上帝神像的腳下棲身。也有村民說最近常下大雨，小蛇可能是來躲雨。民間傳說玄天上帝曾收伏龜、蛇，因此玄天上帝神像都是右腳踩蛇、左腳踩龜。

Apple Daily Vol. 1 Number 1 2005 May 18

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記者邱瑞杰／攝影

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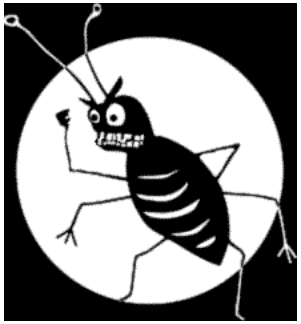

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Format – One-Column Journal

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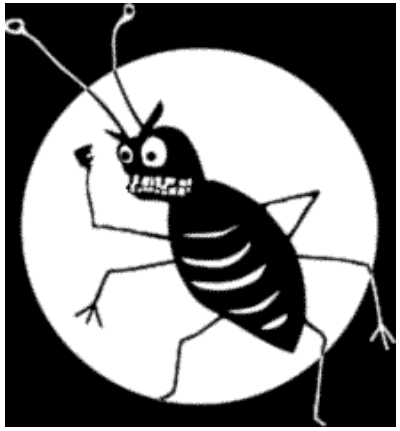

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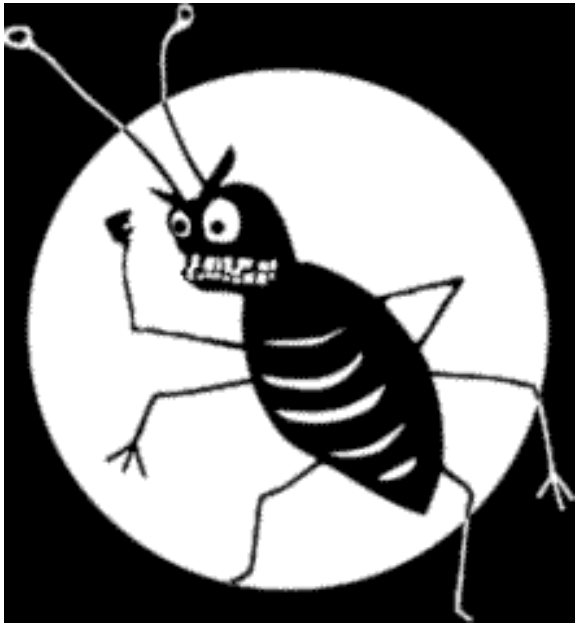

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Format – One-Column Composite

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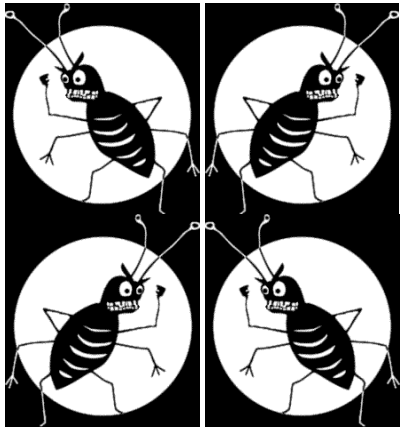

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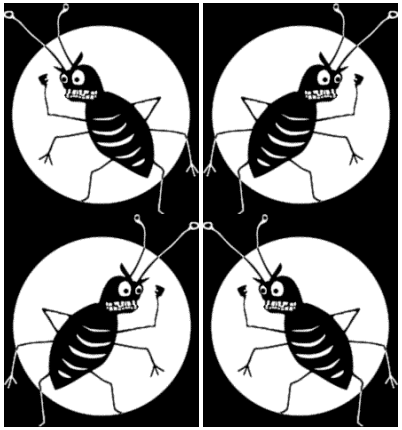

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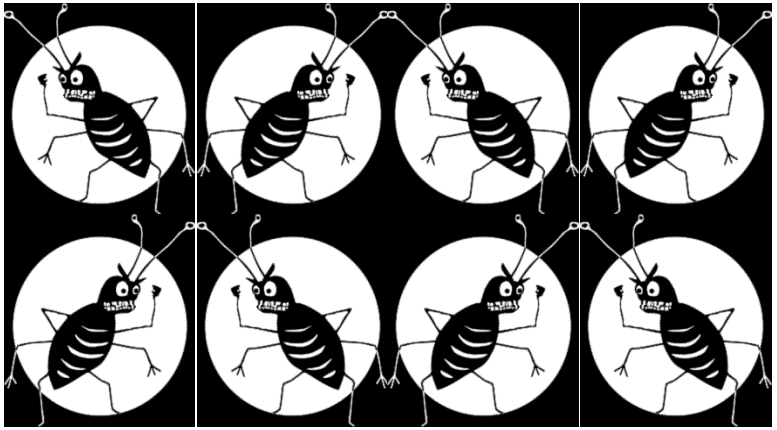

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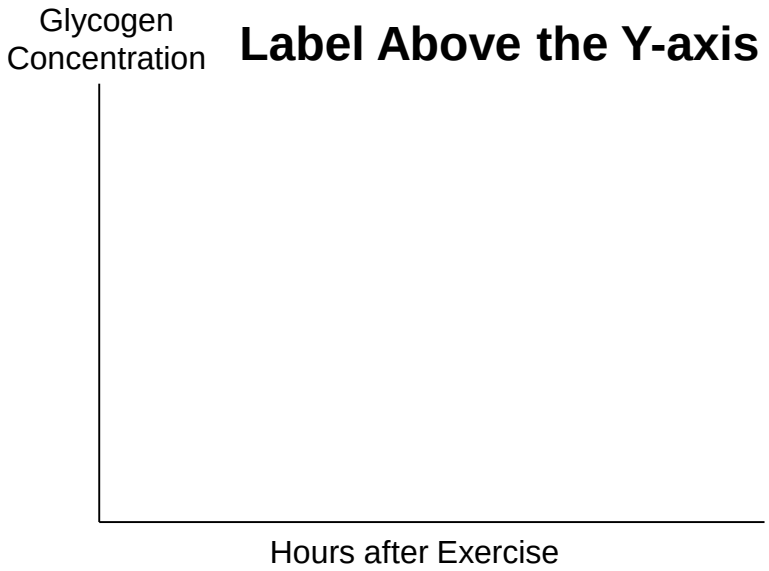
Labels – Label Position

Horizontal or Vertical Labels?

Label Above the Y-axis



Consistency

- Size
- Shape
- Nomenclature
- Symbols

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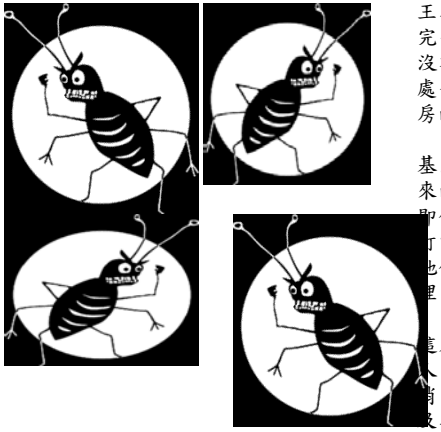

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Final Preparation

- Examine black lines and clean white background
- Reduce the figure on a copy machine to check label legibility and make sure that lines do not drop out
- Check good contrast, sharpness, tonal range, and faithfulness to the original ones
- Indicate where you want figures to appear near each other or with specific text
- Check the digital work printing policy of the journal very carefully
- All figures must be numbered consecutively to conform to the text and caption. Check to make sure numbering is correct.